

Independent Reporter A
Annual Return 2006
Final Report

Halcrow Group Limited

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Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Initial
0	1	Draft report compiled	21/07/06	MNG
1	0	Interim report	21/07/06	DJM
1	1	Final report (hard copy)	17/08/06	DJM
1	2	Final report (internet version)	28/09/06	DJM

1 Executive summary

1.1 Reporter's scrutiny and opinion

Commentary on Annual Return 2006

- 1.1.1 I am pleased to report we have experienced co-operation at all levels within Network Rail which has allowed our audit plan to be largely delivered to programme. Where additional supporting information has been requested by the audit teams it has generally been made available although we have been constrained on occasions by the inability of some information management systems to provide the data required or where data could not be provided within the timeframe of the audit.
- 1.1.2 The figures contained in the Annual Return 2006 indicate that Network Rail has achieved the required regulatory targets, with the exception of Broken Rails (M1) where the target has not been met for the first time since regulatory targets were introduced for this measure. Our view is that the levels of performance apparent in the Annual Return are sustainable and result from positive management action by Network Rail. We caution, however, that the achievable levels of cost efficiency and the forward investment required to maintain or improve performance are not clear; balancing asset performance, risk, investment and costs will be an important function of target-setting for the next Control Period.
- 1.1.3 In assessing whether or not Network Rail has achieved the targets set, we have been directed not to take into consideration the tolerance levels detailed in the Annual Return. Similarly to previous years, we have also not taken into account the confidence grades which have been self-assigned by Network Rail to the measures.
- 1.1.4 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. In some areas this can reduce the effectiveness and value of reporting, particularly where measures are not aligned with Network Rail's management information or priorities. 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. We look forward to working with Network Rail and Office of Rail Regulation to develop the suite of measures and targets for the next Control Period to enhance the value available.
- 1.1.5 In conducting our reporting activity we have identified a number of underlying issues which we believe need to be addressed if the reliability and accuracy of the Annual Return is to be improved. Resolution of these issues would, in many cases, also improve Network Rail's performance and stewardship.

Reporter's Audit Statement

- 1.1.6 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 2006 gives a representative view of performance and whether the data reported by Network Rail is consistent with evidence provided to us at audit.
- 1.1.7 We confirm Network Rail has prepared the Annual Return 2006 in accordance with its regulatory and statutory obligations using procedures prepared by Network Rail and agreed with Office of Rail Regulation.
- 1.1.8 We confirm the Annual Return 2006 was submitted in accordance within the timescale required by Condition 15 of Network Rail's Network Licence.

- 1.1.9 We confirm we have completed audits of the data contained in the Annual Return 2006 relating to the measures contained in the "Form of the 2006 Annual Return" prepared by Network Rail and agreed with 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 2006. 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 2006.
- 1.1.10 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 noted in our report commentaries.



Norman McDowell,
Independent Reporter,
Halcrow Group Limited,
August 2006.

1.2 Overview of the Annual Return 2006

Operational Performance

- 1.2.1 **Performance.** Public Performance Measure (PPM) increased by 2.8% to 86.4%. Total delay minutes attributable to Network Rail reduced by 8.2% to 10.5 million minutes; delay to franchised operators reduced by 10.4% to 1.93 minutes per 100 train km. The number of infrastructure incidents causing delay reduced by 3.6% to 56,460.
- 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 the information. In the last 18 months, Network Rail has significantly reorganised its performance management process and the focus of the outputs. In the Routes we sampled, there was evidence of local procedures, although some had not had a full year of application. We believe operational performance measures should have a reliability grading of B.
- 1.2.4 **Accuracy grade.** Network Rail has the processes in place to monitor the quality of the data input via the TRUST reporting points and has demonstrated how changes are managed. The delay attribution process is carried out competently with different levels of audit in the Routes we sampled. Not for want of trying, the attribution teams do not attribute all incidents correctly, as demonstrated by our sampling and Network Rail's own attribution logs. We believe operational performance should have an accuracy grade of 3.

Passenger Complaints

- 1.2.5 **Performance.** The number of passenger complaints per 100,000 journeys has slightly increased by 0.1% to 75 but is significantly lower than the 2000/01-2002/03 levels.
- 1.2.6 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.7 **Accuracy & Reliability.** Network Rail has no control over the collection of this data, as it is provided by train operators and ORR directly to Network Rail for publication. We have not audited the collection and processing of data for this measure. We therefore do not think it appropriate to assess the reliability or accuracy of the Passenger Complaints measure.

Customer & Supplier Satisfaction

- 1.2.8 **Performance.** Although slightly dissatisfied overall, passenger train operators' and suppliers' perception of Network Rail have both improved this year, whilst that of freight train operators has deteriorated.
- 1.2.9 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.10 **Reliability grade.** We are satisfied that Network Rail has demonstrated to us a statistically-reliable process for conducting the customer and stakeholder surveys. We believe the satisfaction measure should have a reliability grade of A.
- 1.2.11 **Accuracy grade.** We are satisfied that the weighting processes applied to the response rates are appropriate for these types of survey. Given the range of accuracy applied to these surveys, we believe the satisfaction measure should have an accuracy grade of 2.

Joint Performance Improvement Plans (JPIPs)

- 1.2.12 **Performance.** In 2005/06, 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, produced a programme for the annual production of JPIPs and produced JPIPs for twenty-five train operators, incorporating all the franchised passenger train operators and two open-access passenger train operators.
- 1.2.13 **Regulatory target.** There is no regulatory target for this measure.

- 1.2.14 **Reliability grade.** This is the first year Network Rail has reported on progress for this measure; there are no stated targets. The Network Rail Route teams and their train operator colleagues have succeeded in transferring the former LOCs to JPIPs for all franchised companies. The volume of effort involved is not underestimated. The process and procedures both at HQ and Route level are still being refined. Recognising that this is still 'work in progress', we believe the JPP measure should have a reliability grade of B.
- 1.2.15 **Accuracy grade.** The data reported by Network Rail in the Annual Return is accurate – process documentation has been produced, resources allocated, a programme developed and JPIPs produced for twenty-five train operators, incorporating all the franchised passenger train operators and two open-access passenger train operators. In line with the remarks in our audit report, the process is still evolving and the establishment of robust quantitative plans has to be proven over the coming year. We feel that whilst Network Rail is improving its ability to forecast, many local teams themselves are still establishing their capabilities, the robustness of the delivery targets in the JPIPs cannot be given an accuracy grade beyond 3.

Route Utilisation Strategies (RUSs)

- 1.2.16 **Performance.** In 2005/06, Network Rail produced a RUS Manual consisting of a Consultation Guide and Technical Guide, maintained sufficient staff and consultants to develop the RUSs currently in progress, produced a programme for the production of RUSs pending formal submission for ORR approval and made progress on eight of nineteen RUSs.
- 1.2.17 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.18 **Reliability grade.** The requirements of this measure are both qualitative and quantitative. Network Rail has been required to establish organisation and documented processes; significant amounts of work have and are still going into both. The organisation and procedures are being tested in practice and then re-developed from best practice. The effort to create a sophisticated strategy planning process is not underestimated. We believe the RUS measure should have a reliability grade of B, not because of failings in effort but in recognition that the creation of the RUS process and organisation as required by the Licence Condition is still a work in progress.
- 1.2.19 **Accuracy grade.** The data reported by Network Rail in the Annual Return is accurate – a RUS Manual has been produced, resources allocated, a programme developed and eight of nineteen RUS commenced or completed. We believe the accuracy grade for the RUS measure is therefore 1.

Customer Reasonable Requirements (CRRs)

- 1.2.20 **Performance.** A total of 29 CRRs remain at the end of the 2005/06 reporting year; no new CRRs were submitted, 5 were completed; 15 were withdrawn. The downward trend continues this year. Similar to last year, there have been no new CRRs submitted and the number of CRRs has significantly reduced. The number of CRRs now live is only 3% of the number live in 2000/01.
- 1.2.21 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.22 **Reliability & Accuracy.** The low numbers of CRRs that remain cease to have any significant value as a measure of Network Rail's customer-facing activities. We therefore do not think it appropriate to assess the reliability or accuracy of the Customer Reasonable Requirements measure.

Linespeed capability (C1)

- 1.2.23 **Performance.** The net change in reported total kilometres of track compared with last year is a reduction of 1.2%, comprising 6.5km of new line and a net value of 383.5km of track removed due to data cleansing.
- 1.2.24 **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.

- 1.2.25 **Accuracy grade.** A minor error was found in Table 48 of the Annual Return. The variation of 1.2% in the reported total track kilometres was almost entirely due to data cleansing. We believe C1 should have an accuracy grade of 2.

Gauge capability (C2)

- 1.2.26 **Performance.** The reported net change in total kilometres of route is a reduction of 1.9%; this has been caused by data cleansing.
- 1.2.27 **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.
- 1.2.28 **Accuracy grade.** Our sampling found no errors. We were unable to verify the impact of data cleansing on gauge capability; however, our C1 audit found the net variation due to cleansing on the total network kilometres was 1.2%. We believe that measure C2 should have an accuracy grade of 2.

Route availability value (C3)

- 1.2.29 **Performance.** Track in RA10 has increased by 8.6%; track in RA1-6 has shown a roughly equivalent reduction. The net change in reported total kilometres of track is due to 6.5km of new line and (net) 383.5km of track removed due to data cleansing.
- 1.2.30 **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.
- 1.2.31 **Accuracy grade.** Our sampling found no errors. We were unable to verify the impact of data cleansing on RA capability; however, our C1 audit found the net variation due to cleansing on the total network kilometres was 1.2%. We believe that measure C3 should have an accuracy grade of 2.

Electrified track capability (C4)

- 1.2.32 **Performance.** The reported net change in total electrified track kilometres is a 1.1% increase; this variance has been caused by a new section of track opened Haughmead Junction to Larkhall (LRK) and data cleansing.
- 1.2.33 **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.
- 1.2.34 **Accuracy grade.** We found seven misclassification errors in GEOGIS. We believe that C4 should have an accuracy grade of 3.

Mileage

- 1.2.35 **Performance.** Passenger train miles have increased by 2.0%, whilst the freight miles increased by 10.4%. Total train mileage has increased by 2.8% to 302.6 million train miles (excluding empty coaching stock)
- 1.2.36 **Reliability grade (Passenger Train Miles).** 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 Mileage (Passenger Train Miles) should have a reliability grade of B.
- 1.2.37 **Accuracy grade (Passenger Train Miles).** We found uncertainties in the data arising from inclusion of Chiltern Railways services running on LUL infrastructure. We believe that Mileage (Passenger Train Miles) should have an accuracy grade of 3.
- 1.2.38 **Reliability grade (Freight Train Miles).** 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 Mileage (Freight Train Miles) should have a reliability grade of B.

- 1.2.39 **Accuracy grade (Freight Train Miles).** We found the query used to extract data from BIFS gave rise to discrepancies – the data extracted for one year was not equal to the sum of data from the 13 constituent periods. Further, we found significant differences between the freight train miles sourced from BIFS and from PALADIN. We believe that Mileage (Freight Miles) should have an accuracy grade of 3.

Freight Gross Tonne Miles

- 1.2.40 **Performance.** Freight gross tonne miles (GTM) have increased by 6.7% to 30.3 million gross tonne miles.
- 1.2.41 **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 tonne miles should have a reliability grade of B.
- 1.2.42 **Accuracy grade.** We found the query used to extract data from BIFS gave rise to discrepancies – the data extracted for one year was not equal to the sum of data from the 13 constituent periods. We believe freight gross tonne miles should have an accuracy grade of 3.

Bottlenecks

- 1.2.43 **Performance.** Network Rail has reported on the top ten congested locations on the network using the data presented in its annual route strategy publication. This consists of a map of the locations and a brief commentary on the nature of the capacity constraints at each point.
- 1.2.44 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.45 **Reliability & Accuracy.** The allocation of a grade is not appropriate this year.

Number of broken rails (M1)

- 1.2.46 **Performance.** 317 broken rails were reported for 2005/06. This has continued the downward trend of this measure since 2000/01. The result for 2005/06 is a 1.6% improvement on 2004/05.
- 1.2.47 **Regulatory target.** The regulatory target for this measure has not been met.
- 1.2.48 **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, 4-weekly and annual basis. We believe that M1 should have a reliability grade of A.
- 1.2.49 **Accuracy grade.** Two parallel systems are used to identify broken rails for this measure and a reconciliation process is used to increase accuracy. The process would have to misreport four broken rails or more in 2005/06 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)

- 1.2.50 **Performance.** In 2005/06, the number of isolated defects was 20,605, which is 33.1% fewer defects than in 2004/05; the length of continuous rail defects was 2,013,319 yards, which is 16.9% fewer yards of defects than in 2004/05.
- 1.2.51 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.52 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect this measure; however the process for reporting the measure has not been as per the procedure. Data correction has been required at the start of each reporting year for the last five years, including for 2005/06. We believe that M2 should have a reliability grade of B.

- 1.2.53 **Accuracy grade.** We have concerns regarding the level of data correction required at the start of the 2005/06 reporting year. We believe that M2 should have an accuracy grade of 4.

Track geometry (M3 & M5)

- 1.2.54 **Performance – National SDs.** The results for 2005/06 for all twelve national standard deviation (SD) parameters are at the highest level of track geometry since before 2000/01.
- 1.2.55 **Performance – PTG.** The trends for poor track geometry show a continuing improvement for 2005/06 across all routes.
- 1.2.56 **Performance – speed band data.** The speed band results show a decrease for all measures compared with 2004/05, except for 70m Line in the 115-125mph linespeed range. The commentary within the Annual Return explains this increase, by the increase in track km within the linespeed range, mainly down to upgrading of the west coast mainline (WCML).
- 1.2.57 **Performance – L2 exceedances.** This year, all Routes had the lowest level of Level 2 exceedences per track mile for the last five years.
- 1.2.58 **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.
- 1.2.59 **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.
- 1.2.60 **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)

- 1.2.61 **Performance.** There were 867 condition of asset temporary speed restrictions on the network with a total of severity score of 4,285, bettering the target by 8% for the number of sites and by 7% for the severity score.
- 1.2.62 **Regulatory target.** The regulatory targets for this measure have been met.
- 1.2.63 **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 puts the reliability of the process at risk. We believe M4 should continue to have a reliability grade of B.
- 1.2.64 **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)

- 1.2.65 **Performance.** There was a 24% decrease in earthworks failures to 41. Earthworks failures causing train derailment have increased to 2.
- 1.2.66 **Regulatory target.** The regulatory target for this measure has been met.

- 1.2.67 **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.
- 1.2.68 **Accuracy grade.** The process is not sufficiently robust to ensure that the number of reported incidents is within 1%. The process is over-reliant on the national operations log as the sole source of information; if the local track engineer/ manager does not declare track movement is related to an embankment failure at the time of the incident, which is known to occur, then it can be overlooked as a reportable embankment failure. Therefore, we believe that M6 should have an accuracy grade of 2.

Bridge condition (M8)

- 1.2.69 **Performance.** 5,430 under-bridges and over-bridges were surveyed. 79% of bridges are in the top two (out of five) condition grades, 98% are in the top three grades.
- 1.2.70 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.71 **Reliability grade.** The definition for this measure is documented. The process of condition inspections is subjective. The scoring method is entirely based on the ability of the examiner to assess with precision the condition of the structure; however, the competency standard has been withdrawn. We believe the M8 measure should have a reliability grade of B.
- 1.2.72 **Accuracy grade.** We found minor discrepancies in the number of inspections reported in 2005/06 and have concerns regarding the level of SCMI examinations from two, three, four and five years ago which are being reported as new condition grades in 2005/06. We believe the M8 measure should have an accuracy grade of 2.

Signalling failures (M9)

- 1.2.73 **Performance.** There were 23,367 incidents attributed to signalling failures causing more than 10 minutes delay; this is an improvement of 6.3%.
- 1.2.74 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.75 **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; the commentary provided by Network Rail are general remarks rather than the result of analysis of the data reported. We believe that M9 should have a reliability grade of C because the understanding of the measure will be based on the results table and the accompanying commentary.
- 1.2.76 **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)

- 1.2.77 **Performance.** 63% of assets assessed to date using the SICA methodology were in the top two condition grades; 96% were in the top three. 98.8% of interlockings have been assessed; 21 interlockings remain to be assessed.
- 1.2.78 **Regulatory target.** The regulatory target for this measure has been met.

- 1.2.79 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. 2005/06 has seen significant progress and improvement in the assessment and management of condition data; the introduction of SIS has removed a potential source of inaccuracies in collated data. 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.
- 1.2.80 **Accuracy grade.** The assessment process for determining remaining asset life is subjective and a further subjective adjustment factor is introduced for SICA2B, pSICA and pSICA3; however, unwanted variation from this subjectivity is significantly suppressed by categorising the results into the five condition categories. The peer review process by the Headquarters Signalling Principles Engineer provides an independent check on the accuracy of the resulting SICA scores against experience. However, there are still concerns in the migration of historic data to SIS and agreeing the final number of interlockings. We believe that M10 should have an accuracy grade of 3.

Traction power incidents causing train delays (M11 & M12)

- 1.2.81 **Performance – M11.** For 2005/06, the result reported by Network Rail was 49; however, we believe nine incidents were incorrectly excluded from the Annual Return and a further five are subject to query.
- 1.2.82 **Performance – M12.** For 2005/06, the result reported by Network Rail was 6; however, we believe one incident was incorrectly excluded from the Annual Return and a further five are subject to query.
- 1.2.83 **Regulatory target.** The regulatory target for this measure has been met; this will not change pending the queries above.
- 1.2.84 **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.
- 1.2.85 **Accuracy grade (M11).** We found nine incidents which we believe were incorrectly excluded from the Annual Return in comparison with the 49 reported. Further Network Rail has subsequently accepted that two incidents have been caused by an OHLE fault. We believe that M11 should have an accuracy grade of 3.
- 1.2.86 **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 C).

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

- 1.2.87 **Performance.** 84% of assets assessed to date using the ECAP methodology were in the top two (out of five) condition grades; 99% were in the top three.
- 1.2.88 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.89 **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 is subjective. 100% of the assets have now been surveyed. We believe that M13 should have a reliability grade of B.
- 1.2.90 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. However we found a minor error discovered in the calculation of the final scores. We believe that M13 should have an accuracy grade of 2.

Electrification condition – d.c. substations (M14)

- 1.2.91 **Performance.** 86% of assets assessed to date using the ECAP methodology were in the top two (out of five) condition grades; 99% were in the top three.
- 1.2.92 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.93 **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 is subjective. 100% of the assets have now been surveyed. We believe that M14 should have a reliability grade of B.
- 1.2.94 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. We believe that M14 should have an accuracy grade of 2.

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

- 1.2.95 **Performance.** 92% 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.
- 1.2.96 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.97 **Reliability grade.** The definition for this measure is clearly documented. A single documented process has been followed to collect and report this measure. The results are subject to extrapolation. We believe that M15 should have a reliability grade of C
- 1.2.98 **Accuracy grade.** Our sampling found no errors. However, the process of condition assessment is subjective and the results are extrapolated across 78.9% of the asset population which has not yet been assessed. We believe that M15 should have an accuracy grade of 3.

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

- 1.2.99 **Performance.** 80% of assets assessed to date using the ECAP methodology were in the top two (out of five) condition grades; 98% were in the top three.
- 1.2.100 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.101 **Reliability grade.** The definition and procedure for this measure is clearly documented and has been followed this year. The process of condition assessment is subject to extrapolation. We believe that M16 should have a reliability grade of C
- 1.2.102 **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. Further we have been informed that the data reported in the Annual Return for the Kent Area is inaccurate and will need to be corrected. We believe that M16 should have an accuracy grade of 4.

Station condition index (M17)

- 1.2.103 **Performance.** 77% of assets assessed to date using the station condition assessment methodology were in the top two (out of five) condition grades; 99% were in the top three.
- 1.2.104 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.105 **Reliability grade.** The definition for this measure is clearly documented except for the methods used for processing the data into a station and network score, although a consistent approach has been adopted for this. The process for condition assessment is subjective although an attempt has been made to assess the asset condition against measurable criteria. The defined scoring system is non-linear and ensures that averaged scores almost entirely falls in one of three scores. Internal and external audits specified in the procedure have not been undertaken this year, competency checks of the contractors undertaking the surveys have not been undertaken this year; report checking has not been undertaken in some Territories. We believe that M17 should have a reliability grade of B.

- 1.2.106 **Accuracy grade.** We have found a number of discrepancies which we are discussing with Network Rail; however, these are below 1% error. However, we have concerns regarding the subjective nature of this measure and significant concerns regarding its implementation this year. We believe that M17 should have an accuracy grade of 3.

Station facility score (M18)

- 1.2.107 **Performance.** The station facility score has risen steadily over the last four years. There has been a 1.7% increase for the measure this year, driven by a 3.7% increase for Category A stations and a 2.3% increase for Category C stations.
- 1.2.108 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.109 **Reliability grade.** The definition for this measure is clearly documented. The factual score is measured using the established procedure albeit from a much smaller sample of stations than required. We believe that M18 should have a reliability grade of B.
- 1.2.110 **Accuracy grade.** We were unable to undertake a sample audit this year as the Headquarters database was unavailable. Due to the high number of facilities counted (185,609) there would need to be significant error to create a 5% error rate. The process of counting facilities is relatively simple, and compared to other measures, percentage accuracy should be reasonably high; however, the data management processes for this measure are deficient. We believe that M18 should have an accuracy grade of 2.

Light maintenance depot – condition index (M19)

- 1.2.111 **Performance.** 54% of assets assessed to date using the depot condition assessment methodology were in the top two (out of five) condition grades; 91% were in the top three.
- 1.2.112 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.113 **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.
- 1.2.114 **Accuracy grade.** We found a discrepancy in the total number of depots reported under this measure which impacts the results. We found shortcomings in both report checking and Headquarters audit. The restatement of previous years' data without adequate explanation is a cause for concern. We believe M19 should have an accuracy grade of 4.

Network Rail Asset Stewardship Incentive Index (ASII)

- 1.2.115 **Performance.** The ASII for 2005/06 was reported as 0.80, which represents an 11% improvement in the ASII figure. This reflects an improvement in all of the constituent elements of the index, however the factors dominating this improvement are Structures & Earthworks temporary speed restrictions and Electrification failures (incidents >500min delay).
- 1.2.116 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.117 **Reliability grade.** We believe the reliability grade given to the ASII should be a weighted average of all its constituent parts. When the reliability grades are given numeric equivalents (e.g. A=1, B=2 etc.) and these are weighted, the result is 1.7, which equates to a B. We therefore believe the ASII should have a reliability grade of B.
- 1.2.118 Error! Reference source not found.

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

- 1.2.119 **Performance.** The rising trend for non-WCRM rail, sleeper and ballast renewal which was interrupted in 2004/05 has restarted, with a 22% increase in rail renewal volumes, 18.7% increase in ballast renewal volumes and 8.1% increase in sleeper renewal volumes. Non-WCRM S&C renewals have risen by 235% over the last five years and by 6% this year to 369 units.

- 1.2.120 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.121 **Reliability grade.** The definition for this measure is clearly documented. While a single documented process has been followed to collect and report the high level summary data for this measure, we were unable to gain access to audit the process at the individual job level. An audit of WCRM was also undertaken. We believe that the track renewals measures (M20, M21, M22, M25) should have a reliability grade of B.
- 1.2.122 **Accuracy grade.** The data has been reported by the MP&I teams based on the MBR Reports accurately. We were unable to sample the data for cost and volume at an individual job level. An audit of WCRM showed that there were some inaccuracies in reporting of all 4 measures due to the definitions used in the WCRM PCS system. We believe that the track renewals measures (M20, M21, M22, M25) should have an accuracy grade of 2.

Signalling Renewed (M24)

- 1.2.123 **Performance.** We are in discussion with Network Rail regarding the number of signalling equivalent units to be reported this year.
- 1.2.124 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.125 **Reliability grade.** The definition and procedure for this measure is documented; however, we have found the procedure to be open to interpretation where a substantial part of the scheme is comprised of partial renewals. We believe that M24 should have a reliability grade of C.
- 1.2.126 **Accuracy grade.** Calculation of SEUs for full renewals is accurate; however, the application of this measure for partial renewals is subjective. We believe M24 should have an accuracy grade of 4.

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

- 1.2.127 **Performance.** There was a 47% reduction in the Area of bridge deck replacements undertaken and a 23% decrease in the Area of retaining walls renewed. There were significant reductions in the number of renewals for bridge, culvert and earthwork renewals (which met the financial threshold for this measure).
- 1.2.128 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.129 **Reliability grade.** The definitions for these five measures are clearly documented. A single documented process has been followed to collect and report the data for these measures. We believe that the measures M23, M26, M27, M28, and M29 should have a reliability grade of B.
- 1.2.130 **Accuracy grade.** Our samples found the data had been reported accurately. We believe that the measures M23, M26, M27, M28, and M29 should have an accuracy grade of 2.

Safety and Environment Plan

- 1.2.131 **Performance.** Network Rail has not needed to draw upon the full annual allowance for the Safety & Environment Plan for 2005/06, spending £31m against a regulatory allowance of £115m and a Business Plan forecast of £65m. During 2005/6, Network Rail has reported that a total of forty-two enhancements were authorised under the Safety & Environment Plan, with a total value of £17.5m.
- 1.2.132 **Regulatory target.** There is no regulatory target for this measure.
- 1.2.133 **Reliability grade.** There is no definition or procedure for the reporting of this measure in the Annual Return. There is a documented procedure for the initial allocation process, applying industry standard assessment tools for the cost benefit analysis, and thereafter Network Rail's standard documented procedures for authorisation, delivery and monitoring of the investment are used. We believe the Safety & Environment Plan measure should have a reliability grade of A.

- 1.2.134 **Accuracy grade.** We have confirmed the value of allocations from the Safety & Environment Plan budget for 2005/06. The accuracy of reporting actuals for this measure meets the same level of accuracy as Network Rail's financial reporting of other expenditures, as audited in the signed-off Regulatory Accounts. We believe the Safety & Environment Plan measure should have an accuracy grade of 1.

Financial Efficiency: Unit Cost Indices & Composite Rates

- 1.2.135 **Performance.** Reported unit cost indices for track and civils renewals have shown year-on-year improvement since 2003/04, except for plain line track which has slipped back from the 2004/05 position; this latter measure has been impacted by short job-lengths. Composite rates for plain line and S&C renewals have shown year-on-year improvement since 2002/03.
- 1.2.136 **Regulatory target.** The regulatory targets for efficiency savings calculated from these measures shows three of twelve have been met.
- 1.2.137 **Reliability & Accuracy.** As the source data for this measure is the same as for measures M20-23 and M24-M29 and the financial reporting audited as part of the regulatory accounts, we have based the confidence grading on these measures. We believe the unit cost indices and composite rates should have a reliability grade of B2.

Financial Efficiency: Variance Analysis

- 1.2.138 **Performance.** The reported result of financial efficiency savings for core renewals is 18.1% this is an improvement on last year's result of 9%.
- 1.2.139 **Regulatory target.** The regulatory target for this measure has been met.
- 1.2.140 **Reliability grade.** The procedure for this measure is documented. However, the procedure has not been consistently followed this year. We believe that financial efficiency variance analysis should have a reliability grade of B.
- 1.2.141 **Accuracy grade.** The internal audit by Network Rail led to considerable reattribution of variances which impacted the efficiency saving results. It was not possible for all attributions to be assessed during the audits in the detail necessary to achieve accurate results. Our sample found use of incorrect templates, incorrect attribution, and insufficient evidence for some attributions. Many of these issues were retrospectively corrected but we cannot confirm this has not had an adverse effect on the reported results. There is therefore doubt regarding the accuracy of the data. We believe financial efficiency variance analysis should have an accuracy grade 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 2005/06 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	2005/06 Target	2005/06 Result
Operational Performance (NR caused delay (million minutes) & Total delay minutes/100 train km)	B3	≤11.3 ≤2.12	10.5 1.93
Customer & Supplier Satisfaction	A2	n/a	n/a
Joint Performance Process (JPP)	B3	n/a	n/a
Route Utilisation Strategies (RUSs)	B1	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)	B3	n/a	n/a
Mileage	B3	n/a	n/a
Freight Gross Tonne Miles	B3	n/a	n/a
Number of broken rails (M1)	A1	≤300	317
Rail defects (M2)	B4	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	815 4,285
Earthworks Failures (M6)	A2	≤47	41
Bridge condition (M8)	B2	≤2.1	2.0
Signalling failures (M9)	C4	≤28,098	23,367
Signalling asset condition (M10)	B3	≤2.5	2.4
Traction power incidents causing train delays (M11)	B3	≤107	49
Traction power incidents causing train delays (M12)	BX	≤30	6
Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	B2	≤2.1	1.85
Electrification condition – d.c. substations (M14)	B2	≤2.2	1.78
Electrification condition – a.c. traction contact systems (M15)	C3	≤1.9	1.7
Electrification condition – d.c. traction contact system (M16)	C4	≤1.8	1.8
Station condition index (M17)	B3	≤2.25	2.22
Station facility score (M18)	B2	n/a	n/a
Light maintenance depot – condition index (M19)	B4	≤2.63	2.58
Network Rail Asset Stewardship Incentive Index (ASII)	BX	≤0.90	0.80
Track Renewal Volumes (M20, M21, M22, M25)	B2	n/a	n/a
Signalling Renewed (M24)	C4	n/a	n/a
Structures Renewal & Remediation Volumes (M23, M26, M27, M28, M29)	B2	n/a	n/a
Safety and Environment Plan	A1	n/a	n/a
Financial Efficiency: Unit Cost Indices & Composite Rates	B2	n/a	n/a
Financial Efficiency: Variance Analysis	B3	≥15%	18.1%

Figure 1.3.1 Confidence grades targets and results for measures in Annual Return 2006

2 Content

1	Executive summary.....	1
1.1	Reporter’s scrutiny and opinion.....	1
1.2	Overview of the Annual Return 2006.....	3
1.3	Confidence grades and results against targets.....	14
2	Content	15
3	Introduction	17
3.1	Background	17
3.2	This report.....	18
4	Assessment of compliance	19
4.1	Compliance with requirements.....	19
4.2	Regulatory targets	20
4.3	Confidence grades	21
5	Audit report and commentary – Operational performance & Customer reasonable requirements	22
5.1	Operational Performance.....	23
5.2	Passenger Complaints.....	30
5.3	Customer & Supplier Satisfaction.....	33
5.4	Joint Performance Process (JPP)	36
5.5	Route Utilisation Strategies (RUSs)	39
5.6	Customer Reasonable Requirements	43
6	Audit report and commentary – Network capability	46
6.1	Linespeed capability (C1)	47
6.2	Gauge capability (C2).....	49
6.3	Route availability value (C3)	51
6.4	Electrified track capability (C4).....	53
6.5	Mileage	55
6.6	Freight Gross Tonne Miles.....	58
6.7	Bottlenecks.....	60
7	Audit report and commentary – Asset Management	62
7.1	Number of broken rails (M1)	63
7.2	Rail defects (M2)	67
7.3	Track geometry (M3 & M5)	72
7.4	Condition of asset temporary speed restriction sites (M4).....	77
7.5	Earthworks Failures (M6).....	82
7.6	Bridge condition (M8).....	85
7.7	Signalling failures (M9)	90
7.8	Signalling asset condition (M10)	94
7.9	Traction power incidents causing train delays (M11 & M12)	99
7.10	Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	102
7.11	Electrification condition – d.c. substations (M14)	105

7.12	Electrification condition – a.c. traction contact systems (M15)	108
7.13	Electrification condition – d.c. traction contact system (M16)	111
7.14	Station condition index (M17).....	115
7.15	Station facility score (M18).....	120
7.16	Light maintenance depot – condition index (M19)	124
7.17	Network Rail Asset Stewardship Incentive Index (ASII).....	128
8	Audit report and commentary – Activity Volumes	131
8.1	Track Renewal Volumes (M20, M21, M22, M25).....	132
8.2	Signalling Renewed (M24).....	136
8.3	Structures Renewal & Remediation Volumes (M23, M26, M27, M28, M29) ...	139
9	Audit report and commentary – Safety and Environment	142
9.1	Safety and Environment Plan.....	143
10	Audit report and commentary – Expenditure and Efficiency	146
10.1	Financial Efficiency: Unit Cost Indices & Composite Rates.....	147
10.2	Financial Efficiency: Variance Analysis	150
11	Reporter’s scrutiny and opinion	154
11.1	Commentary on Annual Return 2006.....	154
11.2	Reporter’s Audit Statement.....	159
12	Appendix A: Table of figures.....	160
13	Appendix B: Audit meeting schedule	162
14	Appendix C: OFWAT confidence grading system	172
15	Appendix D: Confidence grade trends	174
15.1	Summary of grades	174
15.2	Commentary.....	176
16	Appendix E: Material changes to measures.....	177
16.1	Summary of change	177
16.2	Commentary.....	178
17	Appendix F: Network Rail Monitor (NRM).....	179
17.1	Measures reported in both NRM and Annual Return	179
18	Appendix G: Maintenance Unit Costs.....	180
18.1	Audit of Maintenance Unit Costs.....	180
19	Appendix H: Recommendations	187

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, customer reasonable requirements, 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 two extensions of one year. 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 2006 in respect of the 2005/06 financial year.
- 3.2.2 A programme of audits took place in May, June and July 2006 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 are:
- (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 B 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 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 of the data and evidence requested, except as detailed in our audit report and commentary.
- 4.1.4 As part of the auditing of the Draft Annual Return, nineteen issues were identified and notified to Network Rail. We are awaiting responses on some of these issues.

Audit organisation and preparation

- 4.1.5 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 HQ champions. Generally, the organisation of the audits with HQ, Territory and Area personnel has been good with minor exceptions.
- 4.1.6 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

- 4.1.7 Network Rail's Annual Return 2006 is compliant with ORR's requirements as set out in the "Form of the 2006 Annual Return". However, making this assessment, we have identified the following issues:
- (a) There is an inconsistency in units and the rounding of figures which has impacted the ability to discern trends; this is 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 is subject to change without approval, leading to presentation of data that is not required and loss of data that is required for the purposes of trend analysis.
- 4.1.8 **General recommendation 1.** The inconsistency in units and the rounding of figures, and the constant format changes to the tables in the Annual Return, are impacting the ability to discern trends. We would welcome the opportunity to discuss the form and content of the Annual Return in more detail so that this can be resolved.

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 2005/06 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	01/02 result	02/03 result	03/04 result	04/05 result	05/06 target	05/06 result
Operational Performance						
Total Network Rail caused delay (million minutes)	13.8	14.7	13.7	11.4	≤11.3	10.5
Total delay minutes/100 train kms (franchised passenger operators)	2.75	2.92	2.66	1.96	≤2.12	1.93
Number of broken rails (M1)	535	444	334	322	300	317
Track geometry (M3)						
35mm Top 50%	62.4	61.9	62.4	66.0	62.4	67.9
35mm Top 90%	89.4	88.9	89.2	90.9	89.2	91.8
35mm Top 100%	97.1	97.0	97.0	97.7	97	98.0
35mm Alignment 50%	73.6	74.6	72.7	76.9	72.7	78.8
35mm Alignment 90%	93.1	93.6	92.9	94.1	92.9	94.8
35mm Alignment 100%	96.3	96.7	96.5	97.0	96.5	97.3
70mm Top 50%	61.9	62.2	63.6	67.7	63.6	70.5
70mm Top 90%	92.5	92.1	92.4	93.6	92.4	94.3
70mm Top 100%	95.6	95.2	95.3	96.2	95.3	96.5
70mm Alignment 50%	80.0	80.9	79.5	82.8	79.5	83.2
70mm Alignment 90%	96.0	96.2	95.8	96.9	95.8	97.1
70mm Alignment 100%	97.4	97.5	97.2	98.0	97.2	98.2
Track geometry – level 2 exceedences (M5)	1.35	1.17	1.11	0.91	0.9	0.82
Condition of asset TSRs (M4) (Number & Severity)	N/A	1,308	1,199	942	≤942	815
	N/A	6,169	6,089	4,624	≤4,622	4,285
Earthworks Failures (M6)	N/A	N/A	47	54	≤47	41
Bridge condition (M8)	2.1	2.0	2.0	2.0	≤2.1	2.0
Signalling failures (M9)	27,905	29,013	28,098	24,950	≤28,098	23,367
Signalling asset condition (M10)	2.4	2.4	2.5	2.5	≤2.5	2.4
Traction power incidents causing train delays (M11 & M12)	107	102	79	71	≤107	49
	30	32	33	13	≤30	6
Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	2.1	1.9	1.9	1.87	≤2.1	1.85
Electrification condition – d.c. substations (M14)	2.3	2.1	1.9	1.82	≤2.2	1.78
Electrification condition – a.c. traction contact systems (M15)	1.9	1.8	1.7	1.7	≤1.9	1.7
Electrification condition – d.c. traction contact system (M16)	1.8	1.8	1.8	1.9	≤1.8	1.8
Station condition index (M17)	2.25	2.25	2.25	2.23	≤2.25	2.22
Light maintenance depot – condition index (M19)	3.07	3.04	2.63	2.63	≤2.63	2.58
Network Rail Asset Stewardship Incentive Index (ASII)	N/A	1.20	1.09	0.90	≤0.90	0.80
Financial Efficiency: Variance Analysis	N/A	N/A	N/A	9%	≥15%	18.1%

Figure 4.2.1 Performance against regulatory targets

4.2.3 In 2005/06, 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 2006 Annual Return using the OFWAT grading system. Details of the OFWAT grading system are set out in Appendix C 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	2006 Confidence Grade
Operational Performance	B3
Customer & Supplier Satisfaction	A2
Joint Performance Process (JPP)	B3
Route Utilisation Strategies (RUSs)	B1
Linespeed capability (C1)	B2
Gauge capability (C2)	B2
Route availability value (C3)	B2
Electrified track capability (C4)	B3
Mileage	B3
Freight Gross Tonne Miles	B3
Number of broken rails (M1)	A1
Rail defects (M2)	B4
Track geometry (M3 & M5)	A1
Condition of asset temporary speed restriction sites (M4)	B2
Earthworks Failures (M6)	A2
Bridge condition (M8)	B2
Signalling failures (M9)	C4
Signalling asset condition (M10)	B3
Traction power incidents causing train delays (M11)	B3
Traction power incidents causing train delays (M12)	BX
Electrification condition – a.c. traction feeder stations & track sectioning points (M13)	B2
Electrification condition – d.c. substations (M14)	B2
Electrification condition – a.c. traction contact systems (M15)	C3
Electrification condition – d.c. traction contact system (M16)	C4
Station condition index (M17)	B3
Station facility score (M18)	B2
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)	C4
Structures Renewal & Remediation Volumes (M23, M26, M27, M28, M29)	B2
Safety and Environment Plan	A1
Financial Efficiency: Unit Cost Indices & Composite Rates	B2
Financial Efficiency: Variance Analysis	B3

Figure 4.3.1 Confidence grades for the measures in Annual Return 2006

5 Audit report and commentary – Operational performance & Customer reasonable requirements

5.1 Operational Performance

Audit scope

- 5.1.1 This audit was undertaken to assess the reliability and accuracy of data reported in Network Rail's Annual Return 2006, Section 1, Operational Performance, including Tables 12-40.
- 5.1.2 Operational performance is measured using:
- (a) Public Performance Measure (PPM; ORR KPI 2); this 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); this 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 This audit comprised:
- (a) Interviews with Headquarters and three sample Route Performance Teams: Scotland, LNW and Wessex.
 - (b) Analysis of data from Network Rail's systems TRUST and PALADIN.

Commentary on reported data

Regulatory target

- 5.1.4 There is no regulatory target for PPM. The industry objective for PPM was to achieve at least 85% by 31 March 2005. The result for 2005/06 is 86.4%.
- 5.1.5 ORR set 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 2005/6 was 11.3 million delay minutes. The result for 2005/06 was 10.5 million delay minutes which meets the regulatory target.
 - (b) The regulatory target for delays to franchised operators in 2005/6 was 2.12 minutes per 100 train km. The result for 2005/06 was 1.93 minutes per 100 train km which meets the regulatory target.
- 5.1.6 There is no regulatory target for infrastructure incidents recorded for attribution of delay (ORR KPI 4).

Trend

- 5.1.7 Figure 5.1.1 shows that the delay per 100 train kilometres reduced by 10.4% compared to 2004/05. In percentage terms, the greatest increase was 96.6% for 'External police on line/security alerts' and the greatest decrease was 46.8% for 'Lineside structure defects (inc. weather impact)'. In numeric terms, the greatest increase was 87,356 minutes for 'External fatalities and suicides' and the greatest decrease was 333,218 minutes for 'External weather impact'.
- 5.1.8 Figure 5.1.2 shows that the number of infrastructure incidents causing delay reduced by 3.6% compared to 2004/05. LNE had the greatest reduction (8.7%) of in total number of infrastructure incidents and Kent the highest increase (9.5%). The number of 'Fires on Network Rail Infrastructure' increased by 11.3%; we were not able to find a specific explanation for this.

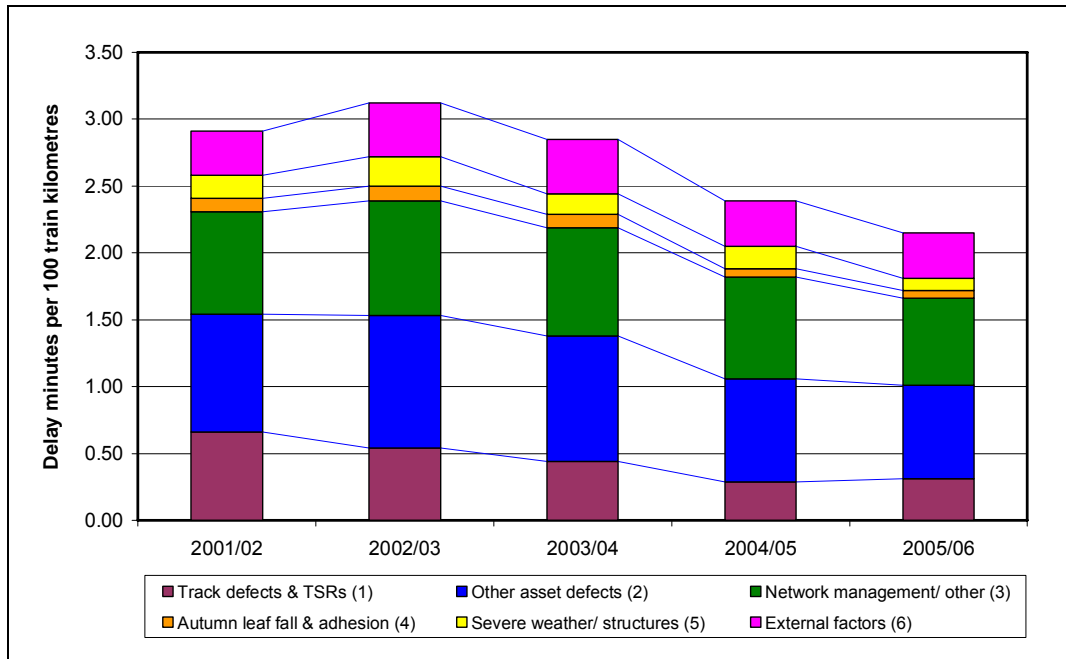


Figure 5.1.1 Delay minutes per 100 train kilometres²

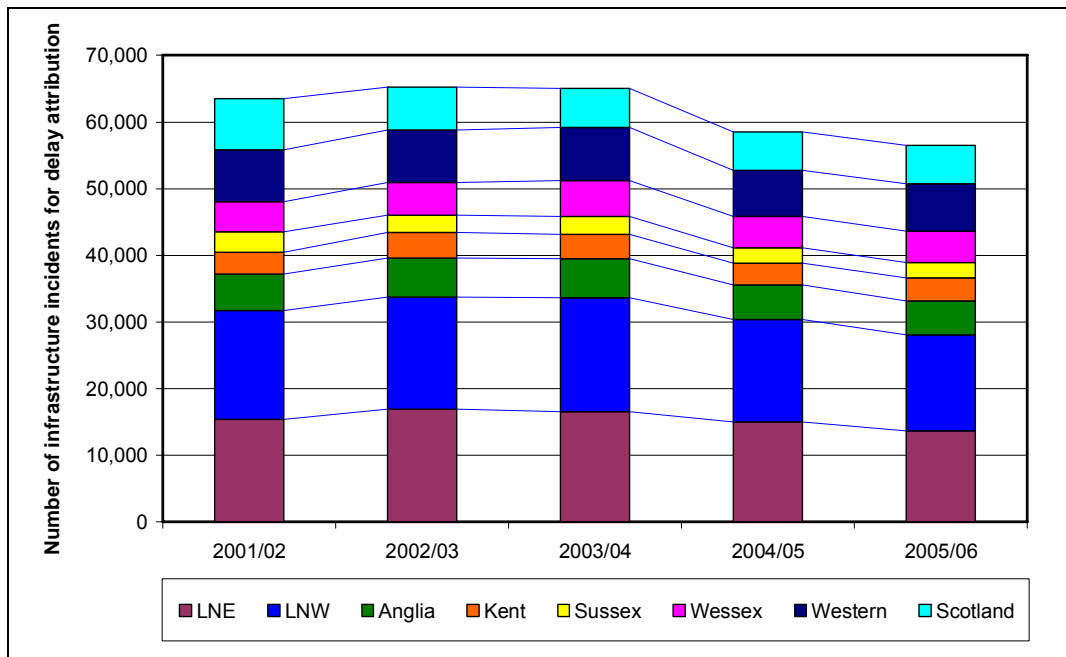


Figure 5.1.2 Number of infrastructure incidents per Route recorded for delay attribution

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.

Audit Findings

Process

- 5.1.9 Delay and incident data for these measures is collected automatically by TRUST (Train Running System) and associated systems or manually by signallers; the cause of this delay is attributed by Network Rail Route performance teams and train operators. The data is managed and reported using a variety of systems including PALADIN.
- 5.1.10 **Data Accuracy.** Network Rail's template organisation has a dedicated data quality specialist for each Route; each of the sample Routes had filled the post. We found evidence in all three sample Routes of processes for maintaining data accuracy for the following issues:
- (a) Attribution. The internal audit of attribution is not standardised; each Route had its own procedures and documentation, but the underlying processes are the same: the senior delay attributor or equivalent shift management role is required to review incidents and check the attributions. Wessex requires all incidents to be reviewed when practical; LNW review the daily top-ten incidents as a minimum; both produce daily logs which include incident reattribution reports. LNW have established a process of joint reviews on data quality which involves all parties: engineers, train operators and performance team. Wessex has a similar process incorporated into their JPIP (Joint Performance Improvement Plan) review process.
 - (b) Monitoring 'missed monitoring points', especially for technical transmission problems and compliance at manual monitoring points. All three routes sampled now have semi-automated reporting systems in place at former "manual" reporting locations; Wessex has no manual reporting locations.
 - (c) Checking berth offsets.
 - (d) Adjusting timings at reporting points to take account of defensive driving techniques and the impact of TPWS on driving.
 - (e) Monitoring reporting points after re-signalling schemes or alterations to track circuits.
- 5.1.11 **Delay attribution (Network Rail/TOC).** There is no evidence of Network Rail attributing delays to train operators without agreement. The sample routes had consistent processes for Level 1 attribution and escalation of unresolved incidents to Level 2. All sample Routes had a process agreed with their train operators for resolving small delay incidents where the effort required was not balanced by its impact upon the performance regime. However, we did note that there were different levels of relationship between Network Rail Routes and their train operators; all Routes stated that relationships had improved. Wessex was particularly keen to stress the benefits removing an adversarial culture and developing good working relationships.
- 5.1.12 **Delay attribution (Network Rail).** All sampled Routes remarked that the functional organisation had produced more positive commitment to the use of delay minutes as a key indicator for prioritising engineering work. This has led to an increase level of challenge by engineers to ensure incidents are attributed correctly. All sampled Routes could cite examples of where the initial attribution had been changed as a result of investigation. Examples, not unexpectedly, came from the situation where the operator had reported the symptom and not the cause (e.g. track circuit failures, point detection failures, signal aspect changes) and subsequent investigation reveals the equipment had functioned correctly, 'failing safe' due to another cause.
- 5.1.13 **Major incident attribution.** All Routes interviewed stated that major incidents tended to attract all surrounding minor delay. All sampled Routes remarked that on days with a major incident the level of background and sub-threshold delay largely disappears; minor operating delays, for example, associated with station overtime are reduced on such days. LNW and Wessex both have internal audit processes in place which are designed to review the attribution to attempt to minimise incorrect attribution to major incidents.

- 5.1.14 **Planned Network Delays and TSRs.** The process, known as P-coding, of allocating a pre-calculated level of delay to a booked TSR, in accordance with the allowance permitted in the Working Timetable (Rules of the Plan) permits the discounting of that delay from trains on the affected Route for the purposes of both delay attribution and PPM. The actual calculation for booked TSRs is a manual process using tables for determining the impact upon different train types. The manager responsible for the initial calculations varied between Routes; however, it was a responsibility of the data quality specialists in each Route to check the calculation. The system has weaknesses, particularly (a) on multiple track sections because of the way the time is allocated to the geographic section and not to the affected line and (b) for adjacent TSRs where the train has insufficient time to accelerate to line speed before braking for the second TSR. The sample Routes reported few issues with P-codes as train operators agree the correct allowance in advance.
- 5.1.15 **Organisation.** For the Routes sampled, the teams were structured according to the Network Rail template. We were impressed by the commitment and enthusiasm of those we met. All had basic processes in place to deliver reliable attribution; some processes were more fully documented than others. There were also differences in the degree of process, which we recognise reflects the different size and complexity each Route covers. Some managers remarked that the current organisation of responsibilities, which is split managerially between the operations and commercial management, was not ideal but had not impacted upon the work to improve both the actual attributions and the overall improvement in performance.
- 5.1.16 **Competency.** Network Rail has established a national training course for delay attribution; it is also available for train operator staff. LNW and Wessex recruit externally for these roles, seeking candidates with a determination to seek and challenge information rather than candidates with specific railway knowledge.
- 5.1.17 **Continuous Improvement.** All three Routes identified that the current challenge is to address the operational causes of delay, which are not decreasing as quickly as infrastructure causes. The evidence from Wessex is that where the timetable has been completely recast to reflect more accurately the current capabilities of both Network Rail's and the train operators' assets, operational delay has reduced – though the (nearly) coterminous geographic coverage of the main train operator and the Route's infrastructure may also aid effective performance delivery.
- 5.1.18 Wessex is now also monitoring all incidents, whether they cause reportable delay or not, recognising all perturbations can have some impact on the running of the network. LNW does not have such a degree of detailed management but it too has in place processes to achieve equivalent improvements. We would expect Scotland to be able to demonstrate similar levels of management control next year.
- 5.1.19 Route Performance Managers meet regularly but there is little evidence of the sharing of best practice; our impression is that there is still a focus on teams resolving their own issues. We would expect to see an increasing amount of convergence in Route management processes during the coming year.

Accuracy of data reported

- 5.1.20 Our initial attempts to analyse the apparent trends were frustrated somewhat by Network Rail's difficulties sourcing raw data from their systems. We recognise this is also an internal frustration to Network Rail managers which intended to be addressed with the development of PSS. Once the data was sourced, we conducted a series of tests, some of which are detailed below.
- 5.1.21 The performance data received from Network Rail was:
- (a) 2,570,799 distinct train rows;
 - (b) 914,053 distinct incidents;
 - (c) 4,657,904 distinct delay rows;

- (d) 52 train running data files received with an average of 2,600,000 rows per file.
- 5.1.22 We limited the train running data for our analysis to the following service groups, selected on the basis of having a mixture of automatic and manual reporting points:
- (a) Kidderminster/ Stourbridge Junction: Service Group HG01;
 - (b) Redditch/ Barnt Green: Service Group HG02;
 - (c) Clitheroe/ Blackburn: Service Group ED08;
 - (d) Preston/ Kirkham & Wesham: Service Group ED03 and ED02;
 - (e) Shaw & Crompton/ Oldham Mumps: Service Group ED08.
- 5.1.23 **Delay attribution (Network Rail/TOC).** We analysed selected delay causation codes which have a higher risk of misattribution between Network Rail and train operator. An example is overhead line incidents, which can be caused by the fixed infrastructure or the train pantograph. For primary delay, we took and analysed all the records that include the following delay codes associated with OLE failures:
- (a) I1 – Overhead Line/Third Rail Defect;
 - (b) I2 – Obstruct on OHL/Third Rail, not result of T&V, weather, thrown/fallen off trains;
 - (c) I3 – AC/DC Trip;
 - (d) I4 – OHL/Third Rail power supply failure/reduction;
 - (e) OF – Blanket speed restriction for extreme heat or high wind.
- 5.1.24 The total number of incidents was 1,532. Of these incidents, we manually analysed 200 selected at random and using the delay description, found that 28 (14%) appeared to be incorrectly attributed to Network Rail as OLE failures.
- 5.1.25 **Delay attribution (Network Rail/Network Rail).** Choosing the categories of Track Circuit Failures (TRUST code IC) and traction power supply / OLE / Third Rail failures (TRUST codes I1, I2, I3, I4, OF) as examples where attribution could be problematic, we compared the TRUST code's implied responsibility with that implied by the FMS equipment type. The results are given in Figure 5.1.3.

Code	Description	TRUST resp.	Records Sampled	Incidents where FMS resp. differs	% with different FMS resp.	FMS resp.	FMS Fault Category (misattributed in TRUST)	FMS Blank	% Blank
IC	Track Circuit Failure/ Axle Counter Failure	S&T	5,545	101	1.8%	E&P/ Track	CCTB; S&C; Traction; Track	240	4.3%
I1	Overhead Line/ Third Rail Defect	E&P	274	48	17.5%	S&T/ Track	Signal Box/ Head failures; Track circuit; Track	74	27.0%
I2	Obstruct on OHL/ 3 rd Rail, not result of T&V, weather, thrown/ fallen off trains	E&P	402	57	14.2%	S&T/ Track	AWS; CCTV; Level Crossing; Point Operating Equip; Route Ind; Signal; TPWS; Track Circuit; Track	61	15.2%
I3	AC/ DC Trip	E&P	82	5	6.1%	S&T/ Track	Point Operating Equip; Signal Head; Track circuit; Track	23	28.0%
I4	OHL/ Third Rail power supply failure/reduction	E&P	58	31	53.4%	S&T/ Track	PT OP Equip; Signal Head; Track circuit; Track	4	6.9%
OF	Blanket speed restriction for extreme heat or high wind	Ops	13	11	84.6%	S&T/ Track	PT OP Equip; Signal Head; Track circuit; Track	2	15.4%

Figure 5.1.3 Analysis of attribution to infrastructure failures (resp.= responsibility)

- 5.1.26 Within Figure 5.1.3, the column 'Records Sampled' gives the number of occurrences, covering about one year, where there exists an FMS record for a TRUST incident in our data set. The column 'Incidents where FMS responsibility differs' shows the number of incidents we detected where the 'TRUST Cause' suggests a different functional responsibility from that recorded in FMS; the performance impact will therefore be misattributed to the responsible manager. We can conclude that track circuit failures are very largely correctly allocated and there is no significant issue of conflict between the S&T and Track elements of this failure. We can further observe that for the lesser-used (and probably therefore lesser-known) cause codes, a significant proportion – around 20% overall – of the responsibilities are inconsistent between TRUST and FMS. These, however, represent a very small proportion of Network Rail delay minutes and are therefore not significant.
- 5.1.27 **Delay code generation.** We analysed a quantity of TRUST train running data to verify that TRUST was correctly generating delay records for increased in lateness between monitoring points of 3 minutes or more. We detected approximately 99,000 minutes of delay not created by TRUST in the course of 11 periods. This is relative to about 28.4 million minutes of delay accounted for by TRUST and therefore represents an insignificant 0.35% of recorded delay.
- 5.1.28 Further examination of the data reveals that most of the missing data occurrences are sporadic and occur at a small number of locations, suggesting that TRUST hardware failures or obscure train routings are responsible for most of them, rather than any systematic problem with TRUST.
- 5.1.29 We also examined the distribution of missing data by Schedule 8 service group. The five worst-affected service groups have over 2% of delay missing – and 3.5% missing in the worst case – whereas a majority of service groups have no missing data at all.
- 5.1.30 **Major incident bias.** For a single Network Rail territory, we selected the top-ten incidents in terms of minutes delay caused during the year for which data was provided, and looked to see if there was any consistent trend towards attribution of reactionary delay on the dates of those incidents when compared with 'average' behaviour.
- 5.1.31 We examined the proportion of reactionary delay that was attributed to Network Rail on each day of the year, and plotted period averages and confidence limits (at the 95% level). We then looked to see if the NR proportion on the dates of the major incidents, excluding the delay allocated to the large incident itself, was skewed towards Network Rail ('NR') or the train operator ('TOC'). The results are shown in Figure 5.1.4.
- 5.1.32 We see that on all the dates of TOC-caused large incidents (diamonds) and on more than half of the NR-caused large incidents (squares), the proportion of NR reactionary delay is below the period average. This suggests that the attribution process tends to generate more reactionary delay for the train operators on dates where there is a large incident, whoever is responsible for that incident. However, the effect is not particularly significant when seen at the Territory-level we have used in this analysis. There may be a case for a more detailed examination of the process at the Route level, where the consequences of any particular large incident have a more direct impact.

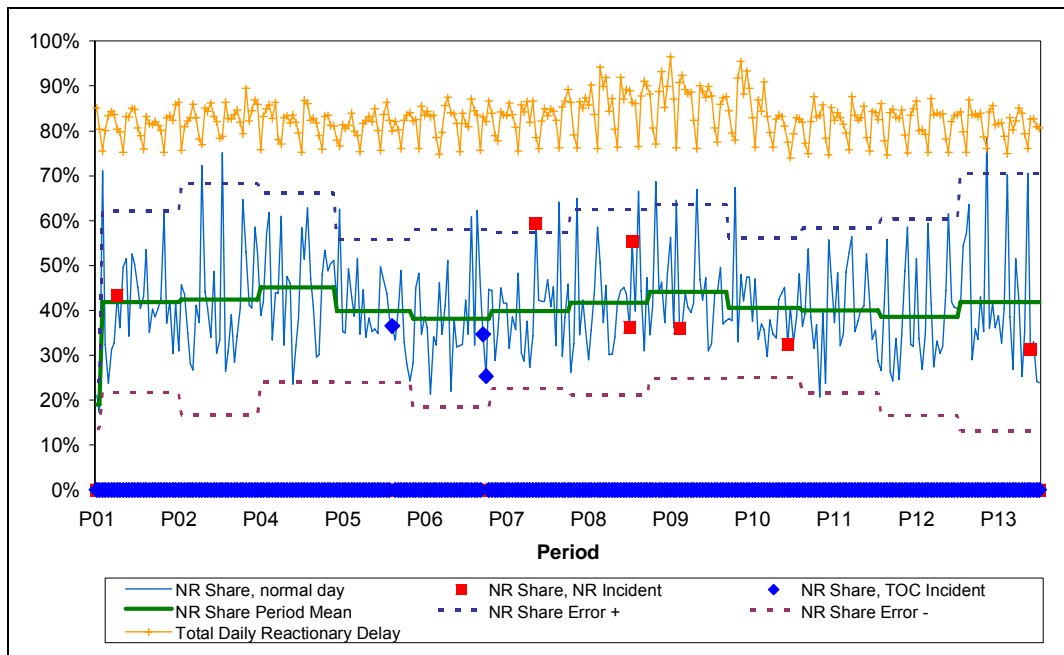


Figure 5.1.4 Split of reactionary delay between NR/TOC to compare 'normal days' with days containing 'major NR incidents' or 'major TOC incidents' (one sample Territory; 2005/06)

Assessment of confidence grade

- 5.1.33 **Reliability grade.** The definition of these measures is documented. Network Rail has established procedures to report and analyse the information. In the last 18 months, Network Rail has significantly reorganised its performance management process and the focus of the outputs. In the Routes we sampled, there was evidence of local procedures, although some had not had a full year of application. We believe operational performance measures should have a reliability grading of B.
- 5.1.34 **Accuracy grade.** Network Rail has the processes in place to monitor the quality of the data input via the TRUST reporting points and has demonstrated how changes are managed. The delay attribution process is carried out competently with different levels of audit in the Routes we sampled. Not for want of trying, the attribution teams do not attribute all incidents correctly, as demonstrated by our sampling and Network Rail's own attribution logs. We believe operational performance should have an accuracy grade of 3.

Audit Statement

- 5.1.35 We have audited the processes and procedures that create the PPM, delay minute and infrastructure failure measures. We can confirm that those procedures are improving in robustness and quality. We recognise that much work is proceeding to improve the quality of the information. The data has been assessed as having a confidence grade of B3. The regulatory targets for these measures have been met.

Recommendations arising

- 5.1.36 **Operational Performance recommendation 1.** There are significant levels of good practice documented in the local procedures of the Routes sampled, we recommend that the documentation is standardised on a national basis.

5.2 Passenger Complaints

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 2006, Section 1, Customer and Supplier Satisfaction, including Table 41.
- 5.2.2 This measure provides an indication of the rate of passenger complaints about the rail industry in comparison with the number of passenger journeys travelled; the rate is calculated as the annual average of the quarterly number of passenger complaints recorded per 100,000 journeys.
- 5.2.3 Complaints are defined as “any expression of dissatisfaction by a customer or potential customer about service delivery or about company or industry policy” made by letter, fax, e-mail, pre-printed form or telephone. This measure is not specific to Network Rail’s performance.
- 5.2.4 This audit was undertaken as a desk study as the data is collected by train operators and is reported by ORR in National Rail Trends; Network Rail does not collect or process the data other than by reporting it in the Annual Return with a commentary.

Commentary on reported data

Regulatory target

- 5.2.5 There is no regulatory target for this measure.

Trend

- 5.2.6 Figure 5.2.1 shows the number of passenger complaints per 100,000 journeys has slightly increased from 71 in 2004/05 to 75 in 2005/06 but is significantly lower than the levels in 2000/01-2002/03, which are presumably due to the impact of the disruption after the Hatfield accident (October 2000) and subsequent recovery period.

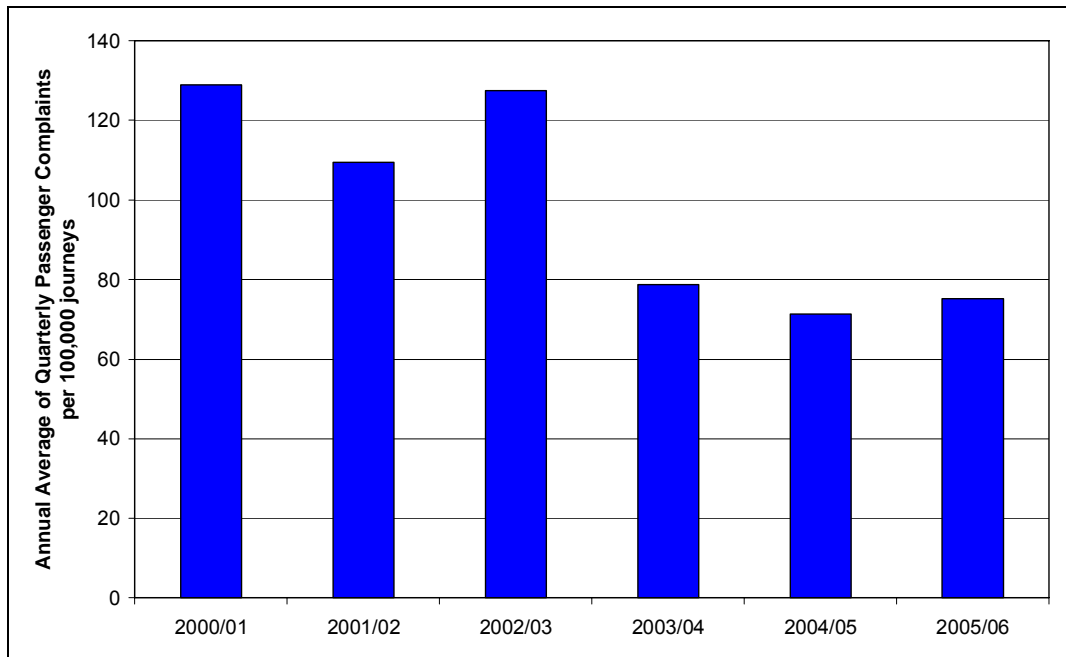


Figure 5.2.1 Unweighted Annual Average of Quarterly Passenger Complaints per 100,000 journeys

Audit Findings

Process

- 5.2.7 The data for this measure is not compiled or collated by Network Rail but is supplied by train operators to ORR; Network Rail extracts the details from the information published on the ORR website in National Rail Trends and takes an unweighted average of the quarterly results to provide an annual result.

Results

- 5.2.8 We have confirmed the numbers reported in the Annual Return reflect those reported in National Rail Trends (Table 2.2a <http://www.rail-reg.gov.uk/upload/pdf/294.pdf>).

Commentary

- 5.2.9 We support the need to monitor complaints from members of the public about the performance of Network Rail and the industry as a whole; however we are concerned at the value of this measure, as:
- (a) The number is expressed as a rate per journey when the definition includes complaints about non-journey items such as national policy and complaints from potential passengers; however, we recognise the alternatives also have flaws;
 - (b) The annual average is unweighted, in that it is an average of the four quarterly figures and does not take account of the different number of passenger journeys undertaken in each quarter;
 - (c) There seems little ownership of the process of reporting the passenger complaints measure within Network Rail; we found no evidence of specific management actions in response to this measure;
 - (d) Network Rail has an established infrastructure for complaints handling, dealing with complaints from railway neighbours which arise as a consequence of Network Rail's business as a neighbour and land owner, which would appear to be useful in judging Network Rail's responsiveness to complaints than the Passenger Complaints measure reported in the Annual Return.
- 5.2.10 In the light of these observations, we remain to be convinced about the appropriateness of requiring Network Rail to report on this measure in the Annual Return, especially as it is already published in National Rail Trends.

Assessment of confidence grade

- 5.2.11 **Accuracy & Reliability.** Network Rail has no control over the collection of this data, as it is provided by train operators and ORR directly to Network Rail for publication. We have not audited the collection and processing of data for this measure. We therefore do not think it appropriate to assess the reliability or accuracy of the Passenger Complaints measure.

Audit Statement

- 5.2.12 Although we have criticisms of the scope of the measure which is too broad (including issues such as national policies), its presentation as a rate per journey which is problematic (given complaints are accepted from potential passengers as well as actual passengers), and the annual average which is an unweighted average of the quarterly scores, the process is documented and established. Network Rail has no control over the collection of this data, as it is provided by train operators and ORR directly to Network Rail for publication. We have not audited the collection and processing of data for this measure. We therefore do not think it appropriate to assess the reliability or accuracy of the Passenger Complaints measure.

Recommendations arising

- 5.2.13 **Complaints recommendation 1.** We recommend that Network Rail and ORR review the industry passenger complaints measure in respect of its calculation method – and perhaps to supplement it with a further measure that is representative of the type of complaints Network Rail receives.

5.3 Customer & Supplier Satisfaction

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 2006, Section 1, Customer and Supplier Satisfaction, including Tables 42-44.
- 5.3.2 These three measures provide indicators of the perceptions of Network Rail by some of its primary stakeholders:
- Customer satisfaction survey of passenger train operators;
 - Customer satisfaction survey of freight train operators;
 - Supplier satisfaction survey.
- 5.3.3 Network Rail measures satisfaction using externally-administered multi-question opinion surveys. One 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?” and the possible responses are:
- I would be critical without being asked (scores -2);
 - I would be critical if someone asked my opinion (scores -1);
 - I would be neutral if someone asked my opinion (scores 0);
 - I would speak highly if someone asked my opinion (scores +1);
 - I think so much that I would speak highly of them without being asked scores +2).
- 5.3.4 The reported data is the average of the scores associated with the respondents’ answers weighted for the population of respondents.
- 5.3.5 This audit was undertaken at Network Rail Headquarters only, reflecting the centralised collection and reporting method of this measure.

Commentary on reported data

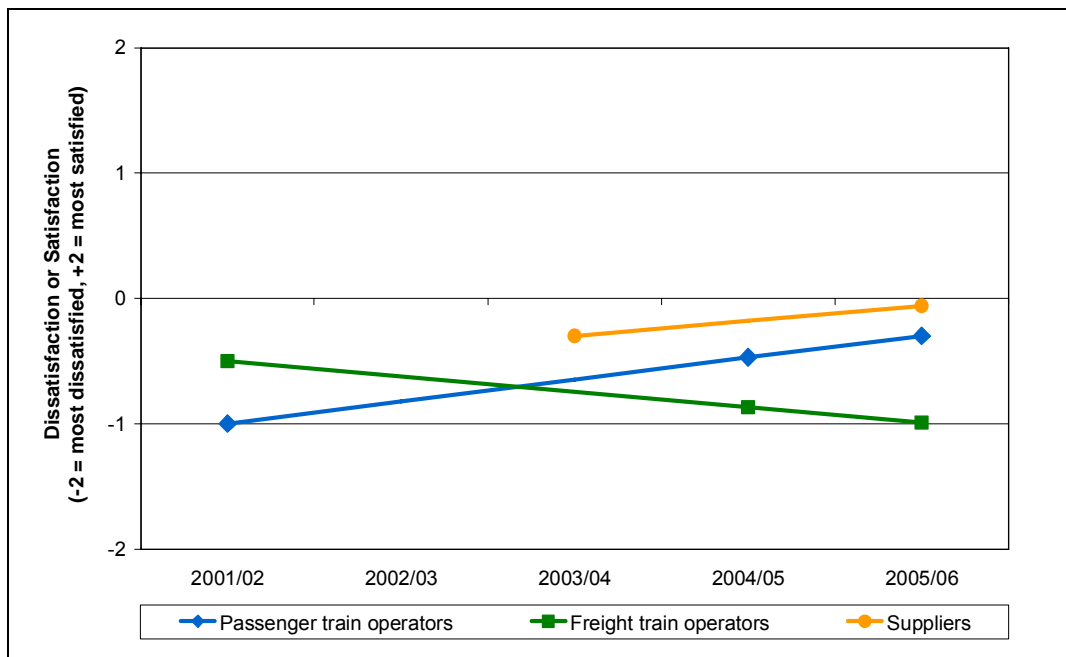


Figure 5.3.1 Customer & Supplier Satisfaction

Regulatory target

- 5.3.6 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".

Trend

- 5.3.7 Figure 5.3.1 shows that, although dissatisfied overall, passenger train operators' and suppliers' perception of Network Rail have both improved this year, whilst that of freight train operators has deteriorated.

Audit Findings*Process*

- 5.3.8 The data which comprises the customer and supplier satisfaction survey is collected by an external opinion polling company, Mori. The selection of the target sample in each group is agreed by Network Rail:
- (a) For passenger and freight train operators, both managers and train drivers are surveyed; managers are written to directly, whilst the train operator issues the surveys to drivers on Network Rail's behalf;
 - (b) Suppliers are surveyed by structured interviewing on a face to face basis; the survey is conducted with the support of the Rail Industry Association.
- 5.3.9 To ensure transparency and encourage genuine feedback, all responses are permitted to be anonymous although respondents are invited to identify themselves if they wish. The opinion polling company keeps track of the response rates and weights the results accordingly.
- 5.3.10 In order to manage the relationship with external providers of opinion polls and other surveys, Network Rail has employed a market research expert at Headquarters to act as 'informed buyer' in this specialised field. Network Rail appears to regard the results of these surveys as a vital indicator of their performance; although the surveys are only conducted annually, the full results are extensively analysed and a senior manager at Headquarters is responsible for following up emerging issues.

Commentary

- 5.3.11 In January 2006, 1,411 paper self-completion questionnaires were mailed to freight and passenger train operators to distribute to their drivers and 350 paper self-completion questionnaires were sent to Managing Directors, Chief Executives and Senior Middle Managers of freight and passenger train operators. The response rate was 26% for drivers and 43% for managers.
- 5.3.12 Fifty suppliers, representing a cross-section by size, volume of business and value to Network Rail, were asked to take part in the face-to-face interviews, thirty-seven of which agreed to take part.
- 5.3.13 We are satisfied that the processes used to determine the samples for the surveys and the weighting of responses are appropriate for this type of surveying and population size.
- 5.3.14 We are interested that the measure identifies only one, albeit important, indicator as the measure of satisfaction. We believe Network Rail should report more details from the multi-question surveys undertaken in order to provide a more complete picture of stakeholder perception.
- 5.3.15 We believe it is anomalous that the survey of train drivers is not reported separately. Drivers represent a significant and specific body of Network Rail's customers who may have a very different view from their managers. This further disaggregation of the survey results might enable the decrease in satisfaction of freight customers to be better understood.

Assessment of confidence grade

- 5.3.16 **Reliability grade.** We are satisfied that Network Rail has demonstrated to us a statistically-reliable process for conducting the customer and stakeholder surveys. We believe the satisfaction measure should have a reliability grade of A.
- 5.3.17 **Accuracy grade.** We are satisfied that the weighting processes applied to the response rates are appropriate for these types of survey. Given the range of accuracy applied to these surveys, we believe the satisfaction measure should have an accuracy grade of 2.

Audit Statement

- 5.3.18 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 A2.

Recommendations arising

- 5.3.19 **Satisfaction recommendation 1.** We recommend Network Rail considers presenting in the Annual Return more details from the multi-question surveys undertaken in order to provide a more complete picture of stakeholder perception.
- 5.3.20 **Satisfaction recommendation 2.** We recommend Network Rail should consider reporting the managers' and drivers' survey results separately.

5.4 Joint Performance Process (JPP)

Audit scope

- 5.4.1 This audit was undertaken to assess the reliability and accuracy of the data and commentary reported in Network Rail's Annual Return 2006, Section 1, Joint Performance Process, including Table 45.
- 5.4.2 This year, the JPP measure is reported in the Annual Return for the first time. 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.
- 5.4.3 The requirement to undertake a Joint Performance Process with train operators, and to create the associated JPIPs, was included in the Network Code (condition LA) on 27 March 2006; all franchised TOCs opted-in from that date. The process is a change from Local Output Commitments (LOCs), which Network Rail produced in previous years to demonstrate to its customers how it intended to improve performance to their benefit.
- 5.4.4 The audit comprised meetings with Headquarters and local teams associated with the production of JPIPs and the transfer from LOCs to JPIPs. Five JPIPs for individual train operators were sampled. The sample was not random but was representative of both service mix and size of activity. We held interviews with Route managers in Network Rail Route commercial & performance teams responsible for ScotRail, First Great Western, Northern, Chiltern Railways and South West Trains.

Commentary on reported data

- 5.4.5 There is no regulatory target for this measure as part of the Annual Return.
- 5.4.6 Notwithstanding this, our summary of the requirements on Network Rail in respect of this measure is:
- (a) Establish governance arrangements for the process, including production of a 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.
- 5.4.7 In 2005/06, 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, produced a programme for the annual production of JPIPs and produced JPIPs for twenty-five train operators, incorporating all the franchised passenger train operators and two open-access passenger train operators.

Audit Findings

- 5.4.8 The Joint Performance Improvement Plan (JPIP) process forms a key part of the Joint Performance Process (JPP) established with the transfer of responsibilities from the Strategic Rail Authority to Network Rail. The JPP process requires Network Rail and the train operators to establish combined plans to deliver coherent performance improvements. Individual JPIPs are produced for each train operator. The primary metric for measuring the success of JPIPs is the Public Performance Measure (PPM); delay minutes are secondary metrics.
- 5.4.9 The process requires both parties to jointly analyse their current performance, identify and agree individual and joint actions in order for each party to deliver agreed targets based on, *inter alia* franchise commitments for train operators and regulatory obligations for Network Rail.
- 5.4.10 Network Rail Headquarters has issued a comprehensive series of documents to the Route teams during the year, including:

- (a) Briefing material associated with changes in the Network Code;
- (b) Detailed JPP process document and template JPIP framework;
- (c) A spreadsheet modelling tool for projecting the impact of delay minutes on PPM, in part inherited from the SRA;
- (d) Papers to advise teams on emerging best practice and as discussion documents addressing emerging issues.

5.4.11 From our sample of Routes, we are able to make the following observations:

- (a) **Organisation.** The commitment across the Route teams to the process was high; all were individually keen to demonstrate how they were contributing to the JPIP process. Route-level activities are robust in terms of team competence and resource. No team expressed concern about its structure. We note that the basic competences are increasingly available within Network Rail and, as exemplified by some team members, drawn as a result of promotional opportunities from train operators. The process does not require specialist skills in its delivery beyond good industry knowledge and standard management competences.
- (b) **Joint Working.** All Route teams stressed the joint nature of the activity and emphasised that working relationships had been positive. Indeed, one Route invited their train operator representative to the audit process as an observer.
- (c) **Process.** The framework for production of the JPIP had been adopted and the modelling tool had been used, but each Route had adapted it to its own circumstances. The different nature of each train operator resulted in minor departures of format for most of the JPIPs sampled; this departure was most often the degree of detail in the individual plans, reflecting the size of the performance challenge for the individual train operator. All Routes had a monitoring and review process in place with, again, differing levels of detail and attention; however all undertook joint Network Rail/ train operator reviews at operational management and director level.
- (d) **Baselines.** There were differences in the detailed approaches to the development of baselines, due to (i) the requirement to forecast a year-end position and (ii) the consideration of how to treat perceived single significant events in any given year (the Gerrards Cross 'tunnel' collapse and the impact of '7/7' on the rail network were cited as examples). It is our view that the primary determinant of the baseline should be the Moving Annual Average; this removes the need for a complex forecasting process and provides an easily available baseline.
- (e) **Targets.** There were differences in the degree to which plans could be considered to stretch the delivery teams. Network Rail is keen to stress that it wants to encourage a positive attitude to target setting which is not inhibited through 'fear of failure'. Unfortunately, this progressive approach to motivation will make it difficult to use the resulting targets to quantitatively demonstrate how JPIPs will deliver the required national target. A more consistent approach is likely to be needed.

5.4.12 Network Rail has established a JPIP Delivery Monitor which reports performance indicators on a twice-a-year basis. Network Rail intends to increase the frequency of this report as part of an improved process for monitoring and challenging delivery. As a result of this JPIP Delivery Monitor, we expect to see quantitative reports in future Annual Returns on:

- (a) The extent that planned activity is expected to impact delay minutes and PPM;
- (b) The success of planned activity in reducing the delay minutes and improving PPM.

- 5.4.13 The JPIP process is evolving. We are interested to observe the degree to which the JPIP process is moving from being a stand-alone activity to becoming a key driver for all performance improvement activity; the JPIPs for South West Train and Chiltern Railways were strong examples of the latter. All Network Rail Routes interviewed had, or were establishing, a hierarchy of internal meetings with their Area production and engineering colleagues to review and monitor JPIP implementation progress and emerging issues.
- 5.4.14 It is our view that the JPIP process is accelerating the establishment of mature non-adversarial working relationships which has sometimes been lacking in the industry. The HQ procedure has ensured a good degree of commonality for the outputs of the joint Network Rail and train operator teams who are developing the JPIPs. This commonality is necessary if the individual plans are to be reliably combined to demonstrate achievement of a national target.

Assessment of confidence grade

- 5.4.15 **Reliability grade.** This is the first year Network Rail has reported on progress for this measure; there are no stated targets. The Network Rail Route teams and their train operator colleagues have succeeded in transferring the former LOCs to JPIPs for all franchised companies. The volume of effort involved is not underestimated. The process and procedures both at HQ and Route level are still being refined. Recognising that this is still 'work in progress', we believe the JPP measure should have a reliability grade of B.
- 5.4.16 **Accuracy grade.** The data reported by Network Rail in the Annual Return is accurate – process documentation has been produced, resources allocated, a programme developed and JPIPs produced for twenty-five train operators, incorporating all the franchised passenger train operators and two open-access passenger train operators. In line with the remarks in our audit report, the process is still evolving and the establishment of robust quantitative plans has to be proven over the coming year. We feel that whilst Network Rail is improving its ability to forecast, many local teams themselves are still establishing their capabilities, the robustness of the delivery targets in the JPIPs cannot be given an accuracy grade beyond 3.

Audit Statement

- 5.4.17 We have audited the Network Rail JPP process against the requirements set out in the Network Code and against their own procedures. We confirm that the basic process is in place and a high degree of commitment to the joint Network Rail/ train operator element of the activity was found. We recognise that the current Annual Return reflects a year of 'work in progress' and the robustness in delivery of individual JPIPs have yet to be demonstrated. We also recognise that work is continuing to establish the process, however as the activity is in its early stages we assess the confidence grade as B3.

Recommendations arising

- 5.4.18 **JPIP recommendation 1.** We recommend the development of a more robust challenge process for standard and stretch targets, in order to provide a better basis for comparison with national targets.
- 5.4.19 **JPIP recommendation 2.** We recommend the use of moving annual averages (MAA) for establishing JPIP performance baselines.
- 5.4.20 **JPIP recommendation 3.** We recommend discussion between ORR and Network Rail to develop quantitative reporting in the Annual Return for the level of planned and delivered changes to delay minutes and PPM from JPIPs/JPP.

5.5 Route Utilisation Strategies (RUSs)

Audit scope

- 5.5.1 This audit was undertaken to assess the reliability and accuracy of the data and commentary reported in Network Rail's Annual Return 2006, Section 1, Route Utilisations Strategies (RUSs).
- 5.5.2 This measure is reported in the Annual Return for the first time this year. The measure reports progress on the production and update of Route Utilisation Strategies not their content.
- 5.5.3 Network Rail is required to produce RUSs as a condition of its network licence (Condition 7 para 3A.1). A RUS is a documented strategy in compliance with Network Rail's Licence Condition 7 to promote "the effective and efficient use and development of the capacity available, consistent with funding that is, or is reasonably likely to become available, during the period of the route utilisation strategy and the licence holder's performance of the duty."
- 5.5.4 Office of Rail Regulation has produced a set of guidelines on Route Utilisation Strategies. These guidelines set out the purpose of a RUS, how it should be developed including the principal processes required, which we summarise as follows:
- (a) Determination of existing capacity;
 - (b) Establishment of customer demand requirements;
 - (c) Engagement with stakeholders and funders;
 - (d) Appraisal of options;
 - (e) Detailed review by the ORR prior to final approval.
- 5.5.5 The audit comprised meetings with Headquarters and local teams associated with the production of RUSs. A sample of three local teams was interviewed, responsible for Scotland, the North West, Cross-London and South West Main Line. The sample was not random but was representative of both different stages of progress and different types of RUS.

Commentary on reported data

- 5.5.6 There is no regulatory target for this measure as part of the Annual Return.
- 5.5.7 Notwithstanding this, our summary of the requirements on Network Rail in respect of this measure is:
- (a) Establish governance arrangements for the process, including production of a process/ procedural documentation;
 - (b) Maintenance of sufficient resources to develop RUSs;
 - (c) Production of a programme for the production of RUSs;
 - (d) Production of the RUSs to meet the programme.
- 5.5.8 In 2005/06, Network Rail has produced a RUS Manual consisting of a Consultation Guide and Technical Guide, maintained sufficient staff and consultants to develop the RUSs in progress, produced a programme for the production of RUSs pending formal submission for ORR approval and made progress on eight of nineteen RUSs. This progress is shown in Figure 5.5.1.

RUS	Planned Completion Date	Progress
Cross London	October/November 2006	Compiling Final Strategy
Cumbria	April/May 2008	Not Started
East Coast Main Line	April/May 2007	Baselining
East Midlands	January/February 2009	Not Started
Freight	April/May 2007	Gap Analysis
Great Western	August/September 2009	Not Started
Greater Anglia	August/September 2007	Not Started
Kent	September/October 2008	Not Started
Mersey Rail	January/February 2009	Not Started
Network	April/May 2007	Not Started
North West	April/May 2007	Forecasting
Scotland	March/April 2007	Gap Analysis
South London	December 2007/January 2008	Not Started
South Midlands	January/February 2009	Not Started
South West Main Line	May 2006	Completed, awaiting Establishment
Sussex	August/September 2009	Not Started
Wales	April/May 2008	Not Started
West Coast Main Line	January/February 2009	Not Started
Yorkshire and Humber	December 2007/January 2008	Scope Discussion

Figure 5.5.1 Progress in developing Route Utilisation Strategies at year end 2005/06

Audit Findings

- 5.5.9 **Organisation.** The RUS process commenced under the former Strategic Rail Authority, Network Rail inherited the duty under the Railways Act 2005. At that point in time Network Rail had no structure for the development of RUSs, in the past year this organisation has been created.
- 5.5.10 The process is under the management of Director Planning & Regulation:
- (a) The Head of Route Planning and a Headquarters team lead the process and provide extensive support to the out-based teams using their specialist competences in analysis and consultation.
 - (b) Out-based teams managed by a Route Planning Manager are responsible for inter alia (i) developing the base rail information, (ii) developing options, (iii) managing and delivering the consultation process with stakeholders.
- 5.5.11 For our sample, the Network Rail teams were unable to supply all of the specialist skills required for all the processes; this has required the use of external consultants or recruitment and development of in-house expertise:
- (a) External consultants are being used to supplement in-house skills, particularly in the area of demand forecasting. The challenge for both the Headquarters and Route teams is to become informed clients in the use of consultants for these processes. For our sample, the management of consultants caused initial delays in reaching the demand assessment milestones, through either the need to rework or to clarify understandings for outputs.
 - (b) The appraisal process has required the recruitment and development of the appropriate in-house expertise; this is being addressed by the creation of a central (Headquarters) group of specialists.

- 5.5.12 **RUS Process.** Network Rail has produced a RUS Manual as required by the Licence Condition; it is a 'work in progress'. We would expect it to become more aligned with other business process manuals as the development of further RUSs proceeds and best practice examples become standard practice. The document is valuable as a tool to inform stakeholders of the details of the process, particularly in the open way it discusses the strengths and weaknesses of particular data sources; to this extent a decision may be required at some stage in the near future as to which audience it is being targeted: internal route planning teams or external stakeholders.
- 5.5.13 **Integration with other Network Rail Processes.** We see it is particularly important that Network Rail ensures the RUS process is incorporated as a key part of the business planning process and that each RUS has a mechanism incorporated to ensure it remains a 'live' document after production. All existing documentation implies that the RUS is a one-off process with no firm commitment to an updating process.
- 5.5.14 **Managing Consultations.** We note that all Route teams remarked upon the complexity (and time consuming nature) of conducting the appropriate consultations; all maintain a process of issue tracking and have a regular meeting structure to ensure continued involvement. We also note that the actual approach used, particularly with external stakeholders and funders, has to be dictated by local (geographic and political) considerations rather than a standard format/ process. We also note the importance of individual team members, with the right skill set in both industry knowledge and interpersonal skills to conduct these exercises effectively.
- 5.5.15 **Maintaining, updating and using RUSs.** We are interested in understanding how Network Rail will both continue to maintain existing RUSs and develop those still outstanding. We remark earlier that the current teams involved appear to work effectively together; we evidence this through the number of unprompted remarks about the roles and contributions made across local teams and from Headquarters. The teams we met displayed a wide range of industry knowledge and mix of competences which appear as essential to the effective delivery of a RUS, but it is also evident that the skill mix is still being developed. We are concerned as to how an adequate level of resource can be maintained, rather than created, as the number of RUSs to be maintained increases. We perceive a current dilemma facing Network Rail for the next phase of RUS production in the allocation of people: those with the process knowledge to lead also now have the full width of 'local knowledge' to continue the development of the existing RUSs into leading the business planning processes for their route.
- 5.5.16 **Results.** The establishment of strategic forecasts is not an exact science; we are satisfied the Network Rail is taking all practical steps to ensure professionalism in its forecasting and appraisal techniques; it is however, as with reliability, still developing that professionalism. It has only completed one RUS and we have no evidence of the degree of formal acceptance or otherwise by stakeholders (beyond the approval of the ORR).
- 5.5.17 **Reporting in Annual Return.** We are pleased to note that there has been no attempt to produce a single capacity utilisation index figure and any such attempt should be resisted. We note that the team recognises the importance of presenting options through normal business investment criteria. However, we would encourage Network Rail to report in the Annual Return the year-end position for each RUS against the milestones in its delivery programme.

Assessment of confidence grade

- 5.5.18 **Reliability grade.** The requirements of this measure are both qualitative and quantitative. Network Rail has been required to establish organisation and documented processes; significant amounts of work have and are still going into both. The organisation and procedures are being tested in practice and then re-developed from best practice. The effort to create a sophisticated strategy planning process is not underestimated. We believe the RUS measure should have a reliability grade of B, not because of failings in effort but in recognition that the creation of the RUS process and organisation as required by the Licence Condition is still a work in progress.

- 5.5.19 **Accuracy grade.** The data reported by Network Rail in the Annual Return is accurate – a RUS Manual has been produced, resources allocated, a programme developed and eight of nineteen RUS commenced or completed. We believe the accuracy grade for the RUS measure is therefore 1.

Audit Statement

- 5.5.20 We have audited the process supporting the creation of Route Utilisation Strategies in accordance with Network Rail's Licence and the ORR's guidelines for the development of RUSs. We can confirm that Network Rail has a programme in place and the process conforms to the guidelines. A manual as required is also in existence albeit still a 'work in progress'. The statements made in the Annual Return reflect our findings of the current situation. We recognise the significant effort being made to create high quality RUSs, however as the process is still in its early stages we assess the reliability and accuracy as B1.

Recommendations arising

- 5.5.21 **RUS recommendation 1.** We recommend that the Technical Guide include reference to project management processes.
- 5.5.22 **RUS recommendation 2.** We recommend that Network Rail sets out how the RUS process will be internalised into the Route development and business planning processes to ensure it does not become a stand-alone exercise. The Business Planning Criteria might be an appropriate vehicle for this.

5.6 Customer Reasonable Requirements

Audit scope

- 5.6.1 This audit was undertaken to assess the reliability and accuracy of the data and commentary reported in Network Rail's Annual Return 2005/6, Section 8, Customer Reasonable Requirements including Table 173-174.
- 5.6.2 The Customer Reasonable Requirements (CRR) measure records the progress of Network Rail in responding to requests for improvements or enhancements agreed with customers and designated a customer reasonable requirement in accordance with Network Licence Condition 7.
- 5.6.3 The audit was undertaken at Headquarters and with the responsible local managers where there are significant CRRs remaining: Freight, Scotland (SPT), Eurostar and South West Trains.

Commentary on reported data

Regulatory target

- 5.6.4 There is no regulatory target for CRRs.

Trend

- 5.6.5 The Annual Return reports that a total of 29 CRRs remain at the end of the 2005/06 reporting year; no new CRRs were submitted, 5 were completed; 15 were withdrawn. Figure 5.6.1 and Figure 5.6.2 show the trend from 2000/01 to 2005/06.

	2000/1	2001/2	2002/3	2003/4	2004/5	2005/6
CRRs submitted	388	70	44	22	0	0
CRRs at year end	994	403	161	112	52	29

Figure 5.6.1 Customer Reasonable Requirements

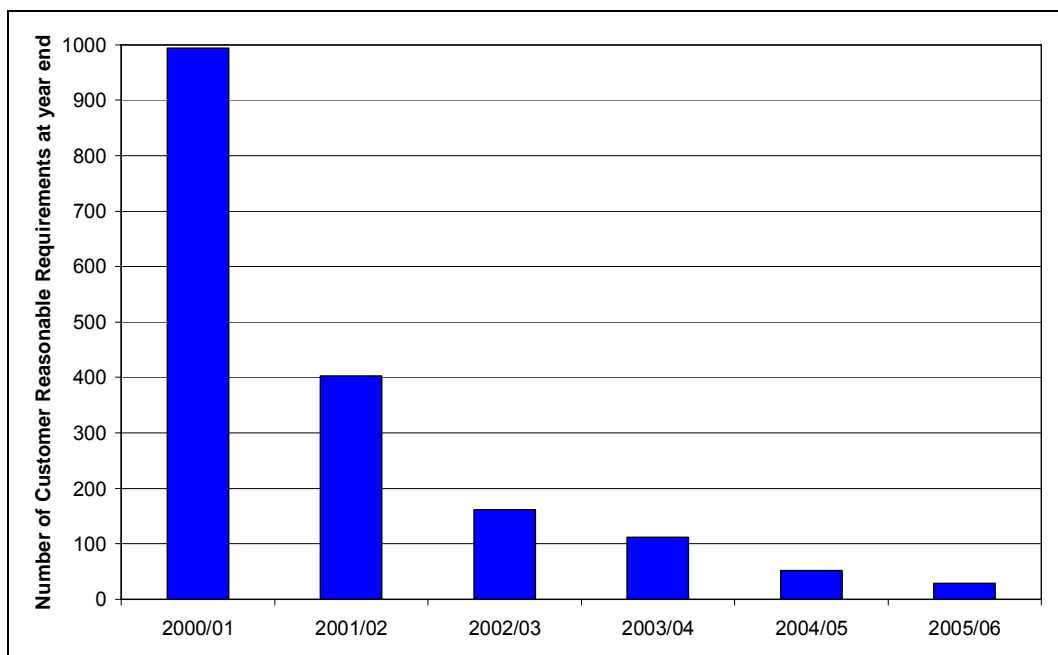


Figure 5.6.2 Number of Customer Reasonable Requirements live at year end

- 5.6.6 The downward trend continues this year. Similar to last year, there have been no new CRRs submitted and the number of CRRs has significantly reduced. The number of CRRs now live is only 3% of the number live in 2000/01.

Audit Findings

Process

- 5.6.7 Network Rail now only monitors progress on CRRs on an annual basis.
- 5.6.8 Initially, CRRs were created to formalise the relationship between the then Railtrack and its customers to deliver enhancement projects and performance improvements. CRRs were the means by which Railtrack ensured it was able to fulfil its duties under Licence Condition 7, to comply with all reasonable requests from customers to undertake (predominantly enhancement) work on the network. To test reasonableness, a project had to pass the 'SMART+f' test which is documented in the Network Rail Commercial Manual; this document also sets out the supporting procedures and responsibilities.
- 5.6.9 **Enhancements.** It is now apparent that as the commercial relationships mature between Network Rail and its customers the function of the CRR as a means to manage enhancements is being overtaken by more conventional commercial contractual arrangements. Network Rail has a number of templated contracts for third party enhancements, which are set out on its website. We note there is significant project activity taking place under these and other contractual arrangements for third parties.
- 5.6.10 **Performance Improvements.** Many early CRRs were directly related to performance improvement, these have been largely replaced, initially through Local Output Commitments (LOC) and now through the Joint Performance Improvement Plans (JPIP) which have been formally incorporated into the Network Code for franchised train operators. Network Rail expect to continue the LOC process with non-franchised train operators for performance enhancements, although there will be a convergence of management process with that used for JPIPs.
- 5.6.11 The consequence is CRRs will continue to have a minor place (if any) in the development and implementation of both performance and enhancement projects. CRRs certainly do not represent a good measure of the activity of Network Rail on behalf of its customers.
- 5.6.12 There is therefore a need to identify a suitable measure that will enable Network Rail to demonstrate its responsiveness to customers; given JPIPs cover the performance improvement works, such a measure should focus on the number, value and type of third-party project works performed under conventional contractual processes for Dependent Persons which might earlier have been categorised as CRRs.

Results

- 5.6.13 Our interviews confirmed the following:
- (a) The CRRs for EWS have now either been withdrawn or are being progressed through other contractual processes, with the exception of one. This remaining CRR, which is partially complete, refers to a range of possible further enhancements to the West Highland Line. It is retained whilst both parties seek clarification of the need for further works.
 - (b) SPTe is in correspondence with Network Rail regarding the continued need to use the CRR mechanism to progress schemes as other specific contractual methods are now available.
 - (c) Network Rail and Eurostar are in discussion regarding developing a JPIP and other commercial initiatives which will either absorb the remaining CRRs or result in their withdrawal.
 - (d) South West Trains has three remaining CRRs; these are all physically complete and in the final stages of closure; Wessex Route confirmed these were significant schemes commenced under previous enhancement contractual formats. Further projects are being progressed for South West Trains using the current contractual

formats. Network Rail's Wessex Route local managers confirmed that in practice new projects and the remaining CRRs are managed through the same process.

- (e) The ATOC CRR has been recorded for the last three Annual Returns; its continued existence and purpose is questionable.

Assessment of confidence grade

- 5.6.14 **Reliability & Accuracy.** The low numbers of CRRs that remain cease to have any significant value as a measure of Network Rail's customer-facing activities. We therefore do not think it appropriate to assess the reliability or accuracy of the Customer Reasonable Requirements measure.

Audit Statement

- 5.6.15 We have examined the current situation with CRRs within Network Rail. We note Network Rail has reduced the frequency of monitoring CRRs and is more focused upon other commercially-based contractual processes for deliver of enhancements and performance delivery through the JPIP process. We believe that CRRs are no longer a relevant indicator of activity. We therefore do not think it appropriate to assess the reliability or accuracy of the Customer Reasonable Requirements measure.

Recommendations arising

- 5.6.16 **CRR recommendation 1.** We recommend that CRRs cease to be a specific measure reported within the Annual Return.
- 5.6.17 **CRR recommendation 2.** We recommend Network Rail and ORR seek to develop a more meaningful measure of customer-facing project activity; such a measure should focus on the number, value and type of third-party project works performed under conventional contractual processes for Dependent Persons, which might earlier have been categorised as CRRs.

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 2006, Section 2, Linespeed capability (C1), including Tables 46-49.
- 6.1.2 The measure reports the length of running track in kilometres in the following speed bands:
- Up to 35 miles per hour;
 - 40-75 miles per hour;
 - 80-105 miles per hour;
 - 110-125 miles per hour;
 - 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.

Commentary on reported data

Regulatory target

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

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	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Variance
<35	3,603	4,427	5,289	5,570	4,163	3,821	-8.2%
40-75	17,214	17,462	16,978	16,585	16,927	16,895	-0.2%
80-105	7,476	7,724	7,106	6,994	7,650	7,482	-2.2%
110-125	2,553	2,359	2,393	2,415	2,741	2,907	6.1%
125+	-	-	-	-	-	-	-
Total	30,846	31,972	31,766	31,564	31,482	31,105	-1.2%

Figure 6.1.1 Linespeed capability (speed band in mph, capability p.a. reported in km) (C1)

- 6.1.7 The net change in reported total kilometres of track compared with last year is a reduction of 1.2%, comprising 6.5km of new line and a net value of 383.5km of track removed due to data cleansing.
- 6.1.8 In addition to the new line, the Annual Return 2003/04 lists 58 linespeed changes:
- 40 linespeed increases totalling 192.7km of track;
 - 18 linespeed decreases totalling 10.6km of track.

Audit Findings

Process

- 6.1.9 The process for reporting the network capability measures has not changed from the 2004/05 reporting year. Linespeed data in GEOGIS is updated regularly by the MP&I, 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) 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.
 - (b) 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. However, we found the track type for ELR WHC1 (South East Territory) is incorrectly given as 2110 in Table 48 of the Annual Return. GEOGIS shows it as 3100 (bi-directional track).
 - (c) 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.** A minor error was found in Table 48 of the Annual Return. The variation of 1.2% in the reported total track kilometres was almost entirely due to data cleansing. 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 2006 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 1.2% 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

- 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.

6.2 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 2006, Section 2, Gauge capability (C2), including Tables 50-51.
- 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 5 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 in Network Rail Headquarters.

Commentary on reported data

Regulatory target

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

Trend

- 6.2.6 Figure 6.2.1 shows the reported net change in the total kilometres of route compared with last year is a reduction of 1.9%. The extent of W10 capability increased by 17% in the year.

Gauge	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Variance
W6			5,379	5,223	4,955	4,771	-3.7%
W6 & W7			1,632	2,284	2,794	2,741	-1.9%
W8			7,126	6,340	5,648	5,504	-2.5%
W9			2,370	2,483	1,714	1,615	-5.8%
W10 & W6		Data not reported on a comparable basis	-	-	6	6	0.0%
W10 & W8			-	-	60	73	21.7%
W10 & W9			163	163	939	1,100	17.1%
Total			16,670	16,493	16,116	15,810	-1.9%

Figure 6.2.1 Gauge capability (kilometres) (C2)

- 6.2.7 These variances have been caused by either:
- (a) Physical changes to the network leading to alterations in the loading gauge;
 - (b) New lines;
 - (c) Data cleansing activity.

Audit Findings

Process

- 6.2.8 The process for reporting the network capability measures has not changed from the 2004/05 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 band from GEOGIS.

Accuracy of the reported data

- 6.2.9 We undertook the following sampling activities:
- (a) A sample of Certificates of Gauging Authority was provided to us by Network Rail, which pertained to changes in the loading gauge mentioned in the commentary of the Annual Return 2005/06. A check confirmed that these changes were correctly recorded in the Capabilities Database and in GEOGIS.
 - (b) A sample of loading gauges for various locations was selected from the Sectional Appendices. These were found to be correctly recorded in the Capabilities database and in GEOGIS.
 - (c) Our C1 audit found GEOGIS has been subject to data cleansing, leading to a net 1.2% reduction in total track kilometres.

Assessment of confidence grade

- 6.2.10 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C2 should have a reliability grade of B.
- 6.2.11 **Accuracy grade.** Our sampling found no errors. We were unable to verify the impact of data cleansing on gauge capability; however, our C1 audit found the net variation due to cleansing on the total network kilometres was 1.2%. We believe that measure C2 should have an accuracy grade of 2.

Audit Statement

- 6.2.12 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 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. Our C1 audit found the net variation due to cleansing on the total network kilometres was 1.2%. The data has been assessed as having a confidence grade of B2.

Recommendations arising

- 6.2.13 We have no recommendations for this measure.

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 2006, Section 2, Route availability value (C3), including Tables 52-53.
- 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, was for no reduction in the capability of any route for broadly existing use from April 2001 levels.

Trend

- 6.3.6 Figure 6.3.1 shows the reported net change in the total kilometres of track for three RA bands. Track in RA10 has increased by 8.6%; track in RA1-6 has shown a roughly equivalent reduction.

RA Band	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Variance
RA 1-6	2,725	2,321	2,411	2,375	2,529	2,309	-8.7%
RA 7-9	14,729	26,196	24,262	26,297	26,319	25,935	-1.5%
RA 10	13,392	2,582	4,734	2,585	2,634	2,861	8.6%
Total	30,846	31,099	31,407	31,257	31,482	31,105	-1.2%

Figure 6.3.1 Structures route availability (C3)

- 6.3.7 These variances have been caused by either:
- Data cleansing activity;
 - Physical changes to the network leading to alterations in the route availability;
 - New lines.

Audit Findings

Process

- 6.3.8 The process for reporting the network capability measures has not changed from the 2004/05 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.

Accuracy of Reported Data

- 6.3.9 We undertook the following sampling activities:
- A sample of the changes sent from Territory Structure Assessments Engineers to Headquarters was checked against the Capabilities Database. These changes 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.
- (c) The RAs for the two new sections of track reported in 2005/06 were checked. These were found to be correctly recorded in the Capabilities Database and in GEOGIS.
- (d) For Western Territory, 17 minor sections of track were found where an RA classification had not yet been assigned in GEOGIS. However, these sections were either closed sections, leased freight routes, or were excludable for reporting purposes.

Assessment of confidence grade

- 6.3.10 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C3 should have a reliability grade of B.
- 6.3.11 **Accuracy grade.** Our sampling found no errors. We were unable to verify the impact of data cleansing on RA capability; however, our C1 audit found the net variation due to cleansing on the total network kilometres was 1.2%. We believe that measure C3 should have an accuracy grade of 2.

Audit Statement

- 6.3.12 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 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 1.2%. The data has been assessed as having a confidence grade of B2.

Recommendations arising

- 6.3.13 We have no 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 2006, Section 2, Electrified track capability (C4), including Tables 54-55.
- 6.4.2 The 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, was for no reduction in the capability of any route for broadly existing use from April 2001 levels.

Trend

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

Electrification	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Variance
25 kV a.c. overhead	7,578	7,937	7,751	7,780	7,748	7,882	1.7%
650/750 V d.c. 3rd rail	4,285	4,493	4,463	4,483	4,497	4,493	-0.1%
Dual a.c. OHL & d.c. 3rd rail	-	-	33	33	35	39	11.4%
1500V d.c. overhead	-	4	19	19	39	39	0.0%
Electrified	11,863	12,434	12,266	12,315	12,319	12,453	1.1%

Figure 6.4.1 Electrification capability (C4)

- 6.4.7 These variances have been caused by either:
- Data cleansing activity;
 - A new section of track opened Haughmead Junction to Larkhall (LRK).

Audit Findings

Process

- 6.4.8 The process for reporting the network capability measures has not changed from the 2004/05 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

- 6.4.9 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. A majority were found to be correctly reported in the database; however, for one of the locations on LNW Territory, the following errors were identified:
 - (i) Six cross-over sections (track type 1700) were not coded as electrified; the average distance of these sections was 45 yards;
 - (ii) 385 yards on the mainline were wrongly coded as non-electrified.
 - (b) The new electrified section (Haughmead Junction to Larkhall) had been correctly entered into GEOGIS.

Assessment of confidence grade

- 6.4.10 **Reliability grade.** The definition for this measure is clearly documented. A reasonably well documented process has been followed to collect and report this measure. We believe that measure C4 should have a reliability grade of B.
- 6.4.11 **Accuracy grade.** We found seven misclassification errors in GEOGIS. We believe that C4 should have an accuracy grade of 3.

Audit Statement

- 6.4.12 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 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. We found seven misclassification errors in GEOGIS. The data has been assessed as having a confidence grade of B3.

Recommendations arising

- 6.4.13 **C4 recommendation 1.** We recommend that the GEOGIS database be checked to ensure that electrification classifications are correctly recorded.

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 2006, Section 2, Mileage, including Tables 56-58.
- 6.5.2 The 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, was 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 have increased by 2.0% between 2004/05 and 2005/06, whilst the freight miles increased by 10.4% during the same period.

Measure	2003/04	2004/05	2005/06	Variance
Passenger train mileage (franchised)	263.6	262.9	267.8	+1.9%
Passenger train mileage (open access)	3.9	3.5	4.0	+14.3%
Freight train mileage	29.3	27.9	30.8	+10.4%
Total Mileage	296.8	294.3	302.6	+2.8%

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

Audit Findings

Process

Passenger Miles

- 6.5.7 Passenger train miles data is compiled at Network Rail Headquarters from PALADIN, the information 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 79 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 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 information system which is used for invoicing 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. The summary spreadsheet used to compile the data was also checked.
- 6.5.12 We requested data from the ACTRAFF database in order to compare the ACTRAFF records of actual traffic miles with the reported figures sourced from PALADIN, but the ACTRAFF data for 2005/06 had not yet been processed.
- 6.5.13 For both franchised and open access operators, a sample of train miles from the summary spreadsheet was checked against the figures reported in the Annual Return. Differences were found for three train operators:
- (a) South West Trains: 23.1 million miles are reported in the Annual Return, the summary spreadsheet showed 23.216 million miles, which is 0.5% higher;
 - (b) South Eastern Trains: 17.2 million miles are reported in the Annual Return, the summary spreadsheet showed 17.308 million miles, which is 0.6% higher;
 - (c) WAGN: 6.9 million miles are reported in the Annual Return, the summary spreadsheet showed 7.085 million miles, which is 2.7% higher.
- 6.5.14 Network Rail believes that this discrepancy is due to these three operators classifying empty coaching stock movements as Class 3 (Parcel) trains, which PALADIN extracts from TRUST and therefore is included in the results. Network Rail confirmed that for the above three operators the figures in the summary sheet were adjusted downwards to arrive at the reported mileages. The mileages for Class 3 movements were obtained via a separate query run on the PALADIN database; this query was also checked.
- 6.5.15 It was understood from discussions held as part of the audit that 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. Network Rail have confirmed this.

Freight Miles

- 6.5.16 The query used to extract train miles data from BIFS was checked. The summary spreadsheet was also checked.
- 6.5.17 The data reported is a sum of the period-by-period train miles extracted from BIFS. However, when a test query was run to extract data for the year as a whole, it generated different results from those reported: 30.782 million miles are reported in the Annual Return, the test query generated 30.707 million miles, which is 0.2% lower than the reported value.
- 6.5.18 We requested data from the ACTRAFF database in order to compare the ACTRAFF records of actual traffic miles with the reported figures sourced from PALADIN; however, the ACTRAFF data for 2005/06 had not been processed at the time of the audit.
- 6.5.19 While auditing passenger miles, we also checked the freight train miles generated from PALADIN. There were significant differences in the miles generated from PALADIN, against those reported in the Annual Return, which were generated from BIFS.
- (a) The total train miles from BIFS is 30.782 million miles, while the total generated from PALADIN is 29.059 million miles, which is 5.6% lower;
 - (b) For particular operators the percentage differences are even greater; for example, for Advenza, the PALADIN figure is lower by 66%, and for DRS it is lower by 18%.
- 6.5.20 Network Rail suggested this difference might be explained by the following reasons:

- (a) PALADIN does not capture Very Short Term Planning (VSTP) trains;
- (b) BIFS data includes all freight services for billing purposes, including light locomotives and infrastructure trains which are excluded from the train mileage used for performance monitoring.

Assessment of confidence grade

- 6.5.21 **Reliability grade (Passenger Train Miles).** 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 Mileage (Passenger Train Miles) should have a reliability grade of B.
- 6.5.22 **Accuracy grade (Passenger Train Miles).** We found uncertainties in the data arising from inclusion of Chiltern Railways services running on LUL infrastructure. We believe that Mileage (Passenger Train Miles) should have an accuracy grade of 3.
- 6.5.23 **Reliability grade (Freight Train Miles).** 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 Mileage (Freight Train Miles) should have a reliability grade of B.
- 6.5.24 **Accuracy grade (Freight Train Miles).** We found the query used to extract data from BIFS gave rise to discrepancies – the data extracted for one year was not equal to the sum of data from the 13 constituent periods. Further, we found significant differences between the freight train miles sourced from BIFS and from PALADIN. We believe that Mileage (Freight Miles) should have an accuracy grade of 3.

Audit Statement

- 6.5.25 **Passenger Train Miles.** We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for Mileage. Our audit found one source of error in the results. The data has been assessed as having a confidence grade of B3.
- 6.5.26 **Freight Train Miles.** We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for Mileage. Our audit found discrepancies in the reporting query used and found significant differences between the reported data and another standard source of industry source. The data has been assessed as having a confidence grade of B3.

Recommendations arising

- 6.5.27 **Mileage recommendation 1.** We recommend that Chiltern Railways running on LUL infrastructure is excluded from the figure reported.
- 6.5.28 **Mileage recommendation 2.** We recommend the queries used to extract train mileage data from the BIFS database are checked to ensure results are the same irrespective of whether the data is extracted on a period-by-period basis or on an annual basis.
- 6.5.29 **Mileage recommendation 3.** We recommend Network Rail analyse the significant differences between the BIFS and PALADIN train mileages.

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 2006, Section 2, Freight Gross Tonne Miles, including Table 59.
- 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, was 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 increased by 6.7% between 2004/05 and 2005/06.

Measure	2003/04	2004/05	2005/06	Variance
Million Gross Tonne Miles	27.235	28.392	30.305	6.7%

Figure 6.6.1 Freight Gross Tonne Miles (millions)

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 information system which is used for invoicing 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 summarises 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. The summary spreadsheet was also checked.
- 6.6.10 The data reported is a sum of the period-by-period train miles extracted from BIFS. However, when a new test was run to extract data for the year as a whole, it generated results from those reported: 30.305 million GTM are reported in the Annual Return, the test query generated 30.722 million GTM, which is 1.4% higher.

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 tonne miles should have a reliability grade of B.
- 6.6.12 **Accuracy grade.** We found the query used to extract data from BIFS gave rise to discrepancies – the data extracted for one year was not equal to the sum of data from the 13 constituent periods. We believe freight gross tonne miles should have an accuracy grade of 3.

Audit Statement

- 6.6.13 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for freight gross tonne miles. We can confirm the data has been collected and reported in accordance with the relevant definition. Our audit found discrepancies in the reporting query used. The data has been assessed as having a confidence grade of B3.

Recommendations arising

- 6.6.14 **Freight gross tonne miles recommendation 1.** We recommend the queries used to extract GTM data from the BIFS database are checked to ensure the results are the same irrespective of whether the data is extracted on a period-by-period basis or on an annual basis.

6.7 Bottlenecks

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 2006, Section 2, Bottlenecks.
- 6.7.2 The bottlenecks measure reports the congested locations on the network along with possible solutions and actions to be taken.
- 6.7.3 The audit was undertaken at Network Rail Headquarters; we interviewed the team responsible for developing the route strategy plans to understand how they assessed congestion and reported bottlenecks in the Annual Return.

Audit Findings

Definition

- 6.7.4 A significant change in the process of dealing with congested infrastructure has been implemented this year. The Railways Infrastructure (Access & Management) Regulations 2005 (SI 2005 no.3049) has been enacted which requires the infrastructure manager to carry out certain actions. The regulation enacts an EU Directive associated with the enhancement of open access regimes across the European rail network. Part 3 of the Regulation requires the production of annual business plans and network statements which demonstrate "optimal and efficient use and development of infrastructure" and supporting financial statements.
- 6.7.5 Network Rail produces annual Business Plans and has previously produced a Network Statement, though this latter document is undergoing significant revision to meet the requirements of the Railways Infrastructure (Access & Management) Regulations 2005.
- 6.7.6 The regulation additionally requires the infrastructure manager to have specific processes to eliminate network congestion and to set out steps that must be taken when congestion prevents network access. When congestion is identified, the infrastructure manager must create, through systematic analysis, appropriate enhancement plans to remove that congestion. It is our understanding of the regulation that if an operator who has existing rights of access to the network is unable to exercise those rights because of network congestion, the infrastructure manager is required to develop enhancement plans supported with appropriate analysis of options to remove the congestion.

Process

- 6.7.7 The process commences as part of the normal timetable bidding cycle. At the point of allocation of paths, the infrastructure manager declares that infrastructure is congested when it is unable to satisfy the operators' rights of access. The infrastructure manager commences analysis to deliver an enhancement plan on a strict timescale, stated as six months in the regulation, and at a point at least one month before the period expires the option for resolution is required to be submitted to the Secretary of State for consideration.
- 6.7.8 The procedure is currently outside Network Rail's business planning processes. As the regulation was enacted on 28th November 2005, Network Rail is currently examining the legislation and developing an appropriate business process. This work is not at a sufficiently advanced stage to be available for us to review. However, the Route Utilisation Strategy process has permitted some systematic consideration of enhancement projects against robust analysis of future demand which may assist the development of business cases to removed congested locations.

Accuracy of Data Reported

- 6.7.9 Network Rail has reported on the top-ten congested locations on the network using the data presented in its annual route strategy publication. This consists of a map of the locations and a brief commentary on the nature of the capacity constraints at each point.

- 6.7.10 The congested locations are identified each year using a standard Capacity Utilisation Index and consideration is given to either alleviation or removal as appropriate.

Assessment of confidence grade

- 6.7.11 **Reliability & Accuracy.** The allocation of a grade is not appropriate this year.

Audit Statement

- 6.7.12 We have reviewed the early work of Network Rail to comply with changes in its business processes required from the Railways Infrastructure (Access and Management) Regulations 2005 (SI 2005 no.3049). We are satisfied Network Rail is developing a business process to comply with the regulation.

Recommendations arising

- 6.7.13 We have no 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 2006, Section 3, Broken Rails (M1), including Table 61.
- 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 a sample Area in each Territory: North East Area for LNE, West Midlands & Chilterns Area for LNW, Scotland West Area for Scotland, Wessex Area for South East, Wales & Marches Area for Western.

Commentary on reported data

Regulatory target

- 7.1.5 The regulatory target for broken rails set in ORR’s Access Charges Review 2003 was “no more than 300 broken rails pa 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.
- 7.1.6 317 broken rails were reported for 2005/06 which has not met the target of 300.

Trends

- 7.1.7 Figure 7.1.1 shows the number of rail breaks for 2005/06 has continued the downward trend of this measure since 2000/01. The result for 2005/06 is a 1.6% improvement on 2004/05.

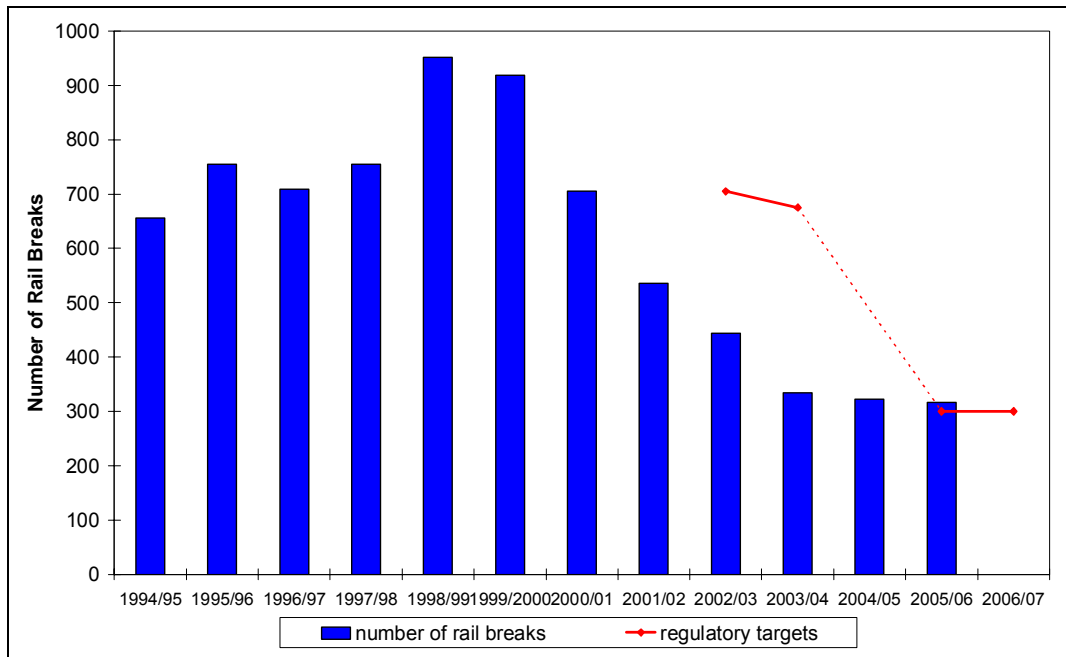


Figure 7.1.1 Number of broken rails (M1)

- 7.1.8 Despite the national downward trend in the number of broken rails reported, Figure 7.1.2 shows an increase from the 2005/06 results in two Territories, Western and Scotland. Historical numbers have been restated for the new Territory boundaries.

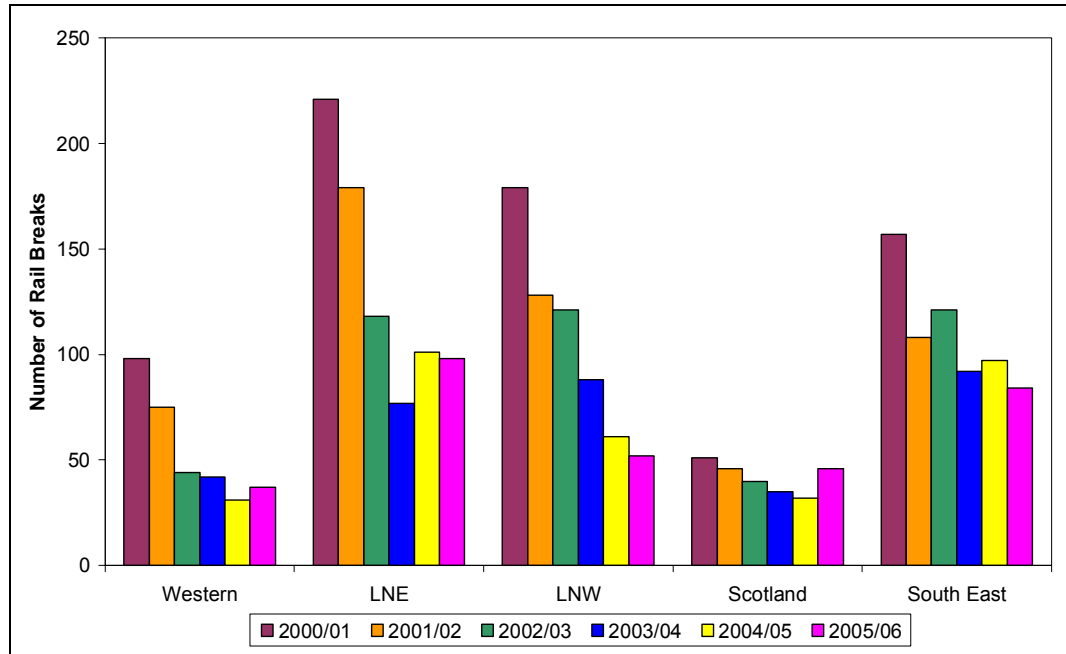


Figure 7.1.2 Number of broken rails by Territory (M1)

- 7.1.9 Within Western, only Thames Valley contributed to the increase in broken rails. It reported 14 broken rails in 2005/06, up from 7 in 2004/05. This Area reported 3 broken rails which were caused by a wheel flat. We suspect the increase in rail breaks was caused by the age profile of the track and the high renewals backlog on the Territory. It was noted that there was a particular problem with broken welds and foot corrosion.
- 7.1.10 Both Areas within Scotland have shown an increase of reported broken rails. West Scotland reported 19 broken rails in 2005/06, up from 17 in 2004/05. East Scotland had 27 broken rails reported, increasing from 17 reported in 2004/05. The majority of breaks were caused by (a) defects that originated in parts of the rail profile which cannot be tested using Network Rail's existing testing methods and (b) are associated with some of the older CWR sites installed in the 1960s and 1970s. Specifically, these are (a) Corroded Rails, generally mid-rail and not necessarily associated with tunnels, bridges, platforms or level crossings, (b) SMW Weld Failures, which are the first generation aluminothermic welds, and (c) broken expansion switches. Within the East Scotland Area, which had the majority of the breaks, Network Rail suspected this was due to an increase in freight traffic flow from the Eastern Sea Ports; however we found no specific evidence for this.
- 7.1.11 Engineers in the remaining Areas attributed the decreased rail breaks in their Areas to improved testing technology (Sperry stick and Ultrasonic test train) and the ongoing effect of re-railing and grinding programmes.
- 7.1.12 There is a common concern across all Areas audited about rail foot corrosion, a cause of broken rails, which is undetectable by current ultrasonic testing. We believe that the increase in rail foot corrosion may be due in part to the backlog of rail re-padding works.
- 7.1.13 For comparative purposes we 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 and for each Territory. It is apparent that Wessex, Great Eastern, Scotland East, Liverpool and North Eastern are significantly above the network average.

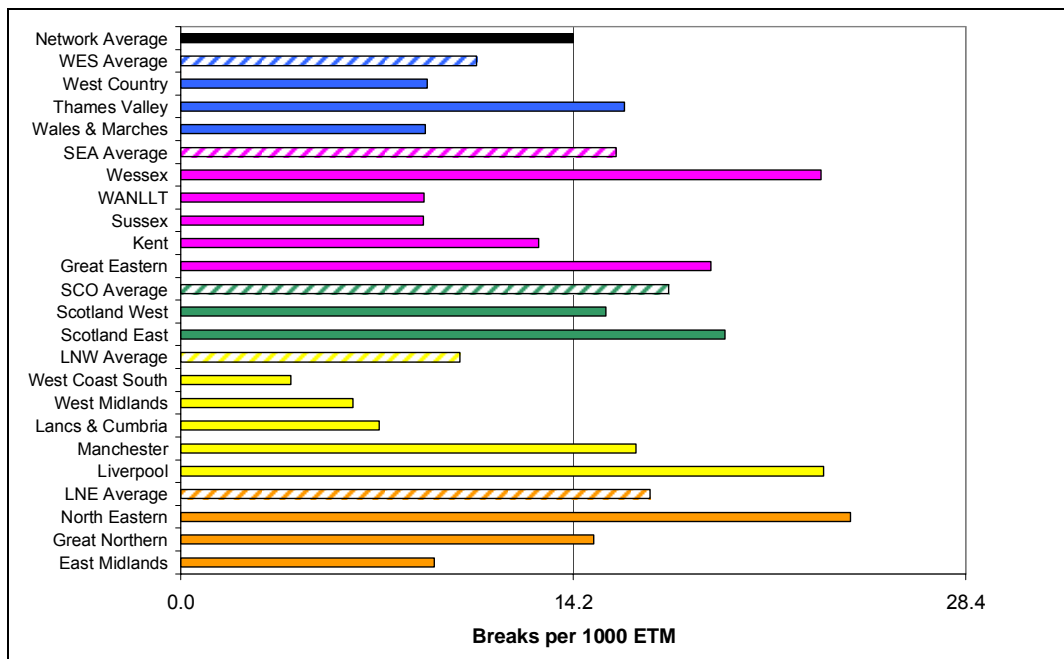


Figure 7.1.3 Rail breaks per 1000 equated track miles (M1)

7.1.14 Rail foot corrosion and first generation aluminothermic welds were noted as the rail break types that were most commonly identified. However, due to inconsistencies between the Territories and over time in the method of classification and analysis of rail break types, we were unable to determine if the number of these rail break types had increased, or had simply become more apparent to track engineers as the number of other break types, such as ultrasonically detectable defects, had reduced.

Audit findings

Process

7.1.15 When a broken rail is identified on the network, it is 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.

- (a) Four of our sample Areas are still using Area Defect Database developed by the former IMCs (infrastructure maintenance companies). In previous years, these databases were developed, owned and operated by the IMCs. When the maintenance organisations were in-sourced from the IMCs, the databases were also transferred; this means that Network Rail currently has a diverse set of Area Defect Databases across its Areas.
- (b) The fifth Area, Wessex, uses the new Rail Defect Tracker (RDT) System, which is progressively being rolled out across all Areas during 2005/06 and 2006/07 and will become the national system. At the time of the audits one sample Area, Wales & Marches, were parallel running RDT in preparation to switch off their former IMC system.

7.1.16 Data from the Area Defect Databases is uploaded to Raildata, using an upload script. The data from Raildata was used by the National Engineering Reporting Team to populate the Railfail database.

7.1.17 In parallel, details of broken rails reported in the daily national control log are also recorded by the National Engineering Reporting Team in the 'Broken Rail Information' spreadsheet.

- 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 4 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 4-weekly Period KPI Reports and the data at year-end for the Annual Report.

Accuracy of reported data

- 7.1.22 For 100% of the reported breaks at each sample Area/ Depot, we successfully matched the location, date and break description of the broken rails from the incident forms/ broken rail reports with the records in the Area Defect Database.
- 7.1.23 For each sample Area, we matched the number of broken rail incident forms with the number of records in the Area Defect database and the number of broken rails in the year-end Broken Rail report for 2005/06 (i.e. the number of broken rails in the Headquarters Spreadsheet) with the number of broken rails in the Annual Return 2006.

Assessment of confidence grade

- 7.1.24 **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, 4-weekly and annual basis. We believe that M1 should have a reliability grade of A.
- 7.1.25 **Accuracy grade.** Two parallel systems are used to identify broken rails for this measure and a reconciliation process is used to increase accuracy. The process would have to misreport four broken rails or more in 2005/06 to have an inaccuracy of 1% or higher; our assessment is that the accuracy of this process would not allow this level of misreporting. We believe that M1 should have an accuracy grade of 1.

Audit Statement

- 7.1.26 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 not been met.

Recommendations arising

- 7.1.27 **M1 recommendation 1.** 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 can 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. Network Rail should confirm that the roll-out of RDT should provide this analysis going forward.

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 2006, Section 3, Rail Defects (M2), including Tables 62-67.
- 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 sample Areas in each Territory: North East Area for LNE, Liverpool Area for LNW, Scotland West Area for Scotland, Wessex Area for South East and Wales & Marches Area for Western. We also undertook monitoring at Network Rail's Engineering Support Centre including an Ultrasonic Testing Unit (UTU) calibration and run.

Commentary on reported data

Regulatory target

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

Trend

- 7.2.6 In 2005/06, the number of isolated defects was 20,605, which is 33.1% fewer defects than in 2004/05; the length of continuous rail defects was 2,013,319 yards, which is 16.9% fewer yards of defects than in 2004/05.
- 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 2005/06 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 2005/06 shows 33.1% fewer defects than the initially reported figure for 2004/05 but shows only 22.6% fewer defects than the subsequently restated figure for 2004/05. Both the initially reported and subsequently restated figures show a decreasing number of isolated defects over last four data points.
- 7.2.9 **Continuous Rail Defects.** Figure 7.2.2 shows the length of continuous defects reported in the Annual Return. The performance for 2005/06 shows 16.9% fewer defects than the initially reported figure for 2004/05 but only 8.1% fewer defects than the subsequently restated figure. Both the initially reported and subsequently restated figures show a decrease in the length of continuous defects for the first time in the last four years.
- 7.2.10 For comparative purposes we normalised the isolated defects using Equated Track Miles (ETM) and compared the results with similarly normalised numbers of broken rails. We expected a correlation between the level of breaks and the number of defects, however there was no correlation. We believe that this is due to the low data quality of the rail defect data.

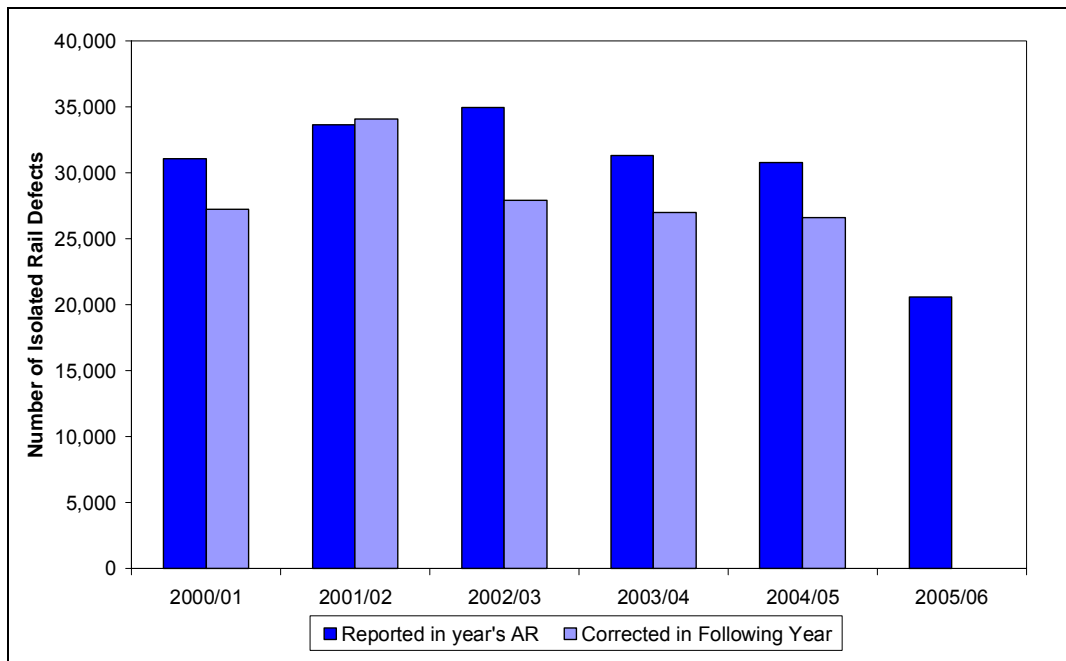


Figure 7.2.1 Numbers of isolated rail defects (M2)

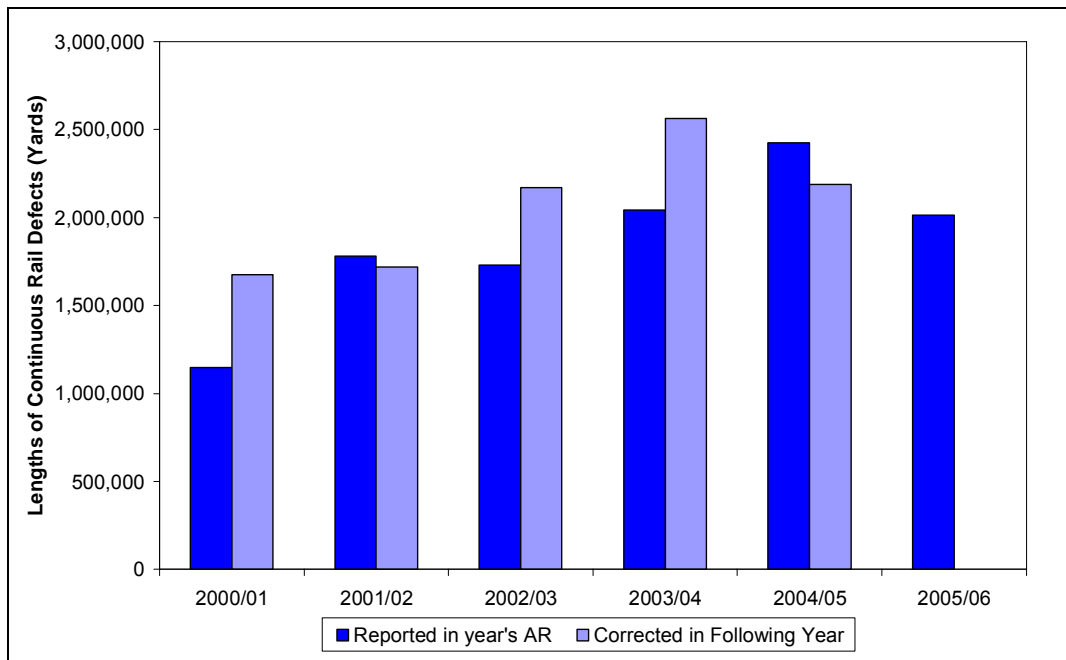


Figure 7.2.2 Length of continuous rail defects (M2)

Audit Findings

Area process

7.2.11 The methods of data collection for this measure are by ultrasonic non-destructive inspection and by visual inspection. When a defect is identified it is recorded on a standard inspection form. Figure 7.2.3 shows the method of detection of each type of defect.

Defect Type	Method of Detection
Ultrasonic Defects (Pedestrian)	Ultrasonic Teams
Ultrasonic Defects (Non-Pedestrian)	Ultrasonic Test Unit (UTU)
Visual Defects	Patroller & TSM Inspections
S&C damage/cracks	TSM (053 Inspections etc.)
Defective Welds	Welding Inspector
Non Compliant Welds	Welding Inspector, TSM
Corroded and Short Circuit defects	Patroller & TSM Inspections

Figure 7.2.3 Defect detection methods (TSM is Track Section Manager) (M2)

- 7.2.12 Network Rail has a strategy to use the Ultrasonic Test Unit (UTU) to replace pedestrian testing on the main line routes in compliance with the standard frequencies for testing. Additional pedestrian testing resource can then be used to target defects – such as wheelburns, vertical longitudinal splits, lipping – outside the UTU's field of testing. As part of the audit process, we monitored the process of train-borne ultrasonic testing using the UTU, including the calibration process and a testing run.
- 7.2.13 **Rolling Contact Fatigue (RCF) continuous rail defects.** Results from the RCF inspection process are entered onto a variety of Area RCF tracking systems. Every 4 weeks the Areas forward this RCF data to the Territory Rail Management Engineer who compiles this data in a standard RCF defect spreadsheet, which is forwarded to the National Engineering Reporting Team for storage.
- 7.2.14 **Isolated defects and other continuous rail defects.** Details of these defects are entered into the Area Defect Database. The Areas use these databases throughout the process of defect management from identification to remediation. Four of our sample Areas are still using databases developed by the former IMCs. As each system was developed separately, 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. The fifth Area, Wessex, use the new Rail Defect Tracker (RDT) System, which is progressively being rolled-out across all Areas during 2005/06 and 2006/07 and will become the national system. At the time of the audits one sample Area, Wales & Marches, was parallel running RDT in preparation to switch off their former IMC system.
- 7.2.15 Figure 7.2.4 shows the variety of different Area Defect Databases in operation at our sample Areas.

Territory	Sample Area	Defect Database	Former IMC owner of Defect Database
Scotland	Scotland West	Tardis	First Engineering
LNE	North East	Railfail	Jarvis
Western	Wales and Marches	Railflaws	Carillion
LNW	Liverpool	Railfail	Jarvis
South East	Wessex	RDT	-

Figure 7.2.4 Defect databases in sample Areas (M2)

- 7.2.16 In all Areas except Wessex, data from the inspection forms are entered into the Area Defect Database by personnel in the Depots rather than the Area office. The method for reporting rail defects to Headquarters varied; this is discussed further below.

Headquarters process

- 7.2.17 Following issues with Raildata previously identified by the Reporter and recent efforts by many Areas to 'clean up' defect data prior to migrating the data to RDT, the Headquarters team has recognised that the defect data in Raildata does not represent the most accurate source of defect data.

- 7.2.18 In order to provide the most accurate information for reporting this year, Network Rail's National Engineering Reporting Team approached the local responsible managers in the Territories and Areas, requesting 2005/06 defect data from the 'best source' of data available. A data-dump of Raildata was provided as a comparator.
- 7.2.19 Figure 7.2.5 shows the variety of sources from which data was provided by our sample Areas to Headquarters for the reporting.

Territory	Sample Area	Isolated		Continuous "Other"		RCF	
		Source	Supplier	Source	Supplier	Source	Supplier
Scotland	Scotland West	Summary spread-sheet	TRME	Summary spread-sheet	TRME	Summary spread-sheet	TRME
LNE	North East	Spread-sheet	TRME	Spread-sheet	TRME	Spread-sheet	TRME
Western	Wales and Marches	Raildata	Railflaw	Raildata	Railflaw	Spread-sheet	TRME
LNW	Liverpool	Spread-sheet	ARME	Spread-sheet	ARME	Spread-sheet	ATE
South East	Wessex	Spread-sheet	TRME	RDT	Direct	Spread-sheet	TRME

Figure 7.2.5 Defect databases in sample Areas (TRME is Territory Rail Management Engineer, ATE is Area Track Engineer; ARME is Area Rail Management Engineer) (M2)

- 7.2.20 Procedurally, there is no requirement for the defect data to be signed off by the Areas, who are the actual owners of the defect data; however, most of the sample Areas we audited had been approached by the Territory for comment on the defect numbers before they were signed-off by the Territory.

Accuracy of reported data

- 7.2.21 We sought evidence of an audit trail from data collection in the sample Areas through to the figures reported in the annual report. We did this by (a) comparing sample inspection forms with the Area Defect Databases; (b) comparing totals from Area Defect Databases with Raildata/ Headquarters spreadsheets; (c) comparing totals from Raildata/ Headquarters spreadsheets with the published Annual Return.

Sampling

- 7.2.22 Samples of five inspection reports were inspected at each sample Area and compared to the records in the Defect Databases. All samples inspected were completed in accordance with the procedure and had been entered correctly into the databases. 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.
- 7.2.23 During our audit at Network Rail Headquarters, we examined the spreadsheet used for compiling the data received from the Territories and producing the numbers reported in the Annual Return. Each Area's sheet in the spreadsheet contains references to the data source (document name/ description) and the manager responsible for supplying the information.
- 7.2.24 A check of the numbers within this spreadsheet against the ones reported in the Annual Return was undertaken and found to be correctly reported.

Asset Management

- 7.2.25 We were pleased to note that Network Rail is currently engaged in the following improvements to rail defect management:
- (a) Measurement of rail dip angle: this is a new indicator recorded by the Track Recording Coach (TRC), involving measurement of the angle that rail ends are

dipped under load. A compliance threshold that has been introduced and a procedure for the local track engineers/ managers to appraise rail dip exceedences and take appropriate action.

- (b) Measurement of wheelset torques: Network Rail has introduced this new measure recorded by the TRC to understand the effect that rails in specific locations with specific characteristics can develop rolling contact fatigue.
- (c) Corroded rails: Network Rail is introducing aluminium coated rails in high risk locations to combat surface corrosion. These will be installed at level crossings and in tunnels/ platforms where corrosion is a problem. Network Rail is also looking at measuring the rotation of the rail under traffic; excessive rotation may indicate hidden corrosion in the foot of the rail to local track engineers at these locations.
- (d) CEN60E2 rail: CEN60 rail continues to be specified on the higher category lines for track renewals. There is a move to use CEN60E2 instead of CEN60E1 to reduce the contact area on the crown of the rail.; this should in turn reduce rolling contact fatigue failures on these rails.
- (e) Rail depth data: management of rail depth data is being improved by introducing a simplified way of presenting the data to aid local managers in the process of site prioritisation.

Assessment of confidence grade

- 7.2.26 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect this measure; however the process for reporting the measure has not been as per the procedure. Data correction has been required at the start of each reporting year for the last five years, including for 2005/06. We believe that M2 should have a reliability grade of B.
- 7.2.27 **Accuracy grade.** We have concerns regarding the level of data correction required at the start of the 2005/06 reporting year. We believe that M2 should have an accuracy grade of 4.

Audit Statement

- 7.2.28 We have audited the data presented in the Annual Return for Number of Rail Defects (M2). We can confirm the data has been collected in accordance with the relevant definition and procedure, however the reporting of this measure is not in line with the procedure. We have noted a number of concerns in our audit report. The data has been assessed as having a confidence grade of B4.

Recommendations arising

- 7.2.29 **M2 recommendation 1.** We 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 B4. We recommend that Network Rail ensure that the data that is transferred to the new national system, RDT, is from the most accurate source and is systematically checked by the Territories and Areas.
- 7.2.30 **M2 recommendation 2.** We recognise the concentrated effort which has been undertaken by Network Rail to reduce RCF-type defects, particularly rail grinding and re-railing activities. 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 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.

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 2006, Section 3, for Track geometry:
- National standard deviation data (M3) including Tables 68-69. 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 70. 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 Table 71-77. This is the standard deviation value for a series of speed bands and track geometry bands.
 - Level 2 exceedences (M5), including table 81. 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 4), NR/ARM/M5DF (issue 3) and NR/ARM/M3PR (issue 4).
- 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 and the Engineering Support Centre at Derby, including a track recording vehicle (TRV) calibration and run.

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) was set in ORR's Access Charges Review 2003; the target was 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 2005/06 reporting year are presented in Figure 7.3.1.

Geometry parameter	35m Top (Vertical Deviation)			35m Alignment (Horizontal Deviation)			70m Top (Vertical Deviation)			70m Alignment (Horizontal Deviation)		
	50%	90%	100%	50%	90%	100%	50%	90%	100%	50%	90%	100%
Results for 2005/06	67.9%	91.8%	98.0%	78.8%	94.8%	97.3%	70.5%	94.3%	96.5%	83.2%	97.1%	98.2%
Regulatory target	62.4%	89.2%	97.0%	72.7%	92.9%	96.5%	63.6%	92.3%	95.3%	79.5%	95.8%	97.2%
Result against target	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Figure 7.3.1 National SD data (M3)

- 7.3.6 All twelve of the new regulatory targets for M3 track geometry national standard deviation data were met in 2005/06.

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) was set in ORR’s Access Charges Review 2003; the target was set as “no more than 0.9 Level 2 exceedences per track mile within two years”.

7.3.10 0.82 L2 exceedences per track mile were reported for 2005/06 which is better than the target of 0.9.

Trends

7.3.11 The Annual Return Commentary attributes this continued improvement in track geometry to the effective targeting of maintenance efforts and renewals, especially on S&C.

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 six years. The results for 2005/06 for all twelve measures are at the highest level of track geometry level since before 2000/01.

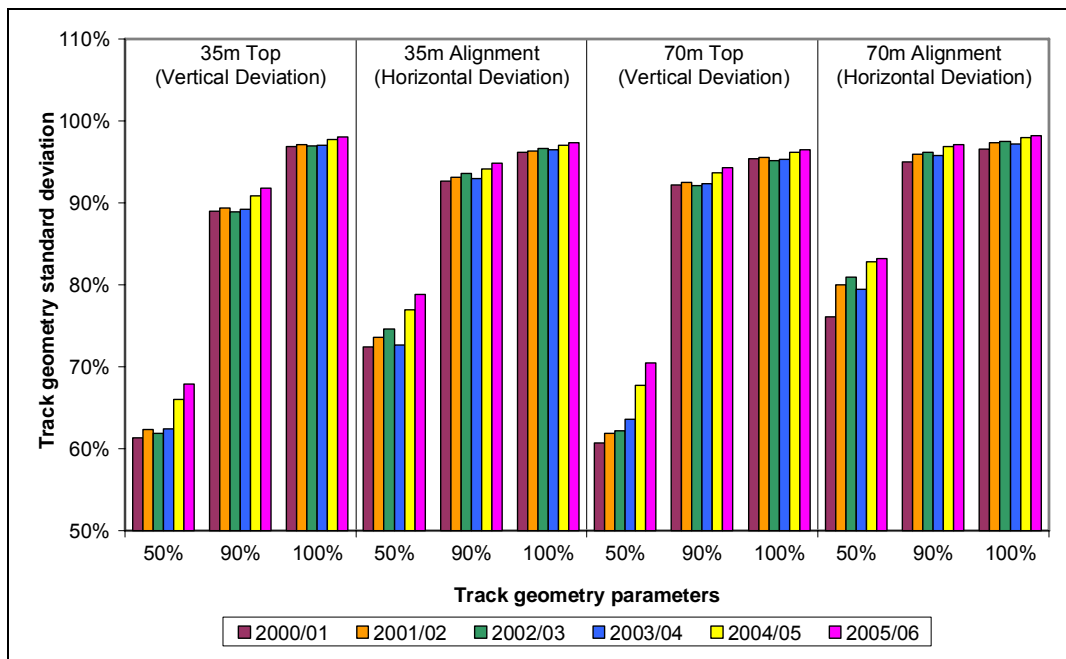


Figure 7.3.2 Track geometry standard deviation 2000/01 – 2005/06 (M3)

Poor track geometry

7.3.13 For the third year running, the Annual Return 2006 presents a measure of poor track geometry (PTG). This 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 this year across all Routes.

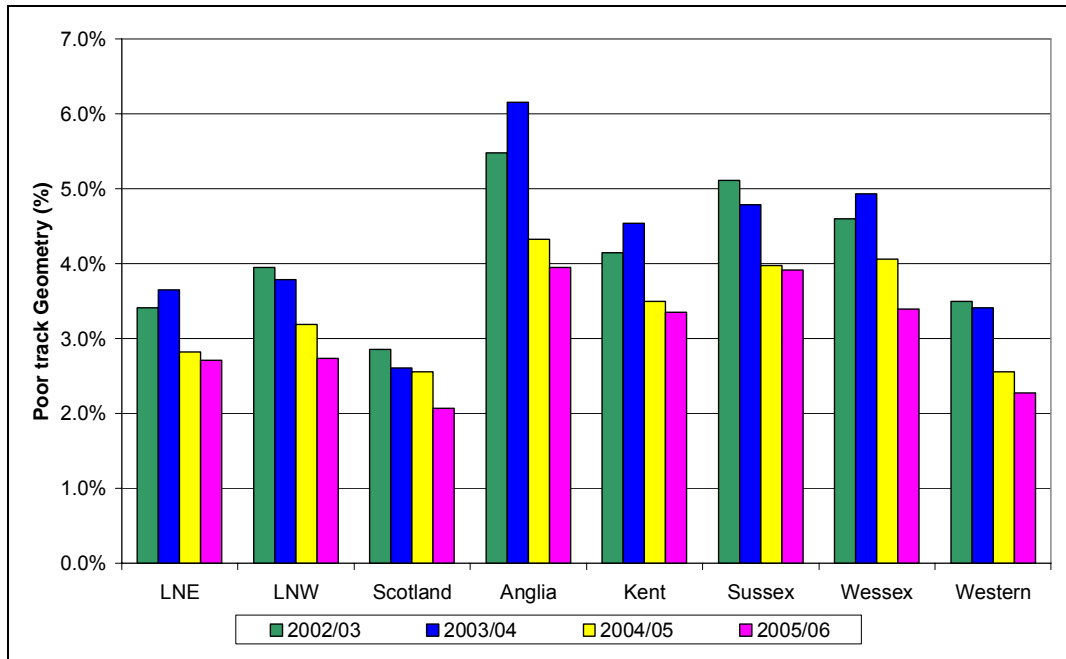


Figure 7.3.3 A comparison of Route PTG 2002/03 – 2005/06 (M3)

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 2004/05, except for 70m Line in the 115-125mph linespeed range. The commentary within the Annual Return suggests this is due to an increase in track kilometres within this linespeed range, mainly caused by the upgrade of the west coast mainline (WCML).

Track geometry parameter	Linespeed range (mph)	Overall SD at year-end (mm)						Variance (04/05 vs. 05/06)
		2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	
35m Top	15-125	3.06	3.03	3.04	3.02	2.93	2.87	-0.06
	15-40	4.29	4.24	4.24	4.28	4.23	4.16	-0.07
	45-70	3.34	3.31	3.34	3.34	3.25	3.20	-0.06
	75-110	2.54	2.51	2.52	2.5	2.4	2.34	-0.06
	115-125	1.83	1.8	1.82	1.81	1.73	1.68	-0.05
35m Line	15-125	2.06	2.03	1.97	1.98	1.89	1.84	-0.05
	15-40	4.27	4.33	4.09	4.08	4.06	3.93	-0.13
	45-70	2.07	2.06	2.01	2.04	1.94	1.88	-0.06
	75-110	1.28	1.23	1.22	1.27	1.17	1.14	-0.03
	115-125	0.92	0.84	0.83	0.9	0.79	0.76	-0.03
70m Top	80-125	3.29	3.26	3.26	3.21	3.06	2.97	-0.09
	80-110	3.39	3.36	3.37	3.32	3.19	3.12	-0.07
	115-125	2.49	2.42	2.48	2.49	2.43	2.35	-0.08
70m Line	80-125	2.38	2.23	2.19	2.23	2.07	2.03	-0.04
	80-110	2.48	2.33	2.28	2.33	2.18	2.15	-0.03
	115-125	1.59	1.48	1.48	1.61	1.49	1.52	0.03

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.

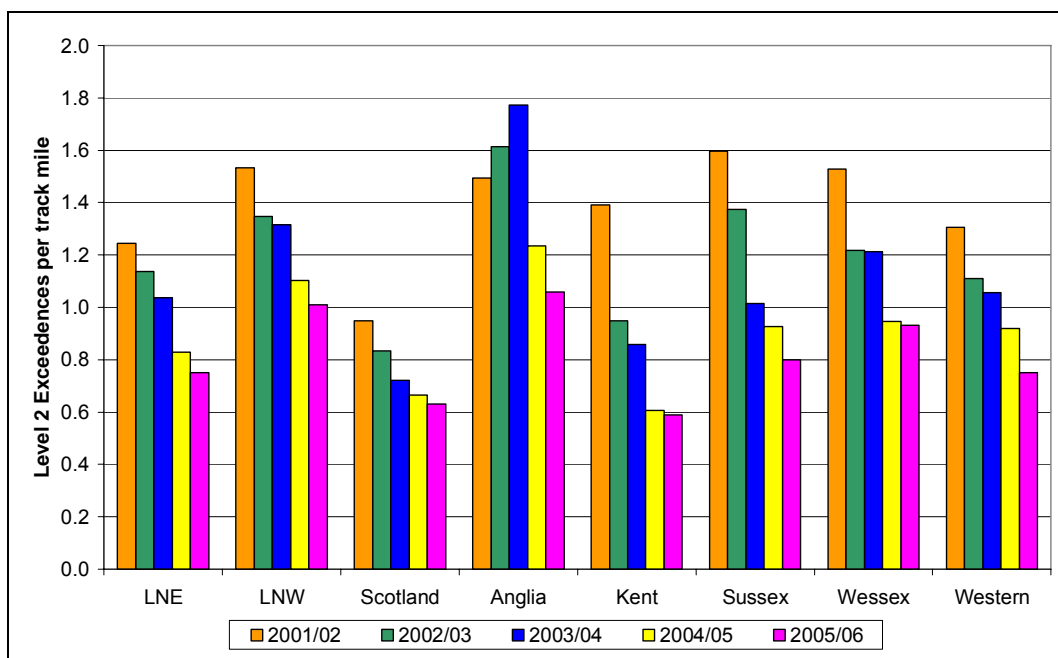


Figure 7.3.5 Level 2 exceedences for 2001/02 – 2005/06 (M5)

Audit findings

- 7.3.17 Network Rail have three 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. These three trains are fitted with Serco-Lewis measuring equipment, which is currently the only Network Rail product-approved system. The annual track measurement plan for 2005/06 was completed using these three trains.
- 7.3.18 In addition to the Serco Lewis method, Network Rail is introducing new track recording equipment, using the Laserail 3000 measuring system. Results from the monitoring runs are not included in the reported results.

Calibration

- 7.3.19 As the reported data is based on a measurement system, calibration is necessary to ensure accuracy. The three track recording vehicles equipped with Serco Lewis are calibrated on a six-monthly basis and annually for cross-vehicle validation of recording data. For the six-monthly calibrations the transducers and lasers are removed, cleaned, visually examined and a sensitivity check carried out. For the annual cross-vehicle validation checks, the results from recording runs on all three vehicles were compared using a test track at Derby. The results were all within the allowed tolerances.

Process

- 7.3.20 On completion of a recording run using the Serco-Lewis method, the information is downloaded from the train's recording system and uploaded to the Condition Data Management System (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.

- 7.3.21 Following checking, the standard deviations for each eighth-of-a-mile are uploaded to the Track Quality Main Frame (TQMF) and to the new Condition Data Distribution System (CDDS). From the TQMF, the National Track Geometry 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 CDDS.
- 7.3.22 Area track engineers also obtain track geometry information directly using Trackmaster. Trackmaster is fed with information from TQMF 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 exceedences recorded. TQMF and Trackmaster are expected to be replaced by CDDS in 2006/07.
- 7.3.23 At the end of the year, the annual track geometry report is produced by the National Track Geometry Analyst and passed to the National Track Geometry and Gauging Engineer for sign-off.
- 7.3.24 We verified the process described above and inspected the spreadsheets used by the National Track Geometry Analyst.

Assessment of confidence grade

- 7.3.25 **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.
- 7.3.26 **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

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

Recommendations arising

- 7.3.28 **M3 recommendation 1.** 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.

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 2006, Section 3, Condition of asset temporary speed restriction sites (M4), including Tables 78-80.
- 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 (which are jointly referred to hereafter 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 NR/ARM/M4DF (issue 5) and NR/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 Swindon offices, 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) was set in ACR2003; the target was "annual reduction required", which we have interpreted as a requirement to maintain the network at or below the baseline level recorded in 2004/05.
- 7.4.7 In numeric terms, the regulatory target is therefore:
- (a) Number of sites not greater than 942;
 - (b) Severity score not greater than 4,622.
- 7.4.8 In 2005/06 there were 867 condition of asset TSRs on the network reportable for this measure with a total of severity score of 4,285, bettering the target by 8% for the number of sites and by 7% for the severity score.

Trend

- 7.4.9 Figure 7.4.1 shows the reported TSRs are dominated by track-related faults, accounting for 88% of the total number and 97% of the total severity score.
- 7.4.10 Figure 7.4.2 shows the number of TSRs has improved significantly in every category with structures achieving the highest reduction of 47% for the number of sites and 62% for severity scores.

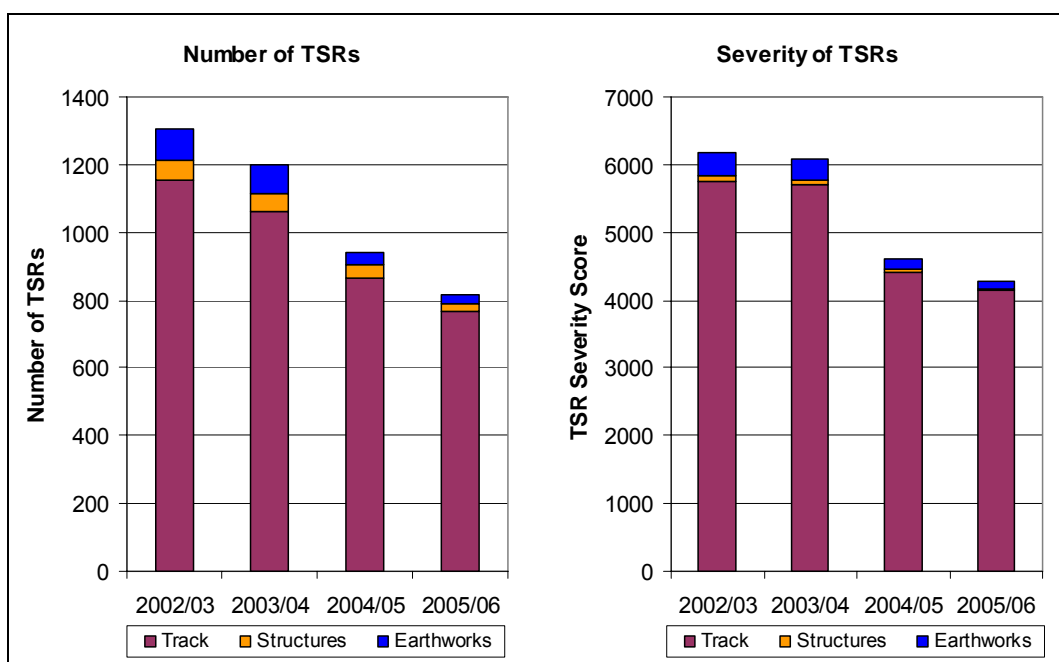


Figure 7.4.1 Number and severity of temporary speed restrictions (M4)

Measure (M4)	Cause of TSR	Variance 02/03-03/04	Variance 03/04-04/05	Variance 04/05 - 05/06
Number	Track	-8%	-18%	-12%
	Structures	-9%	-28%	-47%
	Earthworks	-11%	-56%	-24%
	Total	-8%	-21%	-13%
Severity Score	Track	-1%	-23%	-6%
	Structures	-42%	-17%	-62%
	Earthworks	0%	-51%	-26%
	Total	-1%	-24%	-7%

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, whilst nationally there was improvement in both TSR numbers and severity scores, there was a worsening in Scotland with the number of TSR sites reportable to M4 measure increasing by 14% and the severity score increasing by 39%. The national improvement this year has been driven by the Western and South East, with the number of TSRs sites reduced by 27% and 19% respectively and the severity score reduced 9% and 14% respectively. We have found no evidence as to the causation of these differences.

Former Region/ Present Territory	2002/03	2003/04	2004/05	2005/06	Variance
East Anglia & Southern/ South East	200	215	122	99	-19%
Great Western/ Western	193	199	130	95	-27%
LNE & MD & NW/ LNE & LNW	756	703	612	532	-13%
Scotland/ Scotland	159	82	78	89	+14%
Total	1308	1199	942	815	-13%

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

Former Region/ Present Territory	2002/03	2003/04	2004/05	2005/06	Variance
East Anglia & Southern/ South East	484	530	166	142	-14%
Great Western/ Western	868	908	591	538	-9%
LNE & MD & NW/ LNE & LNW	4389	4410	3756	3451	-8%
Scotland/ Scotland	428	241	111	154	+39%
Total	6169	6089	4624	4285	-7%

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

7.4.12 For each track classification (Primary, Secondary, Rural, Freight, London & South East Commuter), Figure 7.4.5 shows the total number of TSRs per track mile and severity score per track mile.

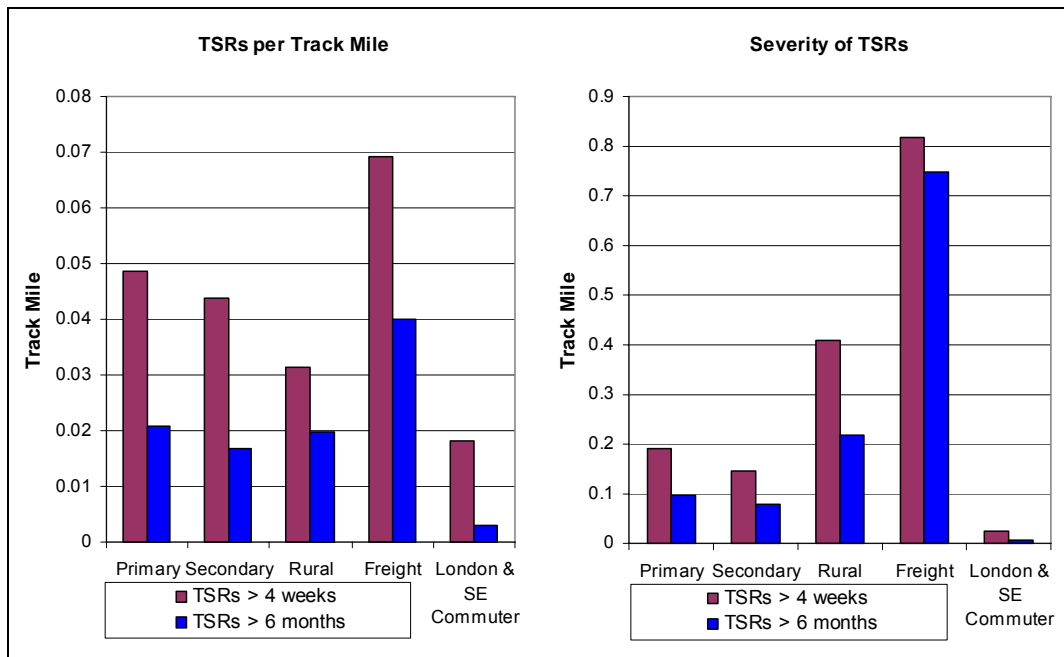


Figure 7.4.5 Number of Severity of temporary speed restrictions (M4)

7.4.13 Given the incentive regime in place, the results shown in Figure 7.4.5 are as we would expect – Network Rail focuses its effort on removing TSRs from London & South East Commuter and Primary routes which attract the greatest quantum of performance penalty payments:

- (a) For both TSRs >4 weeks and for TSRs >6 months, Freight routes incur the greatest rate of TSRs per mile and severity score per mile; whilst London & South East Commuter incur the least. For > 4 weeks TSRs per mile, L&SE Commuter routes are 76% lower than Freight routes;
- (b) Whilst the number TSRs per mile is comparatively low for Rural routes, reflecting their relatively low traffic and wear rates, the severity scores per track mile are comparatively high on an TSR >4 weeks and TSR > 6 month basis.

- 7.4.14 If measure M4 were to be altered to remove the qualifying period, the data would more closely reflect operational reality and allow more instructive analysis of the impact of Network Rail's track management regime. Consequently, we believe the measure is flawed as an indicator of asset condition. The measure says more about maintenance resource availability and the priority of maintenance managers than the condition of assets.
- 7.4.15 A number of these sites have been in place for very long periods with TSRs in place for long periods – particularly on freight and rural routes. We expect Network Rail to have policies in place to deal with these situations: either to arrange repair or convert them to permanent line speeds (PSRs). We have been advised that Network Rail has recently conducted an internal audit of TSRs in existence for more than 6 months but we are not aware of what action if any has resulted.

Audit Findings

- 7.4.16 The primary function of PPS (Possession Planning System) is to store and report the content of Section A of the Weekly Operating Notice for rail staff. However, since its introduction in 2004, PPS also ensures the integrity of much of the base information for measure M4. However, there are some systemic weaknesses of PPS which mean that the M4 measure cannot be wholly produced using PPS without manual intervention; Network Rail has made internal requests for a PPS upgrade to meet this need.

Process

- 7.4.17 The information for the measure is derived from PPS. TSRs details 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 (ESRs) to TSRs.
- 7.4.18 At year end, the reportable TSR data is sourced from PPS by the Headquarters TSR Planner 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.

Results

- 7.4.19 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 measure using the calculation spreadsheet remains largely within the expertise of one individual; we understand a process has commenced to turn the individual's knowledge into a procedure so that its production is less reliant upon one person's skill set.
- 7.4.20 **Emergency Speed Restrictions.** From our sample observations of local teams, we observed a number of different approaches to ensuring the correct date was used for ESRs that turn into TSRs entered into PPS. In Scotland the date of the commencement of the ESR was taken as the date of the commencement of TSR. However, the teams in Birmingham, York and Woking used the date the TSR was imposed as the commencement date. There is no formal process the teams can follow in order to assign the correct starting date of a TSR that was an ESR.
- 7.4.21 **Manual Processing.** From our interviews with the analysts undertaking the manual processing, we observed the process is different for Structures & Earthworks TSRs and Track TSRs:
- (a) In the case of track TSRs, the analyst cleanses PPS records so only the ones that comply with M4 measure requirements are included. The linespeed is entered manually.

- (b) In the case of Structures and Earthworks TSRs, the analyst receives data in the form of an Excel spreadsheet from the Assurance Engineers at the end of every period; the Assurance Engineers derive the data either from PPS or from local staff. The data is collated and checked for compliance with the requirements of the M4 measure. No checks are made to validate linespeeds.
- 7.4.22 However, we note neither of these manual processing methods is documented in the procedure for this measure (NR/ARM/04PR).
- 7.4.23 **Sampling.** To audit the Track TSRs reported, we took samples from the WON and tracked them through PPS. We also checked the calculation spreadsheet and the formulae used to calculate the severity score. We found the data and formulae to be accurate.

Assessment of confidence grade

- 7.4.24 **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 puts the reliability of the process at risk. We believe M4 should continue to have a reliability grade of B.
- 7.4.25 **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

- 7.4.26 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2005/6 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

- 7.4.27 **M4 recommendation 1.** We recommend the documents NR/ARM/M4PR (issue 5) and NR/ARM/M4DF (issue 6) are updated to reflect the change in organisation.
- 7.4.28 **M4 recommendation 2.** We recommend the additional process notes currently in development to document the manual manipulation and checking be incorporated within the NR/ARM/M4PR as further guidance to correct compilation of the measure.
- 7.4.29 **M4 recommendation 3.** We recommend the PPS system is considered for further enhancement to further automate the generation of the measure.
- 7.4.30 **M4 recommendation 4.** We recommend instructions be issued to all local teams regarding the correct procedure for inputting Emergency Speed Restrictions to PPS.
- 7.4.31 **M4 recommendation 5.** We recommend the definition of the measure be amended to remove the qualifying time period of >4 weeks.

7.5 Earthworks Failures (M6)

Audit scope

- 7.5.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Earthworks Failures (M6).
- 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 is documented in:
- (a) NR/ARM/M6DF (issue 4);
 - (b) NR/ARM/M6PR (issue 4)
- 7.5.4 Audits were undertaken at Network Rail Headquarters and at London North Eastern, London North Western, Scotland, South East and Western Territories.

Commentary on reported data

Regulatory target

- 7.5.5 The regulatory target for earthworks failures set in ORR's Access Charges Review 2003 was for there to be no deterioration from the 2003/04 levels, which is 47 network wide earthworks failures.
- 7.5.6 There were 41 earthworks failures in 2005/06. The regulatory target has been met.

Trend

- 7.5.7 Figure 7.5.1 shows the 41 earthworks failures for 2005/06 reverse the upward trend reported in 2004/05. There was a 24% decrease compared to last year and is also 12.8% below target. Earthworks failures causing train derailment has increased to two.

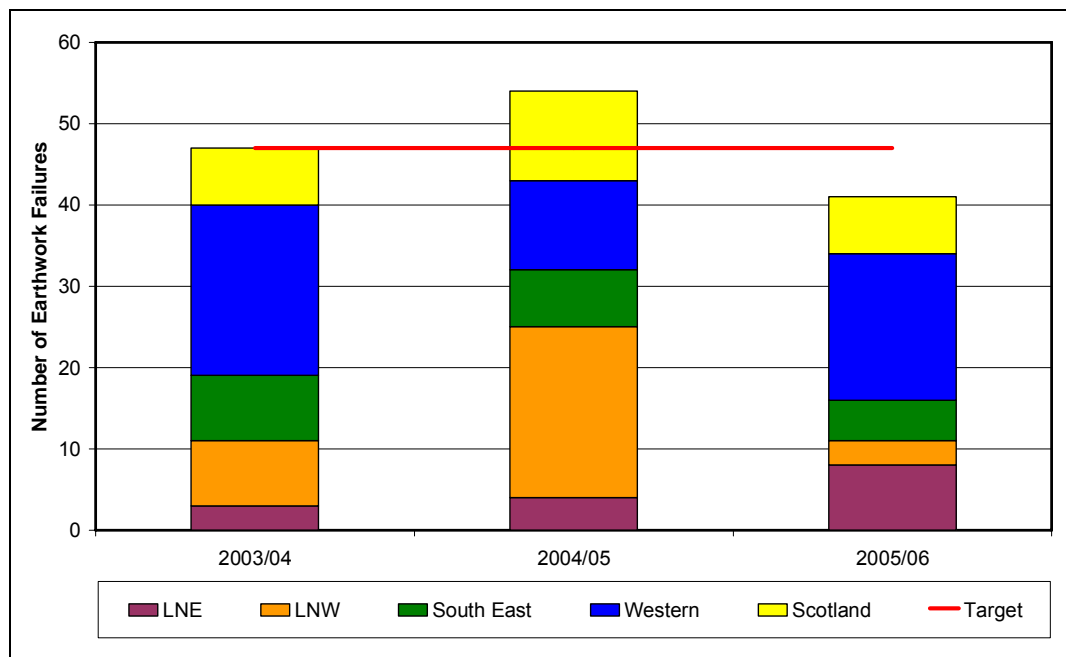


Figure 7.5.1 Number of Earthwork failures reported during the last three years (M6)

- 7.5.8 Figure 7.5.2 shows the improvement has been driven by London North West, Scotland and South East Territories.

Territory	2003/04	2004/05	2005/06	Variance
LNE	3	4	8	+100%
LNW	8	21	3	-85.7%
South East	8	7	5	28.6%
Western	21	11	18	63.6%
Scotland	7	11	7	-36.4%
Total	47	54	41	-24.1%

Figure 7.5.2 Variance of Earthwork failures (M6)

Audit findings

Process

- 7.5.9 The data acquisition, verification and reporting mechanisms for this measure have not materially changed this year; but, as noted below, we found evidence that there were some inconsistencies with embankment failures in the application of the reporting definitions.
- 7.5.10 On a daily basis, the Civil Engineer (Geotechnics) collates earthworks failures from the national incident log into a single spreadsheet. The results of this are reviewed and summarised by the National Engineering Reporting team.
- 7.5.11 Every four weeks, the spreadsheet is sent to the Territory Earthworks & Drainage Engineers for verification that these failures meet the definition for measure M6; a commentary is provided for each incident as appropriate. The Territories use a variety of data sources to verify the incidents including Daily Logs, routine and incident specific reports from the local Permanent Way organisation, earthworks examination reports and contact with personnel involved in the incident and its remediation.
- 7.5.12 The spreadsheet is returned to the National Engineering Reporting team for reporting on a four-weekly basis. At year-end Territory Earthworks & Drainage Engineers formally sign-off the data to be reported.

Accuracy of reported data

- 7.5.13 For each Territory, we reviewed each of the M6 failures reported.
- 7.5.14 In the London North East Territory we found that two failures (a collapsed culvert and a loss of ballast shoulder) were questionable regarding whether they fell within the definition for this measure. However, both were later confirmed and agreed as earthworks-related failures that fell within the definition.
- 7.5.15 More significant was the reporting of embankment failures, and specifically those failures which cause track geometry movement due to shrinkage or swell of the embankment. These are reported as a result of an emergency speed restriction or train driver caution and should be reported by the local track engineer/ manager at the time of the incident as track movement caused by an embankment failure. However, we found that there is a risk that if the local track engineer/ manager does not declare that track movement is related to an embankment failure at the time of the incident, then it may get overlooked as a reportable embankment failure. There was one example of this discovered during the audit.
- 7.5.16 In Scotland Territory, we found evidence of a more rigorous management focus on finding the root cause and testing of each incident against the definition for the measure. This led to a reduction in reported incidents this year in that Territory.

Assessment of confidence grade

- 7.5.17 **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.
- 7.5.18 **Accuracy grade.** The process is not sufficiently robust to ensure that the number of reported incidents is within 1%. The process is over-reliant on the national operations log as the sole source of information; if the local track engineer/ manager does not declare track movement is related to an embankment failure at the time of the incident, which is known to occur, then it can be overlooked as a reportable embankment failure. Therefore, we believe that M6 should have an accuracy grade of 2.

Audit Statements

- 7.5.19 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 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 been met.

Recommendations arising

- 7.5.20 **M6 recommendation 1.** The consistency of reporting embankment failures that cause disruption due to track geometry faults (usually when the embankment shrinks or swells) needs to be reviewed. This may lead to a revision of the definitions as stated 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.
- 7.5.21 **M6 recommendation 2.** It was noted that many of the earthworks failures were symptomatic of the condition and characteristics of the drainage systems associated with the failures. These drainage systems have to deal with large volumes of water when flash floods and heavy rainfall occurs. The suitability and maintenance of these drainage systems whether they are inside the railway boundary or not can determine the consequences of a potential wash out or slipping of slope material, particularly in cuttings. The two derailments were failures of this type. HQ informed us that all Territories have commissioned a drainage survey to reinforce their asset knowledge of their drainage systems. We recommend that the outcome of the drainage surveys are followed up appropriate.
- 7.5.22 **M6 recommendation 3.** The competency process for earthworks examiners was reviewed in each Territory. It was noted that each Territory has its own process for training and competency and that the standard for earthworks examination NR/SP/CIV/065 refers to RT/CE/S/046 'Standards of Competence for Examination of Earthworks' to be published in 2005. However, by the end of the 2005/06 year this hadn't been published and inconsistencies were noted in the training and competency assessment of examiners. Since the audits were carried out, a new specification NR/SP/CTM/017 'Competence & Training in Civil Engineering' has been published (June 2006) which supersedes RT/CE/S/046. This includes a compliance plan for 2006/07. We recommend consistency of competence is achieved across the Territories.
- 7.5.23 **M6 recommendation 4.** It was also noted during discussions about failures in cuttings that the examination of Rock slopes was hindered in many places by the dense cover of vegetation. This is a particular problem in the Western and Scotland Territories which have many rock cuttings. Western stated that there was a backlog of vegetation clearance on these cuttings. We recommend that this is reviewed in order to improve the process of assessing rock faces where potential rock falls could impact on the running lines.

7.6 Bridge condition (M8)

Audit scope

- 7.6.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Bridge condition (M8).
- 7.6.2 This measure assesses Network Rail's stewardship of bridges. The condition of each bridge is assessed using the Structures Condition Marking (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 respectively documented in NR/ARM/M8DF (issue 5) and NR/ARM/M8PR (issue 5).
- 7.6.4 Audits were undertaken at Network Rail Headquarters, at each of the five Territories, at five of the seven structures examination contractors (SEC) and for the contractor undertaking audits and SCMI support work on behalf of Network Rail Headquarters.

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.
- 7.6.6 The result for the 2000/01–2005/06 average condition grade is 2.0 which met the regulatory target.

Trends

- 7.6.7 SCMI scores for 5,430 under-bridges and over-bridges were reported for the 2005/06 year bringing the cumulative total of reported SCMI scores up to 20,624. The number reported this year represents an 8.5% increase than in the previous year.
- 7.6.8 However, the full asset population has not yet been inspected and the programme has not been conducted on a fully randomised basis; therefore we are unable to draw conclusions regarding a trend.
- 7.6.9 Figure 7.6.1 illustrates the cumulative distribution of grades for the past six years. Currently 60% of bridges scored are in condition grade 2, 79% are in the top two grades, 98% are in the top three grades.
- 7.6.10 Accumulation of a full set of SCMI data for the bridges population was originally programmed to take six years, commencing April 2000. However, both Network Rail and Independent Reporter B (last year's auditor of this measure) have expressed concerns regarding the accuracy of SCMI scores in 2000/01 and 2001/02 and wish to exclude them from the dataset. The present target is therefore to complete SCMI examination of all bridges by the end of 2007/08; this represents the full six-year detailed examination cycle from April 2002. However, at current rates, the SCMI programme will take longer than six years due to some Territories undertaking insufficient examinations each year to hit the targets; we discuss this further below.

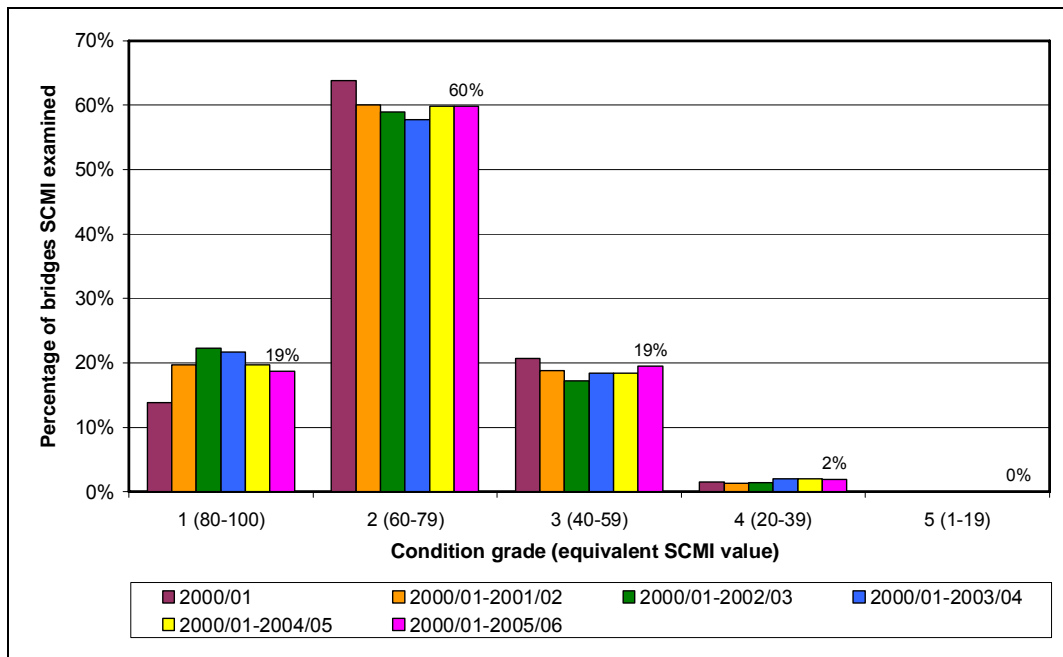


Figure 7.6.1 Bridge condition reported during the last six years (M8)

Audit findings

Process

- 7.6.11 The data acquisition, verification and reporting mechanisms for this measure have not materially changed for the reporting year 2005/06 and Network Rail confirmed that no changes have been made to the definition and procedures for this measure since last year.
- 7.6.12 Network Rail's process is to give each bridge on the network a detailed (i.e. tactile) examination, which are on a pre-defined six-year cycle. Examinations are undertaken by structures examination contractors (SECs). There are three SEC contractors covering seven contract areas.
- 7.6.13 An SCMI inspection is undertaken at the same time as a detailed examination. Certain structures do not receive SCMI inspections. These include footbridges, culverts, tunnels, retaining walls and a significant proportion of tenanted arches.
- 7.6.14 The SCMI inspection involves dividing an individual bridge into a number of elements and then allocating a score for both severity and extent. These tables of severity and extent scores are loaded into a database (the SCMI tool), from which an algorithm derives an SCMI score for the overall structure and consequently the condition grade.
- 7.6.15 The SCMI tool is hosted by Network Rail Headquarters but is heavily supported by a further contractor (Lloyd's Register Rail, LRR). This contractor has had a long role in the support and development of many aspects of SCMI, including (a) development of the SCMI tool, SCMI handbook, Network Rail standard, (b) chairing the SCMI technical users group with the SECs and (c) undertaking annual re-scoring/ Headquarters audits of selected SCMI inspections. This work feeds into the Annual Return commentary.

Accuracy of reported data

Programme

- 7.6.16 Whilst Network Rail Headquarters are preparing for the introduction of a new national database to assist in the asset management of structures, there is currently no national database of bridge structures.

- 7.6.17 Network Rail has reported that 20,624 bridges have SCMI scores. GEOGIS data from March 2005 downloaded into the National Bridge & Culvert Books (issue 2) shows 41,251 bridges, but this includes tenanted arch bridges, complex structures and major structures which are excluded from the M8 definition. There is no central list of bridges that are programmed to be inspected using SCMI; Network Rail is therefore unable to show the SCMI inspection programme will complete in 2007/08. However, the Civils Asset Register and electronic Reporting System (CARRS) and Central Asset Inventory (CAI) Projects programmed for implementation January 2007 are expected to fulfil this function and thereby enable an SCMI inspection programme to be confirmed.

Inspections undertaken in previous years but reported for 2005/06

- 7.6.18 The data reported each year in the Annual Return is based on the inspections input to the SCMI tool for the twelve months ending on 31st March each year; this means inspections reported in 2005/06 might have been undertaken in previous years. Figure 7.6.2 shows the SCMI examinations reported for 2005/06.
- 7.6.19 Our analysis shows:
- The average time for an inspection to be input to the SCMI tool was 145 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.
 - 35% (1,924) of the 5,424 inspections in the SCMI tool for reporting in 2005/06 were from a previous examination year. South East Territory contributes over one third of these examinations carried out before the reporting year. We have found no adequate reason why examinations from 2003/04 and before are still being entered into the SCMI tool years later and reported as 2005/06 condition data.

Territories	SCMI examinations reported for 2005/06							Total Reported in 2005/06
	Exams Apr98 - Mar00	Exams Apr00 - Mar01	Exams Apr01 - Mar02	Exams Apr02 - Mar03	Exams Apr03 - Mar04	Exams Apr04 - Mar05	Exams Apr05 - Mar06	
London North East	1	-	-	-	1	143	707	852
London North West	1	-	2	6	9	372	1,131	1,521
South East	-	-	1	4	204	468	501	1,178
Western	-	-	1	2	15	523	590	1,131
Scotland	-	-	-	-	-	171	571	742
Totals	2	0	4	12	229	1,677	3500	5,424

Figure 7.6.2 SCMI examinations reported for 2005/06 (M8)

Inspections reported for 2005/06

- 7.6.20 The Annual Return 2006 identified 5,430 SCMI examinations for 2005/06. The data supplied separately from the SCMI tool showed 5,424 examinations for the year. From our discussions with Network Rail regarding this discrepancy we received a summary of the HQ results in the 'SCMI Final Asset Report 05_06', but there are still 3 discrepancies between the information downloaded directly from SCMI tool that adds to a grand total of 5,427 structures examined in 2005/06 and the reported number of 5,430.
- 7.6.21 We requested twenty sample examination reports for each Territory at random from the SCMI tool. Some Territories were unable to provide us with all the requested reports due to poor document management systems; we comment further on this in the section below.
- 7.6.22 We are broadly satisfied from the 79 reports we did receive that those examinations were undertaken and that the actual conditions of each bridge were accurately reflected in the condition grade. We also verified the results in these reports were correctly stored in the SCMI tool.

- 7.6.23 As in previous years, Network Rail commissioned Lloyd's Register Rail to undertake audits of SCMI examinations. In 2005/06, Lloyds Register Rail undertook re-scoring of 216 examinations, which represented 4% of the total SCMI reports for the year. The audit report found that whilst previous examination years had shown significant improvements, this continued improvement had not been repeated in 2005/06. The results presented a mixed picture of improvements and in some areas such as labelling of SCMI sketches, the audit found that the gains made up to 2004/05 have not been maintained and accuracy worsened due to a lack of attention to detail.

Management of SCMI

- 7.6.24 There are a number of specific issues of concern relating to this measure:

- (a) Headquarters functions. Network Rail has not retained the services of Lloyd's Register Rail for 2006/2007. Network Rail is presently going through consultation to create a new three-person team comprising a National Civils Examination Engineer, Civils Examination Engineer (covering tenanted arches) and Structures Specialist (as a lead for SCMI). The role of the Structures Specialist will be to be the focus for ongoing support to Territories and SEC's for SCMI. However, at the time of audit, the plans to continue the work undertaken by Lloyd's Register Rail were incomplete and insufficient; the Reporter has concerns that the current levels of reliability and accuracy of SCMI data may not continue unless these plans are improved.
- (b) South East Territory. The work undertaken by SECs is of a repetitive nature and, as work can be planned up to six years ahead, should require a flat resource profile with some steady improvement in efficiency. However, there are specific problems with regard to South East Territory:
 - (i) There is a backlog of detailed examinations of bridges and SCMIs; this has been due to Network Rail's management of contractors and difficulties gaining access to site. Many examinations have been deferred beyond the six-yearly examination cycle specified in the company standard. The backlog recovery plan instigated by Network Rail utilises a risk-ranking approach based on the structure type, proportions, location and number of years past the planned examination date. This seeks to reduce the total number of years each bridge examination is 'out-of-date', therefore lowering the overall risk.
 - (ii) Both SECs in the Territory stated that budget constraints meant they continued to be unable to perform sufficient inspections each year. In other words, the examination cycle will remain beyond six years. However, Network Rail have assured us that "key structures/ bridges etc are alright".
- (c) Re-scoring. Once the programme is complete, bridges will be subject to their second SCMI inspection. There are currently no instructions on this process; 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 collected will drop as a result.
- (d) Report management. Network Rail does not currently have a national system for managing SEC reports in electronic format. LNE and Scotland territories have worked with their respective SECs to develop electronic data management (EDM) solutions; the Reporter was impressed by the interim management systems of both these territories. In LNW, South East and Western the Reporter found the systems for review, monitoring and storage of reports to be quite archaic considering the volume of reports involved and their importance to Network Rail, including hand-written comments in margins, huge piles of photocopying, retrieval times measured in days etc. In these Territories there was no mechanism for reporting on the status of examination reports.

Assessment of confidence grade

- 7.6.25 **Reliability grade.** The definition for this measure is documented. The process of condition inspections is subjective. The scoring method is entirely based on the ability of the examiner to assess with precision the condition of the structure; however, the competency standard has been withdrawn. We believe the M8 measure should have a reliability grade of B.
- 7.6.26 **Accuracy grade.** We found minor discrepancies in the number of inspections reported in 2005/06 and have concerns regarding the level of SCMI examinations from two, three, four and five years ago which are being reported as new condition grades in 2005/06. We believe the M8 measure should have an accuracy grade of 2.

Audit Statements

- 7.6.27 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for bridge condition (M8). We can confirm the data has generally been collected and reported in accordance with the relevant definition and procedure. We have concerns regarding the level of SCMI examinations from two, three, four and five years ago which are being reported as new condition grades in 2005/06. The data has been assessed as having a confidence grade of B2. The regulatory target for this measure has been met.

Recommendations arising

- 7.6.28 **M8 recommendation 1.** 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.
- 7.6.29 **M8 recommendation 2.** We recommend the programme and budgets for undertaking detailed inspections and SCMIs for South East Territory are reviewed to ensure that they are both sufficient to meet the required six-yearly cycle of examinations.
- 7.6.30 **M8 recommendation 3.** 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 collected will drop as a result.
- 7.6.31 **M8 recommendation 4.** 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.
- 7.6.32 **M8 recommendation 5.** We recommend competency standards for SCMI assessments are re-introduced to Network Rail company standards.

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 2006, Section 3, Signalling failures (M9), including Table 85.
- 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 NR/ARM/M9DF (issue 5) and NR/ARM/M9PR (issue 3).
- 7.7.4 Audits were undertaken at Network Rail Headquarters and sample Areas in each Territory: North East Area for LNE, West Midlands & Chilterns Area for LNW, Scotland West Area for Scotland, West Anglia Area for South East and Wales & Marches Area for Western.

Commentary on reported data

Regulatory target

- 7.7.5 The regulatory target for signalling failures set in ORR's Access Charges Review 2003 was to maintain the network at or below the baseline level recorded in 2003/04. In numerical terms, the regulatory target was not greater than 28,098 signalling failures per annum.
- 7.7.6 In 2005/06, there were 23,367 incidents attributed to signalling failures causing more than 10 minutes delay, which has met the regulatory target for Control Period 3.

Trend

- 7.7.7 Figure 7.7.1 shows performance from 2000/01 to 2005/06; there has been an improvement of 11.2% in 2004/05 and an improvement of 6.3% improvement in 2005/06.

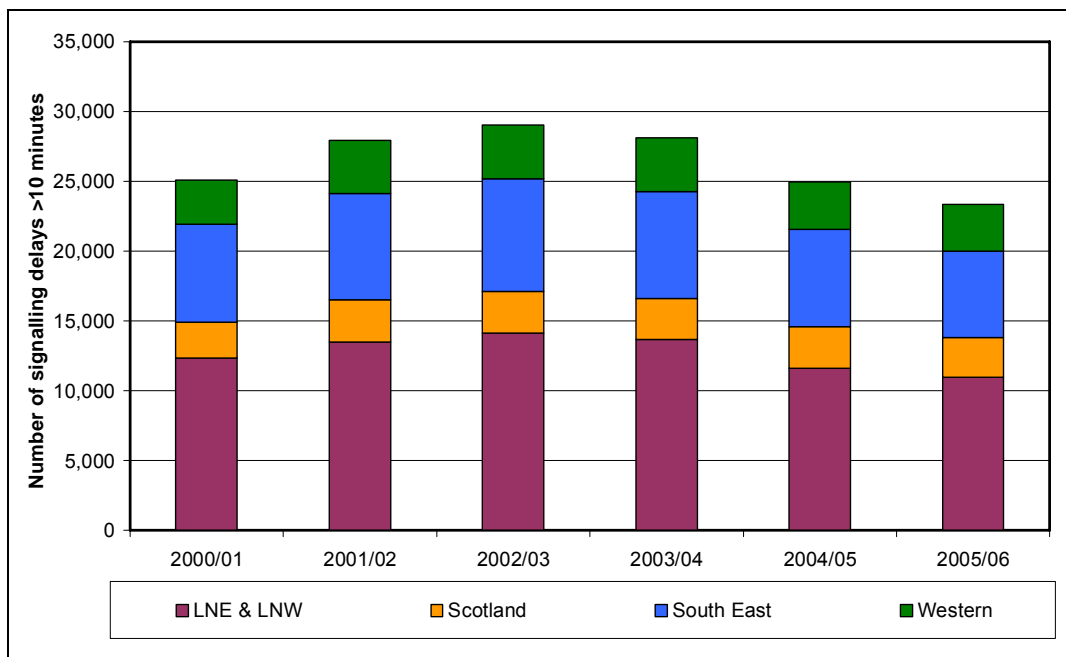


Figure 7.7.1 Number of signalling failures >10 minutes (M9)

- 7.7.8 Analysis on a geographical basis is less easy than in previous years due to organisational mergers and boundary changes; however, by grouping some of the former Regions and present Territories it is possible to create comparable datasets with similar geographical boundaries. Using these datasets, Figure 7.7.2 shows the improvement has been driven by London North Western/ London North Eastern (combined) and Western Territories.

Territory	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Variance
LNE & LNW	12,340	13,494	14,144	13,662	11,616	10,981	-5.5%
Scotland	2,578	3,025	2,988	2,948	2,968	2,843	-4.2%
South East	6,983	7,610	8,043	7,641	6,993	6,175	-11.7%
Western	3,205	3,776	3,838	3,847	3,373	3,368	-0.1%
Total	25,106	27,905	29,013	28,098	24,950	23,367	-6.3%

Figure 7.7.2 Variance from 04/05 of signalling failures >10 minutes (M9)

- 7.7.9 Network Rail has attributed the improved performance to 8,000 hour lamps and increasing maturity of TPWS, HPSS and LED signals. We believe this may be partially true, but the effects of TPWS maturity have already been seen and reported upon in previous years. There was no hard evidence presented to support this assertion, and we believe that in reality the picture is too occluded by other issues to allow such a judgement to be validated.
- 7.7.10 The number of signalling failures per million train kilometres is also presented in the Annual Return. This statistic does not form part of measure M9 nor was it requested by ORR in the agreed 'Form and Content for the Annual Return 2006'. These have not been subject to audit.

Audit findings

- 7.7.11 The procedure NR/ARM/M9PR (issue 3) had not been up-dated to reflect the new organisation; however, its meaning is still understandable by readers.

Data sourced from TRUST

- 7.7.12 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. Auditing of the delay attribution process has been undertaken as part of the performance measures (Section 2 of this report) and so will not be repeated within this section.
- 7.7.13 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:
- Track faults which cause points failure are categorised as signalling failures even if there is no signalling fault. These can actually be successful detections of unsafe track situations by the signalling system, not failures of the signalling system.
 - 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.
- 7.7.14 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.

- 7.7.15 At the end of 2005/06, following the 42-day refresh of the TRUST system, a summary of delays by type, by Area and by period is sent to the National Engineering Reporting Team. From this summary, the delays coded as attributed to signalling failures are summarised and forwarded to the Headquarters Signalling team for reporting.

Commentary sourced from FMS

- 7.7.16 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); FMS stores the results of the fault management process undertaken in the Areas. In order to investigate this mismatch, we (a) conducted audits to review the use of FMS and (b) analysed the degree of correlation between the two systems.

Use of FMS

- 7.7.17 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. Currently, a fault can only be attributed and coded to a ‘verified asset’, i.e an asset already entered into FMS.
- 7.7.18 This raises two issues:
- (a) Not all assets have been entered into FMS as verified. This is a transient situation. Network Rail estimates that c.80% of assets are verified. This will impact the veracity of data and analysis being sourced from FMS.
 - (b) The second concern is more fundamental in nature. We believe that there is a shortcoming in the FMS system in that it is not possible to code failed assets which are unverified.
- 7.7.19 In discussion with Area maintenance signalling engineers, it was apparent that the inputting of data into FMS is widely recognised as a major source of difficulty and frustration. The Controllers, who are mostly non-technical, have to follow a series of on-screen choices presented to them in order to determine the cause of the failure. It was felt that the system is far from easy to use and this led to incomplete or incorrect coding. Where coding is not possible, descriptions are entered in text form; this, in turn leads to an inability to undertake meaningful failure cause analysis. We were advised that a training programme for Controllers is planned.
- 7.7.20 Engineers use a data analysis tool called Discoverer to obtain information from FMS. We have been advised by Network Rail Headquarters that Discoverer, when used to interrogate FMS, does have the same functionality as the system FMS replaced (FRAME). However, we were advised by users that they can't obtain the same functionality; this may be a training issue.
- 7.7.21 We believe the ability of engineers to analyse the causes of signalling failures has been reduced by the implementation of FMS, the shortcomings of the associated data analysis tool and the difficulties in data entry. The effect of the above will lead to degradation of Network Rail's ability to monitor and control fault levels.

Correlation between FMS and TRUST reportable failures

- 7.7.22 We undertook analysis to determine if the two data sources – FMS and TRUST – showed an adequate level of correlation such that the Headquarters Signalling team could reasonably use FMS as the source of data for the Annual Return commentary rather than using data from TRUST. We tried to link the data from FMS and TRUST but were unable to do so due to significant levels of incomplete data fields. However, comparison of the numbers of signalling failure records in FMS and M9 reportable failures from TRUST was sufficient for our purpose: for the sample Areas we audited, there was on average only 21 reportable failures from TRUST for every 100 failures in FMS, and this percentage, when analysed for each Areas in each periods, ranged from 13% to 32%; the data sets are clearly not comparable.

- 7.7.23 This underlines our comments this year and previously; there is a significant gap between the engineering view of signalling faults (i.e. the data in FMS) and the number of signalling failures and associated delay recorded in TRUST. We recognise that the M9 measure is not used as a tool for failure trend analysis and business case production; however, the tool used to produce the commentary (FMS) is Network Rail's failure analysis tool which we have been informed is not user-friendly for either data entry or subsequent failure analysis.
- 7.7.24 The combination of restructuring combined with the introduction of a new, possibly underdeveloped tool – and the possibility of further reorganisation of Fault Control offices – means that Network Rail does not have the ability to properly assess, on a systematic national basis, failure trends of equipment at a detailed sub-system level. The impact of this will not only be on the M9 ORR measure, but on the railway's ability to maintain its current levels of signalling equipment reliability in the future.

Assessment of confidence grade

- 7.7.25 **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; the commentary provided by Network Rail are general remarks rather than the result of analysis of the data reported. We believe that M9 should have a reliability grade of C because the understanding of the measure will be based on the results table and the accompanying commentary.
- 7.7.26 **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

- 7.7.27 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2004/05 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 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

- 7.7.28 **M9 recommendation 1.** The procedure NRARM/M9PR (issue 3) should be up-dated to reflect the change of organisation.
- 7.7.29 **M9 recommendation 2.** 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 in a real time stressful situation.

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 2006, Section 3, Signalling asset condition (M10), including Tables 86-87.
- 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; it does not include level crossings or ground frames. Although there is a separate exercise being undertaken to assess the condition of all Level Crossings, this is not currently reported in the annual return.
- 7.8.3 The definition and procedures for this measure are documented in NR/ARM/M10DF (issue 5) and NR/ARM/M10PR (issue 3).
- 7.8.4 Audits were undertaken at Network Rail Headquarters and at all five Territories.

Commentary on reported data

Regulatory target

- 7.8.5 The regulatory target for signalling asset condition set in ORR's Access Charges Review 2003 was to maintain the network at or below the baseline level recorded in 2003/04. In numerical terms, the regulatory target was not greater than an average condition grade of 2.5.
- 7.8.6 In 2005/06, the average condition band was 2.39, which met the regulatory target for Control Period 3.

Trend

- 7.8.7 Figure 7.8.1 shows the trend for asset condition. For the first time in the last five years, there has been an increase in the number of assets in grade 2 (10-20 years life remaining) and equivalent decrease in assets in grade 3 (3-10 years life remaining).

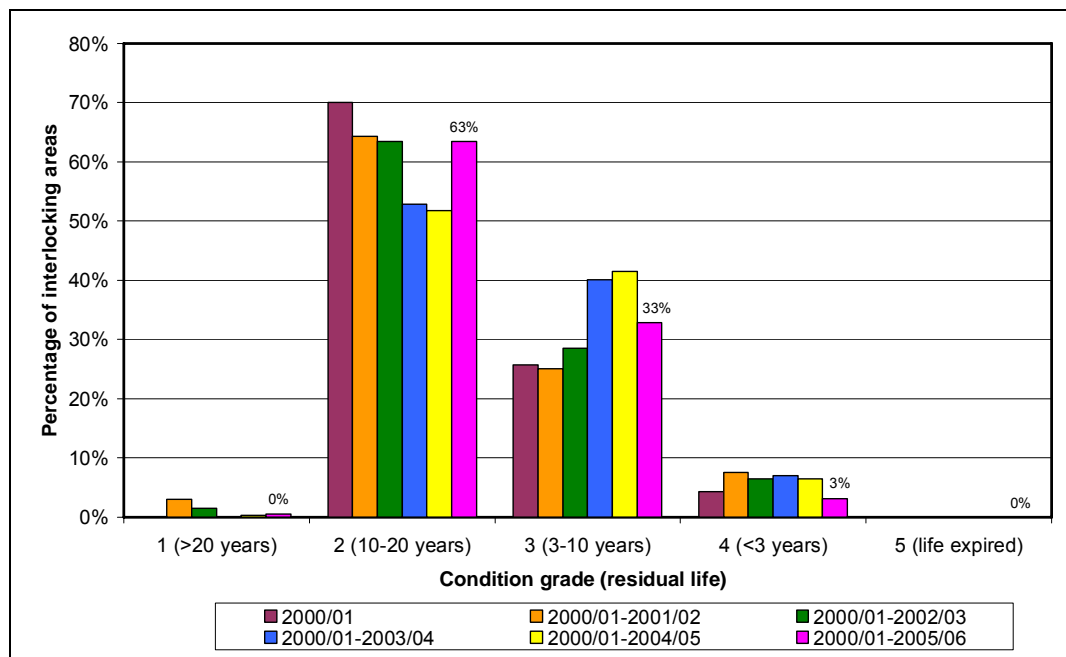


Figure 7.8.1 Average signalling asset condition (M10)

- 7.8.8 Network Rail has implemented a new Signalling Information System (SIS) this year, which provides a more transparent data storage and reporting process. Standardised interlocking information is available for all Territories for the first time on 'interlocking data cards' (spreadsheets); however, the information is not yet fully checked.
- 7.8.9 The population of interlockings in each Territory changes each year as signalling schemes are commissioned and old interlockings replaced. There has also been a process of cross-checking and clarifying the number of interlocking recorded in the Territory's spreadsheets, in the Interlocking Data Cards (IDCs), and within the new SIS system. Network Rail Headquarters has reported that there are currently 1,687 interlockings with separate interlocking data cards.
- 7.8.10 Some of the improvement in the average condition this year can be attributed to the rationalisation of the data set, where some quite large fairly new installations were previously held as a single SICA assessment; as a single installation in good condition is replaced by several records of installations in good condition the results are skewed towards a better average condition. This is a one-off effect which will not be seen in future years.
- 7.8.11 Network Rail's procedure NR/ARM/M10PR sets a target to assess 100% of interlockings by March 2006. This requirement was not achieved, as Figure 7.8.2 shows; 98.8% of interlockings have been assessed; 21 interlockings remain to be assessed. The number of interlockings under 5 years old is referenced because the cycle of assessment commences when installations are more than 5 years old.

Territory	Interlocking population ³	Number assessed (or under 5 years old)	Percentage assessed	Number still to be assessed
LNE	475	465	97.9%	10
LNW	375	375	100.0%	0
Scotland	167	167	100.0%	0
South East	386	377	97.7%	9
Western	284	282	99.3%	2
Total	1,687	1,666	98.8%	21

Figure 7.8.2 Interlocking population and SICA assessments (M10)

Audit findings

- 7.8.12 During the initial Headquarters audit, a draft revised procedure NR/ARM/M10PR (issue 5) was provided, which has been updated to reflect the new organisation structure and the introduction of SICA3 and SIS. This draft was still out for stakeholder review at the time of our audits.

SICA3

- 7.8.13 For 2005/06, condition assessments have been undertaken using SICA3. Similar to the previous version, SICA3 can be used to provide an overview of condition ('primary SICA3' or pSICA3) or a more detailed assessment of condition (a 'secondary SICA3' or sSICA3). The current dataset of condition assessments has used five different methodologies – SICA2B, pSICA, sSICA, pSICA3 and sSICA3. Though SICA3 is an improvement, the diversity of assessment methods has reduced the reliability of the historical dataset.

³ Based on reconciliation from number of Interlocking Data Cards and interlockings in SIS

- 7.8.14 One of our technical experts observed four SICA3 assessments being undertaken in Aston SCC, Busby, Virginia Water and Tallington. The assessment process was in all cases observed to be thorough and systematic. There was a common methodical approach to the assessment of a representative selection of equipment. In most cases, assessment is carried out under the IWA (Individual Working Alone) regulations; the presence of an observer thus prevented some lineside assessment being witnessed. In all cases the assessor indicated other samples would form part of the assessment. The ability to record the equipment condition in the form of digital photographs much improves the subsequent usefulness of assessment reports to engineers, especially as these reports are stored within SIS and are available to those subsequently developing renewals proposals. It was apparent that the user group had done much to build a common team approach to the assessment process, with a common understanding of the assessment of the more difficult situations and equipment.

Collection Process

- 7.8.15 For 2005/06, assessments have been 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 (see below).
- 7.8.16 Peer reviews of assessments were undertaken by senior Headquarters signalling engineers; at least one review was conducted for each Territory in 2005/06. We sampled the output of these Peer Reviews; the scope and approach to the review was appropriate.
- 7.8.17 From our audits, the key issues with regards to the collections process are:
- (a) The tool was updated to SICA3, which in our opinion will impart an improvement to the consistency of the assessment process.
 - (b) A new SICA users' group was implemented. 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.
 - (c) None of the Territories undertook formal audits of SICA users/ practitioners as per procedure NR/ARM/M10PR; the Headquarters Peer Review process carried out by senior Headquarters engineers appears to be a replacement for this and ensures that the business process for renewals is based on sound engineering judgement and thorough review of proposed renewals. Although in previous years we have not agreed with this, the combination of this check, on a sampling basis, together with the actions of the Users' group together make a satisfactory replacement for the omission of formal Territory audits.
 - (d) The greatest difference between the Territories is in their approach to competence, training and succession issues. Western were content, even after the loss of their only key practitioner, to rely on a single post with peak-clipping and vacancy-cover by contract, whereas most of the other Territories eschewed the use of contractors; most had identified and trained a number of back-up staff able assist or deputise where necessary.

Reporting Process

- 7.8.18 The new national database, Signalling Information System (SIS) allows for inter alia (a) automated upload of SICA results directly from the summary spreadsheet, (b) upload and storage of associated SICA Assessments Reports and Peer Reviews and (c) reporting of the data for the Annual Return. SIS is securely available across the internet and thus is accessible at all levels of Network Rail's organisation; it has rendered local databases unnecessary. Some Territories are still in a process of migrating data to SIS but the process is almost complete, with all except the oldest SICA reports transferred. The final checking process of SIS data, however, is not yet complete.

- 7.8.19 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. The adjustment factor is not recorded in the definition or procedure. The adjustment factor is applied as part of the reporting function of SIS.
- 7.8.20 A sample of five SICA assessments undertaken during 2005/06 were selected in each Territory and the scores of the SICA assessments were checked against information in SIS:
- The data in SIS was found to be correctly recorded for our sample of twenty-five;
 - Four of the territories also keep a local spreadsheet; the fifth did not. For our sample, we discovered a number of inconsistencies with the data stored in these local spreadsheets. This is of concern, as the Territories were using this data for planning purposes, a function that SIS provides. We recommend that the use of the local spreadsheets is abandoned in favour of SIS.
- 7.8.21 The checking process for the SIS data, however, is not yet complete, such that when we analysed the number of interlocking records reported to us by Territories and by Headquarters there were discrepancies; though the results in Figure 7.8.3 show a markedly improvement over previous years, the asset population is not yet fully agreed and reliance of the single source of data is not yet fully mature.

Territory	Interlocking population (as reported by HQ)	Interlocking population (as reported by Territories)	Variance
LNE	475	479	4 (0.8%)
LNW	375	389	14 (3.7%)
Scotland	167	171	4 (2.4%)
South East	386	368	-18 (4.7%)
Western	284	273	-11 (3.9%)
Total	1,687	1,680	-7 (0.0%)

Figure 7.8.3 Interlocking population as reported by HQ and Territory (M10)

Asset Management

- 7.8.22 Increasing confidence in the output of SICA3 has led to its increased usage to populate 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 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.
- 7.8.23 To put the condition of signalling systems and equipment into context, it should be recognised that the original specified nominal life of signalling equipment was set at 25 years. The installations of the 1960s and 1970s are obviously older than this. These installations are surviving on the over-specification of some items and the better-than-expected performance. Some of the later installations were more 'quality engineered' to the stated requirements and are declining more rapidly than the older installations. It should be noted that the issue is whether an installation which had a nominal life of 25 years will last for 30, 35 or 40 years before requiring replacement.
- 7.8.24 During our audits, the issue of wire degradation was consistently raised as an issue by Network Rail signalling engineers:
- Wire degradation is far harder to predict, identify and manage than any other aspect of equipment aging; and

- (b) The wire condition of 1960s installations is degrading; 1970s installations are maintaining relative stability of wire condition, but the 1980s installations are degrading in some cases much faster than would be expected; and
- (c) There is concern that the 70's installations may suddenly start to degrade, but the date and rate of this sudden degradation cannot be forecast; current planning assumes that degradation will not be sudden and can be managed; however, should this vintage of wiring start to degrade quickly, other plans would need to be radically revised, and measures currently in place, seen as adequate, would inevitably prove insufficient; and
- (d) We note that there is a genuine but unquantifiable concern here; in response, Network Rail can only continue to monitor the situation closely.

Assessment of confidence grade

- 7.8.25 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. 2005/06 has seen significant progress and improvement in the assessment and management of condition data; the introduction of SIS has removed a potential source of inaccuracies in collated data. 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 and a further subjective adjustment factor is introduced for SICA2B, pSICA and pSICA3; however, unwanted variation from this subjectivity is significantly suppressed by categorising the results into the five condition categories. The peer review process by the Headquarters Signalling Principles Engineer provides an independent check on the accuracy of the resulting SICA scores against experience. However, there are still concerns in the migration of historic data to SIS and agreeing the final number of interlockings. We believe that M10 should have an accuracy grade of 3.

Audit Statement

- 7.8.27 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 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 B3. The regulatory target for this measure has been met.

Recommendations arising

- 7.8.28 **M10 recommendation 1.** We recommend the current practice of applying adjustment factors to primary SICA scores should be further researched and documented to provide evidence for the level of the adjustment factor, and if justifiable the procedure and definition should be updated to include an explanation of this practice.
- 7.8.29 **M10 recommendation 2.** We recommend that a concerted management effort is undertaken to ensure that the SIS data is checked and signed off such that the SICA scores and numbers of interlockings is correct for 2006/07.

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 2004/05, Section 3, traction power incidents:
- (a) Alternating current traction power incidents causing train delays (M11);
 - (b) Direct current traction power incidents causing train delays (M12).
- 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 five hundred 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:
- (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 London North Eastern, London North Western, Scotland 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 not greater than 107 OLE component failures causing train delay. For 2005/06, the result reported by Network Rail was 49; however, Network Rail have accepted a further 2 more incidents as resulting from OLE component failure, and we believe nine incidents were incorrectly excluded from the Annual Return; either way, the result meets the regulatory target.
- 7.9.7 **M12.** In numerical terms, the regulatory target is not greater than 30 conductor rail component failures causing train delay. For 2005/06, the result reported by Network Rail was 6; however, we believe one incident was incorrectly excluded from the Annual Return and for a further three we have not received any clarifications from NR despite repeated requests. (see further discussion below); either result would meet the regulatory target.

Trend

- 7.9.8 We will comment in our final report upon the trends once the correct number of incidents for each measure is determined.

Audit findings

Process

- 7.9.9 The data acquisition, verification and reporting mechanisms for this measure have not materially changed this year.

- 7.9.10 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. The Territories use a variety of data sources to verify the incidents including Production Logs, Compass, TRUST, FMS and contact with personnel involved in the incident and its remediation.
- 7.9.11 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

- 7.9.12 We undertook a 100% verification 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.

M11 Audit

- 7.9.13 The following OLE related incidents were rejected by the responsible Territory as falling outside the definition of the measure; however, we believe the following nine incidents should be reported as part of M11 in the Annual Return:
- (a) LNW Territory; TRUST incident 782137 and 982800; we believe that this incident was caused by a fault with the OHLE.
 - (b) LNW Territory; TRUST incident 386856, 720609, 149694, 446667, 658600; the Territory has rejected these, stating they did not cause greater than 500 minutes delay; however, TRUST attributes a delay of over 500 minutes for each of them. The Territory has incorrectly used the delay minutes recorded in the local control logs to assess these failures; the procedure stipulates the use of TRUST, which is the industry source of data for delay.
 - (c) South East Territory; TRUST incident 732256 and 417633; we believe that these incidents were caused by a fault with the OHLE. Further, Network Rail have accepted that TRUST incidents 622237 and 732256 were caused by OHLE faults.
- 7.9.14 Table 88 in the Annual Return will need to be corrected to take account of these findings.

M12 Audit

- 7.9.15 The following conductor rail related incidents were rejected by the responsible Territory as falling outside the definition of the measure; however, we believe the following incident should be reported as part of M12 in the Annual Return:
- (a) SEA Territory; TRUST incident 3189; we believe that this incident was caused by a fault with the d.c. equipment that caused the delay.
- 7.9.16 We requested additional information from South East Territory for a further three other conductor rail incidents, which has not been received so far. We found the other incidents were correctly reported.
- 7.9.17 Table 89 in the Annual Return will need to be corrected to take account of these findings

Other items of note

- 7.9.18 We were impressed that LNE have initiated a failure/ trends database system and have expended some energy in recovering data from historic systems to produce this useful monitoring tool. Unfortunately this is not a company-wide initiative but is limited to LNE at this time.

Assessment of confidence grade

- 7.9.19 **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.
- 7.9.20 **Accuracy grade (M11).** We found nine incidents which we believe were incorrectly excluded from the Annual Return in comparison with the 49 reported. Further Network Rail has subsequently accepted that two incidents have been caused by an OHLE fault. We believe that M11 should have an accuracy grade of 3.
- 7.9.21 **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 C).

Audit Statements

- 7.9.22 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2005/06 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, with the exception of nine incidents which we believe were incorrectly excluded from the Annual Return plus two which Network Rail have subsequently accepted. The data has been assessed as having a confidence grade of B2. The regulatory target for this measure has been met.
- 7.9.23 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2005/06 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, with the exception of one incident which we believe were incorrectly excluded from the Annual Return plus three subject to query. The data has been assessed as having a confidence grade of BX. The regulatory target for this measure has been met.

Recommendations arising

- 7.9.24 **M11 recommendation 1.** We recommend that the Territories are reminded that the delay minutes in TRUST should be taken as the definitive number of minutes for this measure as per the procedure and rail industry practice.
- 7.9.25 **M11 recommendation 2.** LNE have initiated a failure/ trends database system and have expended some energy in recovering data from historic systems to produce this useful monitoring tool. We recommend that this is standardised and introduced nationally.

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

Audit scope

- 7.10.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Electrification condition – a.c. traction feeder stations and track sectioning points (M13).
- 7.10.2 This is a condition measure for alternating current (a.c.) traction feeder stations (FSs) and track sectioning points (TSPs), using an assessment methodology called Electrification Condition Assessment Process (ECAP) to provide a condition grade from 1 to 5, where 1 is good condition and 5 is poor condition. ECAP for a.c. traction feeder stations and track sectioning points (M13-ECAP) is based on visual inspection, design, maintenance history, refurbishment history and performance of the 25kV switchgear.
- 7.10.3 The definition and procedure for this measure are documented in NR/ARM/M13DF (issue 3) and NR/ARM/M13PR (issue 5).
- 7.10.4 Audits were undertaken at Network Rail Headquarters and South East Territory.

Commentary on reported data

Regulatory target

- 7.10.5 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 2.1.
- 7.10.6 The average condition score for year-end 2005/06 was 1.87, which has met the target.

Programme

- 7.10.7 The procedure for this measure has an internal target for the number of assets to be assessed each year such that by the end of 2005/06 100% of the 83 a.c. feeder stations and 100% of the 207 a.c. track sectioning points should have been assessed. A total of 5 FSs and 25 TSPs were assessed in 2005/06. 100% of the population for this measure has now been assessed.

Trend

- 7.10.8 Figure 7.10.1 shows the average asset condition has remained stable over the last four years once the initial concentration on poor condition assets had been completed and a larger proportion of the population had been assessed.

Period	00/01	00/01-01/02	00/01-02/03	00/01-03/04	00/01-04/05	00/01-05/06
Average Condition Score	2.1	2.1	1.9	1.9	1.87	1.85

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

- 7.10.9 Figure 7.10.2 shows that in general the assets in worst condition were assessed in the early years of the five year assessment programme, with the better condition (newer) assets assessed in the latter years. This reflects Network Rail's programming strategy for the inspections.

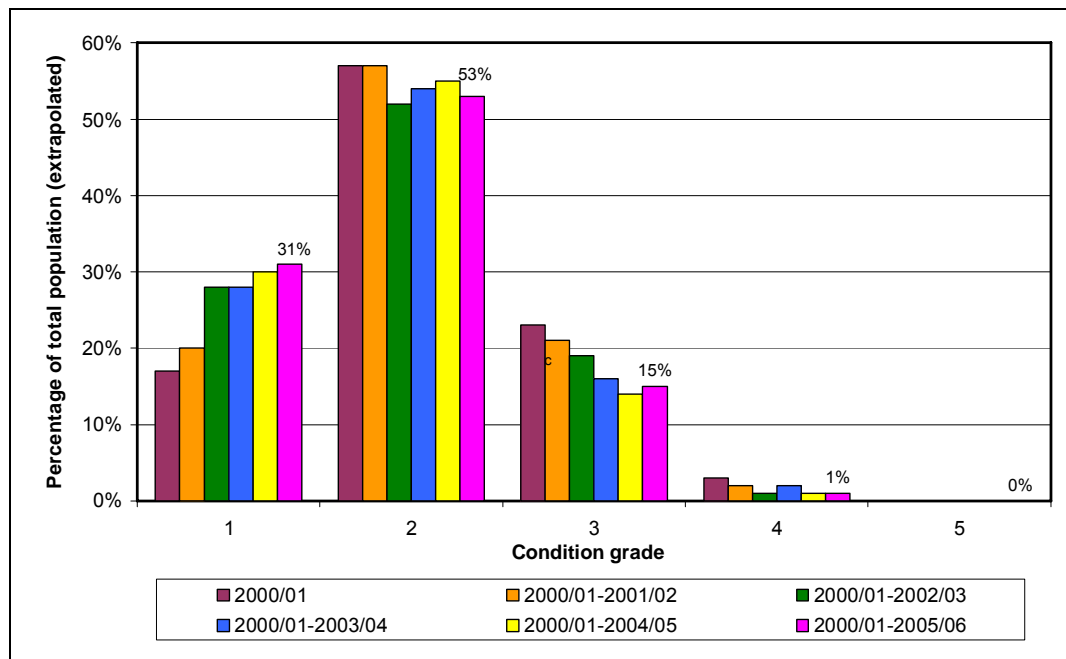


Figure 7.10.2 condition a.c. traction feeder stations & track sectioning points (M13)

Audit findings

Process

- 7.10.10 The data acquisition, verification and reporting mechanisms for this measure have not materially changed this year.
- 7.10.11 The assets for assessment in 2005/06 were selected from a spreadsheet, controlled by the Headquarters Distribution Engineer, containing details of all feeder stations and track sectioning points on the network. For 2005/06 the FSs and TSPs selected were all those that had not been assessed since 2000, ensuring 100% coverage of assets. M13-ECAP questionnaires were completed on site by Territory E&P Engineers (Distribution) or Territory Assurance Engineers.
- 7.10.12 The M13-ECAP scores were sent to the Headquarters Distribution Engineer, who checked them and sent them back to the Territory for comment. Final copies approved copies were then sent back to Headquarters via email, though no formal signed copies received by Headquarters.
- 7.10.13 The Headquarters Distribution Engineer manually inputted the scores to the spreadsheet. For previous years the spreadsheet extrapolated the average results for the assessed population across the entire population; this was not required this year as 100% of the assets had been surveyed. The Headquarters Engineer reported the results using a formal sign-off process.
- 7.10.14 No formal training in use of the M13-ECAP questionnaires was conducted for the personnel undertaking this subjective condition assessment process this year but a guidance note for the questionnaire is provided.

Accuracy of reported data

- 7.10.15 We inspected a sample of M13-ECAP questionnaires which we found were completed in accordance with the guidance note; the scores on the questionnaires aligned with those reported by Headquarters personnel and in the Annual Return.

- 7.10.16 A review of the summary spreadsheet we were sent to audit revealed two errors in calculating the scores for 2005/06 which has impacted the Territory averages but not the national average condition grade:
- (a) South East is reported in the Annual Return as having 56% for grade 2 and 0% for grade 3; we calculated the results as 44% for grade 2 and 11% for grade 3;
 - (b) London North Western is reported in the Annual Return as having 50% for grade 1 and 50% for grade 2; we calculated the results as 56% for grade 1 and 44% for grade 2.
- 7.10.17 As noted in previous years, we are concerned the condition score is always rounded down in the reporting process. An assessing engineer in the Territory would not expect an asset assessed by M14-ECAP as 2.99 to be scored as a condition grade of 2 but for it to be naturally rounded to 3. We suggest that the entire dataset should be recalculated using natural rounding now that all of the population has been assessed.

Proposed changes to process

- 7.10.18 We have commented on the technical basis of this measure in previous years. We understand Network Rail is to change the ECAP questionnaires and to move the inspections to the Network Rail Maintenance teams. We look forward to reporting on this next year.

Assessment of confidence grade

- 7.10.19 **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 is subjective. 100% of the assets have now been surveyed. We believe that M13 should have a reliability grade of B.
- 7.10.20 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. However we found a minor error discovered in the calculation of the final scores. We believe that M13 should have an accuracy grade of 2.

Audit Statement

- 7.10.21 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2004/05 for Electrification condition of AC 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. We found a minor error in the reporting spreadsheet. The data has been assessed as having a confidence grade of B2. The regulatory target for this measure has been met.

Recommendations arising

- 7.10.22 **M13 recommendation 1.** 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.
- 7.10.23 **M13 recommendation 2.** We recommend that the dataset of condition scores should be recalculated using natural rounding now that 100% of the population has been assessed.

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

Audit scope

- 7.11.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Electrification condition – d.c. substations (M14).
- 7.11.2 This is a condition measure for direct current (d.c.) substations, using an assessment methodology called Electrification Condition Assessment Process (ECAP) to provide a condition grade from 1 to 5, where 1 is good condition and 5 is poor condition. ECAP for d.c. substations (M14-ECAP) is based on visual inspection and the robustness of design, maintenance history, refurbishment history and performance of the high voltage switchgear, rectifier transformers, rectifiers and d.c. switchgear.
- 7.11.3 The definition and procedure for this measure are documented in NR/ARM/M14DF (issue 3) and NR/ARM/M14PR (issue 5).
- 7.11.4 Audits were undertaken at Network Rail Headquarters and at a sample Territory, South East, which has the majority (89%) of the d.c. substations on the network.

Commentary on reported data

Regulatory target

- 7.11.5 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 2.3.
- 7.11.6 The average condition score for year-end 2005/06 was 1.48, which has met the target.

Programme

- 7.11.7 The procedure for this measure has an internal target for the number of assets to be assessed each year such that by the end of 2005/06 100% of the 417 d.c. substations should have been assessed. A total of 44 d.c. substations were assessed in 2005/06. 100% of the population for this measure has now been assessed.

Trend

- 7.11.8 Figure 7.11.1 shows a steady increase in average asset condition as a larger proportion of the population had been assessed.

Period	00/01	00/01-01/02	00/01-02/03	00/01-03/04	00/01-04/05	00/01-05/06
Average Condition Score	2.2	2.3	2.1	1.9	1.82	1.78

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

- 7.11.9 Figure 7.11.2 shows that in general the assets in worst condition were assessed in the early years of the five year assessment programme, with the better condition (newer) assets assessed in the latter years. This reflects Network Rail's programming strategy for the inspections.

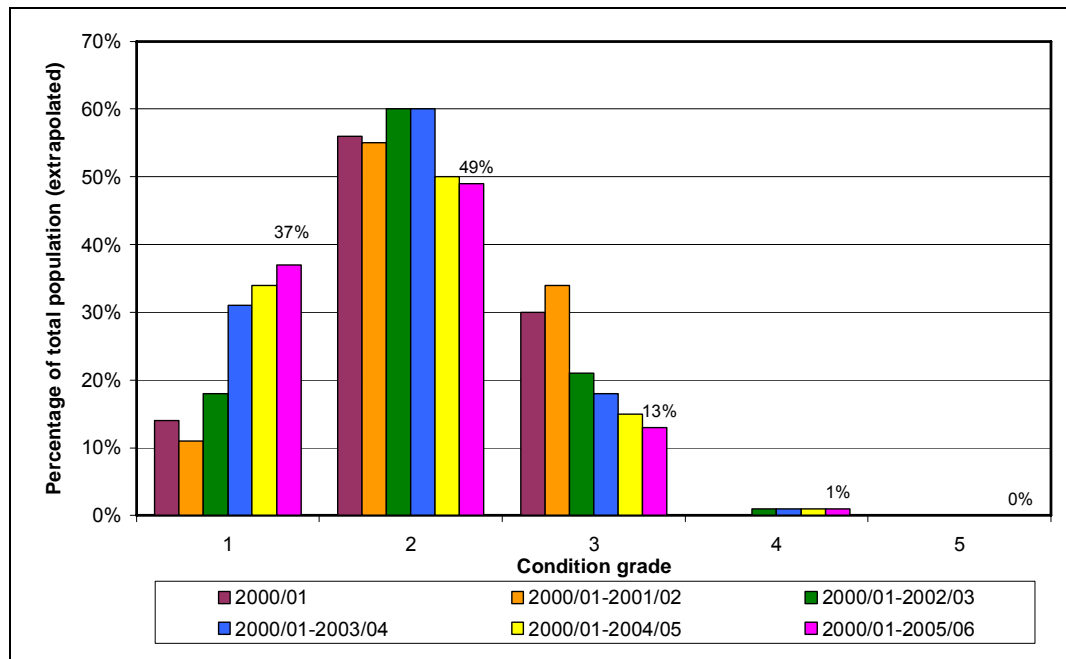


Figure 7.11.2 Average condition grades for d.c. sub-stations (M14)

Audit findings

Process

- 7.11.10 The data acquisition, verification and reporting mechanisms for this measure have not materially changed this year.
- 7.11.11 This process is similar to the process for M13 described elsewhere in this report, except that the ECAP questionnaire is for d.c. traction substations. The process is also run by the Headquarters Distribution Engineer.
- 7.11.12 Similar to M13, no formal training in use of the M14-ECAP questionnaires was conducted for the personnel undertaking this subjective condition assessment process this year.
- 7.11.13 An Headquarters audit of the process was undertaken once during the year for South East and the Territory also undertook an ad hoc check of the assessment questionnaires; we were not able to view the evidence at the audit.

Accuracy of reported data

- 7.11.14 We inspected a sample of M14-ECAP questionnaires which we found were completed in accordance with the guidance note; the scores on the questionnaires aligned with those reported by Headquarters personnel and in the Annual Return.
- 7.11.15 As noted in previous years and for M13 elsewhere in this report, we are concerned the condition score is always rounded down in the reporting process. An assessing engineer in the Territory would not expect an asset assessed by M14-ECAP as 2.99 to be scored as a condition grade of 2 but for it to be naturally rounded to 3. We suggest that the entire dataset should be recalculated using natural rounding now that all of the population has been assessed.

Proposed changes to process

- 7.11.16 We have commented on the technical basis of this measure in previous years. We understand Network Rail is to change the ECAP questionnaires and to move the inspections to the Network Rail Maintenance teams. We look forward to reporting on this next year.

Assessment of confidence grade

- 7.11.17 **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 is subjective. 100% of the assets have now been surveyed. We believe that M14 should have a reliability grade of B.
- 7.11.18 **Accuracy grade.** Our samples found the data was recorded accurately in the Headquarters spreadsheet this year. We believe that M14 should have an accuracy grade of 2.

Audit Statements

- 7.11.19 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2004/05 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 B2. The regulatory target for this measure has been met.

Recommendations arising

- 7.11.20 **M14 recommendation 1.** 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.
- 7.11.21 **M14 recommendation 2.** 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.
- 7.11.22 **M14 recommendation 3.** We recommend that the dataset of condition scores should be recalculated using natural rounding now that 100% of the population has been assessed.

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

Audit scope

- 7.12.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Electrification condition – a.c. traction contact systems (M15).
- 7.12.2 This is a condition measure for a.c. traction contact systems, using an assessment methodology called Electrification Condition Assessment Process (ECAP) to provide a condition grade from 1 to 5, where 1 is good condition and 5 is poor condition. ECAP for a.c. contact systems is based on visual inspection of a tension length (TL), such as contact wires, catenary wires, registration assemblies and structures; the measure excludes earthing, bonding and traction return circuits.
- 7.12.3 The definition and procedure for this measure is documented in NR/ARM/M15DF (issue 3) and NR/ARM/M15PR (issue 4).
- 7.12.4 The audit was undertaken at Network Rail Headquarters.

Commentary on reported data

Regulatory target

- 7.12.5 The regulatory target for electrification condition set in ORR's Access Charges Review 2003 was to maintain the network at or below the baseline level recorded in 2001/02. In numerical terms, the regulatory target was an average condition score of not greater than 1.8.
- 7.12.6 The extrapolated average condition score for year-end 2005/06 was 1.7, which has met the target.

Programme

- 7.12.7 The procedure for this measure has an internal target for the number of assets to be assessed each year, starting in 2000/01. For 2005/06, the cumulative target is 20% of the a.c. contact system. Figure 7.12.1 shows 21.1% of the population has been assessed. This target has been met this year, despite the fact that no assessments were undertaken in Scotland or Western this year.
- 7.12.8 This internal target is based on the assumption of 1 tension length = 1 kilometre. However, if the assumption is changed to 1 tension length = 1 mile, the proportion of population assessed increases to 34%.

Territory	Population (standardised track km: STK)	20% Target 2000/01-2005/06 (STK)	Achieved 2000/01-2005/06 (tension length: TL)	Percentage achieved (1 TL ≈ 1 STK)
LNE	2,125	425.0	357.0	16.8%
LNW	2,640	528.0	674.0	25.5%
Scotland	1,167	233.4	216.0	18.5%
South East	1,415	283.0	318.0	22.5%
Western	110	22.0	12.0	10.9%
Total	7,457	1,342.3	1258.0	21.1%

Figure 7.12.1 Progress for inspections – a.c. contact systems (M15)

- 7.12.9 In 2005/06, a total of 310 tension lengths were assessed, which increased the total M15 sample by 4.2% from 16.9% of the population last year to 21.1% this year. This is further discussed in the audit findings section below.

Trend

7.12.10 Figure 7.12.2 and Figure 7.12.3 show the trend for average asset condition of a.c. contact systems has been largely static over the last four years.

Period	00/01	00/01-01/02	00/01-02/03	00/01-03/04	00/01-04/05	00/01-05/06
Average Condition Score	1.9	1.8	1.8	1.7	1.7	1.7

Figure 7.12.2 a.c. traction contact systems (M15)

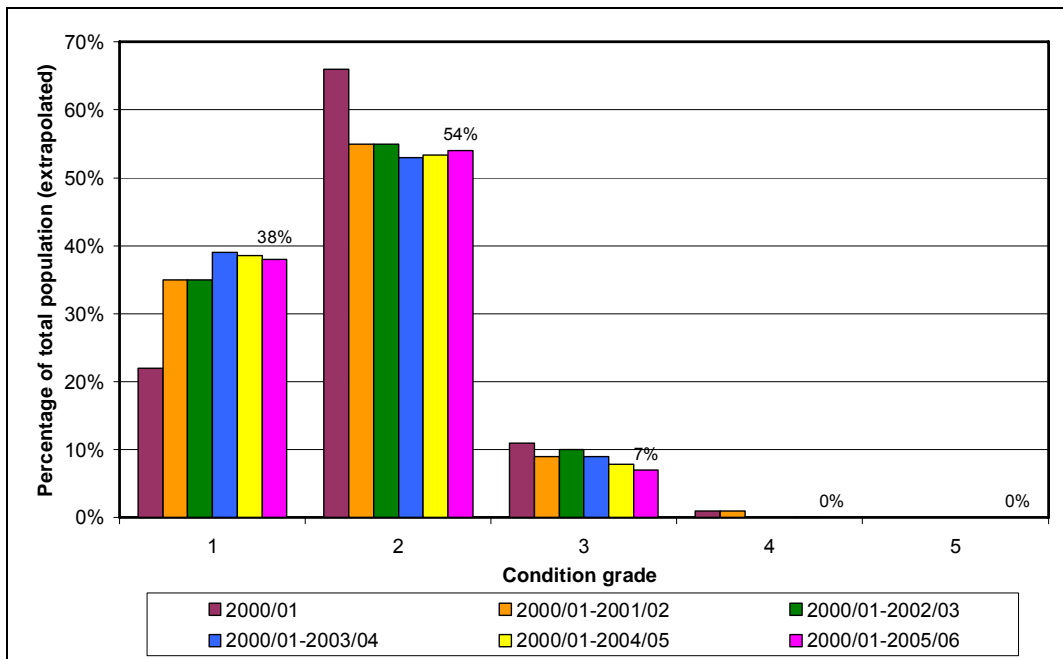


Figure 7.12.3 a.c. traction contact systems (M15)

Audit findings

Process

7.12.11 The definition and procedure have not been changed this year, except in two instances:

- (a) Assessments are now undertaken by the maintenance organisation rather than by the Territory Engineering teams. Scotland Territory has not yet implemented the changes and hence did not collect data this year.
- (b) Previously Network Rail Headquarters selected the sample of locations for assessments to ensure an appropriate sample of geography and asset characteristics so that the data can be extrapolated for the purposes of the measure. However, the assessments are now carried out by the maintenance organisations at the same time as maintenance checks and therefore are undertaken according to their maintenance schedules. This is expected to provide more assessments per annum but may lead to skewed annual samples which will impact the extrapolation.

7.12.12 Inspections are undertaken by maintenance staff and reported to the Headquarters Principal Engineer (Contact Systems) using the M15-ECAP questionnaire. The Headquarters Business Planning Manager (E&P) was responsible for using this data in a spreadsheet to extrapolate the wear measurements for reporting.

Accuracy of reported data

- 7.12.13 We inspected a sample of M15-ECAP questionnaires which we found were completed in accordance with the guidance note; the scores on the questionnaires aligned with those reported by Headquarters personnel and in the Annual Return.
- 7.12.14 We audited of the Headquarters spreadsheet for calculating the condition grades, and found the calculations to be in order. We note that there are currently 9 sample routes out of 119 sample routes which have not been inspected at all and therefore are excluded from the extrapolation calculation. Following our comments last year, the spreadsheet has improved, in terms of its layout and presentation of data; however, it is still not as clear as we would expect given its purpose.

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 results are subject to extrapolation. We believe that M15 should have a reliability grade of C, as stipulated in the confidence grading guidance (Appendix C).
- 7.12.16 **Accuracy grade.** Our sampling found no errors. However, the process of condition assessment is subjective and the results are extrapolated across 78.9% of the asset population which has not yet been assessed. We believe that M15 should have an accuracy grade of 3.

Audit Statements

- 7.12.17 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2004/05 for electrification condition of a.c. traction contact systems (M15). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure; however, it is based on extrapolation. The data has therefore been assessed as having a confidence grade of C3. The regulatory target for this measure has been met.

Recommendations arising

- 7.12.18 **M15 recommendation 1.** 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.

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

Audit scope

- 7.13.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Electrification condition – d.c. traction contact systems (M16).
- 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 replacement required. The measure excludes all equipment other than the conductor rail itself.
- 7.13.3 The definition and procedure for this measure are documented in NR/ARM/M16DF (issue 3) and NR/ARM/M16PR (issue 4).
- 7.13.4 Audits were undertaken at Network Rail Headquarters and at South East Territory. No data was reported by London North Eastern and London North Western Territories this year. 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. The average condition score for all assets assessed to year-end 2004/05 was 1.8 which has met the regulatory target.

Programme

- 7.13.6 The procedure for this measure has an internal target to ensure that wear measurements are undertaken "with a periodicity of up to ten years". Figure 7.13.1 shows the age profile of measurements for South East; 14.9% are greater than ten-years old.

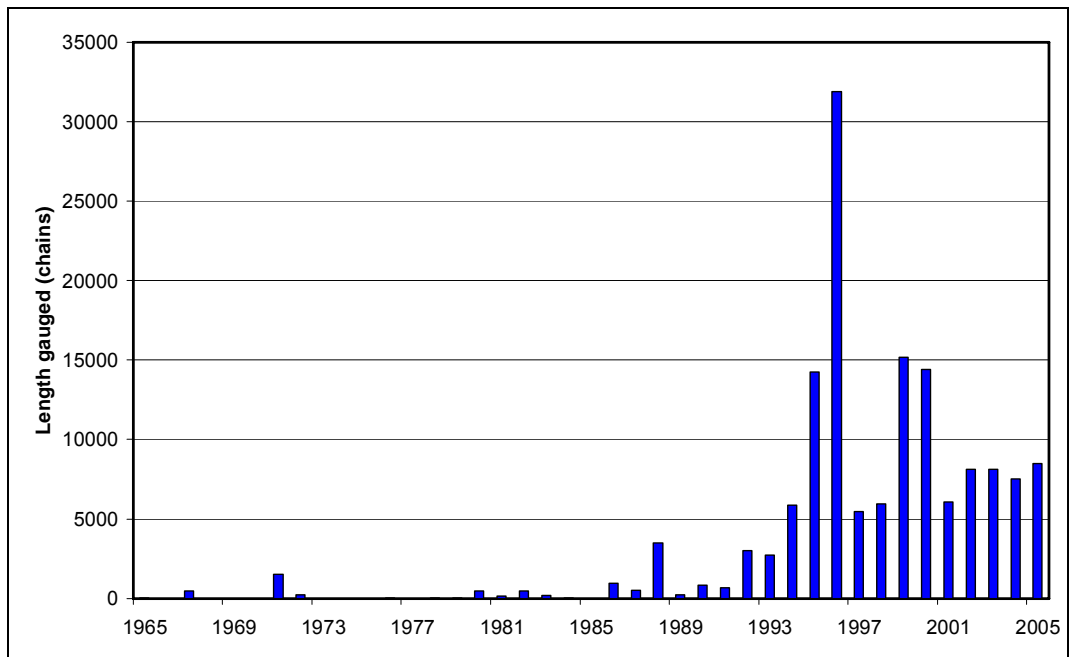


Figure 7.13.1 Age profile for wear measurements on South East Territory (M16)

Trend

7.13.7 Figure 7.13.2 and Figure 7.13.3 show the trend for average asset condition of conductor rails (M16). The results reported for measure M16 have remained largely static since 2000/01 at 1.8. This stability is not surprising as only 69% of conductor rail wear measurements⁴ included within the measure have been undertaken since 2000. A large proportion of the information reported for this measure is based upon old wear measurements, extrapolated to reflect an estimate of current wear.

Period	00/01	00/01-01/02	00/01-02/03	00/01-03/04	00/01-04/05	00/01-05/06
Average Condition Score	1.8	1.8	1.8	1.8	1.9	1.8

Figure 7.13.2 Average condition of conductor rails (M16)

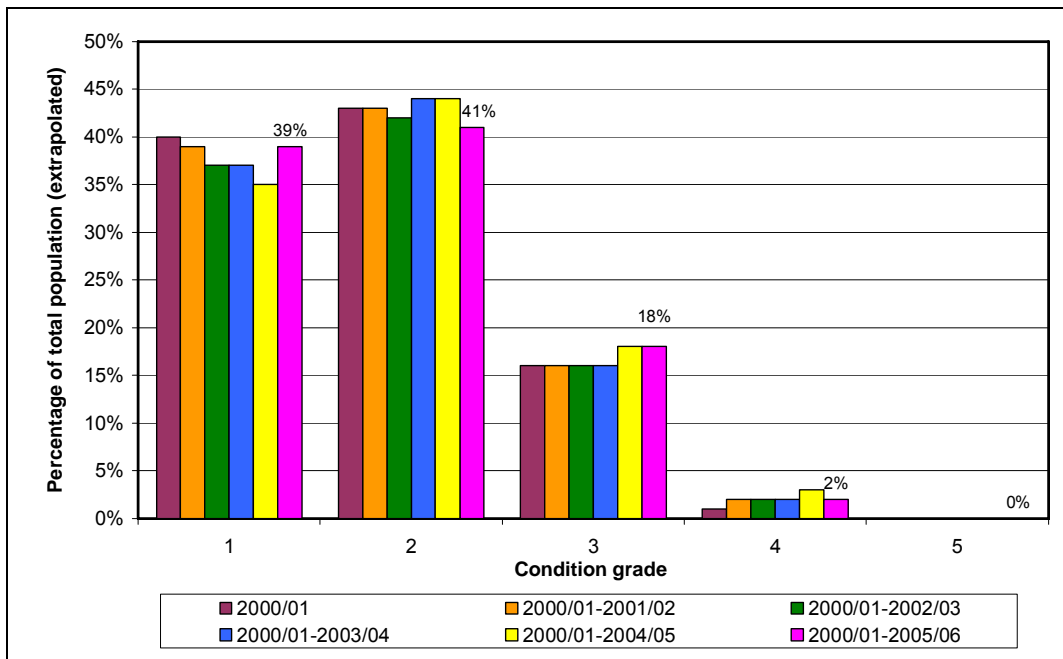


Figure 7.13.3 Average condition of conductor rails (M16)

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 RT/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;

⁴ This figure is for South East Territory which contains the vast majority of the asset population.

- (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, London North Western Territory or East Anglia Area.
- 7.13.11 We audited of the South East Territory calculation spreadsheet for Wessex, Sussex and Kent Areas:
- (a) A sample of scores was found to be accurately reflected in the South East Territory spreadsheet.
 - (b) South East Territory reported that there is an error in the figures reported to Headquarters for Kent Area; the corrected figures were provided to us. This correction has not yet been reflected in the Annual Return.
- 7.13.12 Except for Kent, the data provided to us by South East Territory matched that in the Headquarters spreadsheet and correlated with the data presented in the Annual Return. With some difficulty due to the poor layout of the spreadsheets, we inspected the Headquarters spreadsheets used to store and calculate the condition grades; we were able to verify the calculations.

Developments

- 7.13.13 Access to the d.c. conductor rail to obtain data is now a significant problem for Network Rail as gauging on live conductor rails is not justifiable under the Electricity at Work Regulations. To rectify this, a train-borne conductor rail gauging system is being developed to measure the position and cross-sectional profile of contact rails for wear calculations. This system is now fitted to the UFM160 measurement train and is currently undergoing validation. If the project is delivered to plan then some data will be available for the 2006/07 reporting year.

Assessment of confidence grade

- 7.13.14 **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 C).
- 7.13.15 **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. Further we have been informed that the data reported in the Annual Return for the Kent Area is inaccurate and will need to be corrected. We believe that M16 should have an accuracy grade of 4.

Audit Statements

- 7.13.16 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 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 been met.

Recommendations arising

- 7.13.17 **M16 recommendation 1.** We recommend that the spreadsheets used to calculate this measure are (a) consistently formatted in line with standard practice to improve clarity and (b) tidied so that regulatory calculations are in a logical order.

7.14 Station condition index (M17)

Audit scope

- 7.14.1 These audits were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Station condition index (M17).
- 7.14.2 This measure is intended 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 34 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 34 elements. The condition grades are integers from 1 to 5, where 1 is good condition and 5 is poor condition. The condition grades are then averaged (unweighted) for each station and presented as an average (unweighted) for all stations.
- 7.14.3 The definition and procedure for this measure is documented in:
- (a) NR/ARM/M17DF (issue 3);
 - (b) NR/ARM/M17PR (issue 4);
 - (c) NR/ARM/M17MN (issue 3)
- 7.14.4 Audits were undertaken at Network Rail Headquarters and at London North Eastern, London North Western, Scotland, South East and Western Territories with the Territory Building Engineers.

Commentary on reported data

Regulatory target

- 7.14.5 The regulatory target for the station condition index was set to be no deterioration from the 2003/04 levels, which was to maintain the average condition grade at 2.25.
- 7.14.6 For 2005/06, the reported result of the national average condition grade for the complete portfolio is 2.22 which met the target for the year.

Trend

- 7.14.7 Figure 7.14.1 shows that the trend of the reported figures for 2005/06 is slight improvement.

Period	2001/02	2003/03	2003/04	2004/05	2005/06
Average Condition Score	2.25	2.25	2.25	2.23	2.22

Figure 7.14.1 Average condition of Stations (M17)

- 7.14.8 The number of stations achieving grades 1-5 across the entire network in the last 4 years is shown in Figure 7.14.2. Grade 2 represents 71% of the inspected population; grades 1-3 represent 100% of the inspected population.
- 7.14.9 The procedure requires that 20% of stations are surveyed each year on a rolling programme. In 2005/06, 517 stations were surveyed giving a total of 20.6%. The full asset population has been surveyed and resurveying has now commenced.

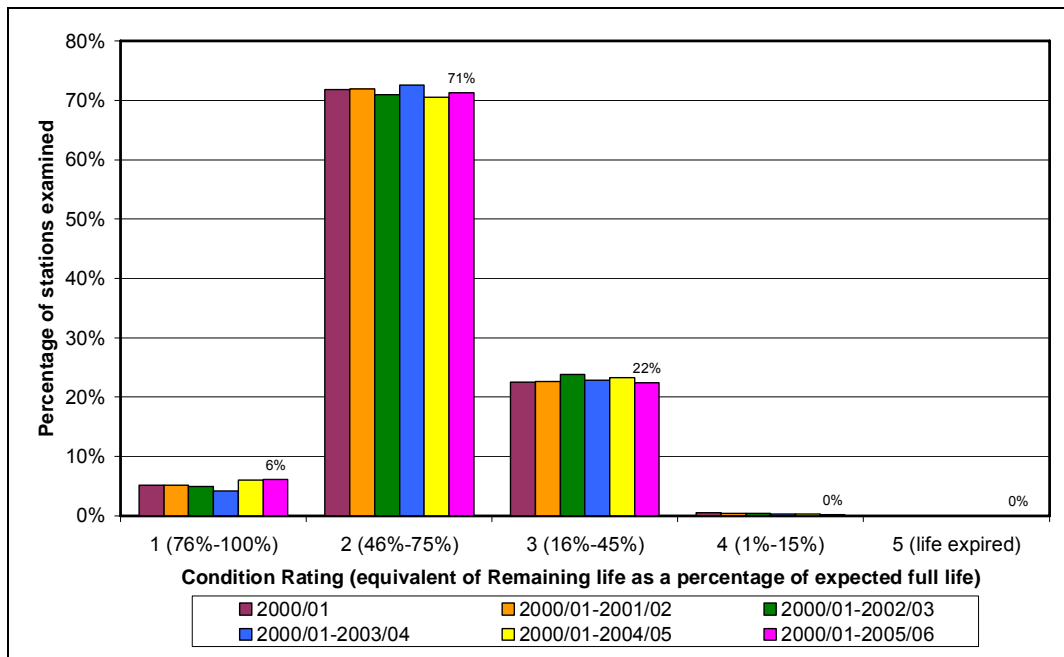


Figure 7.14.2 Station condition reported during the last six years (M17)

Audit findings

Definition

- 7.14.10 The definition and procedure have not changed this year despite this being identified as an issue in 2003/04 and as a matter of note in the 2004/05 ORR Annual Assessment. We were informed by the acting Network Rail Reporting Champion that the measure is under review with ORR.
- 7.14.11 As we have reported in previous years, we have the following concerns with the definition of the measure:
- The inspections should cover physical integrity as well as cosmetic appearance.
 - The average percentage remaining asset lives for each of the assets are equally weighted when producing the condition score for each of the 34 asset types; we suggest these should be weighted to reflect their relative importance to customers or differing levels of maintenance and renewal expenditures.
 - The scores for each of the 34 asset types are equally weighted when producing the average condition score for each station; we suggest these should be weighted to reflect the relative volume of assets or their relative importance to customers or differing levels of maintenance and renewal expenditures.
 - The scores for each station are equally weighted when producing the average condition score for the network; we suggest these should be weighted to reflect their importance or passenger footfall.
 - Grades 1-3 dominate the results partly due to the non-linear nature of the grade bands. The gaps between the grades are 25% (grade 1-2), 30% (grade 2-3), 30% (grade 3-4), 15% (grade 4-5) of residual life, i.e. grades 1-3 cover 85% of the possible range of condition. We have found no reason why the grades are not linear, with equal gaps between the grades.
 - It is improbable that Grade 5 will ever be used, as the grade for a station is derived from the asset condition of 34 different types of station asset. In order for a station to score a grade 5, virtually all of its assets would have to be life expired, which is

highly unlikely. It would be more useful if grade 5 was expanded to cover a range of asset life so that it becomes a useful part of the measure.

Process

- 7.14.12 During the year, Network Rail carried out a reorganisation, which resulted in the ownership of the M17 measure moving from Railway Estates to Civil Engineering. The Reporting Champion responsibility has not been transferred to Civil Engineering and has been retained on an acting basis by Railway Estates.
- 7.14.13 The station condition inspections are undertaken by contractors, procured by Headquarters but managed locally by Territory Building Engineers. The reports are assessed and stored locally; the results forwarded to Headquarters for storage and reporting.
- 7.14.14 We have the following concerns regarding the implementation of this measure this year:
- (a) The procedure requires that an external consultant is appointed to carry out an audit of the inspections undertaken by each inspector. No such audits were undertaken in 2005/06.
 - (b) The procedure requires that Regional Process Owners are responsible for ensuring that all surveys are carried out by approved inspectors. Several Territories made no such checks, instead relying entirely on the internal QA processes of the appointed contractors.
 - (c) No briefing workshops for inspectors have been held for two years. This appears to be because the contractors are now in the fourth year of five-year term commissions; training might result in an expectation of continuity.
 - (d) Several Territories made no check on staff turnover in the appointed contractor's teams or the use of sub-contractors, even though some Territories noted that the appointed contractor's staff had turned over and surveys had sometimes been sub-contracted out by the appointed contractor.
 - (e) Some Territories carried out minimal or no sense checks on the data received from contractors, or only checked it for completeness rather than accuracy. The exception to this was Scotland Territory, which undertook an audit. Western Territory carried out a sense check, but only after the data had been sent to Headquarters directly by the contractor.
 - (f) In the reorganisation, responsibility for assessing major stations has transferred to the Territories. Most were aware of this, but these stations had not been added to their rolling programme of surveys.
- 7.14.15 Headquarters has produced Volume 1 of a Fabric Assessment Manual in order to reduce the subjective nature of assessing the residual life of each element. It was intended to produce further volumes, but this has now been abandoned. Some Territories were unaware of the existence of the manual due to internal reorganisations and staff turnover.
- 7.14.16 As part of a wider initiative, Network Rail has been attempting to introduce collection of data using handheld computers for several years but ongoing technical difficulties have led to suspension of this initiative. Even if the technical problems can be solved, several Territories have expressed concern that there is no benefit in terms of the time to input data directly into a handheld computer, and the quality of information recorded is also much reduced.
- 7.14.17 We found little use of the data from this measure by Territories in the planning and management of maintenance or renewals work banks. It is a measure collected only for reporting to ORR.

Accuracy of reported data

- 7.14.18 We sampled five reports from each Territory, the content was correctly input to the Headquarters database.

- 7.14.19 We analysed the Head quarters database and found discrepancies compared with data presented in the Annual Returns; the results are shown in Figure 7.14.3. The discrepancies may have been due to misreporting in the 2005/06 Annual Return or recent changes in the Headquarters database. We are in discussion with Network Rail regarding the correct data but would note that the error rate is low.

Period	2001/02	2003/03	2003/04	2004/05	2005/06
Reported in 2005/06 Annual Return	2,456	2,499	2,500	2,505	2,506
2005/06 Headquarters database	2,452	2,496	2,497	2,502	2,505
Discrepancy	-6	-3	-3	-3	-1

Figure 7.14.3 Average condition of Stations (M17)

- 7.14.20 One Territory conducted an internal audit on a report, 17 of the 87 scores were amended, and of the 11 stations where site visits were carried out, 6 scores were amended.

Assessment of confidence grade

- 7.14.21 **Reliability grade.** The definition for this measure is clearly documented except for the methods used for processing the data into a station and network score, although a consistent approach has been adopted for this. The process for condition assessment is subjective although an attempt has been made to assess the asset condition against measurable criteria. The defined scoring system is non-linear and ensures that averaged scores almost entirely falls in one of three scores. Internal and external audits specified in the procedure have not been undertaken this year, competency checks of the contractors undertaking the surveys have not been undertaken this year; report checking has not been undertaken in some Territories. We believe that M17 should have a reliability grade of B.
- 7.14.22 **Accuracy grade.** We have found a number of discrepancies which we are discussing with Network Rail; however, these are below 1% error. However, we have concerns regarding the subjective nature of this measure and significant concerns regarding its implementation this year. We believe that M17 should have an accuracy grade of 3.

Audit Statements

- 7.14.23 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for station condition index (M17). The data has been collected and processed generally in accordance with the procedures but with some significant omissions concerning auditing and checking to ensure the consistency of surveys. The data has been assessed as having a confidence grade of C2. However, we would note that this does not reflect the value of this measure as a true score of station condition. The regulatory target for this measure has been met. Minor amendments to Network Rail Annual Return results table will be required.

Recommendations arising

- 7.14.24 **M17 recommendation 1.** 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.

7.14.25 **M17 recommendation 2.** We recommend Network Rail reviews arrangements for the ownership of this measure and improves the level of compliance.

7.15 Station facility score (M18)

Scope of audit

- 7.15.1 These audits were undertaken to assess the reliability and accuracy of data reported in Network Rail's Annual Return 2006 for Station Facilities Index (M18).
- 7.15.2 The measure reports the level of facilities present at stations broken down by station category and by theme. The score is calculated by counting the number of specific items at each station. It is entirely quantitative, and makes no attempt to assess the quality of facilities or whether they are available for use. The Facilities scores for each station are added and reported by theme and station category for the entire network, both by total number and indexed compared to a value of 100 in 2000/01.
- 7.15.3 The definition and procedure for this measure is documented in:
- (a) NR/ARM/M18DF (issue 4);
 - (b) NR/ARM/M18PR (issue 6)
- 7.15.4 Audits were undertaken at Network Rail Headquarters and at London North Eastern, London North Western, Scotland, South East and Western Territories with the Operational Estate Managers.

Commentary on reported data

Regulatory target

- 7.15.5 No regulatory target has been set for this measure.

Trend

- 7.15.6 The station facility score has risen steadily over the last four years, showing a 7% increase. There has been a 1.7% increase for the measure this year driven by a 3.7% increase for Category A stations and a 2.3% increase for Category C stations. Figure 7.15.1 shows that this increase is dominated by the safety & security theme, which also accounts for over 61% of the total score.

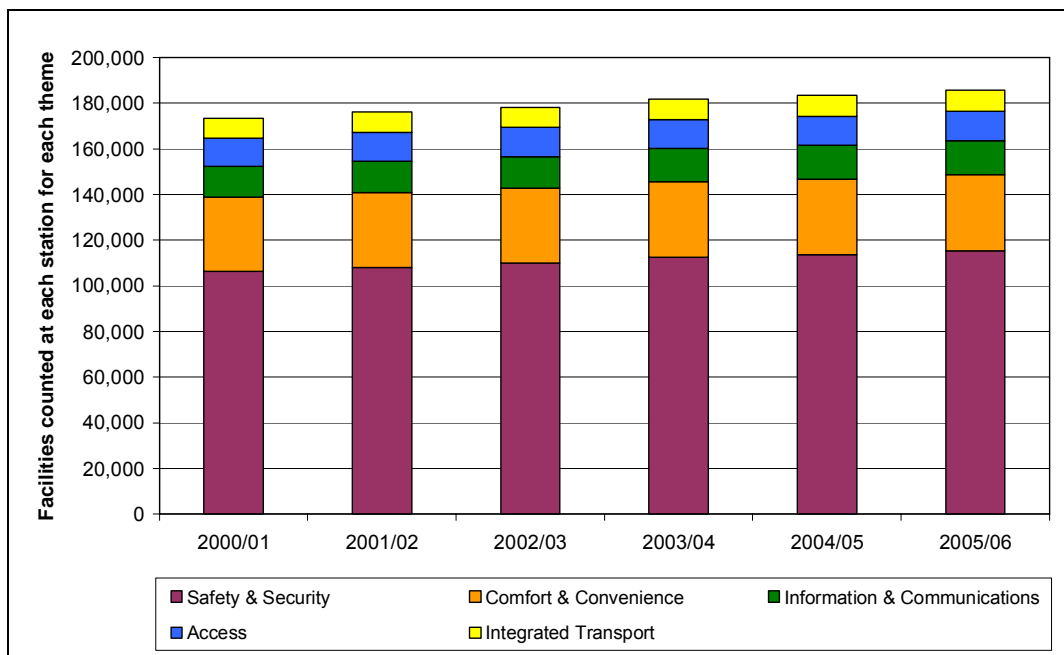


Figure 7.15.1 Station facility scores (M18)

- 7.15.7 There is imprecise information from each Territory on how many surveys have been undertaken in reporting year 2005/06. We believe that in total approximately 170 stations were surveyed giving a total of less than 7% compared to the target of 20% as described in the procedure, which is under the requirement.

Audit findings

- 7.15.8 The definition and procedure have not changed this year despite this being identified as an issue in 2003/04 and as a matter of note in the 2004/05 ORR Annual Assessment. We were informed by the acting Network Rail Reporting Champion that the measure is under review with ORR.
- 7.15.9 As we have reported in previous years, we have the following concerns with the definition of the measure:
- The scoring system is arbitrary in nature. The score comprises 67 different elements grouped into broad categories. Items counted on platforms have a dominant effect on the overall score. Previous audits identified that the facilities score was dominated by lamp-heads which accounted for 54% of the entire score even though the number of lamp-heads is not proportional to the luminance level or coverage. We have previously identified other situations where individual scores have a disproportionate effect on the total score.
 - The scores are entirely unweighted for the size of a facility, its importance to customers or the size/ footfall of the station at which the facility is provided.
 - The score focuses entirely on quantity rather than quality; no account is taken of whether the facilities are functional and in use or not. The relevance of items counted towards the overall score is not assured casting doubt on the usefulness of the measure in both relative and absolute terms.
- 7.15.10 Given these unresolved misgivings, we have not sought to undertake a detailed site audit of asset inspections made under this measure.

Process

- 7.15.11 The count of facilities at stations is collected by Network Rail Account Surveyors and comes from a number of sources:
- Site visits to 20% of stations each year on a rolling programme, including surveys undertaken as part of the franchise change processes;
 - Information about changes to the number of facilities, provided by station facility owners through landlord's approvals and station change procedures;
 - Information about changes to the number of facilities, provided by project managers and building surveyors.
- 7.15.12 The reports are assessed and stored locally; the results forwarded to Headquarters for storage and reporting.
- 7.15.13 We have the following concerns regarding the implementation of this measure this year:
- In previous years, Scotland Territory has not submitted the underlying data for each station to Headquarters, but has submitted totals only. In 2005/06, following a change of local owner, the entire database for Scotland was lost. By the time this was discovered, it was too late to recover it from server back-ups. The Territory is now carrying out a process of resurveying every station, and until this is completed, no updated results for Scotland will be available.
 - We found evidence of poor planning by some Territories, which explained the failure to achieve the 20% per annum target this year.
 - There are a number of stations maintained by Network Rail, generally major stations which are used by a number of train operators. As M18 data is collected by Account Surveyors, who are organised to meet the needs of specific train

operator franchises, it is not clear how the data for major stations is collected or maintained.

- (d) During the year, there have been many changes in personnel, and some teams have been reduced in size, creating pressure on available resources particularly when franchise changes have also taken place;
 - (e) Some Territories are only undertaking facility count surveys during specific visits to stations for this purpose. This is clearly inefficient; surveys can be conducted as part of normal visits to stations and only supplemented with additional surveys as necessary.
- 7.15.14 Western Territory has developed a questionnaire sheet which has made the collection process more efficient and a suitable approach to planning. This represented best practice.

Accuracy of reported data

- 7.15.15 The data reported is changed in two ways – from a resurvey or from known changes delivered by the station facility owner or Network Rail; this latter approach, whilst capturing useful information, is only incremental and therefore depends on the veracity of the original facilities count at that station.
- 7.15.16 We were unable to undertake a sampling audit as we were unable to obtain the Headquarters database within the period of our audits, despite a number of requests to the Headquarters Champion for this measure.

Confidence grade

- 7.15.17 **Reliability grade.** The definition for this measure is clearly documented. The factual score is measured using the established procedure albeit from a much smaller sample of stations than required. We believe that M18 should have a reliability grade of B.
- 7.15.18 **Accuracy grade.** We were unable to undertake a sample audit this year as the Headquarters database was unavailable. Due to the high number of facilities counted (185,609) there would need to be significant error to create a 5% error rate. The process of counting facilities is relatively simple, and compared to other measures, percentage accuracy should be reasonably high; however, the data management processes for this measure are deficient. We believe that M18 should have an accuracy grade of 2.

Audit Statement

- 7.15.19 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for station facilities index (M18). The data has been collected and processed generally in accordance with the procedures apart from a shortfall in the number of station visits recorded and a total loss of data in Scotland Territory. However, due to the nature of this measure this has not significantly impacted the results. The data has been assessed as having a confidence grade of B2. There is no regulatory target for this measure.

Recommendations

- 7.15.20 **M18 recommendation 1.** 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 relevance and purpose of measure, (b) take account of split responsibility for providing facilities between Network Rail and train operators, (c) introduce weighting of the scores to reflect importance to public e.g. disabled access and security; (d) review scoring of facilities to reflect quality as well as/ rather than quantity; (e) review scoring for facilities which are not currently operational; (f) introduce benchmark for what facilities stations of various categories/footfalls should have; (g) consider combining collection of data with other surveys.

7.15.21 **M18 recommendation 2.** We recommend Network Rail reviews the current acting arrangements for the internal ownership of this measure and improves the level of compliance with the procedure.

7.16 Light maintenance depot – condition index (M19)

Audit scope

- 7.16.1 This audit were undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Light maintenance depot – condition index (M19), including Table 107-108.
- 7.16.2 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. 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;
- 7.16.3 The definition and procedures for this measure are documented in NR/ARM/M19DF (issue 3) and NR/ARM/M19PR (issue 4). There is also a supplementary manual, NR/ARM/M19MN (Issue 2).
- 7.16.4 Audits were undertaken at Network Rail Headquarters and on-site at a selection of depots.

Commentary on reported data

Regulatory target

- 7.16.5 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.
- 7.16.6 In numerical terms, the regulatory target was not greater than 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.
- 7.16.7 In 2005/06, the average condition grade was 2.58, which has bettered the target of 2.63 and therefore met the regulatory target.

Trend

- 7.16.8 Figure 7.16.1 shows the trend for asset condition. Over the last five years, there has been a decrease in the percentage of assets in condition grade 3 (16-45% asset life remaining) and condition grade 4 (1-15% asset life remaining) and equivalent increase in assets in condition grade 2 (46-75% asset life remaining).

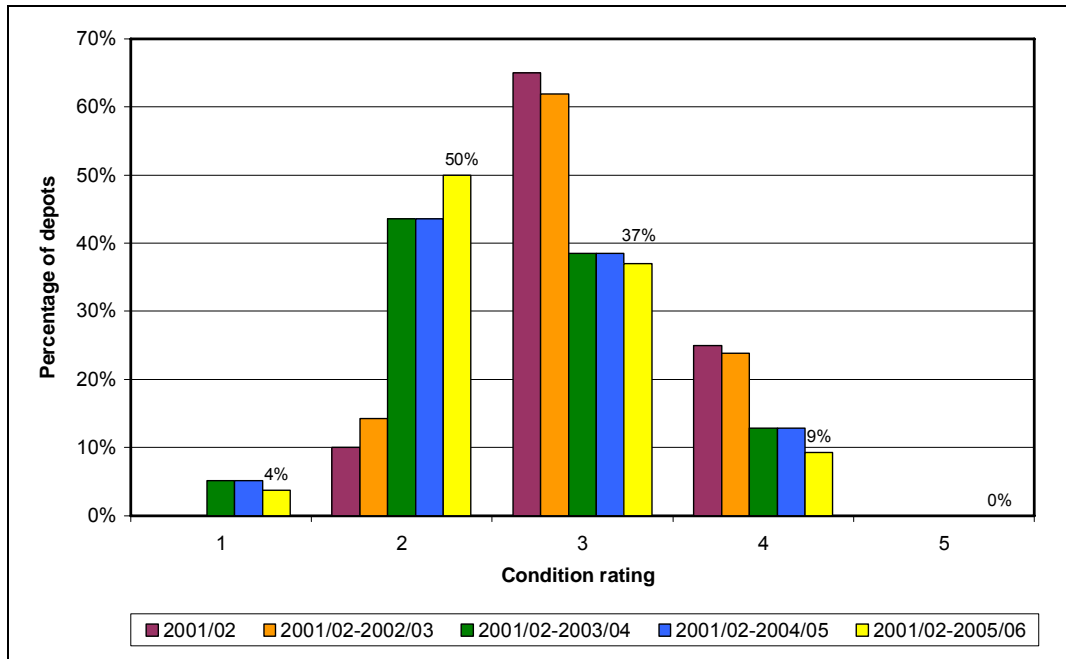


Figure 7.16.1 Average LMD asset condition (M19)

- 7.16.9 However, the full asset population has not yet been inspected and the programme has not been conducted on a randomised basis; therefore we are unable to draw conclusions regarding a trend.
- 7.16.10 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 sixth year of undertaking inspections; however, Only 64 of the stated population of 91 had been inspected by year end 2005/06. Of these 64, 10 inspections were undertaken in 2004/05 and the information was lost due to issues with handheld devices. Therefore only 54 LMDs have been included in the condition figures in the Annual Return. Figure 7.16.2 illustrates the current shortfall of 55 inspections which is a shortfall of over 50%.

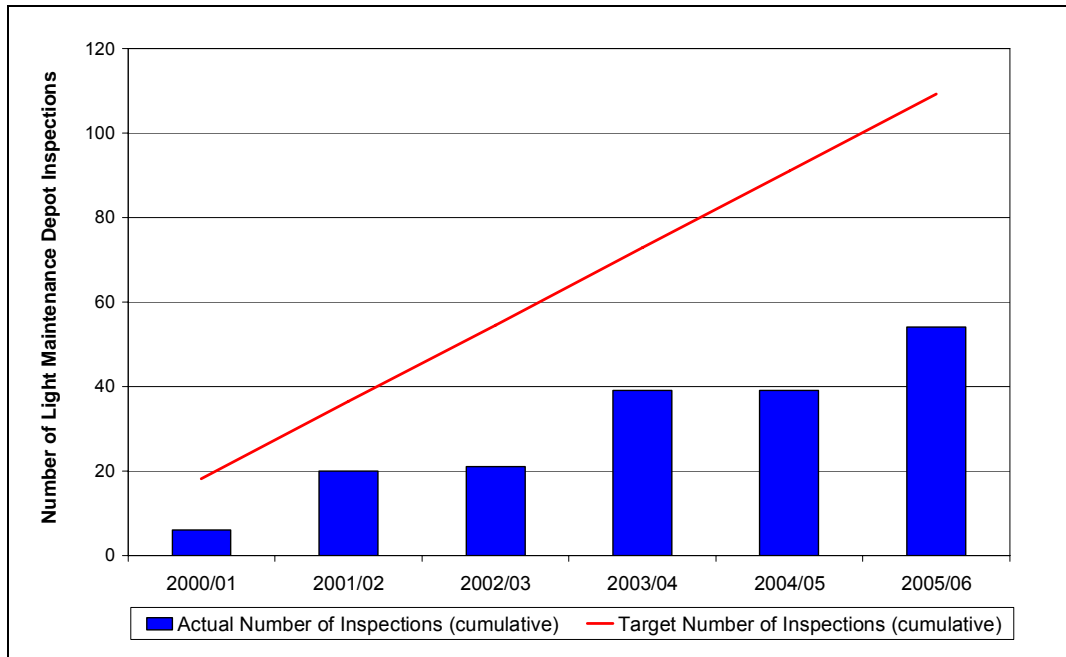


Figure 7.16.2 Number of LMD inspected by year (M19)

Audit Findings

- 7.16.11 The procedure NR/ARM/M19PR (issue 4) had not been up-dated to reflect the new organisation; however, its meaning is still easily understandable by readers.
- 7.16.12 We have not audited this measure before, however, we have encountered similar issues with M19 and we did with M18. We have the following concerns with the measure itself:
- (a) The 11 asset elements include many but not all the significant assets of an LMD; other elements such as security systems, fire protection systems, safety systems, drainage, motive power supplies & equipment (25kv and 3rd rail), wheel/ bogie drops or jacks, data acquisition and other IT systems should also be considered.
 - (b) The scores for each of the 11 asset types are equally weighted when producing the average condition score for each depot; this means track is given an equal weighting to internal lighting. We suggest these should be weighted to reflect the relative volume of assets or their relative importance to depot facilities operators or differing levels of maintenance and renewal expenditures.
 - (c) The scores for each depot are equally weighted when producing the average condition score for the network; we suggest these should be weighted to reflect their size.
 - (d) Grades 1-3 dominate the results partly due to the non-linear nature of the grade bands. The gaps between the grades are 25% (grade 1-2), 30% (grade 2-3), 30% (grade 3-4), 15% (grade 4-5) of residual life, i.e. grades 1-3 cover 85% of the possible range of condition. We have found no reason why the grades are not linear, with equal gaps between the grades.
 - (e) It is improbable that Grade 5 will ever be used, as the grade for a depot is derived from the asset condition of 11 different types of depot asset. In order for a depot to score a grade 5, virtually all of its assets would have to be life expired, which is highly unlikely. It would be more useful if grade 5 was expanded to cover a range of asset life so that it becomes a useful part of the measure.

Process

- 7.16.13 Inspections are outsourced on a five-year term contract. Each Territory plans for 20% of their LMDs to be inspected each year. Reports are emailed to Headquarters and stored in a database for reporting purposes. The original reports are retained in the Territory.
- 7.16.14 However, due to the difficulties encountered during 2004/05, when the introduction of handheld devices led to loss of all data from that year's inspections, the term contract was suspended.
- 7.16.15 During 2005/06, condition inspections were undertaken at fifteen LMDs, eight in South Eastern Territory and seven in the Western Territory, commissioned under specific works orders from the term contractor. The inspections in the Western Territory were conducted as part of a dilapidations survey for a train operator re-franchising process.
- 7.16.16 We have the following concerns regarding the implementation of this measure this year:
- (a) The position that would normally undertake the duties of Headquarters Champion for this measure is vacant;
 - (b) The procedure specifies a 5% Headquarters audit which has not been undertaken.
 - (c) The depots population is shown in the Annual Return as 91; the procedure says 89. These figures exclude fourteen depots that are leased on (usually 20-year) full maintain and renew contracts, which we believe is appropriate; however, the Annual Return contains four such depots: Selhurst, Littlehampton, Brighton and Streatham Hill. These should be excluded from the measure or the other full-lease depots should be included.

Accuracy of reported data

- 7.16.17 Of the 15 surveys conducted, Headquarters received a full electronic copy of the reports; we verified the data in the Headquarters database was correct for all the 2005/06 inspections reports.
- 7.16.18 A sample of three reports were taken, one for each a small depot (Chingford LMD), a medium depot (Shoeburyness LMD) and a large depot (Bournemouth LMD), and site visits confirmed the inspection reports were accurate in the assessment of the condition of the asset. A few errors and minor discrepancies were found; these did not affect the final scores to each element of the measure but suggested that the report checking process undertaken by Network Rail was not fully successful, particularly for Shoeburyness.
- 7.16.19 As noted above, the results given in the 2005/06 Annual Return for previous years have been restated. We did not receive an adequate explanation for this change. We are in discussion with Network Rail regarding this.

Assessment of confidence grade

- 7.16.20 **Reliability grade.** The definition for this measure is clearly documented. A documented process has been followed to collect and report this measure. The data from the inspections is subjective although an attempt has been made to assess the asset condition against measurable criteria. We believe that M19 should have a reliability grade of B.
- 7.16.21 **Accuracy grade.** We found a discrepancy in the total number of depots reported under this measure which impacts the results. We found shortcomings in both report checking and Headquarters audit. The restatement of previous years' data without adequate explanation is a cause for concern. We believe M19 should have an accuracy grade of 4.

Audit Statement

- 7.16.22 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for the asset condition of light maintenance depots. We found can confirm the data this year has generally been collected in accordance with the relevant definition and procedure. However, we found discrepancies in the base data for the measure and minor shortcomings in its administration. There is a 50% shortfall in inspections for this measure overall leading to a smaller than expected dataset. The data has been assessed as having a confidence grade of B4. The regulatory target for this measure has been met.

Recommendations arising

- 7.16.23 **M19 recommendation 1.** 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.
- 7.16.24 **M19 recommendation 2.** 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.
- 7.16.25 **M19 recommendation 3.** We recommend Network Rail reviews arrangements for the ownership of this measure and improves the level of compliance.

7.17 Network Rail Asset Stewardship Incentive Index (ASII)

Audit scope

- 7.17.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 3, Network Rail Asset Stewardship Incentive Index (ASII).
- 7.17.2 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.
- 7.17.3 The definition and procedures for this measure are documented in Level 1 of Network Rail's KPI Manual (December 2005).
- 7.17.4 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

- 7.17.5 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.
- 7.17.6 The 2005/06 result of 0.80 would meet the end of control period target.

Trend

- 7.17.7 Figure 7.17.1 shows the trend for the constituent parts of the index.

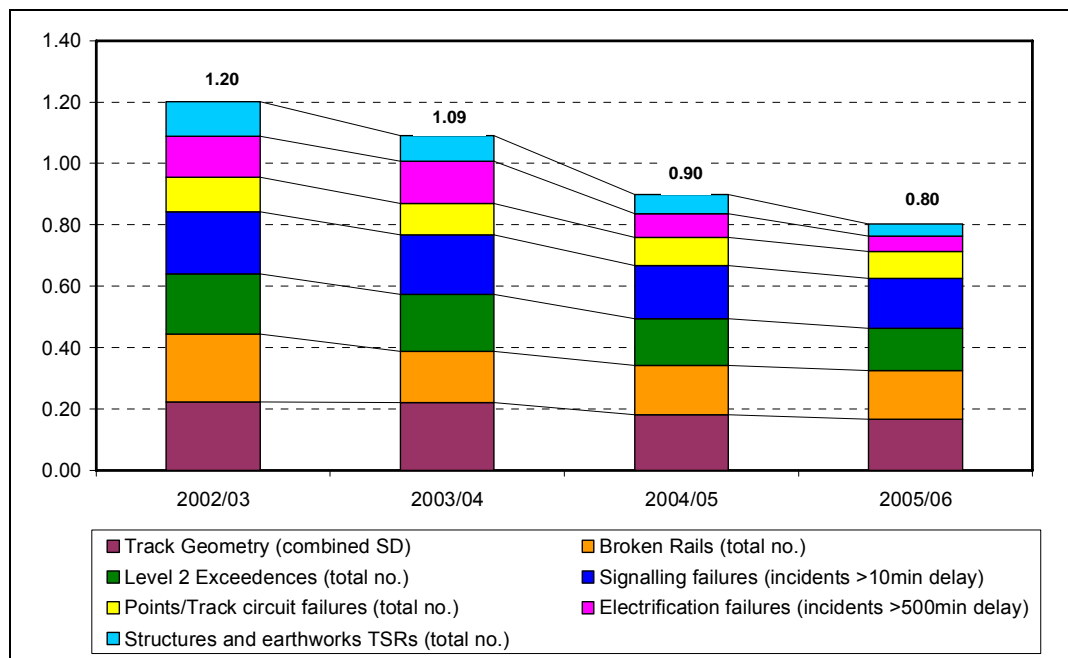


Figure 7.17.1 Asset Stewardship Incentive Index (ASII)

- 7.17.8 This year, Network Rail has reported an 11% improvement in the ASII reported figure. This reflects an improvement in all of the constituent elements of the index, however the factors dominating this improvement are Structures & Earthworks temporary speed restrictions and Electrification failures (incidents >500min delay).

Audit findings

Process

- 7.17.9 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).
- 7.17.10 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 68; it is based on twelve baselines and twelve targets defined by the ORR and averaged to provide the index.
- 7.17.11 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

- 7.17.12 We have verified the values and calculation of the ASII against the target values. Figure 7.17.2 shows the checks that were performed for each element of the ASII.

Asset Measure (NR KPI)	Value	Check
Track geometry index (6.10)	0.835	Index recalculated using M3, Table 68
Broken rails (6.1)	317	Checked against M1, Table 61
Level 2 exceedences (6.2)	0.820	Checked against M5, Table 81
Points/ track circuit failures	17,285	Checked against Table 32
Signalling failures causing delay of 10min or more (6.3)	23,367	Checked against M9, Table 85
Traction power supply failures causing 500min delay or more (6.7 & 6.8)	55	Checked against M11, Tables 88 Checked against M12, Tables 89
Structures & earthworks temporary speed restrictions (6.5 & 6.6)	48	Checked against M4, Tables 79 & 80
Asset Stewardship Incentive Index	0.803	Index recalculated, ASII, Table 109

Figure 7.17.2 Checks performed using data from Annual Return 2006 (ASII)

Assessment of confidence grade

- 7.17.13 **Reliability grade.** We believe the reliability grade given to the ASII should be a weighted average of all its constituent parts. When the reliability grades are given numeric equivalents (e.g. A=1, B=2 etc.) and these are weighted, the result is 1.7, which equates to a B. We therefore believe the ASII should have a reliability grade of B.

- 7.17.14 **Accuracy grade.** This measure is a composite of other measures in the Annual Return 2006. 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 ASII should have an accuracy grade of 'X' to indicate that an accuracy grade cannot be properly ascribed (as stipulated in the confidence grading guidance; Appendix C).

Audit Statement

- 7.17.15 We have audited the data presented in the Annual Return 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. The ASII has been assessed as having a confidence grade of BX.

Recommendations arising

- 7.17.16 We have no 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 2006, Section 3, Track Renewal Volumes which comprises the renewals volumes for rails (M20), sleepers (M21), ballast (M22) and switches & crossings (M25)

8.1.2 The definitions and procedure for these measures are documented in:

- (a) NR/ARM/M20DF (issue 5);
- (b) NR/ARM/M21DF (issue 5);
- (c) NR/ARM/M22DF (issue 5);
- (d) NR/ARM/M25DF (issue 2);
- (e) NR/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 Major Project & Investment (MP&I) track renewals team, and the West Coast Route Modernisation (WCRM) team

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 a steady rising trend for non-WCRM sleeper and ballast renewal from 2000/01 to 2005/06. Rail renewals dropped in 2004/05, but once again increased in 2005/06.

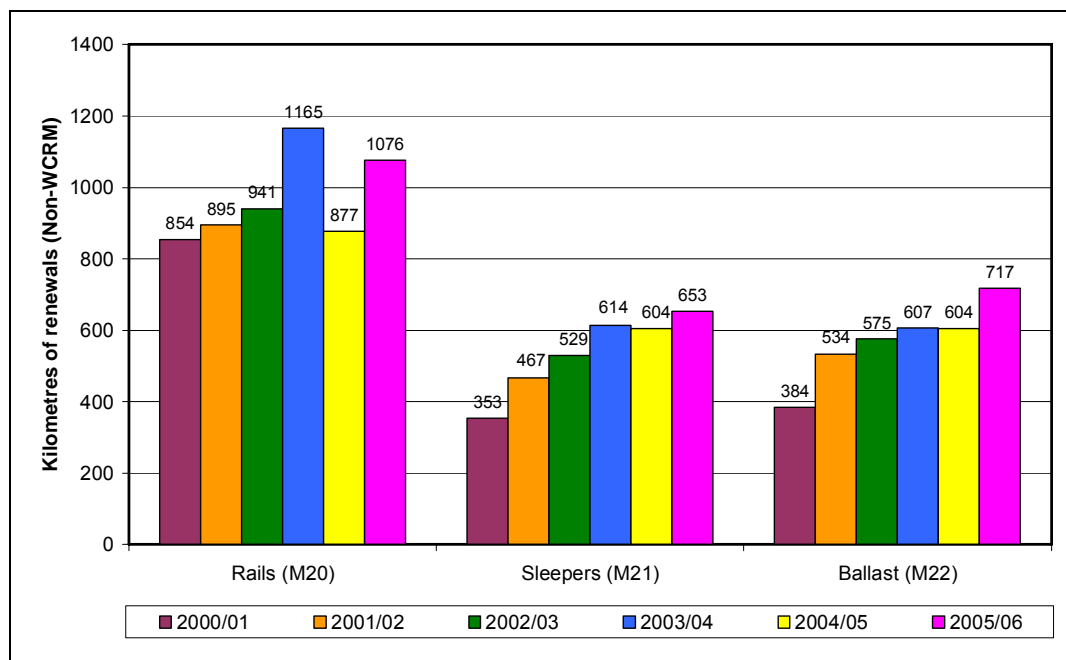


Figure 8.1.1 Track renewal volumes excl. WCRM (M20, M21, M22)

8.1.6 Figure 8.1.2 shows non-WCRM S&C renewals have risen by 235% over the last five years and by 6% this year. This is due to a change in Network Rail’s asset management practices for S&C over this period.

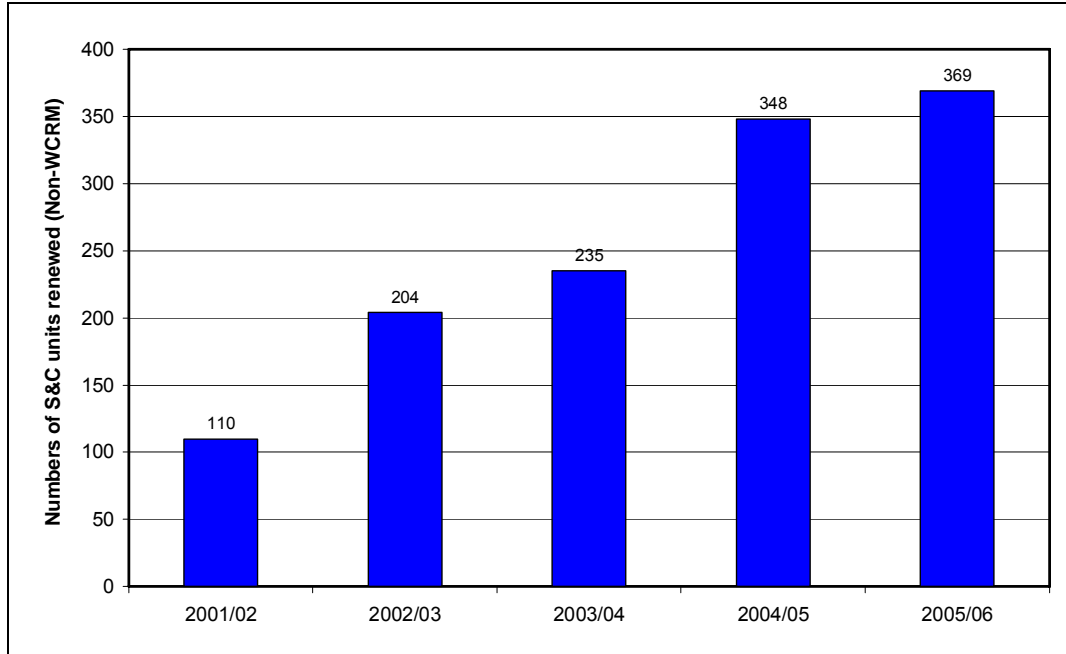


Figure 8.1.2 Switch and crossing renewal excl. WCRM (M25)

8.1.7 Figure 8.1.3 shows the non-WCRM S&C renewals by type of renewals undertaken over the last 5 years. Whilst S&C renewals are increasing, the last year saw a dramatic increase in the reported number of partial renewal/ rebalasting works; this may be due to change in asset management practices or a change in reporting practices. We have asked Network Rail to confirm.

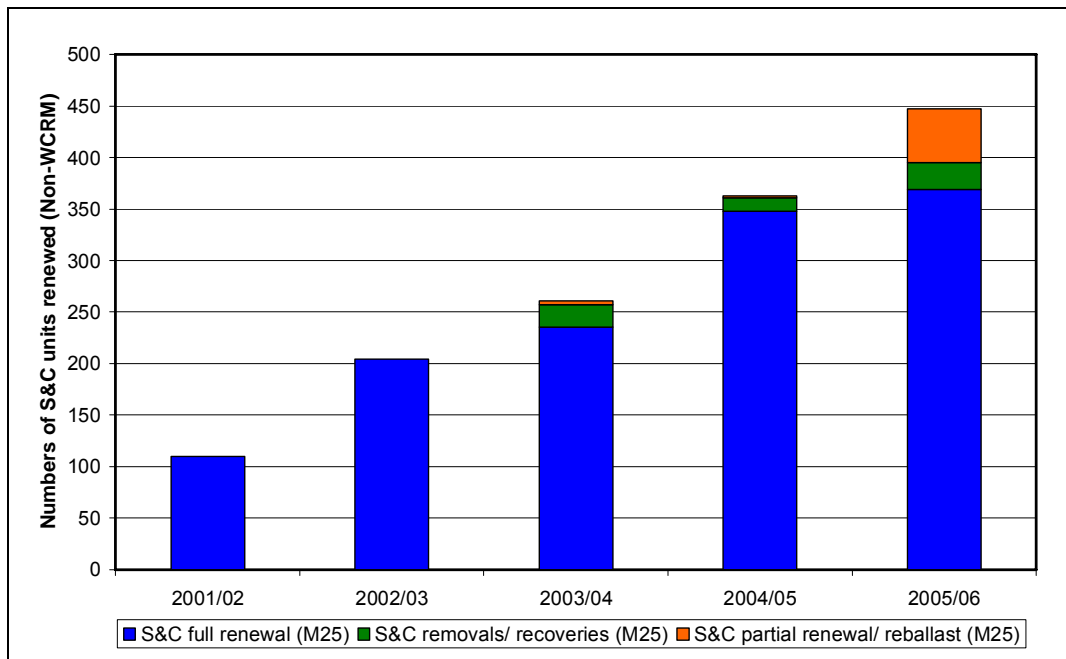


Figure 8.1.3 Switch and crossing renewal excl. WCRM by type (M25)

Audit findings

Process

MP&I track renewals

- 8.1.8 Data is collected and collated by the renewals delivery teams ('Integrated Management Teams' or IMT) as part of normal project controls and forwarded to the central Track Renewals team in York on a period-by-period basis. Data is received in the form of Management Business Review (MBR) Reports or IMT Reports, which summarise the cost and volume of work undertaken by the MP&I organisation.
- 8.1.9 The MBR reports are prepared by the IMTs and sent to the Project Accountants prior to the MBR review. Each report has a summary page (6c), 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.
- 8.1.10 Track renewals are also undertaken by the maintenance organisations. These include (i) work outsourced from MP&I to the maintenance teams, and (ii) reactive renewals using a £15 million p.a. budget allocated equally to the Territories. For these renewals, the Area Finance Controllers send the MP&I team a spreadsheet summarising the work undertaken, giving quantity and value of work. These are summarised into a Maintenance Tracker spreadsheet.
- 8.1.11 The information from the MBR reports and the Maintenance Tracker spreadsheet is brought together in a summary spreadsheet.

West Coast Route Modernisation track renewals

- 8.1.12 Each week, renewals volumes are entered into the WCRM Project Control System (PCS) database by project teams using 424 WCRM activity codes which align with the WCRM cost control system. There are currently around 60-70 project teams. The data entered into PCS is verified by West Coast Engineering, Project Controls Managers and the Project Manager.
- 8.1.13 In order to report the track renewals measures for WCRM, the WCRM Performance Measurement Manager used a bespoke query to collate the appropriate data from PCS.

Accuracy of Reported Data

MP&I track renewals

- 8.1.14 We checked the summary spreadsheet and the processes used to consolidate all the information for reporting purposes, and found this to be correct.
- 8.1.15 We also sought more detailed information for the purposes of sampling and verification; however, we were unable to obtain documentation from the IMTs regarding the specific projects/ works that form the actuals for the 2005/06 renewals programme. Network Rail was not able to release project close out reports for 2005/06 or the individual IMT Reports. We have been in contact with Project Control Managers at the IMTs and hope to be able to obtain and audit more detailed information for the final report.

West Coast Route Modernisation track renewals

- 8.1.16 We inspected the PCS query output and used it to verify the nationally reported figures for M20, M21, M22 and M25. The PCS database reports renewals data in yardage, which were accurately converted to kilometres for reporting in the Annual Return.
- 8.1.17 The following issues with the collection and reporting process were identified:
- (a) **M20 Rail:** The definition requires reportable rail renewal works to be of 200 yards or more. WCRM record all rail renewals in PCS which may have led to some minor over-reporting.
 - (b) **M21 Sleepers:** PCS has not been configured to record sleepers by type (i.e. concrete, timber, or steel), as required in the Annual Return. All sleeper

renewals are classified as concrete sleepers. Given the nature of renewals undertaken by WCRM, this is a reasonable assumption.

- (c) **M22 Ballast:** The type of re-ballasting (i.e. full ballast renewal, partial re-ballast, or scarify) was not recorded by PCS. All re-ballasting has been classified as full ballast renewals.
- (d) **M25 S&C:** PCS records WCRM S&C renewals as either 'Install/Renew' or 'Heavy Maintenance'. WCRM report only Install/Renew yardage under 'S&C full renewals', in Table 120 of the Annual Return 2006. However these 'full' renewals also include some 'partial' renewals, which have not been reported separately. This has led to over reporting of S&C full renewals and under reporting of S&C partial renewals.

Assessment of confidence grade

- 8.1.18 **Reliability grade.** The definition for this measure is clearly documented. While a single documented process has been followed to collect and report the high level summary data for this measure, we were unable to gain access to audit the process at the individual job level. An audit of WCRM was also undertaken. We believe that the track renewals measures (M20, M21, M22, M25) should have a reliability grade of B.
- 8.1.19 **Accuracy grade.** The data has been reported by the MP&I teams based on the MBR Reports accurately. We were unable to sample the data for cost and volume at an individual job level. An audit of WCRM showed that there were some inaccuracies in reporting of all 4 measures due to the definitions used in the WCRM PCS system. We believe that the track renewals measures (M20, M21, M22, M25) should have an accuracy grade of 2.

Audit Statements

- 8.1.20 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2004/05 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

- 8.1.21 **M25 Recommendation 1.** The PCS database should be modified to classify S&C renewals as 'full' and 'partial' renewals separately. .

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 2006, Section 3, signalling renewed (M24), including Table 123.
- 8.2.2 This measure reports the volume of signalling renewed in signalling equivalent units (SEUs). An SEU is a single trackside output function controlled by an interlocking. The number of SEUs reported as renewed is dependent on the extent of work:
- Signalling completely renewed (100% of SEUs commissioned);
 - A "re-locking" or a complete renewal of level crossing control equipment (50% of commissioned SEUs);
 - Renewal of trackside equipment and wiring or level crossing barriers and motors (30% of commissioned SEUs);
 - Renewal of panel or signaller interface (30% of commissioned SEUs);
 - Where a systematic change is carried through signalling equipment; for instance the replacement of relays of a certain size or type or the signalling power supply system (10% or 20% of commissioned SEUs as appropriate).
- 8.2.3 The definition and procedures for this measure are documented in NR/ARM/M24DF (issue 4) and NR/ARM/M24PR (issue 1).
- 8.2.4 An audit was undertaken of the SEU count for a sample scheme on South East Territory.

Commentary on reported data

Regulatory target

- 8.2.5 There is no regulatory target for this measure

Trend

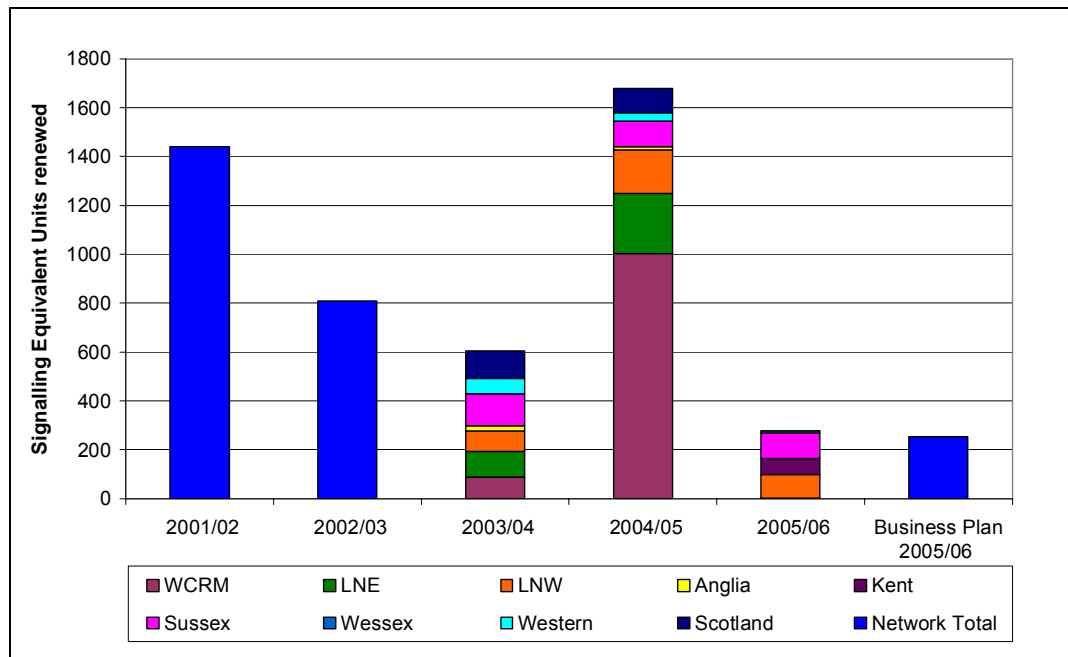


Figure 8.2.1 Signalling renewals (M24)

- 8.2.6 Figure 8.2.1 shows there has been a considerable reduction in the number of SEUs renewed in the reporting period, even taking into account the completion of the West Coast Route Modernisation. The number of SEUs reported is however more than the number anticipated in the 2005/06 business plan.

Audit findings

Definition

- 8.2.7 The definition for this measure quoted in the Annual Return does not match the procedure for this measure. The definition NR/ARM/M24DF is:
- (a) In major or complete renewal works, this is a count of SEUs in the final installation;
 - (b) Where a “re-locking” or a complete renewal of level crossing control equipment has taken place, each SEU affected is counted at 50%;
 - (c) Where trackside equipment and wiring, or level crossing barriers and motors only are renewed, each SEU affected is counted at 30%;
 - (d) Where a panel is replaced, or the signaller interface renewed, each SEU affected is counted at 30%;
 - (e) Where a systematic change is carried through signalling equipment, for instance the replacement of relays of a certain size or type, or the signalling power supply system, then each SEU affected is counted at 10% or 20% as appropriate;
 - (f) No assessment is made for piecemeal component replacement.

Process

- 8.2.8 In the sample project audited, the process described in the procedure for this measure was not been followed. Signalling engineers in the renewals teams used as-built drawings to count the number of renewed Signalling Equivalent Units commissioned into use and forwarded the SEU counts to the Headquarters Champion for reporting. The figures, reported by the engineers to the non-technical team collating the data, did not clearly indicate the number of SEUs commissioned.

Accuracy of data reported

- 8.2.9 We checked the SEUs reported for a sample renewal project. The Annual Return reports 62 SEUs for the Medway Valley Scheme on the Kent route. In the audit, Network Rail was unable to provide systematic evidence/ analysis showing how this figure was reached. Our independent assessment of the number of SEUs reportable for the scheme produced a value of around 80% of that reported in the Annual Return. Network Rail subsequently provided a calculation spreadsheet totalling 62 SEUs. The major difference between the two approaches was the scoring of power upgrades at 42 locations.
- 8.2.10 Previously, we have found that this measure could be used reasonably reliably and accurately where full renewals were undertaken. However, it is apparent from this year’s sample that this measure is subjective where a substantial part of the scheme is comprised of partial renewals.
- 8.2.11 We acknowledge and understand the difficulties surrounding the application of the procedure in relation to partial renewal schemes. We now understand the basis for the reported figure for Medway Valley and do not wish it to be restated.
- 8.2.12 We note Network Rail has prepared a revised measure for signalling renewals which is currently undergoing review and approval.

Assessment of confidence grade

- 8.2.13 **Reliability grade.** The definition and procedure for this measure is documented; however, we have found the procedure to be open to interpretation where a substantial part of the scheme is comprised of partial renewals. We believe that M24 should have a reliability grade of C.

- 8.2.14 **Accuracy grade.** Calculation of SEUs for full renewals is accurate; however, the application of this measure for partial renewals is subjective. We believe M24 should have an accuracy grade of 4.

Audit Statement

- 8.2.15 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for signalling renewed (M24). The process for the collection and reporting of data as described in the procedure was not followed this year. We found the results for partial renewals were subjective. The data has been assessed as having a confidence grade of C4. There is no regulatory target for this measure.

Recommendations arising

- 8.2.16 **M24 recommendation 1.** We recommend a revised method of measuring signalling renewals is agreed with ORR and Independent Reporter.
- 8.2.17 **M24 recommendation 2.** We recommend the procedure is revised to include an internal audit by Headquarters to be undertaken annually on a sample basis.

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 2006, 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).
- 8.3.2 For bridges and earthworks, only schemes above £100k are reported, while for culverts, retaining walls and tunnels, schemes over £50k are reported.
- 8.3.3 The definitions and procedure for these measures are documented in:
- NR/ARM/M23DF (issue 3);
 - NR/ARM/M26DF (issue 2);
 - NR/ARM/M27DF (issue 3);
 - NR/ARM/M28DF (issue 1);
 - NR/ARM/M29DF (issue 1);
 - 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 MP&I team in Swindon.

Commentary on reported data

Regulatory targets

- 8.3.5 There are no regulatory targets for these measures.

Trend

- 8.3.6 Figure 8.3.1 shows the total number of reported renewals undertaken, excluding WCML, for bridges, culverts, retaining walls, earthworks and tunnels since 2000/01, subject to the relevant cost thresholds.

Measure	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Bridges (M23)	40	104	73	143	187	157
Culverts (M26)	n/a	n/a	47	7	8	9
Retaining Walls (M27)	n/a	n/a	n/a	5	8	10
Earthworks (M28)	n/a	n/a	n/a	102	69	75
Tunnels (M29)	n/a	n/a	n/a	12	31	39

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

- 8.3.7 The number of renewals works (greater than threshold values) undertaken in 2005/06, increased for culverts, retaining walls, earthworks and tunnels in comparison with 2004/05.

8.3.8 Figure 8.3.2 shows bridge renewals and remediation by task category (for schemes over £100k) undertaken for the last three years. The number of schemes has fallen in 2005/06, mainly due to a reduction in the number of large repairs undertaken.

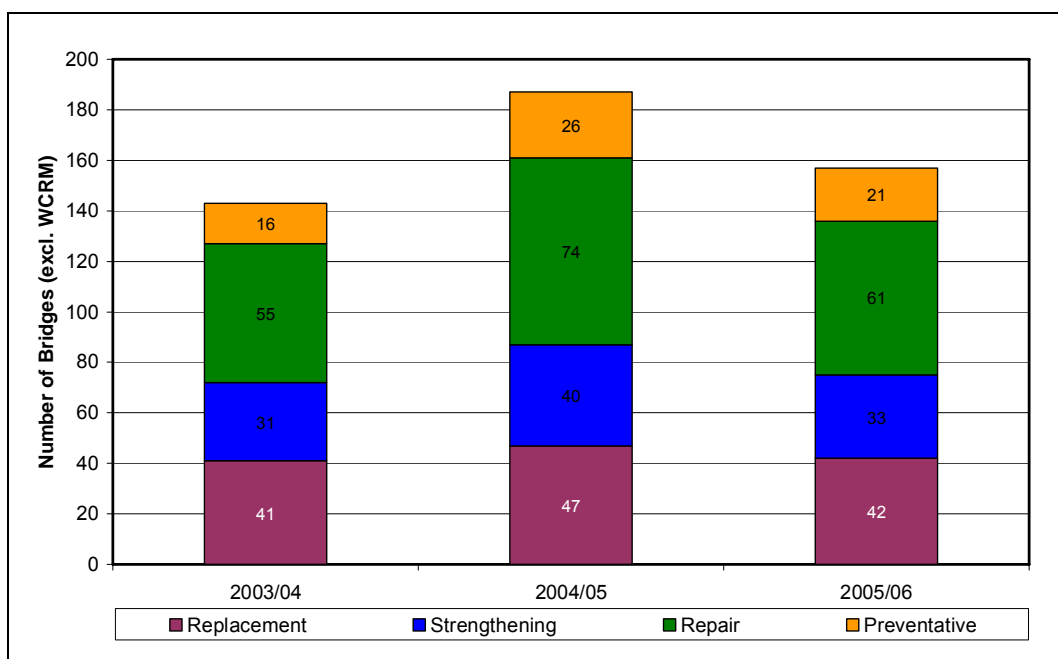


Figure 8.3.2 Bridge renewals by task category (M23)

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

Work Type	2002/03	2003/04	2004/05	2005/06
Bridges (M23)	n/a	5,611m ²	10,222m ²	5,433m ²
Retaining Walls (M27)	1,208m ²	8,811m ²	2,635m ²	2,016m ²

Figure 8.3.3 Area of works renewed (M23, M27)

8.3.10 There has been a 47% reduction in the area of bridge deck replacements undertaken in 2005/06 as compared to the previous year. The Area of retaining walls renewed showed a 23% decrease in 2005/06.

Audit findings

Process

8.3.11 The data for the Annual Return is taken from the SBMT database. The Programme Commercial Managers in the territories are responsible for data entry into the SBMT database. Every quarter the MP&I Programme Efficiency analyst in Swindon checks the data in SBMT against that in the business plan. The business plan is a dynamic document, updated every period. The data from SBMT is exported into a spreadsheet using an MS Access query. At the end of the year, the Annual Return data is sent to the relevant territories for validation.

Accuracy of reported data

- 8.3.12 For the audit we compared the data in the SBMT for each measure and ensured that they were accurately reported. This was confirmed for all measures. Further, for each measure we also compared the total volumes and costs in the SBMT with the business plan (version4). We also audited the summary spreadsheet used to compile the SBMT data and found it to be accurate.
- 8.3.13 For each measure, we selected a sample of individual schemes and compared the volumes and costs in the SBMT with the business plan (version4) and the costs in the Management Business Review (MBR) pack. The data was found to be accurately recorded.
- 8.3.14 We requested project close-out reports of a selection of projects. However these were not yet available.

Assessment of confidence grade

- 8.3.15 **Reliability grade.** The definitions for these five measures are clearly documented. A single documented process has been followed to collect and report the data for these measures. We believe that the measures M23, M26, M27, M28, and M29 should have a reliability grade of B.
- 8.3.16 **Accuracy grade.** Our samples found the data had been reported accurately. We believe that the measures M23, M26, M27, M28, and M29 should have an accuracy grade of 2.

Audit Statements

- 8.3.17 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2004/05 for civils renewals and remediation measures (M23, M26, M27, M28 and M29). We can confirm the data has been collected and reported in accordance with the relevant definition and procedure. The data has been assessed as having a confidence grade of B2. There are no regulatory targets for these measures.

Recommendations arising

- 8.3.18 We have no recommendations for this measure.

9 Audit report and commentary – Safety and Environment

9.1 Safety and Environment Plan

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 2006, Section 5, Safety and Environment, including Table 131.
- 9.1.2 This measure reports on the level of spend in 2005/06 associated with Network Rail's Safety & Environment Plan (S&E Plan). This is the first year this measure has been reported in the Annual Return.
- 9.1.3 The audit examined the processes used to allocate the funding and a review of the level of spending achieved against that in ACR2003 and Network Rail's Business Plan 2005/06. The audit was undertaken at Network Rail Headquarters.

Commentary on reported data

Regulatory targets

- 9.1.4 There are no regulatory targets for this measure.

Trend

- 9.1.5 Network Rail's Cost Submission (Interim Review) 2003 included provision for a number of health & safety enhancement schemes in CP3. This provision was endorsed by the ORR and included in ACR2003. The total allowance included three elements:
- Safety & Environment Plan (£469m CP3 total);
 - Train control development (£209m CP3 total);
 - Other specific schemes (£14m CP3 total).
- 9.1.6 Network Rail's Annual Return 2006 states that the S&E Plan comprises two parts:
- Funding associated the National Pollution Prevention Programme (NPPP) securing compliance with the Control of Pollution (Oil Storage) Regulations and the Groundwater Regulations at Light Maintenance Depots (LMD).
 - Provision for emerging safety enhancements identified during the course of Network Rail's operations. The requirement for these enhancements might come (i) from unanticipated changes to legislation and standards or (ii) from local managers identifying additional work not funded from other sources necessary to ensure safety risk is managed to a low as low as reasonably practicable (ALARP). This latter situation can arise, for example, out of the investigation of incidents or potential incidents. This is a source of funding to be drawn upon in the appropriate circumstances; it is not a spending target to be achieved.
- 9.1.7 Figure 9.1.1 shows that Network Rail has not needed to draw upon the full annual allowance for the Safety & Environment Plan for 2005/06, spending £31m against a ACR2003 allowance of £115m and a Business Plan forecast of £65m.

Control Period 3 (£m)	2004/5	2005/6	2006/7	2007/8	2008/9	Total
ACR2003 allowance	120	115	95	77	62	469
Business Plan 2005 Forecast	65	65	65	65	65	65
Reported Actuals	56	31				

Figure 9.1.1 Safety & Environment Plan for Control Period 3 (£m)

- 9.1.8 During 2005/6, Network Rail has reported that a total of forty-two enhancements were authorised under the Safety & Environment Plan, with a total value of £17.5m.

Audit Findings

- 9.1.9 Network Rail's 2005 Management Plan states the Safety & Environment Plan comprises:
- (a) Train accident risk: level crossing risk, irregular working, signals passed at danger, route crime;
 - (b) Other risks to passengers and customers: crowd control at stations, slips, trips and falls, management systems and processes (system security, fire safety, European integration);
 - (c) Workforce safety risk: improving safety on or near the line, possession control improvement, track warning systems, worker involvement;
 - (d) Enablers to reduce system risk: safety critical communications, system technology enhancements (automated forms for signallers, electronic sectional appendix, signalling simulators), emergency exercises, competence management, transfer of maintenance, decision making;
 - (e) Environmental objectives: visual impact, pollution management, conservation, resources and energy, contaminated land, noise, engagement on the environment.
- 9.1.10 In our discussions, Network Rail was keen to explain that the expenditure reported for the S&E Plan in the Annual Return 2006 was only for (a) LMD NPPP, and (b) additional safety enhancements not funded by normal operating and maintenance provisions or capital projects funded in ACR2003. We would note that the term "Safety & Environment Plan" therefore appears to have two meanings depending on the context – the Annual Return or the Management Plan – which is a possible source of confusion.
- 9.1.11 The process for the management of the provision for additional safety enhancements is:
- (a) Individual applications are processed by the Health & Safety Systems Manager and his team, providing advice to local managers applying for funding and assessing compliance with the process;
 - (b) Application for funding requires a cost benefit analysis using the industry 'value to prevent a fatality' criterion;
 - (c) Projects meeting the eligibility criteria are then managed using Network Rail's normal procedures for authorisation, delivery and monitoring of the investment.
- 9.1.12 We have assessed the written procedure for this process and documentary evidence of the authorisation process, totalling some £17.5m for 2005/06. It is clear that:
- (a) Network Rail recognises that when 'contingency' or 'discretionary' funds such as this are created they require careful management to avoid becoming an alternative to existing budgets;
 - (b) A suitable vetting process is used to ensure that the funds are correctly allocated in respect of established criteria; we are satisfied that the process as applied is robust and the employees involved have suitable experience.
- 9.1.13 We recognise that Network Rail's ACR2003 cost submission for the S&E Plan was a projection based on limited data and that the S&E Plan appears in the Business Plan as a contingency item. It has not been established against known requirements, other than a pragmatic recognition that during the life of each Control Period risks will be identified that are not being managed ALARP and legislation and standards will evolve. The degree of underspend against the ACR2003 provision and business plan is being tracked and, as the trend in S&E Plan spending becomes clear, we expect that business plan forecasts should become more accurate.

Assessment of confidence grade

- 9.1.14 **Reliability grade.** There is no definition or procedure for the reporting of this measure in the Annual Return. There is a documented procedure for the initial allocation process, applying industry standard assessment tools for the cost benefit analysis, and thereafter Network Rail's standard documented procedures for authorisation, delivery and monitoring of the investment are used. We believe the Safety & Environment Plan measure should have a reliability grade of A.
- 9.1.15 **Accuracy grade.** We have confirmed the value of allocations from the Safety & Environment Plan budget for 2005/06. The accuracy of reporting actuals for this measure meets the same level of accuracy as Network Rail's financial reporting of other expenditures, as audited in the signed-off Regulatory Accounts. We believe the Safety & Environment Plan measure should have an accuracy grade of 1.

Audit Statement

- 9.1.16 We have audited the process supporting the management of the Safety and Environment Plan. We can confirm the projects have been allocated funding in accordance with the relevant procedure and that Network Rail's standard financial monitoring and reporting procedures have been to collect and report the expenditure in the Annual Return. This data has been assessed as having a confidence grade of A1

Recommendations arising

- 9.1.17 **S&E Plan recommendation 1.** We recommend Network Rail continues to monitor the allocation of funding from the Safety & Environment Plan budget so as to be able to better determine the Business Plan more accurately the funding allocation in future years.

10 Audit report and commentary – Expenditure and Efficiency

10.1 Financial Efficiency: Unit Cost Indices & Composite Rates

Audit scope

- 10.1.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 6, Variance Analysis, including Tables 167-168.
- 10.1.2 This measure reports:
- Unit cost indices for track (plain line), track (switch & crossings), track (total), civils (linear metres), civils (square metres); each index is an average of the changes in unit costs across a range of activities, weighted by the volume of each activity in 2005/06; the index is based on costs in 2003/04 = 100;
 - Composite rates in 2005/06 prices for plain line (£/metre), switch & crossings full renewal (£k/unit), switch & crossings equivalent renewal (£k/unit);
 - Percentage efficiency saving for unit cost indices and aggregate composite rates.
- 10.1.3 The source data for this measure is the same as for measures M20-23 and M24-M29 and the financial reporting audited as part of the regulatory accounts.
- 10.1.4 We undertook a desk review of the data used to calculate the results for these measures.

Commentary on reported data

Regulatory target

- 10.1.5 The regulatory target for 2005/06 efficiency savings for renewals is -8% per annum which is equivalent to -15% for the Control Period so far; the aggregate efficiency reported is -14%.
- 10.1.6 Individually, this comprises:
- Efficiency for track (plain line) unit cost index from 2004/05 is +1.3% (target -8%) and from 2003/04 is -4.3% (target -15%);
 - Efficiency for track (switch & crossings) from 2004/05 is -9.7% (target -8%) and from 2003/04 is -11.4% (target -15%);
 - Efficiency for track (total) from 2004/05 is -1.9% (target -8%) and from 2003/04 is -6.2% (target -15%);
 - Efficiency for civils (linear metres) from 2004/05 is -8.0% (target -8%) and from 2003/04 is -20.0% (target -15%);
 - Efficiency for civils (square metres) from 2004/05 is -6.4% (target -8%) and from 2003/04 is -12.0% (target -15%);
 - Aggregate efficiency from 2004/05 is -2.7% (target -8%) and from 2003/04 is -14.0% (target -15%).

Trend

- 10.1.7 Figure 10.1.1 shows reported unit cost indices have shown year-on-year improvement since 2003/04, except for plain line track which slipped back from the 2003/04 position; this latter measure has been impacted by short job-lengths.

Index (2003/04 = 100)	2004/05	2005/06	Variance from 04/05	Variance from 03/04
Track – plain line	94.5	95.7	+1.3%	-4.3%
Track – S&C	98.1	88.6	-9.7%	-11.4%
Track – total	95.6	93.8	-1.9%	-6.2%
Civils – linear metres measure	87	80	-8.0%	-20.0%
Civils – square metres measure	94	88	-6.4%	-12.0%
Regulatory target			-8%	-15%

Figure 10.1.1 Unit cost indices

10.1.8 Figure 10.1.2 shows reported composite rates have been reducing for all measures.

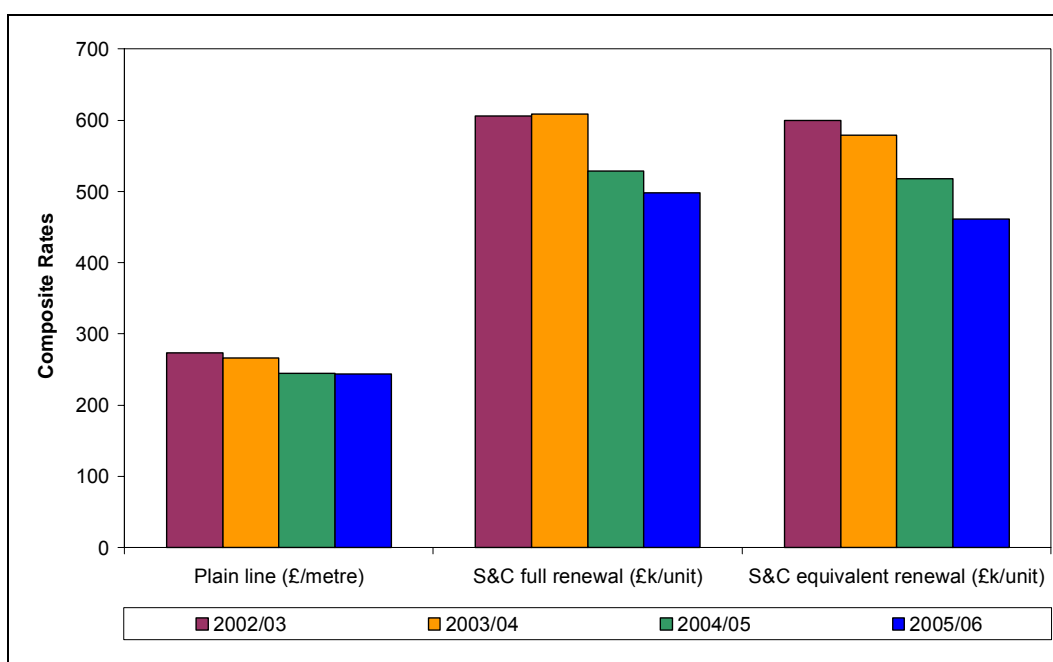


Figure 10.1.2 Composite rates

Audit findings

- 10.1.9 Network Rail’s progress developing a comprehensive series of renewals unit costs (Cost Analysis Framework; CAF) and maintenance units costs (MUC) are described below and in Appendix G respectively.
- 10.1.10 Network Rail has developed a comprehensive set of renewals unit costs and is currently collecting data using these measures. We found that the process has bedded-in, programme teams are collecting data and the information system (RIB) for storage and reporting is in place. For each renewals programme, Figure 10.1.3 shows the current coverage of the unit cost data collected for 2005/06 and forecast for 2007/08 based on bottom-up review of portfolio; this does not show the forecast coverage at repeatable work item or standard cost element levels.

CAF	2005/06 baseline project profile (BPP) reports		2005/06 actual project profile (APP) reports		% Coverage by value	
	Number	Value (£m)	Number	Value (£m)	2005/06	2007/08
Civils	-	-	302	135.5	47.5%	60%
E&P	10	74.8	1	0.3	0.5%	91%
Estates	50	106.1	2	1.5	1.2%	80%
Signalling	25	208.9	7	21.5	8.8%	90%
Telecoms	26	30.0	5	4.1	19.2%	90%
Track	-	-	-	703	89.1%	89%

Figure 10.1.3 Progress developing detailed renewals unit costs

Assessment of confidence grade

10.1.11 **Reliability & Accuracy.** As the source data for this measure is the same as for measures M20-23 and M24-M29 and the financial reporting audited as part of the regulatory accounts, we have based the confidence grading on these measures. We believe the unit cost indices and composite rates should have a reliability grade of B2.

Audit Statement

10.1.12 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for unit cost indices and composite rates. We have based the confidence grade for these measures on the reliability and accuracy grades of the constituent measures. The data has been assessed as having a confidence grade of B2. The regulatory targets for efficiency savings calculated from these measures shows three of twelve have been met.

Recommendations arising

10.1.13 We have no recommendations for this measure.

10.2 Financial Efficiency: Variance Analysis

Audit scope

- 10.2.1 This audit was undertaken to assess the reliability and accuracy of data and commentary reported in Network Rail's Annual Return 2006, Section 6, Variance Analysis, including Table 169.
- 10.2.2 This measure reports budget variance analysis for renewals expenditures in order to assess the likely volume of efficiency savings in areas where Network Rail does not have robust unit cost information. The variance information is collected using eight variance categories and reported as:
- The financial value of budget and actuals for renewals spend;
 - The financial value of variances for renewals spend in terms of scope changes, additional activity efficiencies, rescheduled activities;
 - The percentage efficiency savings (incorporating budgeted and additional activity efficiencies) in comparison with year-commencing budgets for each core renewals category.
- 10.2.3 The documentation for this measure (MP&I, Financial Variance Report Guidelines, v1.5, sent as Programme Instruction 017, Sept 2005) sets out the process and requirements for its collection.
- 10.2.4 We shadowed Network Rail's internal audits of variance analysis with sixteen investment teams, undertaking our audit on a sample basis, by participating directly in the following audit meetings:
- MP&I Signalling North programme team;
 - MP&I Signalling South programme team;
 - MP&I Civils programme team;
 - MP&I Track programme team;
 - West Coast Route Modernisation team.

Commentary on reported data

Regulatory target

- 10.2.5 The regulatory target for 2005/06 financial efficiency savings was 15%.
- 10.2.6 For 2005/06, the reported result of financial efficiency savings for core renewals was 18.1% which met the target for the year.

Trend

- 10.2.7 Last year was the first year for this measure; Figure 10.2.1 shows the reported efficiency savings have increased. It is likely this reflects the maturing of the variance reporting process and (for some teams) proactive use of efficiency plans and efficiency logs to drive and monitor delivery of budgeted and additional efficiencies.

Category	2004/05	2005/06	Change: 2004/05 to 2005/06
Track	6%	9.6%	60.0%
Signalling	14%	29.7%	112.1%
Civils	12%	26.6%	121.7%
Electrification, Plant & Machinery	7%	37.7%	438.6%
Telecoms	12%	17.8%	48.3%
Stations, Depots & Lineside Buildings	8%	24.1%	201.3%
Total Core Renewals	9%	18.1%	101.1%

Figure 10.2.1 Core renewals efficiency savings (budgeted and additional)

Audit findings

Process

- 10.2.8 The sixteen teams delivering renewals spend are the six Major Projects & Investment (MP&I) teams responsible for core renewals, plus Commercial Property, ERTMS, Engineering, Information Management (IM), Maintenance (delivered Renewals), MP&I Enhancements, National Delivery Service (NDS), National Telecoms Programme, SRNTP/TLP, West Coast Route Modernisation (WCRM).
- 10.2.9 The financial variances for each project are reported each period in the Monthly Business Review (MBR) pack using the following categories:
- Previous Years Unbudgeted Rollover;
 - Scope Changes;
 - Work brought forward, funded later in Control Period (CP);
 - Activity efficiency;
 - Planned Slippage to maximise efficiency;
 - Slippage due to a third party, such as train operators and local authorities;
 - Unplanned slippage.
- 10.2.10 Projects with variances greater than £100,000 are reported individually with a short commentary; projects with variances less than £100,000 are consolidated.
- 10.2.11 Due to the present configuration of Oracle Projects, which shows live budgets subject to change control, rather than year commencing budgets, the reporting is split between:
- Banked variances** between the year-commencing budget and the current project budget; these variances are likely to arise from scope changes, substitutions between projects and efficiencies delivered to date.
 - Forecast variances** between the full-year forecast and current project budget. These will include efficiencies delivered during the current phase of the project, such as slippage and below-estimate procurement costs.

Accuracy of data reported

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	PMCS 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 minutes / Authorised Change Request forms
Work brought forward, funded later in CP	Evidence that works were funded later in CP in 2005/6 Business Plan, and supporting RIP paper	RIP minutes / 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 in schedule to explain principle sources
Planned slippage to maximise efficiency	Must relate to conscious decisions to re-plan, agreed at MBR/ RIP or equivalent senior level forum	MBR or RIP minute
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	2006/07 business plan provision

Figure 10.2.2 Core renewals efficiency savings (budgeted and additional)

- 10.2.12 The internal audit of the variance reporting had identified in advance to the programme teams the evidence required to be presented at audit; the details are shown in Figure 10.2.2. However, of the sample audits we attended, few of the teams sought to provide this level of detail.
- 10.2.13 From our sample, we share the following summary conclusions of the internal audit:
- (a) **Knowledge.** Many of the programme teams were either not aware of regulatory requirements to report variance and underspend, or did not understand the link to the reports which they submit each period.
 - (b) **Ownership.** The ownership of the process and reporting template in each programme team was not always clear and was not standardised, led by Finance in some teams and Programme Controls in others. This led to a lack of accountability for the final reported figures and the collection of evidence to support an audit trail.
 - (c) **Consistency.** The audit identified a number of inconsistencies relating to financial variance reporting, particularly in those non-MP&I programmes where the process had been mandated during the year but had not been briefed-in. These included:
 - (i) Old and new reporting templates were used;
 - (ii) There were differing levels of understanding of the variance report headings, which has led to substantial re-attributions of figures during the audit;
 - (iii) Some programmes reported variances, and then consolidated the data on a project-by-project basis, while others attributed the variances centrally at a programme level with a very limited audit trail;
 - (iv) There were different processes for the transfer of budgets between programmes and the net impact on variance reporting, particularly with transfers to Maintenance;
 - (v) Programmes reported using different base data, with some reporting the movement between COWD and the live budget, and others reporting between COWD and the year-commencing budget;
 - (vi) The quality and quantity of evidence presented on the day often did not meet the requirements as laid down in the process guidelines and audit protocol.
 - (d) **Process change.** As Oracle Projects was launched within MP&I during 2005/06, the variance template was changed during the reporting year, which proved to be challenging to the programme teams, exposing issues in respect of (i) weak change controls on programme budgets, (ii) resources not dedicated to the changed reporting process, and (iii) the process not being briefed down into the teams. For 2006/07, many of the MP&I programme teams have reviewed and revised their change control process so that information in Change Requests can feed directly into the financial variance report.
 - (e) **Reconciliation.** For many programmes this was the first year the categorisation of variance against budget has been audited. The process of reconciliation proved to be quite time-consuming for some programmes, which report on a delivered-basis (i.e. by project) rather than on a sponsored-basis (i.e. by asset type).
 - (f) **Reporting.** Only MP&I core renewals programmes used the variance reporting process to identify renewals efficiency savings for the Annual Return.
- 10.2.14 We recognise that this was the first year of reporting for some of the teams and the process changed during the year to take account of changes to financial information system. However, as Figure 10.2.3 shows, the level of re-attributions undertaken as a result of the audits for the total MP&I renewals variance (i.e. prior to reporting) was some £180m of changes or -£18.9m (-22%) net change. The audits were not able to assess all variance attributions.

£m	Previous years unbudgeted rollover	Scope Changes	Work brought forward	Activity efficiency	Planned slippage to maximise efficiency	Slippage due to third party	Unplanned slippage	Total absolute change	Total net change
Electricity	-1.7	2.3	-24.9	9.8	1.6	0.2	11.9	52.4	-0.8
Plant	0.3	2.3	2.3	-0.6	6.5	-	-4.0	16.0	6.8
Estates	0.2	8.9	-12.2	1.5	-	-	5.0	27.8	3.4
Track	-	0.5	-8.9	2.4	-	-	6.6	18.4	0.6
Civils	-	-	-	-	-	-	-	-	-
Signalling	-7.1	-6.2	-19.3	2.4	1.1	0.4	2.7	39.2	-26.0
Telecoms	6.9	-3.2	-6.5	-1.3	4.7	-	-3.5	26.1	-2.9
Total absolute change	16.2	23.4	74.1	18.0	13.9	0.6	33.7	179.9	
Total net change	-1.4	4.6	-69.5	14.2	13.9	0.6	18.7		-18.9

Figure 10.2.3 Re-attribution of financial variances as a result of internal audit

- 10.2.15 We are confident the internal audit was conducted diligently with the time and resources available and has identified recommendations which, if fully implemented, will ensure the 2006/07 variance reports will be of a significantly higher reliability and accuracy.

Assessment of confidence grade

- 10.2.16 **Reliability grade.** The procedure for this measure is documented. However, the procedure has not been consistently followed this year. We believe that financial efficiency variance analysis should have a reliability grade of B.
- 10.2.17 **Accuracy grade.** The internal audit by Network Rail led to considerable reattribution of variances which impacted the efficiency saving results. It was not possible for all attributions to be assessed during the audits in the detail necessary to achieve accurate results. Our sample found use of incorrect templates, incorrect attribution, and insufficient evidence for some attributions. Many of these issues were retrospectively corrected but we cannot confirm this has not had an adverse effect on the reported results. There is therefore doubt regarding the accuracy of the data. We believe financial efficiency variance analysis should have an accuracy grade of 3.

Audit Statement

- 10.2.18 We have audited the reliability and accuracy of data and commentary presented in Network Rail's Annual Return 2006 for financial efficiency variance analysis. We cannot confirm the data has been collected and reported in accordance with the relevant procedure; an internal audit found significant levels of changes were required prior to reporting but this audit could not assess all of the attributions. However, we are confident the internal audit has identified recommendations which, if fully implemented, will ensure the 2006/07 variance reports will be of a significantly higher reliability and accuracy. The data has been assessed as having a confidence grade of B3. The regulatory target for this measure has been met.

Recommendations arising

- 10.2.19 **Financial efficiency variance analysis recommendation 1.** We recommend the recommendations of the Network Rail Investment Financial Variance Year-End Audit Report (IEPODoc013, 20 June 2006) are fully implemented.

11 Reporter's scrutiny and opinion

11.1 Commentary on Annual Return 2006

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 plan to be largely delivered to programme. Where additional supporting information has been requested by the audit teams it has generally been made available although we have been constrained on occasions by the inability of some information management systems to provide the data required or where data could not be provided within the timeframe of the audit.
- 11.1.2 The figures contained in the Annual Return 2006 indicate that Network Rail has achieved the required regulatory targets, with the exception of Broken Rails (M1) where the target has not been met for the first time since regulatory targets were introduced for this measure. Our view is that the levels of performance apparent in the Annual Return are sustainable and result from positive management action by Network Rail. We caution, however, that the achievable levels of cost efficiency and the forward investment required to maintain or improve performance are not clear; balancing asset performance, risk, investment and costs will be an important function of target-setting for the next Control Period.
- 11.1.3 In assessing whether or not Network Rail has achieved the targets set, we have been directed not to take into consideration the tolerance levels detailed in the Annual Return. Similarly to previous years, we have also not taken into account the confidence grades which have been self-assigned by Network Rail to the measures.
- 11.1.4 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. In some areas this can reduce the effectiveness and value of reporting, particularly where measures are not aligned with Network Rail's management information or priorities. 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. We look forward to working with Network Rail and Office of Rail Regulation to develop the suite of measures and targets for the next Control Period to enhance the value available.
- 11.1.5 In conducting our reporting activity we have identified a number of underlying issues which we believe need to be addressed if the reliability and accuracy of the Annual Return is to be improved. Resolution of these issues would, in many cases, also improve Network Rail's performance and stewardship.
- 11.1.6 We have listed these underlying issues in the following text and provided examples. The examples quoted are not a definitive list of findings and are provided to support our comments. Further specific examples can be found within the main body of our report.

Process

"Some of the basic procedures for collecting and reporting data have not been updated and in places there is a lack of diligence and /or rigour in implementing procedures."

- 11.1.7 We found a number of examples where the basic governance of the measures needs attention, including:
- (a) Much of the documentation of the measures, particularly in the Network Rail Asset Reporting Manual, has not been updated for the new organisation, naming organisations and posts that do not exist; however, some of the more proactive Network Rail Champions have made appropriate amendments;

- (b) A significant number of the measures reported in the Annual Return 2006 have no definition or procedure, for example, the measures on Train Mileage and Gross Tonne Miles;
 - (c) Although ownership of the station condition index (M17) and the station facility score (M18) has transferred from Railway Estates to Civil Engineering the role of Headquarters Champion has not been transferred.
- 11.1.8 We found a number of examples where there was a lack of diligence and/ or rigour in the implementation of procedures, including:
- (a) A number of renewals programme teams were not using the most recent financial variance reporting templates and were not diligent in performing the task of accurately reporting the reason for financial variances;
 - (b) Territory teams using production or incident logs compiled by controllers as the definitive source of delay minute information for the electrification failures measures (M11 and M12), rather than using TRUST as defined in the procedure;
 - (c) A number of the procedures stipulate Headquarter audits of the local teams collecting and managing the data; however, the level of compliance with this requirement is not high.
- 11.1.9 We found that some of the procedures, or the managers responsible for their administration, did not give adequate guidance on their implementation
- (a) The initial inspection cycle is coming to a close on some Territories for bridge condition measure (M8), yet there are no instructions to the structures examination contractors on how to conduct second inspections. This will lead to different processes for the collection of this measure;
 - (b) For measure M19, there is no coordinated programme for the survey of light maintenance depot condition and we found that the list of depots in the procedure and Annual Return 2006 was in question, with three different answers as to the correct number of depots to be reported for the measure.

Data Management

"Data management practices are inconsistent"

- 11.1.10 We are pleased to note we found good examples of data management:
- (a) Earthworks Condition (M6). We found three Territories have co-opted use of a documentation management system, which was already in use by some earthworks examination contractors, to manage the significant volumes of information created;
 - (b) The processing and storage of thousands of detailed examination reports and SCMI reports from contractors for the bridge condition measure (M8) is a data management challenge; London North Eastern and Scotland have developed electronic data management systems to manage the documentation arising;
 - (c) Signalling Asset Condition (M10). The roll-out of interlocking data cards (IDC) and SICA Information System (SIS) has made access to information regarding interlockings significantly easier. We expect that this year IDC/SIS will enable Network Rail to provide unified and coherent management information on its interlocking population for the first time.
- 11.1.11 It is interesting to note that two of the three examples above have been local solutions, implemented directly by the out-based teams, where the Headquarters team has not provided a national data management system.
- 11.1.12 We found, however, a number of examples of less good data management practice:
- (a) The robustness of data in GEOGIS and in Area defect databases continues to be an issue, driven by the continuing data cleansing activities; this has caused the data to be restated (i.e. corrected in the following year's Annual Return) for each of

the last four years. We understand the requirement for cleansing to take place but this should be a concentrated one-off operation rather than continuous activity without a definitive date for completion. The continued restatement of data from ongoing cleansing processes puts the value of the measures depending on these systems into question;

- (b) Asset information is still an issue, with the quoted percentage of verified assets in MIMS and FMS remaining at 80%;
- (c) We found Network Rail was unable to identify the number of bridges which require condition scores; there is no national database for the asset management of structures, other than GEOGIS, which can only be used to list all structures assets. We believe that there has been a missed opportunity to develop a robust database from the information which has been collected over the last five years by structures examination contractors;
- (d) We found it takes on average 145 days from inspection of a structure to entry of the information onto the SCMI database for measure M8; we believe that this is evidence of poor management given the contracted timescale is 28 days; it also means the condition of bridges reported as being undertaken this year incorporates examinations from up to four years ago;
- (e) We found four Territories maintain local spreadsheets for managing data for signalling condition (M10) rather than using the national system (SIS). We found a number of inconsistencies within the locally stored data.
- (f) We found that Scotland had lost all of its detailed information relating to station facilities scores (M18) and only had summary information available. The team is currently collecting the data for each station again from scratch.

Systems

“The responsiveness of some systems and their capacity in providing effective management information is of concern”

- 11.1.13 On occasion, we have had to amend the focus of our audit plan where raw data from Network Rail’s systems could not be supplied within the time frame of the audit due to the design or platform of the system. Network Rail managers shared this frustration when seeking to source data from TRUST and PALADIN; we understand this specific issue is expected to be addressed with the introduction of PSS.
- 11.1.14 Also, we have had to amend the focus of our audit plan where reference fields were not completed. The reference fields linking TRUST and FMS (Fault Management System) records is of importance to Network Rail; without this link the cause of delay cannot be traced back to its root-cause and the management information for improving operational performance is incomplete.
- 11.1.15 There is currently no national database to assist in the asset management of structures (for measure M8).
- 11.1.16 We are concerned that recent replacement systems have lost some of the functionality of the systems they have replaced, as well as the confidence of users. A typical example is FMS system where we found users experienced significant difficulties in data input (especially for unverified assets) and data extraction for analysis; this suggested the system requires further development if it is to be of use.
- 11.1.17 Similar to previous years, we found queries to individual champions regarding specific systems issues have often been answered with reference to either the system currently in development (CARRS for structures, measure M8) or even the planned upgrade for systems currently in development (RDT2 for rail defect management, measures M1 and M2). We understand the desire to roll-out fully comprehensive systems but find that often simple solutions using diligent data management would have provided a proactive short-term answer to the information problems we have identified.

- 11.1.18 We are pleased to note that we found evidence of improved management systems in both the PPS (Possession Planning System for measure M4) and SIS (SICA Information System, for measure M10). Both were successful in providing the information required and they appeared to be largely appreciated by their users.

Organisation and People

“The quality of Annual Return data is often a reflection of the ownership of the process or the direction and support from Headquarters”

- 11.1.19 The functional organisation of Network Rail has largely bedded-in and is bearing fruits. We found evidence of increased direction and support from Headquarters leading to standardisation and improved management information and control. However, we also found parts of the organisation where local solutions, both for information technology and for processes and procedures, had been developed more than once due to insufficient direction and support from Headquarters. We have identified in our report opportunities to spread best practice, including:
- (a) The management of detailed examination reports for bridges on London North Eastern and Scotland using electronic document management;
 - (b) The documentation management system, in use by some earthworks examination contractors to manage the significant volumes of information created, which has been co-opted by three Territories;
 - (c) The delay attribution, attribution monitoring and other operational performance procedures developed by Wessex;
 - (d) The development of a spreadsheet-based questionnaire in Western Territory for counting station facilities (M18) which has made the collection process more efficient; this has already been shared with some but not all of the other Territories.
- 11.1.20 Where there has been a period of organisational stability (and often a reduced reliance on temporary staff) it has resulted in a high level of commitment and enthusiasm of the individuals involved; however, some of the measures are being managed by acting Headquarters Champions.
- 11.1.21 We generally found a high level of competence. However, a number of individuals did not have an appreciation of the content of the Annual Return and its position in the regulatory process or who had not bought into the process and saw it as an annual chore which added no value. This may have been due to the level of training we found for some of the measures, some of which have no training documentation or processes. We note that in certain places training was supplemented or replaced by user groups.
- 11.1.22 We expected to have found more direction from Headquarters Champions to ensure that a representative sample of the underlying population was inspected, especially where extrapolation is used to generate the measure.

Annual Return Measures

“The ability to make comparisons and identify trends in the information is being compromised”

- 11.1.23 There are a number of issues regarding trend analysis:
- (a) Data cleansing and restatement of reported data makes meaningful trend analysis problematic, such as for rail defects (M2) and the capability measures (C1-4).
 - (b) Low sample numbers is also makes meaningful trend analysis problematic, often where the rate of inspections is less than that specified in the procedure, such as for light maintenance depot condition (M19) where there is a 50% shortfall of inspections or conductor rail condition (M16) where nearly 15% of inspections are over ten years old.
 - (c) Diversity of measurement techniques, either due to changes to protocols (e.g. there have been five different techniques for measuring M8 over the life-time of the

dataset) or due to subjective assessments being carried out by staff or contractors who are not subject to training and monitoring/audit (e.g. the structures assessment contractors change examiners without review by Network Rail).

- (d) We have found inconsistency in units and the rounding of figures which has impacted our ability to discern trends; this is particularly the case for the average condition measures (M6, M8, M13, M14, M15, M16, M17, M19);
- (e) The format of tables in the Annual Return is subject to change without approval, leading to presentation of data that is not required and loss of data that is required for the purposes of trend analysis. We would welcome the opportunity to discuss the form and content of the Annual Return in more detail so that this can be resolved.

“A number of measures require review if the result is to be of use to the industry”

11.1.24 We have found that where an Annual Return measure is identical to – or uses the same source data as – a Network Rail KPI or is part of an asset management process, the data is essentially robust; track geometry measures (M3, M5) provide an example of such a situation. Some of the other measures, however, may require reviewing to align them more with business and regulatory needs..

- (a) We would welcome the opportunity to discuss the following measures *inter alia* and their improvement: station condition index (M17), station facilities (M18), light maintenance depot condition (M19), customer reasonable requirements;
- (b) We suggest that consideration is given to extending the number of measures to include *inter alia* station plant, trackside plant, telecoms, rail vehicle fleet, neighbour complaints and maintenance activity.

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 2006 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 2005/06 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 2006 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 2006 relating to the measures contained in the "Form of the 2006 Annual Return" prepared by Network Rail and agreed with 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 2006. 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 2006.
- 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 noted in our report commentaries.



Norman McDowell,
Independent Reporter,
Halcrow Group Limited,
August 2006.

12 Appendix A: Table of figures

Figure 1.3.1	Confidence grades targets and results for measures in Annual Return 2006.....	14
Figure 3.1.1	Allocation of Reporting Role to Reporters.....	17
Figure 4.2.1	Performance against regulatory targets.....	20
Figure 4.3.1	Confidence grades for the measures in Annual Return 2006	21
Figure 5.1.1	Delay minutes per 100 train kilometres.....	24
Figure 5.1.2	Number of infrastructure incidents per Route recorded for delay attribution	24
Figure 5.1.3	Analysis of attribution to infrastructure failures (resp.= responsibility).....	27
Figure 5.1.4	Split of reactionary delay between NR/TOC to compare 'normal days' with days containing 'major NR incidents' or 'major TOC incidents' (one sample Territory; 2005/06).....	29
Figure 5.2.1	Unweighted Annual Average of Quarterly Passenger Complaints per 100,000 journeys	30
Figure 5.3.1	Customer & Supplier Satisfaction	33
Figure 5.5.1	Progress in developing Route Utilisation Strategies at year end 2005/06	40
Figure 5.6.1	Customer Reasonable Requirements.....	43
Figure 5.6.2	Number of Customer Reasonable Requirements live at year end	43
Figure 6.1.1	Linespeed capability (speed band in mph, capability p.a. reported in km) (C1).....	47
Figure 6.2.1	Gauge capability (kilometres) (C2)	49
Figure 6.3.1	Structures route availability (C3).....	51
Figure 6.4.1	Electrification capability (C4).....	53
Figure 6.5.1	Train Mileages (million miles; empty coaching stock excluded) (Mileage)	55
Figure 6.6.1	Freight Gross Tonne Miles (millions)	58
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 7.2.1	Numbers of isolated rail defects (M2)	68
Figure 7.2.2	Length of continuous rail defects (M2).....	68
Figure 7.2.3	Defect detection methods (TSM is Track Section Manager) (M2).....	69
Figure 7.2.4	Defect databases in sample Areas (M2).....	69
Figure 7.2.5	Defect databases in sample Areas (TRME is Territory Rail Management Engineer, ATE is Area Track Engineer; ARME is Area Rail Management Engineer) (M2)	70
Figure 7.3.1	National SD data (M3).....	72
Figure 7.3.2	Track geometry standard deviation 2000/01 – 2005/06 (M3)	73
Figure 7.3.3	A comparison of Route PTG 2002/03 – 2005/06 (M3).....	74
Figure 7.3.4	Speed band standard deviations (M3).....	74
Figure 7.3.5	Level 2 exceedences for 2001/02 – 2005/06 (M5)	75
Figure 7.4.1	Number and severity of temporary speed restrictions (M4)	78
Figure 7.4.2	Variance in Severity Score and Number of TSRs (M4)	78
Figure 7.4.3	Number of temporary speed restrictions (M4); grouped for comparison (M4)	78
Figure 7.4.4	Severity of temporary speed restrictions (M4) ; grouped for comparison (M4).....	79
Figure 7.4.5	Number of Severity of temporary speed restrictions (M4)	79
Figure 7.5.1	Number of Earthwork failures reported during the last three years (M6).....	82
Figure 7.5.2	Variance of Earthwork failures (M6).....	83
Figure 7.6.1	Bridge condition reported during the last six years (M8).....	86
Figure 7.6.2	SCMI examinations reported for 2005/06 (M8)	87
Figure 7.7.1	Number of signalling failures >10 minutes (M9).....	90
Figure 7.7.2	Variance from 04/05 of signalling failures >10 minutes (M9).....	91
Figure 7.8.1	Average signalling asset condition (M10)	94
Figure 7.8.2	Interlocking population and SICA assessments (M10)	95
Figure 7.8.3	Interlocking population as reported by HQ and Territory (M10)	97
Figure 7.10.1	Average condition a.c. traction feeder stations & track sectioning points (M13).....	102
Figure 7.10.2	condition a.c. traction feeder stations & track sectioning points (M13).....	103
Figure 7.11.1	Average condition of d.c. sub-stations (M14)	105
Figure 7.11.2	Average condition grades for d.c. sub-stations (M14)	106
Figure 7.12.1	Progress for inspections – a.c. contact systems (M15)	108
Figure 7.12.2	a.c. traction contact systems (M15)	109

Figure 7.12.3 a.c. traction contact systems (M15)	109
Figure 7.13.1 Age profile for wear measurements on South East Territory (M16)	111
Figure 7.13.2 Average condition of conductor rails (M16).....	112
Figure 7.13.3 Average condition of conductor rails (M16).....	112
Figure 7.14.1 Average condition of Stations (M17).....	115
Figure 7.14.2 Station condition reported during the last six years (M17).....	116
Figure 7.14.3 Average condition of Stations (M17).....	118
Figure 7.15.1 Station facility scores (M18)	120
Figure 7.16.1 Average LMD asset condition (M19).....	125
Figure 7.16.2 Number of LMD inspected by year (M19)	125
Figure 7.17.1 Asset Stewardship Incentive Index (ASII).....	128
Figure 7.17.2 Checks performed using data from Annual Return 2006 (ASII).....	129
Figure 8.1.1 Track renewal volumes excl. WCRM (M20, M21, M22).....	132
Figure 8.1.2 Switch and crossing renewal excl. WCRM (M25).....	133
Figure 8.1.3 Switch and crossing renewal excl. WCRM by type (M25).....	133
Figure 8.2.1 Signalling renewals (M24).....	136
Figure 8.3.1 Annual number of structures renewed, excl. WCML (M23, M26-M29).....	139
Figure 8.3.2 Bridge renewals by task category (M23).....	140
Figure 8.3.3 Area of works renewed (M23, M27).....	140
Figure 9.1.1 Safety & Environment Plan for Control Period 3 (£m)	143
Figure 10.1.1 Unit cost indices.....	148
Figure 10.1.2 Composite rates.....	148
Figure 10.1.3 Progress developing detailed renewals unit costs.....	149
Figure 10.2.1 Core renewals efficiency savings (budgeted and additional)	150
Figure 10.2.2 Core renewals efficiency savings (budgeted and additional).....	151
Figure 10.2.3 Re-attribution of financial variances as a result of internal audit	153
Figure 15.1.1 Confidence Grades assigned to Annual Return Measures (2003/04-2005/06)	174
Figure 15.1.2 Confidence Grades assigned to Annual Return Measures (2003/04-2005/06)	175
Figure 15.2.1 Notable variation for 2004/05-2005/06 Independent Reporter confidence grades..	176
Figure 15.2.2 Notable variation for Network Rail/ Independent Reporter confidence grades	176
Figure 16.1.1 Changes to measures reported in the Asset Reporting Manual.....	177
Figure 16.1.2 Changes to measures reported in the Asset Reporting Manual.....	178
Figure 17.1.1 Measures reported in both Network Rail Monitor and Annual Return	179
Figure 18.1.1 Trend in Count of Large Hours and Count of Large Units.....	183
Figure 18.1.2 Trend in Count of Zero Hours and Count of Zero Units	184
Figure 18.1.3 Trend in Work Order Closures.....	184
Figure 18.1.4 Actual Hours Vs Estimated Hours	185

13 Appendix B: Audit meeting schedule

Date	Venue	Audit	For Network Rail	For Reporter A
10/03/06	Network Rail HQ, Melton St, London	Finances	<ul style="list-style-type: none"> Peter Duff, [title tbc] David Cooke, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
15/03/06	Network Rail HQ, Melton St, London	M1 M2	<ul style="list-style-type: none"> Brian Whitney, National Rail Management Engineer 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards
15/03/06	Network Rail HQ, Melton St, London	M3 M5	<ul style="list-style-type: none"> John Turner, National Track Geometry Analyst 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards
20/03/06	Network Rail HQ, Melton St, London	M24	<ul style="list-style-type: none"> Dermot Courtney, Programme Manager 	<ul style="list-style-type: none"> Duncan Mills
20/03/06	Network Rail HQ, Melton St, London	RUS	<ul style="list-style-type: none"> Richard Eccles, Head of Route Planning 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
20/03/06	Network Rail HQ, Melton St, London	M4	<ul style="list-style-type: none"> Richard o'Brien, Head of Operational Planning Chris Myers, TSR Planner 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
21/03/06	Network Rail HQ, Melton St, London	M9	<ul style="list-style-type: none"> Ian Griffiths, Senior Signal Performance Engineer 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt
21/03/06	Network Rail HQ, Melton St, London	M10	<ul style="list-style-type: none"> Jeremy Morling, HQ Signalling Strategy Engineer 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt
22/03/06	125 House, Swindon	M23 M26 M27 M28 M29	<ul style="list-style-type: none"> Robert Oswald, Programme Efficiency Analyst 	<ul style="list-style-type: none"> Duncan Mills
22/03/06	Network Rail HQ, Melton St, London	Satisfacti on	<ul style="list-style-type: none"> Chris Rumfitt, Head of External Communications 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
22/03/06	Network Rail HQ, Melton St, London	Variance & CAF	<ul style="list-style-type: none"> Paul Wiseman, [title tbc] Tariq Yusuf, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
23/03/06	Network Rail HQ, Melton St, London	ASII	<ul style="list-style-type: none"> Mary Jordan, National Engineering Reporting Manager 	<ul style="list-style-type: none"> Megan Gittins
24/03/06	George Stevenson House, York	M20 M21 M22 M25	<ul style="list-style-type: none"> Mike Carden, [title tbc] Ian Wright, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
27/03/06	Network Rail HQ, Melton St, London	M8	<ul style="list-style-type: none"> Steve Fawcett, Network Rail HQ Champion for M8 Martin Winterbottom, Lloyds Register Rail Kevin McLernon, Lloyds Register Rail 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
27/03/06	Network Rail HQ, Melton St, London	M6	<ul style="list-style-type: none"> Eifion Evans, Network Rail Civil Engineer – Geotechnics 	<ul style="list-style-type: none"> Phil Edwards Patricia Rodriguez
27/03/06	Network Rail HQ, Melton St, London	JPIPS	<ul style="list-style-type: none"> Adam Bennett, Head of Performance John Thompson, Performance Improvement Leader 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
27/03/05	Network Rail HQ, Melton St, London	C3	<ul style="list-style-type: none"> Ian Bucknall, Civil Engineer, Bridges Mary Jordan, National Engineering Reporting Manager Tony Smith, National Engineering Information Analyst 	<ul style="list-style-type: none"> Duncan Mills
28/03/05	Network Rail HQ, Melton St, London	C4	<ul style="list-style-type: none"> Nick Snell, Strategy Engineer, E&P Mary Jordan, National Engineering Reporting Manager Tony Smith, National Engineering Information Analyst 	<ul style="list-style-type: none"> Duncan Mills

Date	Venue	Audit	For Network Rail	For Reporter A
28/03/05	Network Rail HQ, Melton St, London	C1 C2	<ul style="list-style-type: none"> Peter Lander, National Track Geometry & Gauging Engineer Mary Jordan, National Engineering Reporting Manager Tony Smith, National Engineering Information Analyst 	<ul style="list-style-type: none"> Duncan Mills
29/03/06	Network Rail HQ, Melton St, London	MUC	<ul style="list-style-type: none"> Andy Whittaker, [title tbc] Erwin Klumpers, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
29/03/06	Network Rail HQ, Melton St, London	S&E	<ul style="list-style-type: none"> Maurice Hemingway, Health & Safety Systems Manager Bill Davidson, Regulatory Economics Manager 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
29/03/06	Network Rail HQ, Melton St, London	Mileage & Freight gross tonne miles	<ul style="list-style-type: none"> John Kennedy, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
30/03/06	Network Rail HQ, Melton St, London	Performance	<ul style="list-style-type: none"> Nigel Salmon, Senior Programme Analyst Richard Guest, Performance Measurement Manager 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli Duncan Mills
04/04/06	Network Rail HQ, Melton St, London	Mileage & Freight gross tonne miles	<ul style="list-style-type: none"> John Kennedy, [title tbc] Martin Hollands, Billing Systems Manager 	<ul style="list-style-type: none"> Duncan Mills
05/04/06	Network Rail HQ, Melton St, London	CRRs	<ul style="list-style-type: none"> Ian Brown, Customer Service Manager Andriana Shiakallis, Customer Service Assistant 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
06/04/06	Network Rail HQ, Melton St, London	M9	<ul style="list-style-type: none"> Emma Craig, Head of Performance Reporting Team Scott Provan, Performance Reporting Analyst 	<ul style="list-style-type: none"> Megan Gittins
10/04/06	11 Albion Street, Leeds	M4	<ul style="list-style-type: none"> Chris Myers, TSR Planner 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
19/04/06	Network Rail HQ, Melton St, London	M17 & M18	<ul style="list-style-type: none"> Simon Longstaffe, NR Building Policy Specialist and M17 HQ Champion Alan.Garnell, Franchise Lease & Freight Manager and M18 HQ Champion Alan.Dray, NR Head of Civil Engineering Policies 	<ul style="list-style-type: none"> Cliff Buckton Patricia Rodriguez
19/04/06	Network Rail HQ, Melton St, London	M19	<ul style="list-style-type: none"> Simon Longstaffe, Properties HQ champion - Building policy Specialist Alan Dray, Properties HQ champion - Head of Civil Engineering policy 	<ul style="list-style-type: none"> Megan Gittins Steve Beaumont
19/04/06	The Bar Convent Trust, 17 Blossom Street, York	Variance: Track	<ul style="list-style-type: none"> Fergus O'Connell, [title tbc] Stephanie Simpson, [title tbc] Tariq Yusuf, [title tbc] Peter Lakhani, [title tbc] Geoff Jones, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
21/04/06	Eversholt Street, London	Variance: Signalling South	<ul style="list-style-type: none"> Rob Doran, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills

Date	Venue	Audit	For Network Rail	For Reporter A
24/04/06	Network Rail HQ, Melton St, London	M11 M12 M13 M14 M15 M16	<ul style="list-style-type: none"> Nick Snell, Strategy Engineer, E&P Charles Hervy, Business Planning Manager (E&P) Mary Jordan, National Engineering Reporting Manager Aaron Black, National Engineering Information Analyst Glenn Wiles, [title tbc] Dave McQuillon, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills Ken Foster Bob Care
25/04/06	Eversholt Street, London	Variance: Signalling North	<ul style="list-style-type: none"> Neil Simmons, Senior Programme Manager, Signalling North Andrew Shaw, Principal Programme Controls Manager Mike Stevenson, Signalling Efficiency Manager Tariq Yusuf, [title tbc] Geoff Jones, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
25/04/06	Network Rail HQ, Melton St, London	M8	<ul style="list-style-type: none"> Steve Fawcett, Network Rail HQ Champion for M8 Innes Brown, NR TPO SE Territory Dan Beveridge, NR TPO Scotland Territory Kevin Giles, NR Renewals Engineer Western Territory Andrew Roberts, NR TPO LNW Territory Richard Sykes, NR TPO LNE Territory Martin Winterbottom, Lloyds Register Rail Kevin McLernon, Lloyds Register Rail Keith Halcrow, Lloyds Register Rail Mat Gascoigne, Lloyds Register Rail 	<ul style="list-style-type: none"> Mike Adkin
28/04/06	125 House, Swindon	Variance: Civils	<ul style="list-style-type: none"> Steve Jenkins, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
02/05/06	11 Albion Street, Leeds	M4	<ul style="list-style-type: none"> Chris Myers, TSR Planner 	<ul style="list-style-type: none"> Maria Kordeli
03/05/06	Buchanan House, Glasgow	Performance Measure s/JPIPs	<ul style="list-style-type: none"> Ann-Marie Harmon, Route Performance Manager 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
03/05/06	Buchanan House, Glasgow	CRR	<ul style="list-style-type: none"> Jo Noble, Account Manager 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
04/05/06	Lloyd's Register – St. Pancras	M8	<ul style="list-style-type: none"> Kevin McLernon, Lloyds Register Rail 	<ul style="list-style-type: none"> Mike Adkin
08/05/06	Buchanan House, Glasgow	RUS	<ul style="list-style-type: none"> Nigel Wunsch, Principal Route Planner 	<ul style="list-style-type: none"> Bob Heasman
08/05/06	Paisley	M4	<ul style="list-style-type: none"> Ann Bowers, PPS input co-ordinator 	<ul style="list-style-type: none"> Bob Heasman
09/05/06	Eversholt Street, London	Variance: WCRM	<ul style="list-style-type: none"> Martin Zobel, [title tbc] 	<ul style="list-style-type: none"> Duncan Mills
10/05/06	125 House, Swindon	M4	<ul style="list-style-type: none"> Rodney Hunt, Infrastructure Data Analyst 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
10/05/06	125 House, Swindon	JPIPs	<ul style="list-style-type: none"> Nic Coome, Business Manager 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
11/05/06	Network Rail HQ, Melton St, London	M24	<ul style="list-style-type: none"> Dermot Courtney, Programme Manager 	<ul style="list-style-type: none"> Duncan Mills
15/05/06	Network Rail HQ, Melton St, London	M10	<ul style="list-style-type: none"> Jeremy Morling, HQ Signalling Strategy Engineer Andy Smith, Assistant Business Planning Engineer 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt Norman McDowell

Date	Venue	Audit	For Network Rail	For Reporter A
15/05/06	Network Rail HQ, Melton St, London	M9	<ul style="list-style-type: none"> Ian Griffiths, Senior Signal Performance Engineer 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt Norman McDowell
16/05/06	The Mailbox, Birmingham	RUS	<ul style="list-style-type: none"> Paul Banks, Principal Route Planner Julie Swallow, Route Planner 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
17/05/06	Network Rail HQ, Melton St, London	M19	<ul style="list-style-type: none"> Simon Longstaffe, Properties HQ champion - Building policy Specialist 	<ul style="list-style-type: none"> Megan Gittins Steve Beaumont Norman McDowell
17/05/06	Waterloo Station	RUS	<ul style="list-style-type: none"> Paul Harwood, Principal Route Planner Ben Wheeldon, Senior Route Planner Alasdair Couper-Johnston, Senior Route Planner 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
18/05/06	Eastern House, Great Eastern St, London	M9	<ul style="list-style-type: none"> Paul Rutter, Area Signalling Maintenance Engineer-West Anglia 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt
19/05/06	Waterloo General Offices	M10	<ul style="list-style-type: none"> Michael Laybourne, Signal Renewal Assessment Engineer - SEA Kenneth Gray, Territory Signal Renewal Engineer - SEA Kevin Leech, Renewal Requirement Engineer - SEA 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt
22/05/06	Network Rail HQ, Melton St, London	M1 M2	<ul style="list-style-type: none"> Brian Whitney, National Rail Management Engineer Mary Jordan, National Engineering Reporting Manager 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards Norman McDowell
22/05/06	Network Rail HQ, Melton St, London	ASII	<ul style="list-style-type: none"> Mary Jordan, National Engineering Reporting Manager 	<ul style="list-style-type: none"> Megan Gittins
22/05/06	Network Rail HQ, Melton St, London	M3 M5	<ul style="list-style-type: none"> Peter Lander, National Track Geometry & Gauging Engineer John Turner, National Track Geometry Analyst 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards Norman McDowell
22/05/06	The Mailbox, Birmingham	Performance Measurements	<ul style="list-style-type: none"> Paul Kelly, Route Performance Manager Martin Colmey, Attribution Duty Manager Andrew Rowe, Performance Data Quality Specialist 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
23/05/06	Wessex Area HQ, Downside Offices, Off Guildford St, Woking	M1 M2 M3 M5	<ul style="list-style-type: none"> Dave Gilbert, Territory Rail Management Engineer - SEA Peter Moore, Territory Rail Testing Engineer - SEA Bob Hardwell, Area Rail Management Engineer - West Anglia Bill Grove, Area Rail Management Engineer - Wessex Jan Penn, Rail Management Technician - Wessex 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards
24/05/06	Alpha Towers, Birmingham	M9	<ul style="list-style-type: none"> Mark Goodwin, Area Signal Maintenance Engineer - LNW 	<ul style="list-style-type: none"> Phil Morton Bob Wyatt
24/05/06	Network Rail HQ, Melton St, London	RUS	<ul style="list-style-type: none"> Peter Northfield, RUS Co-ordinator 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
26/05/06	Virginia Water Interlocking	M10	<ul style="list-style-type: none"> Kevin Leech, Renewal Requirement Engineer - SEA 	<ul style="list-style-type: none"> Phil Morton

Date	Venue	Audit	For Network Rail	For Reporter A
30/05/06	The Mailbox, Birmingham & Saltely Depot	M1 M3 M5	<ul style="list-style-type: none"> Dave Baskett, Territory Rail Management Engineer - LNE Ged Cullinane, Territory Assurance Engineer (Track) - LNE Ted Merricks - Ultrasonic Manager - West Midlands South 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards
30/05/06	111 Piccadilly, Manchester	M8	<ul style="list-style-type: none"> Tony Wilcock, Territory Civil Engineer Neil Jones, Territory Structures Engineer Andrew Roberts, Territory Process Owner and ASME 	<ul style="list-style-type: none"> Mike Adkin
31/05/06	Buchanan House, Glasgow	M10	<ul style="list-style-type: none"> Alan Taylor, Signal Renewal Assessment Engineer - SCO Scott Walldrop, Territory Renewals Engineer - SCO 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt
31/05/06	Buchanan House, Glasgow	M1 M2 M3 M5	<ul style="list-style-type: none"> Michelle Mullen, Territory Rail Management Engineer - SCO Faye Steward, Area Rail Management Engineer – Scotland West Matthew Kane, Area Rail Management Engineer – Scotland East 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards
01/06/06	Buchanan House, Glasgow	M9	<ul style="list-style-type: none"> Alec Ingils, Signal Performance Engineer – Scotland West 	<ul style="list-style-type: none"> Megan Gittins Bob Wyatt
01/06/06	Busby Interlocking	M10	<ul style="list-style-type: none"> Alan Taylor, Signal Renewal Assessment Engineer - SCO 	<ul style="list-style-type: none"> Phil Morton
01/06/06	Buchanan House, Glasgow	M6	<ul style="list-style-type: none"> Jim Brown, NR Territory Earthworks & Drainage Engineer - Scotland John Meecham, NR Territory Assurance Engineer - Scotland David Grant, NR Earthworks Engineer - Scot.East Tom Thompson, NR Earthworks Engineer - Scot.West 	<ul style="list-style-type: none"> Phil Edwards Patricia Rodriguez
02/06/06	Tallington Interlocking	M10	<ul style="list-style-type: none"> Ron Bowes, Signal Assessment Engineer - LNE 	<ul style="list-style-type: none"> Phil Morton
02/06/06	Buchanan House, Glasgow	M17 M18	<ul style="list-style-type: none"> Eddie Mcgloin, NR Territory Civil Engineer Alan Edgely, NR Senior Building Surveyor Alan Muir, NR Operational Estate Manager Lorraine Honell, NR Account Surveyor David O'May, NR Surveyor 	<ul style="list-style-type: none"> Cliff Buckton Patricia Rodriguez
05/06/06	Buchanan House, Glasgow	M8	<ul style="list-style-type: none"> Duncan Sooman, NR - Scotland Territory Civil Engineer, TCE Danny Beveridge, NR - Scotland Territory Process Owner, TPO Andrew Anderson, NR - Scotland Territory Structures Engineer 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
05/06/06	125 House, Swindon	M10	<ul style="list-style-type: none"> Matthew Spencer, Signal Renewals Engineer - WES 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt
05/06/06	Engineering Support Centre, Derby	M1 M2	<ul style="list-style-type: none"> Tez McCall, Examination Technical Specialist (High Speed) 	<ul style="list-style-type: none"> Phil Edwards
05/06/06	George Stephenson House, York	JPIPs	<ul style="list-style-type: none"> Chris Calow, Business Manager John Thompson, Performance Improvement Leader 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli

Date	Venue	Audit	For Network Rail	For Reporter A
05/06/06	125 House, Swindon	M9	<ul style="list-style-type: none"> Andrew Denholm, Area Signal Maintenance Engineer – Wales & Marches Andrew Mitchell, Area Performance Engineer Des Fox, SINCS Engineer 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt
06/06/06	Shoeburyness LMD	M19	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Steve Beaumont
06/06/06	Chingford LMD	M19	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Steve Beaumont
07/06/06	Aston SCC Interlocking	M10	<ul style="list-style-type: none"> Peter Gorry, Territory Signal Assessment Engineer - LNW 	<ul style="list-style-type: none"> Phil Morton
07/06/06	Bournemouth LMD	M19	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Steve Beaumont
07/06/06	George Stevenson House, York	M10	<ul style="list-style-type: none"> Ron Bowes, Signal Assessment Engineer – LNE Bill Troth, Territory Renewal Engineer (Signals) - LNE Mark Anness - Tchnical Clerk 	<ul style="list-style-type: none"> Megan Gittins Bob Wyatt
07/06/06	Marylebone Station	JPIPs	<ul style="list-style-type: none"> Alex Kenney, Business Manager Dave Waldron (Chiltren Railways) 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
07/06/06	North East Area HQ, York	M9	<ul style="list-style-type: none"> Jim Cowan, Area Signal Maintenance Engineer – North Eastern 	<ul style="list-style-type: none"> Megan Gittins Bob Wyatt
07/06/06	Scotland SEC Atkins Rail offices - 200 Broomielaw, Glasgow	M8	<ul style="list-style-type: none"> Ewen Fraser, Atkins – Chartered Engineer Shawn Berry, Atkins – Examining Engineer & Area Manager Robert Bell, Atkins – Examiner Dundee Area Allan Cunningham, Atkins – Examiner Perth Area 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
08/06/06	George Stevenson House, York	M8	<ul style="list-style-type: none"> Richard Bell, NR - LNE Territory Civil Engineer, TCE Richard Skyes, NR - LNE Territory Process Owner, TPO Richard Frost, NR - LNE Territory Structures Engineer Ian Pratt, NR – Structures Maintenance Engineer SME for Midlands Mark Roberts, NR – Major Projects and Investments LNE 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
08/06/06	Network Rail HQ, Melton St, London	S&E	<ul style="list-style-type: none"> Maurice Hemingway, Health and Safety Systems Manager Lawrence Ford, Safety Case Manager 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
08/06/06	The Mailbox, Birmingham	M10	<ul style="list-style-type: none"> Peter Gorry, Territory Signal Assessment Engineer - LNW Graham Wire, Territory Renewal Engineer (Signals) - LNW 	<ul style="list-style-type: none"> Megan Gittins Phil Morton Bob Wyatt
08/06/06	Engineering Support Centre, Derby	M1 M2	<ul style="list-style-type: none"> Ian Stone, Examination Technical Specialist 	<ul style="list-style-type: none"> Phil Edwards
09/06/06	Network Rail HQ, Melton St, London	JPIPs	<ul style="list-style-type: none"> John Thompson, Performance Improvement Leader 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
09/06/06	LNE SEC Owen Williams Railways offices - York	M8	<ul style="list-style-type: none"> Mick Johnson, OWR Contract Manager, Steve Hizzett, OWR Examining Engineer 2No Bridge Examiners N, York Area 	<ul style="list-style-type: none"> Mike Adkin

Date	Venue	Audit	For Network Rail	For Reporter A
09/06/06	George Stevenson House, York	M17 M18	<ul style="list-style-type: none"> Mark Norman, NR Territory Building Engineer Brian Wainwright, NR Territory Assurance Engineer – Civils John Pangely, NR Commercial Property Manager LNE & Anglia Robin Dentor, NR Senior Account Surveyor Margaret Lake, NR Team Organizer for Commercial Property York John Gower, NR Senior Account Surveyor – Anglia 	<ul style="list-style-type: none"> Cliff Buckton Patricia Rodriguez
12/06/06	LNW SEC – Railway Structures Midlands, Birmingham	M8	<ul style="list-style-type: none"> Ian Dodgson, Project Director Karen Capling, Project Manager Glen Darby, Examining Engineer Nominee Bob Robbington, Examining Engineer 	<ul style="list-style-type: none"> Mike Adkin
13/06/06	Network Rail HQ, Melton St, London	Bottlenecks	<ul style="list-style-type: none"> Richard Eccles, Head of Route Planning Julie Rickard, Network Planning Manager Philip Whitehead, Network Planner 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
13/06/06	Network Rail HQ, Melton St, London	Complaints Satisfaction	<ul style="list-style-type: none"> Peter Allen, Senior Market Research Specialist 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
14/06/06	George Stevenson House, York	M6	<ul style="list-style-type: none"> David Anderson, NR Territory Earthworks & Drainage Engineer - LNE Brian Wainwright, NR Territory Assurance Engineer – Civils 	<ul style="list-style-type: none"> Phil Edwards Patricia Rodriguez
14/06/06	125 House, Swindon	M17	<ul style="list-style-type: none"> Derek Basset, NR – [title tbc] 	<ul style="list-style-type: none"> Cliff Buckton
14/06/06	Waterloo Station	CRRs	<ul style="list-style-type: none"> Tamzine Readman, Account Manager 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
14/06/06	Waterloo Station	Performance Measures / JPIPs	<ul style="list-style-type: none"> Tom Westwood, Acting Route Performance Manager Giles Baxter, Acting Current Operations Manager Mark Southon, Delay Resolution Co-ordinator 	<ul style="list-style-type: none"> Bob Heasman Maria Kordeli
15/06/06	Bristol Temple Meads office, Bristol	M18	<ul style="list-style-type: none"> Kevin Miller, NR Operational Estate Manager Chris Beale, NR Account Surveyor 	<ul style="list-style-type: none"> Cliff Buckton Patricia Rodriguez
15/06/06	Waterloo Station	M6	<ul style="list-style-type: none"> Derek Butcher, NR Territory Earthworks & Drainage Engineer - SE Stephanie Anderson, NR Assurance Engineer - Civils 	<ul style="list-style-type: none"> Phil Edwards
16/06/06	125 House, Swindon	M6	<ul style="list-style-type: none"> Peter Muir, NR Territory Earthworks & Drainage Engineer - Western Andrew Holley, NR Earthworks Engineer, Western 	<ul style="list-style-type: none"> Phil Edwards Patricia Rodriguez

Date	Venue	Audit	For Network Rail	For Reporter A
19/06/06	125 House, Swindon	M1 M2 M3 M5	<ul style="list-style-type: none"> Mark Hewinson, Territory Rail Management Engineer – WES John James, Territory Rail Management Engineer – WES Peter Bridges, Territory Track Management Engineer – WES Dave Clements, Area Rail Management Engineer – Wales & Marches Rachael Leighfield Finch, Track Standards & Compliance Engineer - WES 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards
19/06/06	Waterloo Station	M8	<ul style="list-style-type: none"> Innes Brown, NR Territory Process Owner SEA Nigel Ricketts, NR Territory Civil Engineer Tony Ramamathan, Territory Assurance Engineer 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
20/06/06	South East SEC Aktins Rail offices - Croydon	M8	<ul style="list-style-type: none"> Phil Pearson, Area Examinations Manager Dave Metson, Examiner for Sussex/Wessex Areas Peter Smith, Examiner for Wessex Area Jonathan Wilcox, Project Manager Andy Dean, Programme Director Structures 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
20/06/06	Waterloo Station	M8	<ul style="list-style-type: none"> Chris Rosewell, MPI Contracts Manager 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
20/06/06	Engineering Support Centre, Derby	M1 M2 M3 M5	<ul style="list-style-type: none"> Simon Broomhead, Engineering Support Centre Manager Tez McCall, Examination Technical Specialist (High Speed) John Harris, Low Speed Train Monitoring Manager 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards
21/06/06	George Stevenson House, York & Darlington Depot	M1 M2 M3 M5	<ul style="list-style-type: none"> Andrew Beeson, Territory Rail Management Engineer - LNE Dave Charlton, Geometry and Track Component Engineer - LNE Andy Lucas, Territory Rail Management Engineer - LNE 	<ul style="list-style-type: none"> Megan Gittins Bob Collinson Phil Edwards
21/06/06	The Mailbox, Birmingham	M17 M18	<ul style="list-style-type: none"> Derek Owen, NR Operational State Manager Lynn, NR Team Organizer John Keith, [title tbc] 	<ul style="list-style-type: none"> Cliff Buckton Patricia Rodriguez
22/06/06	Merseyside Depot and Liverpool Area Office, Liverpool	M2	<ul style="list-style-type: none"> Dave Baskett, Territory Rail Management Engineer - LNE Ged Cullinane, Territory Assurance Engineer (Track) - LNE Dave Martin, Rail Quality Manager - Liverpool Neil Mitchell, Area Rail Management Engineer - Liverpool 	<ul style="list-style-type: none"> Megan Gittins Phil Edwards
26/06/06	Network Rail HQ, Melton St, London	M11 M12 M13 M14 M15 M16	<ul style="list-style-type: none"> Charles Hervy, Business Planning Manager (E&P) 	<ul style="list-style-type: none"> Vidhi Mohan
26/06/06	Network Rail HQ, Melton St, London	C1 C2 C3 C4	<ul style="list-style-type: none"> Tony Smith, National Engineering Information Analyst 	<ul style="list-style-type: none"> Vidhi Mohan

Date	Venue	Audit	For Network Rail	For Reporter A
26/06/06	125 House, Swindon	M8	<ul style="list-style-type: none"> Kevin Giles, Territory Process Owner, Renewals Engineer Ian Frostick, Territory Civil Engineer Phil Roderick, Structures Maintenance Engineer for Bristol & Thames Valley Areas 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
26/06/06	The Mailbox, Birmingham	M6	<ul style="list-style-type: none"> Julian Harms, NR Territory Earthworks & Drainage Engineer - LNW Steve Couser, NR Territory Assurance Engineer - LNW Tony Butler, NR Earthworks Assessment Engineer - LNW 	<ul style="list-style-type: none"> Phil Edwards Patricia Rodriguez
27/06/06	Western SEC Owen Williams Railways offices - Swindon	M8	<ul style="list-style-type: none"> Steve Violett, Contract Manager for Western & East Anglia Areas Ian Johnston, Senior Examining Engineer Louise Sharp, Examiner for Gloucestershire Area Steve Mayo, Examiner for Gloucestershire Area 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
29/06/06	Network Rail HQ, Melton St, London	M15	<ul style="list-style-type: none"> Charles Hervy, Business Planning Manager (E&P) 	<ul style="list-style-type: none"> Vidhi Mohan
29/06/06	Lloyd's Register offices - St. Pancras	M8	<ul style="list-style-type: none"> Martin Winterbottom, Lloyds Register Rail Kevin McLernon, Lloyds Register Rail Keith Halcrow, Lloyds Register Rail 	<ul style="list-style-type: none"> Mike Adkin Patricia Rodriguez
03/07/06	Network Rail HQ, Melton St, London	Mileage & Freight gross tonne miles	<ul style="list-style-type: none"> Martin Hollands, Billing Systems Manager 	<ul style="list-style-type: none"> Vidhi Mohan
03/07/06	VH (Teleconference)	M11 M12	<ul style="list-style-type: none"> Ron Garrett, Territory Engineer (E&P) 	<ul style="list-style-type: none"> Vidhi Mohan Ken Foster Bob Care
05/07/06	Network Rail HQ, Melton St, London	M13 M14	<ul style="list-style-type: none"> David McQuillan, System Acceptance Engineer 	<ul style="list-style-type: none"> Vidhi Mohan
05/07/06	Network Rail HQ, Melton St, London	C1 C2	<ul style="list-style-type: none"> Peter Lander, National Track Geometry & Gauging Engineer Tony Smith, National Engineering Information Analyst 	<ul style="list-style-type: none"> Vidhi Mohan
05/07/06	Waterloo Station	M17 M18	<ul style="list-style-type: none"> Terry Shorten, NR – [title tbc] Robert Hayward, NR Operational Estate Manager 	<ul style="list-style-type: none"> Cliff Buckton
05/07/06	Waterloo Station	M11 M12 M16	<ul style="list-style-type: none"> Cliff Elsey, Territory E&P Engineer 	<ul style="list-style-type: none"> Vidhi Mohan Bob Care
06/07/06	VH (Teleconference)	M11 M12	<ul style="list-style-type: none"> Graeme Beale, Territory E&P Engineer 	<ul style="list-style-type: none"> Vidhi Mohan Bob Care Rob Williams
06/07/06	Wales & Marches Area HQ, Cardiff	M1 M2 M3 M5	<ul style="list-style-type: none"> Mark Hewinson, Territory Rail Management Engineer – WES Dave Clements, Area Rail Management Engineer – Wales & Marches John James, Territory Rail Management Engineer – WES Peter Bridges, Territory Track Management Engineer – WES 	<ul style="list-style-type: none"> Megan Gittins Phil Edwards
10/07/06	Waterloo Station	M11 M12	<ul style="list-style-type: none"> Cliff Elsey, Territory E&P Engineer Marc Alderman, [title tbc] 	<ul style="list-style-type: none"> Vidhi Mohan Bob Care

Date	Venue	Audit	For Network Rail	For Reporter A
10/07/06	Waterloo Station	M13 M14	<ul style="list-style-type: none"> Cliff Eley, Territory E&P Engineer Marc Alderman, [title tbc] Mike Hill, [title tbc] 	<ul style="list-style-type: none"> Vidhi Mohan Bob Care
10/07/06	Waterloo Station	M16	<ul style="list-style-type: none"> Cliff Eley, Territory E&P Engineer Marc Alderman, [title tbc] Paul Guest, [title tbc] 	<ul style="list-style-type: none"> Vidhi Mohan
11/07/06	Network Rail HQ, Melton St, London	C1 C2 C3 C4	<ul style="list-style-type: none"> Tony Smith, National Engineering Information Analyst 	<ul style="list-style-type: none"> Vidhi Mohan
12/07/06	Network Rail HQ, Melton St, London	M8	<ul style="list-style-type: none"> Steve Fawcett, Network Rail HQ Champion for M8 	<ul style="list-style-type: none"> Patricia Rodriguez Mike Adkin
13/07/06	125 House, Swindon	M23 M26 M27 M28 M29	<ul style="list-style-type: none"> Robert Oswald, Programme Efficiency Analyst 	<ul style="list-style-type: none"> Vidhi Mohan
14/07/06	Hudson House, York	M11 M12	<ul style="list-style-type: none"> Paul Ramsey, Territory E&P 	<ul style="list-style-type: none"> Vidhi Mohan Ken Foster
14/07/06	George Stevenson House, York	M11 M12	<ul style="list-style-type: none"> Andrew Allen, [title tbc] Ian Granville, [title tbc] 	<ul style="list-style-type: none"> Vidhi Mohan
17/07/06	Network Rail HQ, Melton St, London	Mileage & Freight gross tonne miles	<ul style="list-style-type: none"> Scott Provan, Performance Reporting Analyst 	<ul style="list-style-type: none"> Vidhi Mohan
27/07/06	Network Rail HQ, Melton St, London	MUC	<ul style="list-style-type: none"> Erwin Klumpers, Senior Financial Analyst, Maintenance 	<ul style="list-style-type: none"> Vidhi Mohan
02/08/06	Waterloo Station	MUC	<ul style="list-style-type: none"> Robert Pradera, Asset Data Analyst, NST (Systems and Data) 	<ul style="list-style-type: none"> Vidhi Mohan
08/08/06	Eversholt Street, London	M20 M21 M22 M25	<ul style="list-style-type: none"> Martin Zobel, Financial Controller, West Coast, Mark Woodhouse, Performance Measurement Manager 	<ul style="list-style-type: none"> Vidhi Mohan
10/08/06	Carolyn House, Croydon	MUC	<ul style="list-style-type: none"> Chris Davis, Area Financial Controller, Tim Bellchambers, Depot Management Accountant, Croydon 	<ul style="list-style-type: none"> Vidhi Mohan

14 Appendix C: OFWAT confidence grading system

14.1.1 This Appendix presents the criteria used for assigning confidence grades which is used in Reporting to OFWAT:

14.1.2 “The [OFWAT] 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 by the [Water] Company and its Reporter 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.

14.1.3 The confidence grade combines elements of reliability and accuracy, for example:

- (a) A2: Data based on sound records etc. (A, highly reliable) and estimated to be within +/- 5% (accuracy band 2);
- (b) C4: Data based on extrapolation from a limited sample (C, unreliable) and estimated to be within +/- 25% (accuracy band 4);
- (c) AX: Data based on sound records etc. (A, highly reliable) but value too small to calculate meaningful accuracy percentage.

14.1.4 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)	

14.1.5 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

- 14.1.6 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 is expected. Where confidence grades are below these levels, companies should report on their action plans for improvement in the commentary for the table concerned. They should justify in their reports where action plans are limited to the achievement of A4, B3, B4 or C2 levels.
- 14.1.7 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.
- 14.1.8 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.
- 14.1.9 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.”

15 Appendix D: Confidence grade trends

15.1 Summary of grades

15.1.1 This Appendix presents a summary of the confidence grades which have been assigned to the Annual Return measures over the last three years by:

- Independent Reporter A, Halcrow ('H');
- Independent Reporter B, Mouchel Parkman ('MP');
- Network Rail ('NR').

15.1.2 Figure 15.1.1 & Figure 15.1.2 show the confidence grades for the measures reported between 2003/04 and 2005/06. 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	2003/04							2004/05			2005/06	
	Halcrow (H)				Mouchel (MP)			NR	H	MP	NR	H
	East Anglia	LINE	Scotland	Southern	Great Western	Midlands	North West	All Measures	Allocated Measures	Allocated Measures	All Measures	All Measures
Operational Performance	B2	B3	B2	B2	NG	NG	NG	NG		NG	NG	B3
Customer & Supplier Satisfaction								NG		NG	NG	A2
Joint Performance Process (JPP)								NG		NG	NG	B3
Route Utilisation Strategies (RUSs)								NG		NG	NG	B1
Customer reasonable requirements (CRR)								NG		NG	NG	NG
Linespeed capability (C1)	B2	B2	B2	B2	NG	NG	NG	B2		BX	B2	B2
Gauge capability (C2)	B2	B2	B2	B2	NG	NG	NG	B3		B3	B1	B2
Route availability value (C3)	B2	B2	B2	B2	NG	NG	NG	NG		NG	NG	B2
Electrified track capability (C4)	B2	B2	B2	B2	NG	NG	NG	B2		BX	B2	B3
Mileage											NG	B3
Freight Gross Tonne Miles												
Number of broken rails (M1)	B1	B1	B1	B1	A2	A2	A2	A2	A1		A2	A1
Rail defects (M2)	C3	B4	B4	B2	<B3	<B3	<B3	B3	B4		B4	B4

Figure 15.1.1 Confidence Grades assigned to Annual Return Measures (2003/04-2005/06)

Annual Return Measure	2003/04							2004/05			2005/06	
	Halcrow (H)				Mouchel (MP)			NR	H	MP	NR	H
	East Anglia	LINE	Scotland	Southern	Great Western	Midlands	North West	All Measures	Allocated Measures	Allocated Measures	All Measures	All Measures
Track geometry (M3 & M5)	A2 (Halcrow)							A2	A1		A1	A1
Condition of asset TSR sites (M4)	B2	B3	B2	B2	B2	B3	B2	B2	B2		B2	B2
Earthworks Failures (M6)	AX (Mouchel)							A2		AX	A2	A2
Bridge condition (M8)	B3	B4	B4	B3	<B3	<B3	<B3	B3		B2	B3	B2
Signalling failures (M9)	B4	B4	B4	B4	B3	B3	B3	B2	B3		B2	C4
Signalling asset condition (M10)	C4	B4	C4	B4	B4	B4	B4	B3	B3		B3	B3
Traction power incidents causing train delays (M11)	B3	B3	B3	BX	NG	NG	NG	B2	B2		B2	B3
Traction power incidents causing train delays (M12)	B3	B3	BX	B3	NG	NG	NG	BX	BX		BX	BX
Electrification condition – a.c. FS & TSP (M13)	B3	B3	B3	BX	NG	NG	NG	B2	B2		B2	B2
Electrification condition – d.c. substations (M14)	B3	B3	BX	B3	NG	NG	NG	NG	B2		B2	B2
Electrification condition – a.c. contact systems (M15)	C3	C3	C3	CX	NG	NG	NG	B3	B3		B3	C3
Electrification condition – d.c. contact system (M16)	C3	C3	CX	C3	NG	NG	NG	B3	B3		B3	C4
Station condition index (M17)	B2	B2	B2	B2	NG	NG	NG	B2		B3	B2	B3
Station facility score (M18)	B2	B2	B2	B2	NG	NG	NG	B2		B3	B2	B2
Light maintenance depot – condition index (M19)	NG (Mouchel)							B3		BX	B2	B4
Asset Stewardship Incentive Index (ASII)								NG	B2		NG	BX
Track Renewal Volumes (M20, M21, M22, M25)	B2	B2	A2	B2	NG	NG	NG	NG	B2		NG	B2
Signalling Renewed (M24)	C2	A1	C2	C2	NG	NG	NG	B3	B2		NG	C4
Structures Volumes (M23, M26-29)	C2	B2	B2	B2	NG	NG	NG	NG		NG	NG	B2
Safety & Environment Plan											NG	A1
Financial Efficiency: Unit Costs & Composite Rates								NG	B3		NG	B2
Financial Efficiency: Variance Analysis								NG		NG	NG	B3

Figure 15.1.2 Confidence Grades assigned to Annual Return Measures (2003/04-2005/06)

15.1.3 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.

15.1.4 It should be noted that the Independent Reporters assigning grades over the period shown in Figure 15.1.1 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.

15.2 Commentary

15.2.1 Notable variations to confidence grades assigned by the Independent Reporters between 2004/05 and 2005/06 are shown in Figure 15.2.1 with a commentary.

Measure	2004/05	2005/06	Commentary
Signalling failures (M9)	B3	C4	Variation in confidence grade due to a change in the reporter's investigation techniques for 2005/06 leading to a more comprehensive understanding of the confidence that may be assigned to the measure.
Electrification condition – d.c. contact system (M16)	B3	C4	This corrects a historic anomaly; the confidence grading system requires that measures subject to extrapolation are assigned a maximum reliability grade of C.
Light maintenance depot – condition index (M19)	BX	B4	Variation in confidence grade due to an issue with data storage in 2004/05, which resulted in an X accuracy grading.
Signalling Renewed (M24)	B2	C4	Previously, we have found that this measure could be used reasonably reliably and accurately where full renewals were undertaken. However, it is apparent from this year's sample that this measure is subjective where a substantial part of the scheme is comprised of partial renewals.

Figure 15.2.1 Notable variation for 2004/05-2005/06 Independent Reporter confidence grades

15.2.2 Notable variance between NR and Reporter grades in 2005/06 are shown in Figure 15.2.2 with a commentary.

Measure	NR	Halcrow	Commentary
Signalling failures (M9)	B2	C4	The Independent Reporter identified a misalignment between the information system used to supply the data for the measure and the data to support the commentary.
Electrification condition – d.c. contact system (M16)	B3	C4	The confidence grading system requires that measures subject to extrapolation are assigned a maximum reliability grade of C.
Light maintenance depot – condition index (M19)	B2	B4	The Independent Reporter identified discrepancies in base data, minor shortcomings in administration and a 50% shortfall in inspections overall leading to a smaller dataset than planned/ required.

Figure 15.2.2 Notable variation for Network Rail/ Independent Reporter confidence grades

16 Appendix E: Material changes to measures

16.1 Summary of change

- 16.1.1 In order to assess the comparability of results reported in different years for the purposes of trend analysis, this Appendix presents a summary of:
- Changes to the definition of a measure, agreed by ORR and Network Rail;
 - Changes to the processes for the collection or reporting for a measure.
- 16.1.2 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.
- 16.1.3 Currently, measures are formally documented in one of three locations:
- Network Rail: Asset Reporting Manual for asset management measures;
 - Network Rail: KPI Manual for Network Rail Key Performance Indicators;
 - Office of Rail Regulation: ORR KPI definitions for Network Rail Monitor (NRM).
- 16.1.4 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.
- 16.1.5 Figure 16.1.1 & Figure 16.1.2 show 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.
- 16.1.6 To our knowledge, there have been no changes to the definitions in the KPI Manual for NR KPIs or the NRM definitions for ORR KPIs.

Measure	Doc	Rev 1	Rev 2	Rev 3	Rev 4	Rev 5	Rev 6	Impact of change
Linespeed capability (C1)	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	-	
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	-	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	14/12/01	22/03/04	28/02/05	-	
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-00	01/01/01	01/02/01	16/03/01	22/03/04	
Track geometry (M5)	DF	Nov-00	16/03/01	17/02/04	-	-	-	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	-	-	Non-material changes: trend analysis unaffected
	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 [date tbc]
	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	-	Non-material changes: trend analysis unaffected
	PR	Nov-00	16/03/01	22/03/04	-	-	-	
Signalling asset condition (M10)	DF	Nov-00	16/03/01	14/12/01	17/02/04	-	-	Material changes to SICA methodology 2002/03, 2005/06
	PR	Nov-00	16/03/01	14/12/01	22/03/04	-	-	
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	-	-	-	
Electr'n condition – a.c. FS & TSP (M13)	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	28/02/05	-	

Figure 16.1.1 Changes to measures reported in the Asset Reporting Manual

Measure	Doc	Rev 1	Rev 2	Rev 3	Rev 4	Rev 5	Rev 6	Impact of change
Electri'n condition – d.c. substations (M14)	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	28/02/05	-	
Electri'n condition – a.c. contact systems (M15)	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	-	-	
Electri'n condition – 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 condition index (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	
Light maintenance depot – 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	-	-	Non-material changes: trend analysis unaffected
	PR	22/03/04	-	-	-	-	-	
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 16.1.2 Changes to measures reported in the Asset Reporting Manual

16.2 Commentary

- 16.2.1 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.
- 16.2.2 There are three material changes which impact trend analysis:
- On-going changes to the SCMI (Bridge condition; M8) and SICA (Signalling Condition; M10) methodologies have been commented upon in this and previous reports by Independent Reporters. Whilst the intention of these changes has been to improve the condition assessment methodologies, this has impacted the comparability of results for the purposes of trend analysis;
 - A change to the calculation method for temporary speed restrictions severity scores has been commented upon in previous reports by Independent Reporters; this impacted the comparability of results requiring the trend to restart in 2003/04 (inclusive).

17 Appendix F: Network Rail Monitor (NRM)

17.1 Measures reported in both NRM and Annual Return

17.1.1 The quarterly Network Rail Monitor can be found on the website of the Office of Rail Regulation, www.rail-reg.gov.uk

17.1.2 Figure 17.1.1 Appendix 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; Railway Safety & Standards Board (RSSB) train accident precursor measure composite	No equivalent measure
KPI 2 – Train performance; Public Performance Measure (PPM)	Public Performance Measure (PPM); Text, Section 1 of Annual Return
KPI 3 – Network Rail delay minutes; Number of delay minutes attributed to Network Rail causes	National delay data by cause; Table 12, Section 1 of Annual Return
KPI 4 – Asset failures; Number of infrastructure incidents	Asset failure; Table 32, Section 1 of Annual Return
KPI 5 – Asset quality; Composite of eight asset condition measures	Asset Stewardship Incentive Index (ASII); Table 109/110, Section 3 of Annual Return
KPI 6 – Activity volumes; Percentage of activity compared with plan	Activity Volume KPI; Text, Section 4 of Annual Return
KPI 7 – Unit cost efficiency gain; Unit cost compared with benchmark	Financial Efficiency Index; Text, Section 6 of Annual Return
KPI 8 – Expenditure variance; Variation to Network Rail annual budget from ORR determination	Overall Cost Control or Expenditure Variance; Table 172, Section 7 of Annual Return
KPI 9 – Financing; Debt to RAB (Regulatory Asset Base) ratio	Debt to RAB ratio; Table 170, Section 7 of Annual Return
KPI 10a – Customer satisfaction; Train operator customer satisfaction	Customer satisfaction – passenger operators; Table 42, Section 1 of Annual Return
KPI 10b – Customer satisfaction; Train operator customer satisfaction	Customer satisfaction – freight operators; Table 43, Section 1 of Annual Return
KPI 11 – Supplier satisfaction; Major supplier satisfaction	Supplier Satisfaction; Table 44, Section 1 of Annual Return

Figure 17.1.1 Measures reported in both Network Rail Monitor and Annual Return

18 Appendix G: Maintenance Unit Costs

18.1 Audit of Maintenance Unit Costs

Audit scope

- 18.1.1 This audit was undertaken to assess the reliability and accuracy of Network Rail's Maintenance Unit Cost (MUC) processes, developed to monitor maintenance efficiency.
- 18.1.2 The definition and procedure are documented in Network Rail Company Specification FRM702 Reporting of Maintenance Unit Costs.
- 18.1.3 This measure is not currently reported in the Annual Return 2006 but is expected to be reported in a future Annual Return. This audit assesses Network Rail's progress towards delivering a suitably robust measure for reporting.
- 18.1.4 The audit was undertaken at Network Rail Headquarters, the Maintenance National Specialist Team (NST) and Sussex Maintenance Area.

Commentary on reported data

- 18.1.5 Data was not reported in the Annual Return 2006. However, Network Rail have rolled-out maintenance units costs for eighteen types of maintenance work. These are:
- (a) Ultrasonics;
 - (b) Rail Changing;
 - (c) Re-sleepering;
 - (d) Plain Line Tamping;
 - (e) Stone Blowing;
 - (f) Wet Bed Removal;
 - (g) S&C Tamping;
 - (h) S&C Unit Renewal;
 - (i) Replacement of S&C Bearers;
 - (j) S&C Weld Repairs;
 - (k) Visual Inspection (Patrolling);
 - (l) Weld Repair of Defective Rails;
 - (m) Insulated Joint Renewals;
 - (n) Manual Correction of Plain Line Track Geometry;
 - (o) Re-profiling of Ballast;
 - (p) Point End Routing Maintenance;
 - (q) Signals Routine Maintenance;
 - (r) Track Circuits Routine Maintenance.

Audit Findings

Process

- 18.1.6 Currently, this process has been currently rolled out to eighteen work activities – fifteen track MUCs and three signalling MUCs. Data is consolidated from two sources:
- (a) MIMS, Network Rail's maintenance work management system which records hours and volumes against unit rates; and

- (b) BMIS, Network Rail's finance management system.
- 18.1.7 In principle, the method used to generate maintenance units costs is:
- (a) The units (volume) of each type of maintenance activity is recorded in MIMS using MIMS;
- (b) Total Direct Staff costs and Direct Agency Labour costs are captured at a Maintenance Delivery Unit level in BMIS and apportioned using the ratio of hours booked against each type of maintenance activity in MIMS; the hours booked in MIMS are productive hours only, not incorporating travel time etc;
- (c) Other costs are captured in BMIS and allocated directly to each type of maintenance activity.

MIMS Database

- 18.1.8 Data on quantity of work undertaken and person-hours utilised are captured manually on work orders by the maintenance gangs. Data Entry Clerks enter the data into MIMS, checked by the Scheduler and signed off by the Section Manager.
- 18.1.9 The Maintenance National Specialist Team (NST) consolidates the data from MIMS on a weekly basis.

BMIS Database

- 18.1.10 Staff cost comprise the majority of total maintenance costs. Depot Accountants are responsible for ensuring that the correct staff costs are entered into BMIS.
- 18.1.11 Non-staff costs are allocated to each type of maintenance activity in BMIS:
- (a) For bulk material supplied by National Delivery Service (NDS), the costs are directly entered into BMIS by the NDS Management Accountant. The NDS Management Accountant sends Maintenance Area Financial Controllers (AFCs) a weekly report, in form of a summary spreadsheet, identifying the materials which have been ordered by each Area, including volumes, costs, work site and work order number. However, the summary does not allocate the materials to each type of maintenance activity, i.e. it does not identify the BMIS Project Code. In 2005/06, costs were posted in BMIS to a single BMIS Project Code by the NDS Management Accountant; Depot Accountants make manual adjustments to post the bulk material costs to the correct codes.
- (b) For other materials, which are procured through the Excel system, maintenance engineers prepare a BMIS Requisition Form. Depot Accountants check the Project Code is correctly entered and forward to Network Rail Procurement to place the order and enter details, including costs and BMIS Project Codes, into BMIS.
- (c) Plant leased on an annual basis includes On-Track Machines and Road-Rail Vehicles (RRVs). Costs are allocated to each machine on a per-shift basis (based on the rate given in the lease contract); Depot Accountants enter the data into BMIS along with the appropriate BMIS Project Code.
- (d) For agency labour a BMIS Purchase Requisition Form is prepared; again, Depot Accountants ensure the correct BMIS Project Code is used.

Reporting

- 18.1.12 At headquarters, the BMIS data and MIMS data are combined using the MIMS Codes and BMIS Project Codes to create the maintenance unit costs; this task is performed by a bespoke spreadsheet macro. At the end of each period, the AFC checks the unit rates for each work type against the budget/target. These are then reflected in the MBR Pack for the period

Accuracy of Data

18.1.13 Network Rail has stated that the data quality in MIMS and BMIS for the first 6 to 8 periods of 2005/06 was poor, and hence MUC values were not reported in the Annual Return 2006. Network Rail believes eighteen maintenance units cost rates will be reported in the Annual Return 2007.

MIMS Data

18.1.14 **Estimated hours.** For the purposes of planning, estimated hours are calculated automatically by MIMS based on the quantum of work scheduled. MIMS does not take into account issues like economies of scale; hence estimates need not always be correct. Schedulers can over-write these hours, but do not always do so; this means the estimation of maintenance hours is not correct in some cases.

18.1.15 **Actual hours.** A review of individual work orders for a sample Area was undertaken. We found the work orders contained detailed information including description of the work, quantum of work, gross hours required, actual hours worked and quantum of work completed. Unproductive time for each work group (e.g. travel time) is entered to MIMS on a weekly basis; this is not allocated to an individual/particular work order.

18.1.16 **Data Quality.** The Maintenance National Specialist Team (NST) undertakes an analysis of the data in MIMS on a monthly basis to assess data quality and accuracy. Some results of this analysis are discussed below and presented in Figures 18.1.1–18.1.4:

- (a) Work orders closed with zero hours;
- (b) Work orders closed with zero units;
- (c) Work orders with 'large' hours;
- (d) Actual hours *versus* estimated hours;
- (e) Maintenance tasks against obsolete/inactive assets;
- (f) Backlog of tasks;
- (g) Duplicate work orders.

Work Orders closed with large hours or large units

18.1.17 For certain work orders, the number of units of work or the number of hours booked was much larger than for work orders for similar jobs. This indicates the time or employee hours booked in MIMS are incorrect. In 2005/06, Network Rail made efforts to identify such work orders and reduce their number by ensuring correct booking of time and quantity of work.

18.1.18 Figure 18.1.1 shows the trend in the number of work orders with large units and large hours for the eighteen work activities for which MUCs are estimated. We observe a declining trend in the number of work orders with large units during 2005/06. There was a 95% reduction in the number of work orders with large hours. The number of work orders with large hours remained low throughout the year.

18.1.19 Figure 18.1.1 shows a spike (increase) in the number of work orders with large units in weeks 2, 7 and 16. Network Rail was unable to provide an explanation for this.

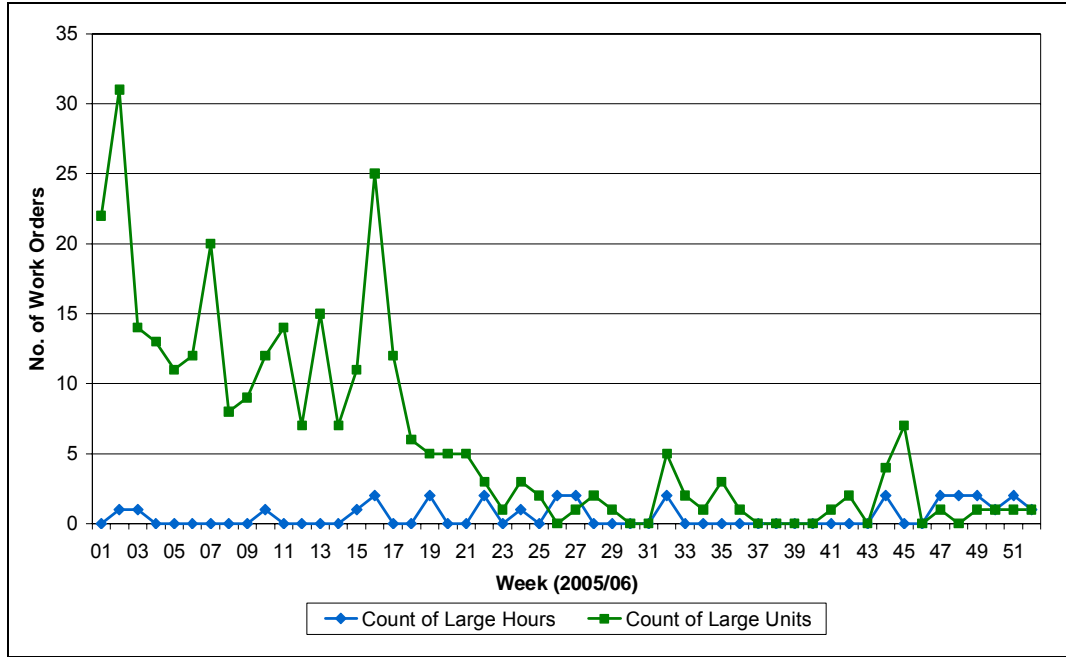


Figure 18.1.1 Trend in Count of Large Hours and Count of Large Units

Work Orders closed with zero hours or zero units

- 18.1.20 Figure 18.1.2 shows the trend in the number of work orders with zero units and zero hours for the eighteen work activities for which MUCs are estimated. We observe a declining trend in the number of work orders with zero hours and zero units, during 2005/06. The work orders with zero hours reduced by 97% and those with zero units reduced by 96%.
- 18.1.21 Figure 18.1.2 shows a spike (increase) in the number of work orders with zero units and zero hours in weeks 10 and 26. Network Rail was unable to provide an explanation for this.

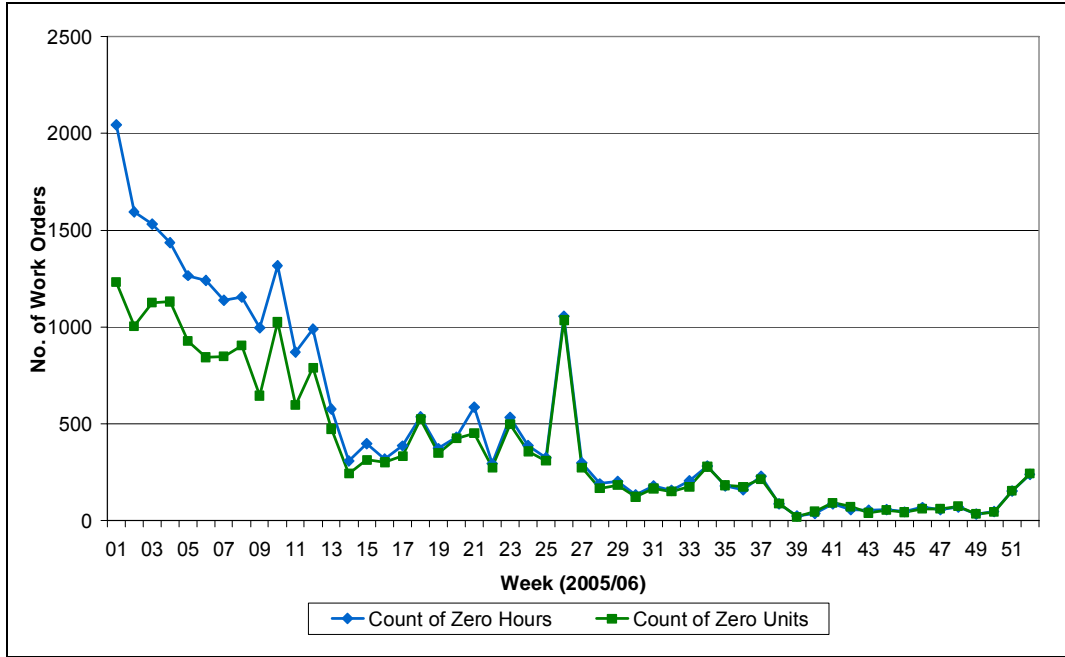


Figure 18.1.2 Trend in Count of Zero Hours and Count of Zero Units

18.1.22 Figure 18.1.3 shows the total number of work orders (for all work types) closed by week during 2005/06. It shows that the works orders closed with hours and zero units form a very low proportion (around 0.07%) of the total work orders closed.

18.1.23 Figure 18.1.3 shows a significant drop in the number of work orders closed in week 39. Network Rail explained that this was due to Christmas.

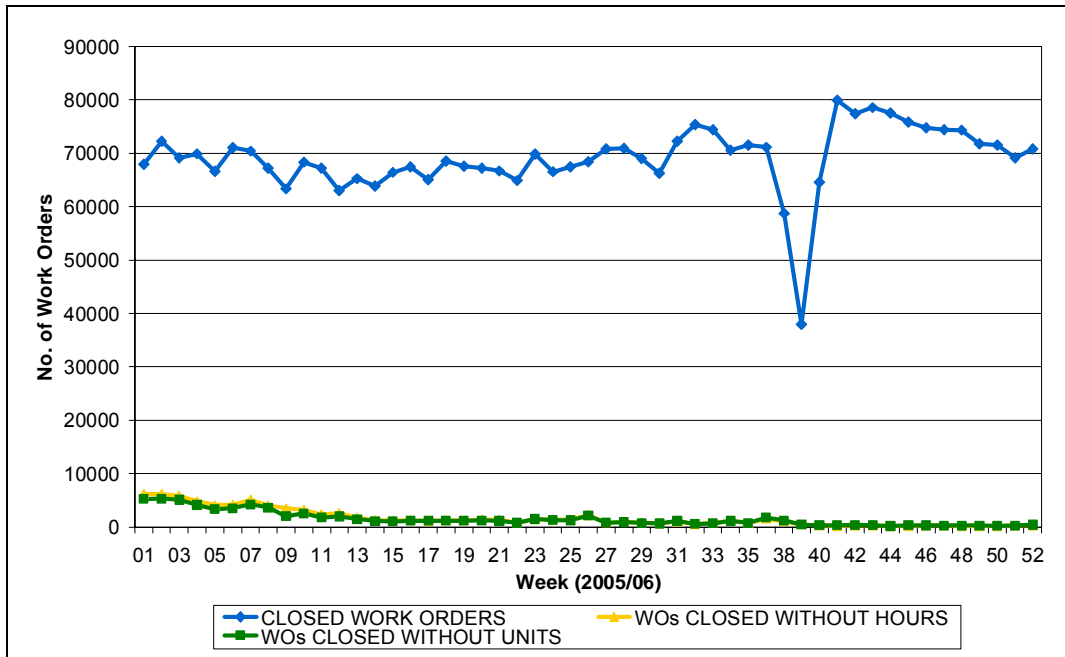


Figure 18.1.3 Trend in Work Order Closures

Actual Hours and Estimated Hours

- 18.1.24 For each job, the work order indicates the estimated hours to complete the job. If there are significant differences between the estimated hours and the actual hours booked, it would indicate that the actual hours are not being properly booked to the job. It could also mean that there is a problem with calculating estimated hours.
- 18.1.25 Figure 18.1.4 shows the trend in the total estimated hours and actual hours (for all work types) by week. At the beginning of 2005/06 the total actual hours was 32% higher than the estimated hours. This situation worsened by the end of the year, with the actual hours being 64% lower than the estimated hours.
- 18.1.26 Figure 18.1.4 shows a spike (increase) in the total estimated hours in weeks 5, 20, 25 and 47. Network Rail was unable to provide an explanation for this. The drop in the number of estimated and actual hours in week 39 is due to Christmas.

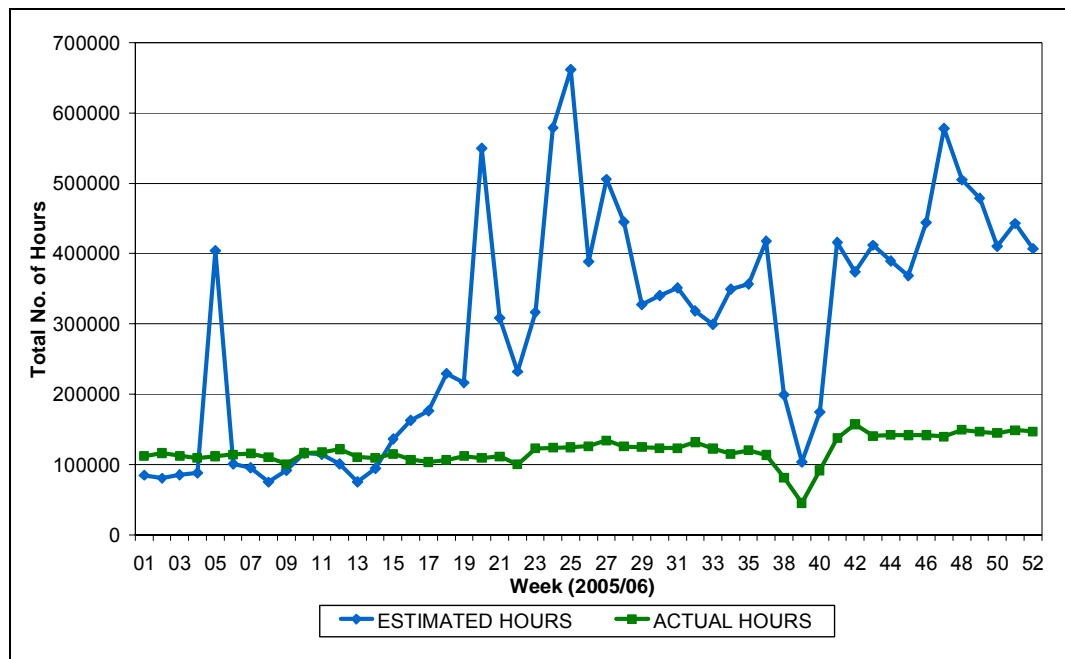


Figure 18.1.4 Actual Hours Vs Estimated Hours

- 18.1.27 We observed that there seems to be a significant difference between actual and estimated hours in certain specific work types, including 'Ultrasonics' and 'Vegetation'.
- 18.1.28 We were unable to investigate in detail the reasons behind this significant difference between estimated and actual hours in 2005/06. However, this may be explained by the method of estimation, which is automatically calculated by MIMS based on the quantum and type of work and does not take into consideration economies of scale; this tends to overestimate required hours. Maintenance NST are encouraging Schedulers to check this and manually overwrite the estimates calculated by MIMS.

Other findings

- 18.1.29 NR's 'Assurance and Compliance' team set a target for the backlog of jobs, i.e. those that have not been completed within 14 days of the required completion date. For 2005/06, this target was 20%. At the beginning of the year, some territories were not hitting this target, i.e. backlog of jobs were over 20%. However, the situation improved by the end of the year with a national average of 6%.

- 18.1.30 Network Rail has identified a problem with the interpretation of certain work definitions, and hence the hours entered in MIMS vary by Area for the same type of maintenance work. However, Network Rail are in the process of rewriting the Network Rail Company Specification FRM702 *Reporting of Maintenance Unit Costs*. The new version will seek to remove any ambiguities that currently exist regarding work definitions.

BMIS Data

- 18.1.31 We sampled the input of costs into BMIS and the emerging unit cost rates with an Area Financial Controller (Sussex) and a Depot Accountant within that Area (Croydon). The key issues examined were:
- (a) For NDS bulk materials, we found instances where materials supplied by NDS (as given in the weekly report sent by NDS to the AFC) were not correctly reflected in BMIS. A sample of NDS materials supplied (as given in the NDS weekly summary spreadsheets) was taken; we checked whether the costs were correctly reflected in BMIS. Two loads of ballast worth £2,523 and £10,094, supplied in Period 11, were not found to be correctly coded in BMIS.
 - (b) For other materials and for agency labour we were unable to check any BMIS Requisition Forms for 2005-06 as they were not readily available during the audit.
- 18.1.32 We also undertook a review of the Sussex Area MBR Pack for Periods 11 and 13 of 2005-06. We selected a sample of unit rates in the MBR pack and checked it against the budget. The following were identified:
- (a) For S&C Tamping the unit rate to the end of period 13 was above budget;
 - (b) For Replacement of S&C Bearers, the unit rate to the end of period 13 looked reasonable when compared to other Areas in the Southern territory. However, the rate was significantly under budget, implying that the budget may have been wrongly set.

Assessment of Confidence Grade

- 18.1.33 As this measure was not reported in the Annual Return we have not assigned a confidence grade.

Audit Statement

- 18.1.34 We have undertaken an audit of maintenance unit cost measures. Based on the analysis viewed, we believe MIMS data quality for volume of work undertaken and employee hours used to complete the work has improved during 2005-06. Analysing the cost data from our sample in Sussex Area, we found that there were still some issues around whether or not all cost data was being accurately captured in BMIS. The system of maintenance unit costs is maturing, so it is not surprising that the budgets and actuals are not yet well-aligned. We believe the eighteen maintenance unit costs are currently sufficiently progressed to be reported in Annual Return 2007.

19 Appendix H: Recommendations

Reference code	Recommendation
2005/06-001	General recommendation 1. The inconsistency in units and the rounding of figures, and the constant format changes to the tables in the Annual Return, are impacting the ability to discern trends. We would welcome the opportunity to discuss the form and content of the Annual Return in more detail so that this can be resolved.
2005/06-002	Operational Performance recommendation 1. There are significant levels of good practice documented in the local procedures of the Routes sampled, we recommend that the documentation is standardised on a national basis.
2005/06-003	Complaints recommendation 1. We recommend that Network Rail and ORR review the industry passenger complaints measure in respect of its calculation method – and perhaps to supplement it with a further measure that is representative of the type of complaints Network Rail receives.
2005/06-004	Satisfaction recommendation 1. We recommend Network Rail considers presenting in the Annual Return more details from the multi-question surveys undertaken in order to provide a more complete picture of stakeholder perception.
2005/06-005	Satisfaction recommendation 2. We recommend Network Rail should consider reporting the managers' and drivers' survey results separately.
2005/06-006	JPIP recommendation 1. We recommend the development of a more robust challenge process for standard and stretch targets, in order to provide a better basis for comparison with national targets.
2005/06-007	JPIP recommendation 2. We recommend the use of moving annual averages (MAA) for establishing JPIP performance baselines.
2005/06-008	JPIP recommendation 3. We recommend discussion between ORR and Network Rail to develop quantitative reporting in the Annual Return for the level of planned and delivered changes to delay minutes and PPM from JPIPs/JPP.
2005/06-009	RUS recommendation 1. We recommend that the Technical Guide include reference to project management processes.
2005/06-010	RUS recommendation 2. We recommend that Network Rail sets out how the RUS process will be internalised into the Route development and business planning processes to ensure it does not become a stand-alone exercise. The Business Planning Criteria might be an appropriate vehicle for this.
2005/06-011	CRR recommendation 1. We recommend that CRRs cease to be a specific measure reported within the Annual Return.
2005/06-012	CRR recommendation 2. We recommend Network Rail and ORR seek to develop a more meaningful measure of customer-facing project activity; such a measure should focus on the number, value and type of third-party project works performed under conventional contractual processes for Dependent Persons, which might earlier have been categorised as CRRs.
2005/06-013	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.
2005/06-014	C4 recommendation 1. We recommend that the GEOGIS database be checked to ensure that electrification classifications are correctly recorded.
2005/06-015	Mileage recommendation 1. We recommend that Chiltern Railways running on LUL infrastructure is excluded from the figure reported.
2005/06-016	Mileage recommendation 2. We recommend the queries used to extract train mileage data from the BIFS database are checked to ensure results are the same irrespective of whether the data is extracted on a period-by-period basis or on an annual basis.
2005/06-017	Mileage recommendation 3. We recommend Network Rail analyse the significant differences between the BIFS and PALADIN train mileages.
2005/06-018	Freight gross tonne miles recommendation 1. We recommend the queries used to extract GTM data from the BIFS database are checked to ensure the results are the same irrespective of whether the data is extracted on a period-by-period basis or on an annual basis.

Reference code	Recommendation
2005/06-019	M1 recommendation 1. 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 can 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. Network Rail should confirm that the roll-out of RDT should provide this analysis going forward.
2005/06-020	M2 recommendation 1. We 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 B4. We recommend that Network Rail ensure that the data that is transferred to the new national system, RDT, is from the most accurate source and is systematically checked by the Territories and Areas.
2005/06-021	M2 recommendation 2. We recognise the concentrated effort which has been undertaken by Network Rail to reduce RCF-type defects, particularly rail grinding and re-railing activities. 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 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.
2005/06-022	M3 recommendation 1. 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.
2005/06-023	M4 recommendation 1. We recommend the documents NR/ARM/M4PR (issue 5) and NR/ARM/M4DF (issue 6) are updated to reflect the change in organisation.
2005/06-024	M4 recommendation 2. We recommend the additional process notes currently in development to document the manual manipulation and checking be incorporated within the NR/ARM/M4PR as further guidance to correct compilation of the measure.
2005/06-025	M4 recommendation 3. We recommend the PPS system is considered for further enhancement to further automate the generation of the measure.
2005/06-026	M4 recommendation 4. We recommend instructions be issued to all local teams regarding the correct procedure for inputting Emergency Speed Restrictions to PPS.
2005/06-027	M4 recommendation 5. We recommend the definition of the measure be amended to remove the qualifying time period of >4 weeks.
2005/06-028	M6 recommendation 1. The consistency of reporting embankment failures that cause disruption due to track geometry faults (usually when the embankment shrinks or swells) needs to be reviewed. This may lead to a revision of the definitions as stated 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.
2005/06-029	M6 recommendation 2. It was noted that many of the earthworks failures were symptomatic of the condition and characteristics of the drainage systems associated with the failures. These drainage systems have to deal with large volumes of water when flash floods and heavy rainfall occurs. The suitability and maintenance of these drainage systems whether they are inside the railway boundary or not can determine the consequences of a potential wash out or slipping of slope material, particularly in cuttings. The two derailments were failures of this type. HQ informed us that all Territories have commissioned a drainage survey to reinforce their asset knowledge of their drainage systems. We recommend that the outcome of the drainage surveys are followed up appropriate.
2005/06-030	M6 recommendation 3. The competency process for earthworks examiners was reviewed in each Territory. It was noted that each Territory has its own process for training and competency and that the standard for earthworks examination NR/SP/CIV/065 refers to RT/CE/S/046 'Standards of Competence for Examination of Earthworks' to be published in 2005. However, by the end of the 2005/06 year this hadn't been published and inconsistencies were noted in the training and competency assessment of examiners. Since the audits were carried out, a new specification NR/SP/CTM/017 'Competence & Training in Civil Engineering' has been published (June 2006) which supersedes RT/CE/S/046. This includes a compliance plan for 2006/07. We recommend consistency of competence is achieved across the Territories.

Reference code	Recommendation
2005/06-031	M6 recommendation 4. It was also noted during discussions about failures in cuttings that the examination of Rock slopes was hindered in many places by the dense cover of vegetation. This is a particular problem in the Western and Scotland Territories which have many rock cuttings. Western stated that there was a backlog of vegetation clearance on these cuttings. We recommend that this is reviewed in order to improve the process of assessing rock faces where potential rock falls could impact on the running lines.
2005/06-032	M8 recommendation 1. 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.
2005/06-033	M8 recommendation 2. We recommend the programme and budgets for undertaking detailed inspections and SCMLs for South East Territory are reviewed to ensure that they are both sufficient to meet the required six-yearly cycle of examinations.
2005/06-034	M8 recommendation 3. 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 collected will drop as a result.
2005/06-035	M8 recommendation 4. 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.
2005/06-036	M8 recommendation 5. We recommend competency standards for SCMI assessments are re-introduced to Network Rail company standards.
2005/06-037	M9 recommendation 1. The procedure NRARM/M9PR (issue 3) should be up-dated to reflect the change of organisation.
2005/06-038	M9 recommendation 2. 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 in a real time stressful situation.
2005/06-039	M10 recommendation 1. We recommend the current practice of applying adjustment factors to primary SICA scores should be further researched and documented to provide evidence for the level of the adjustment factor, and if justifiable the procedure and definition should be updated to include an explanation of this practice.
2005/06-040	M10 recommendation 2. We recommend that a concerted management effort is undertaken to ensure that the SIS data is checked and signed off such that the SICA scores and numbers of interlockings is correct for 2006/07.
2005/06-041	M11 recommendation 1. We recommend that the Territories are reminded that the delay minutes in TRUST should be taken as the definitive number of minutes for this measure as per the procedure and rail industry practice.
2005/06-042	M11 recommendation 2. LNE have initiated a failure/ trends database system and have expended some energy in recovering data from historic systems to produce this useful monitoring tool. We recommend that this is standardised and introduced nationally.
2005/06-043	M13 recommendation 1. 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.
2005/06-044	M13 recommendation 2. We recommend that the dataset of condition scores should be recalculated using natural rounding now that 100% of the population has been assessed.
2005/06-045	M14 recommendation 1. 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.
2005/06-046	M14 recommendation 2. 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.
2005/06-047	M14 recommendation 3. We recommend that the dataset of condition scores should be recalculated using natural rounding now that 100% of the population has been assessed.
2005/06-048	M15 recommendation 1. 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.

Reference code	Recommendation
2005/06-049	M16 recommendation 1. We recommend that the spreadsheets used to calculate this measure are (a) consistently formatted in line with standard practice to improve clarity and (b) tidied so that regulatory calculations are in a logical order.
2005/06-050	M17 recommendation 1. 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.
2005/06-051	M17 recommendation 2. We recommend Network Rail reviews arrangements for the ownership of this measure and improves the level of compliance.
2005/06-052	M18 recommendation 1. 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 relevance and purpose of measure, (b) take account of split responsibility for providing facilities between Network Rail and train operators, (c) introduce weighting of the scores to reflect importance to public e.g. disabled access and security; (d) review scoring of facilities to reflect quality as well as/ rather than quantity; (e) review scoring for facilities which are not currently operational; (f) introduce benchmark for what facilities stations of various categories/footfalls should have; (g) consider combining collection of data with other surveys.
2005/06-053	M18 recommendation 2. We recommend Network Rail reviews the current acting arrangements for the internal ownership of this measure and improves the level of compliance with the procedure.
2005/06-054	M19 recommendation 1. 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 on-going in this Area.
2005/06-055	M19 recommendation 2. 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.
2005/06-056	M19 recommendation 3. We recommend Network Rail reviews arrangements for the ownership of this measure and improves the level of compliance.
2005/06-057	M24 recommendation 1. We recommend a revised method of measuring signalling renewals is agreed with ORR and Independent Reporter.
2005/06-058	M24 recommendation 2. We recommend the procedure is revised to include an internal audit by Headquarters to be undertaken annually on a sample basis.
2005/06-059	M25 Recommendation 1. The PCS database should be modified to classify S&C renewals as 'full' and 'partial' renewals separately. .
2005/06-060	S&E Plan recommendation 1. We recommend Network Rail continues to monitor the allocation of funding from the Safety & Environment Plan budget so as to be able to better determine the Business Plan more accurately the funding allocation in future years.
2005/06-061	Financial efficiency variance analysis recommendation 1. We recommend the recommendations of the Network Rail Investment Financial Variance Year-End Audit Report (IEPODoc013, 20 June 2006) are fully implemented.