Network Rail and Office of Rail Regulation

Independent Reporter (Part A)

Mandate AO/020: Q2 2011-12 Data Assurance Report: Network Availability

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Executive Summary

The Part A Independent Reporter Team carried out a review of the data management arrangements to verify that the Network Availability KPIs produced by Network Rail are calculated reliably and accurately. The findings for the individual KPIs are summarised below.

Of the ten KPIs reviewed, three have improved including the two regulatory measures PDI-P and PDI-F. Five measures remain unchanged and two measures have been awarded lower ratings than last year.

The implementation of NARS has had a positive impact on the production of PDI-P and PDI-F as reflected in their confidence rating and NR have been successfully using the model since Period 5 of this year.

At the last review the recent implementation of ITPS had had a detrimental impact on the production of some of the KPIs. The reporter team were required to check if those issues were still causing any difficulties for the Network Availability KPIs. The conclusion drawn was that subsequent releases had resolved all of the concerns raised last year.

Possession Disruption Index – Passenger (PDI-P)

The PDI-P measure has been rated at B for reliability and 2 for accuracy. This reflects improvements brought about by more formalisation within the Schedule 4 process and the implementation of NARS but this is offset to some degree by the need for manual data transfer between spreadsheets. The accuracy score reflects the removal of the impact of ITPS but the manual transfer of data still risks data errors. This is an improvement from B3 last year.

4(b): Possession Disruption Index – Freight (PDI-F)

The PDI-F measure has been rated as B for reliability and 2 for accuracy. The reliability score reflects the ongoing improvements in process brought about by the implementation of NARS but that the underlying calculation methodology will never fully accurately reflect the impact of possessions on Freight. This is an improvement from last year and in the view of the Reporter Team the highest rating likely to be achievable. The accuracy score reflects the fact that the data is taken directly from NARS and very little processing is required, providing the data is copied and pasted correctly.

WTT Weekend Compliance

This KPI has an assessed rating of B for reliability and 2 for accuracy. This reflects the ongoing improvement in the production process and the eradication of the ITPS problem. However, this is an indicator, not an absolute measure and the scores reflect this. It is the Reporter Team's view that the highest achievable grading is B2 given the base calculation methodology.

Rail Replacement Bus Hours (Weekend)

The KPI is rated B for reliability and 3 for accuracy. This reflects a well documented, consistent procedure but the fact that it will never accurately record actual bus hours means it is only an indicator. B3 is likely to be the highest achievable rating.

Possession Planning - Possession Notification Discount factor

The KPI is rated B for reliability and 2 for accuracy. This reliability score reflects the better documented process within the new user guide but the lack of record keeping on checks is still an issue. The award of a B rating means that 2 is the maximum accuracy rating that can be awarded against the agreed scoring methodology. This measure should be able to achieve A1 in the view of the Reporter Team.

Late and Very Late Possession Changes

This is the major area of concern raised by this year's audit. Changes were made to the process which improved the capture of Late Possession changes. However, this change has led to a complete failure to record any Very Late Possession Changes since P8 2010/11. The local checks discovered eight such changes during the checks of three area offices over just three periods. Last year this KPI was rated as D4. As a result of this year's findings this has been rated as D for reliability and X for accuracy. The reliability grade reflects the fact that the process has no way of capturing Very Late Possession Changes. The X for accuracy is because no data is being captured at all. This process needs urgent attention.

Possessions Involving Single Line Working

The KPI is rated B for reliability and 3 for accuracy. The reliability score reflects the process which cannot be guaranteed error free which in turn impacts on the reliability score. This is the same score as last year and will only be improved by the introduction of a more automated process. This is likely to be the highest achievable score until the process is automated in the view of the Reporter Team.

Possession Incidents - Delay Minutes due to Possession Overrun

The KPI is ranked A for reliability and 1 for accuracy in line with last year's Q4 audit. This is a well documented process with a high degree of automation producing the base data from which this KPI is generated.

Possession Incidents - Cancellations (deemed minutes) due to Possession Overrun

The KPI is ranked A for reliability and 1 for accuracy. This is a well documented process with a high degree of automation producing the base data from which this KPI is generated.

Possession Incidents - Temporary Speed Restrictions

The KPI is rated B for reliability and 2 for accuracy. The reliability score reflects that whilst the process is now more automated than previously it has exposed a weakness with the capture of ESR data. This impacts on the accuracy score and has led to a lower rating than last year. In the view of the Reporter Team A1 should be achievable for this measure.

1 Introduction

Arup is the appointed Part A Independent Reporter, with responsibility for providing assurance as to the quality, accuracy and reliability of the data and processes used by Network Rail to report performance to ORR, the DfT and the wider industry.

This report forms part of a rolling programme of audits carried out quarterly across a range of Key Performance Indicators (KPIs) used to measure Network Rail's delivery against its key obligations. These checks focus on the reliability, quality, consistency, completeness and accuracy of the reported data, and not on any trends highlighted by the data.

This 2011/12 Quarter 2 (Q2) report covers Network Availability data that was last reviewed in 2010/11 Q2. The KPIs covered are:

- 4(a): Possession Disruption Index - Passenger (PDI-P)
- 4(b): Possession Disruption Index - Freight (PDI-F)
- WTT Weekend Compliance
- Rail Replacement Bus Hours
- Possession Planning - Possession Notification Discount factor
- Late and Very Late Possession Changes
- Possessions Involving Single Line Working
- Possession Incidents - Delay Minutes due to Possession Overrun
- Possession Incidents - Cancellations (deemed minutes) due to Possession Overrun
- Possession Incidents - Temporary Speed Restrictions

Of these, KPIs 4(a) and (b) are produced to assess progress relative to the formal regulatory targets set by ORR for CP4, namely a 37% reduction in PDI-P, and no deterioration in PDI-F relative to the start of CP4. The rest of the KPIs have been developed as supporting measures to assist Network Rail in the management of Network Availability, using a series of more transparent measures. They are not constituent elements of PDI-P or PDI-F.

Following this introduction, Section 2 provides an overview of the review process employed. Section 3 presents the findings of a review of progress made in the implementation of recommendations made by the Independent Reporter Team during the course of the 2010/11 review of the KPIs. Section 4 then presents the findings of our 2011/12 review of the Network Availability KPIs, first describing the overall methodology employed, and then presenting, for each KPI covered, a brief description of the KPI, our findings in respect of its reliability and accuracy, any general observations made and our conclusions, for the KPI. The confidence ratings for all the KPIs are combined and summarised in Section 5. Section 6 contains a list of recommendations made on the basis of the foregoing assessment, and also any recommendations outstanding from our 2010/11 report that have yet

to be implemented in full. Appendix A contains a glossary of the terms used in the report, whilst Appendix B contains the Mandate.

2 Review Process

To carry out the reviews, a series of meetings were held with Network Rail at both national and local levels, involving key personnel involved in the production of the KPIs.

The meetings are summarised in the table below:

Date	Network Rail Attendees	Location
6th September	Business Manager (NDS)	Milton Keynes
6th September	Network Operations Publications Manager Network Operations Project Manager (Change)	Milton Keynes
6th September	Manager of Engineering Access Planning Unit	Milton Keynes
6th September	Systems Support Manager	Milton Keynes
13th September	Project Manager (TSR)	40 Melton Street, London
27th September	Lead Planner Delivery, Sussex	London
29th September	Lead Planner Delivery, West Country	Bristol
5th October	Lead Planner Delivery, Lancs & Cumbria	Manchester

All the audit meetings were led by Arup. The Business Intelligence Manager from ORR attended some of the Milton Keynes meetings and the Lead Planner Delivery meetings at Sussex and Bristol.

3 Progress on 2010/11 Recommendations

Following the audits carried out in 2010, a series of recommendations were made by the Reporter Team and subsequently agreed with both Network Rail and ORR. Whilst these are subject to ongoing monitoring, the Reporter Team reviewed progress in detail with Network Rail as part of this audit. For completeness the recommendations are set out in full in the table below, along with the progress made since they were agreed.

No.	Recommendation to NR	NR Data Champions	Due Date	Progress
2010.4.2	Review each of the supporting KPIs and specify if they are for measuring high-level trends or used to provide accurate assessments. This should be done with data providers to confirm that the data represents: • The most appropriate measurement • Best source of base data • What the target accuracy level is for each KPI	Programme Manager (Change)	March 2011	The details are now within the document entitled: Producing the Network Availability Measures Guide which sets out the KPI requirements. **Closed**
2010.4.5	Put in place a plan to automate data collection. This should identify opportunities and set out a path to achievement.	Head of Operational Planning	March 2011	There has been some automation of data within this area but unlikely to be any further significant changes post NARS implementation until a new engineering access planning system, only just being specified is implemented. This recommendation is no longer required. **Closed**
2011.4.1	Ensure that the high-level data checks specified in the document "CP4 Delivery Plan, Network Availability KPIs – Data Requirement" are being undertaken.	Programme Manager (Change)	March 2011	Evidence of checks is still sporadic with record keeping being inconsistent. There is still a need for improvement in this area. This has been replaced with a new recommendation to put in place a summary of all checks required, frequency and by whom. **Replaced by new recommendation (2012.4.1)**

No.	Recommendation to NR	NR Data Champions	Due Date	Progress
2011.4.2	A follow-up review should be conducted of the impacts on the KPI production processes of the staffing and system changes that took place since the 2009/10 review.	Head of Operational Planning	March 2011	The staffing and system changes have now bedded down and no issues were found during this review from either. **Closed**
2011.4.3	The S4CS Process Manual should be completed and issued as soon as practicable.	Business Manager (Road & OTP)	December 2010	A new User Guide has been issued to all S4CS staff. **Closed.**
2011.4.4	A system should be introduced for managing S4CS data and verifying inputs and outputs.	Business Manager (Road & OTP)	September 2011	NR now has a manual system in place. Each member of the team runs their own S4CS report and completes a number of manual checks using a 14 point checklist which is available in CCMS2 and the S4CS user guide. A WACM and REJT spreadsheet was created for any manual calculations. Good record keeping needs to be maintained. **Closed**
2011.4.5	The processes and algorithms underlying the processing of ITPS data for use in the WTT Compliance and Rail Replacement Bus Hours KPIs should be documented.	Publications Manager	March 2011	These are now set out in Publications Standard Operating Procedure NR/OP&C/OP&P which set out the process for creating the KPIs. **Closed**
2011.4.6	Correlations and apparent contradictions between individual Network Availability KPIs (notably between Possession Planning - Possession Notification Discount Factor and Late and Very Late Possession Change) should be monitored, investigated and reported upon.	Programme Manager (Change)	March 2011	These are monitored by NR and none were noted during this audit but this vigilance needs to be maintained. **Closed**

No.	Recommendation to NR	NR Data Champions	Due Date	Progress
2011.4.7	A standard definition of disruptive possessions should be established and disseminated by Network Rail.	Engineering Access Planning Manager	March 2011	Whilst a standard definition was quoted this was not apparent on local visits. This should be incorporated into procedures and fully briefed out. **Replaced by new recommendation (2012.4.2)**
2011.4.8	The recording and collation of late and very late disruptive possession changes should be standardised and documented.	Performance Analysis Manager	March 2011	This remains an issue highlighted within this report and a new recommendation is included to resolve the problem. **Replaced by new recommendation (2012.4.2)**

4 Network Availability KPIs

4.1 Introduction

The KPIs covered by this report are of two types: PDI-P and PDI-F are regulatory measures against which Network Rail is monitored by ORR, and for which regulatory targets have been set for CP4; the remainder of the KPIs audited are supporting measures developed by Network Rail to help them manage the delivery of their targets, given the quite technical nature of the PDI measures. All of the measures are reported periodically in the Possession Indicator Report (PIR) produced by the 7 Day Railway Programme Team.

The methodology for the overall review process is described in the next section, and is followed by coverage of each Network Availability KPI, including a description of the KPI and its preparation (these definitions are taken directly from the Network Rail process document, Network Availability KPIs – Data Requirement (v2.1, August 2011)). Our findings in respect of its reliability and accuracy, general observations, and conclusions follow.

4.2 Methodology

As described in Section 2, an initial meeting was held with Network Rail's Network Availability Data Champion and ORR. This was followed by a series of meetings with the individual data providers for the various KPIs as well as meetings with staff at a sample of Area Possession Planning offices. Process documentation and data were obtained in the course of these meetings, or provided subsequently, and were used in conjunction with the information obtained from the meetings to assess the reliability and accuracy of the individual KPIs.

Data from periods 3 to 5 2011/12 were used to conduct the checks, including S4CS records and the various datasets provided to the Network Availability team by individual data providers, together with the intermediate and KPI output datasets produced by the Network Availability team.

The processes and documentation were reviewed to assess their reliability, and the various datasets and computation processes were checked for consistency and for compliance with the documented processes, to assess their accuracy. Our findings for the individual KPIs are presented in the following sub-sections.

One general comment is that the Network Availability Programme Team have now issued two different publications, one called the Network Availability Measures: Data and Computational Process and the other called Producing the Network Availability Measures Guide both dated August 2011 and version 2.1. It was not entirely clear what the distinction between the two is as both cover the production process. NR should consider either producing a single document or setting out clearly the specific purpose of each guide and who it applies to. This is covered by a recommendation in Section 6. It is also worth noting that several of the data providers interviewed were not familiar with the procedures so it is also important that posts required to undertake tasks in the guides are fully briefed.

4.3 Possession Disruption Index – Passenger (PDI-P)

The measure

The Possession Disruption Index for Passengers is the economic value of the impact of possessions on excess journey time as experienced by passengers as a result of disruptive possessions in a Period.

The measure aims to reduce the disruption experienced by the customer and is expressed as an indexed value (PDI values divided by the PDI at the end of 2007/2008).

Measure	Definition	Calculation
Possession Disruption Index - Passenger	Possession Disruption Index for Passengers measures the value of the impact of possessions on excess journey time as experienced by passengers	(Excess Journey Time x Busyness Factor) x (# Passengers x Time of Day Weighting x Economic Value of Time) divided by (Total Scheduled Passenger Km)

The main variable data source used in the calculation of PDI-P is sourced from S4CS. Alongside this, passenger train km data are supplied from PALADIN on a Periodic basis. The other factors in the calculation are constraints, as summarised in the table below taken from Network Rail's Data Requirements (v2.1) document.

Data	Description	Source	Frequency
NREJT WACM BF Possessions	The values for NREJT, WACM BF and details of disruptive possession are sourced from the S4CS data used in the payment of compensation to operators	S4CS system	Emailed every 4 weeks
• Passenger train-km	• The scheduled passenger train km per service group is sourced from Paladin	• PALADIN	Data is available periodically
• PASS	• Predefined constant of the daily average of annual passengers per Service • Group derived from	• LENNON	Constant but can be updated
• ToDW	• Predefined input determined by distribution profiles of passenger journeys for each Service • Group derived from MOIRA.	• MOIRA.	• Constant but can be updated
• VoT	• Predefined input calculated as defined in WebTAG	• WebTAG • NPS • LENNON	• Constant but can be updated

4.3.1 Findings: Reliability – Process and Procedures

Since the previous audit in Q2 2010/11 the process of calculating PDI-P has changed with the implementation of NARS. A separate mandate, as recommended last year, was issued to review the system prior to its full implementation. The findings of the subsequent review by Arup are contained in the report "Network Availability Reporting System (NARS) Suitability Assessment Report", dated August 2011. The primary conclusion of the report was that NARS does calculate PDI-P and PDI-F reliably. Following the publication of this report NR implemented the use of NARS fully from Period 5 2010/11. This review has not included a further audit of the NARS process and instead has concentrated on checking the processes by which data is collected prior to input into NARS to confirm that this is functioning correctly.

The primary variable data for PDI-P is provided by the S4CS (Schedule 4 Compensation System). The process used to undertake Schedule 4 calculations has remained unchanged since the last audit, although there has been a change in the management structure with the S4CS team reporting to a new manager. This has not affected the main process itself. The previous audit included detailed sampling of disruptive possessions which concluded that the process was correctly capturing possession details.

Following a recommendation from the last review a new Schedule 4 User Guide has been issued which covers the arrangements that staff should use and now acts as a solid training base for all new starters into the team. It contains a lot of detailed information but would benefit from all sections being dated to ensure that staff know they are reading up to date information.

The outputs from the S4CS process are provided on a periodic basis in a spreadsheet to the Network Availability Programme Team for inputting into NARS. This process is described in more detail in 5.1.3.2.

It was suggested at the last review that a similar audit process to that used by the Reporter Team was adopted. This has not been done as yet and any failure to correctly identify and compensate for possessions relies on TOCs identifying errors. There have been some checks set up but records are not always kept.

During the last review specific problems were raised following the implementation of ITPS. This caused problems with duplicated or missing timetable data and led to a major increase in workload. This was exacerbated by problems with service codes. The updated releases of ITPS since last year have removed the issues and an update was provided to the Reporter Team on the latest ITPS position and ongoing developments.

4.3.2 Findings: Data Accuracy

The data and spreadsheets used in the calculation of PDI-P were checked against the raw data provided. It was found that the raw data were being input correctly into the many spreadsheets which make up the PDI-P calculation. Whilst the process works, it would be easier if the amount of spreadsheets used to calculate the KPI were reduced to better control the amount of copying and pasting required. Further checks with Network Rail revealed that a number of S4CS records are removed from the PDI Main Model as their service groups are not

included in the Main Model Weighting. Again, any streamlining of this would benefit the accuracy of the calculation.

It would be beneficial if the guide on the production of the PDI-P KPI included a flow chart to show how all the spreadsheets used in the calculation fit into the process. This would be useful for briefing new users and act as an aide memoir.

4.3.3 General Observations

Our review indicated that the S4CS process has remained stable over the last 12 months and is now supported by a process document. We established that the Network Rail team managing it have remained largely the same and have built on the experiences in providing a reliable base for PDI-P.

The process for transferring data from S4CS to NARS is, however, not optimal. Data is converted from the S4CS spreadsheet into an older spreadsheet template by the Network Availability Programme Team. This involves manual data copying with all the opportunities for error that includes. This weakness should be addressed and it is suggested that the Network Availability Programme Team should review the process to reduce or eliminate the requirements for manual interventions.

4.3.4 Conclusions

The PDI-P measure has benefited from the implementation of NARS and the eradication of the ITPS issues. The process still requires some manual copying, pasting and filtering of the data so care needs to be taken until this is resolved.

4.3.5 Confidence Rating

The PDI-P measure has been rated at B for reliability and 2 for accuracy. This reflects improvements brought about by more formalisation within the Schedule 4 process and the implementation of NARS but the need for manual data transfer between spreadsheets. The accuracy score reflects the removal of the detrimental impact of ITPS but the manual transfer of data still risks data errors. The score has improved from B3 at the last audit. In the view of the Reporter Team B2 is likely to be the highest achievable score for this measure.

4.4 Possession Disruption Index – Freight (PDI-F)

The measure

The Possession Disruption Index for Freight provides network availability measures the 'unavailability' of track for freight use, weighted by the level of freight traffic operated over each section of track.

The measure aims to ensure that freight services experience no increase from 2007/8 levels of disruptions resulting from engineering works. The measure is expressed as an indexed normalised by the MAA for 2007/8.

Measure	Definition	Calculation
Possession Disruption Index – Freight	Possession Disruption Index for Freight measures Track Kilometre availability weighted by relative levels of freight traffic operated over each ELR	Possession Disruption Index for Freight = (Average freight tonne km per SRS divided by Average freight tonne km for network) x (Track Km Available divided by Total Track Km)

4.4.1 Findings: Reliability – Process and Procedure

The production of the PDI-F indicator is now done through NARS. The main variable factor is provided directly from the Possession Planning System (PPS). Unlike with the S4CS link for PDI-P the linkage from PPS is now via an automatic data link with no manual intervention.

PDI-F as a measure remains unchanged in that the NARS model reflects directly the same calculation method as previously used. These include known inaccuracies in the recording of single line operation over multi track railways and other factors which may lead to an underestimate of track availability. This is a known factor within PDI-F which is recognised as an indicator and not an absolute measure.

4.4.2 Findings: Data Accuracy

From Period 5 onwards, PDI-F is recorded via the NARS system. A check on the data provided for Period 5 shows that the values provided for the KPI in the PIR are correct against the values extracted from NARS. The values are also in line with the previous periods, with data up to Period 4 frozen from the previous reporting method. However, the process still requires a number of spreadsheets to be used to take the data from NARS and produce it in the PIR format, which could be reduced and combined into one final spreadsheet.

4.4.3 General Observations

The implementation of NARS has improved the automation of this indicator. The fact that the PPS data is automatically fed to NARS removes the potential for transposition errors by the Network Availability Programme Team. The data is collected and reported consistently against the requirements.

4.4.4 Conclusions

The automation following the introduction of NARS has improved the process. There is potential to streamline the process for graphing the NARS results further and is a recommendation in Section 6.

4.4.5 Confidence Rating

The PDI-F measure has been rated as B for reliability and 2 for accuracy. The reliability score reflects the ongoing improvements in process brought about by the implementation of NARS but that the underlying procedures will never fully accurately reflect the impact of possessions on Freight. The accuracy score reflects the fact that the data is taken directly from NARS and very little processing is required, providing the data is copied and pasted correctly. The score has improved from B3 at the last audit. The highest achievable confidence rating in the view of the Reporter Team is B2.

4.5 WTT Compliance

The measure

The KPI is defined in the reporting pack as:-

Measure	Definition	Calculation
WTT weekend compliance	Working Time Table Compliance measures the % of train schedules ran and disrupted (cancelled or replaced by buses vs. the permanent timetable) per weekend, per TOC.	WTT compliance = (total no of schedules planned and run as trains / (total no of schedules planned and run as trains + bus schedules vs. permanent timetable + cancellations vs. the permanent timetable))*100%

4.5.1 Findings: Reliability – Process and Procedures

At the time of the last review this measure had gone through considerable change. This was both in terms of data source, ITPS rather than Trainplan, and that the work had transferred to a new team in Milton Keynes.

The Publications Team in Milton Keynes have now been producing the measure for over a year and in that time it was established that they have refined the process. To facilitate this, they support the Network Availability Measures procedures with a detailed Publications Standard Operating Procedure NR/OP&C/OP&P which covers WTT Compliance Measure and Bus Replacement Measure. The procedure is dated 06/09/2011.

The procedure gives detailed instructions on the data extraction process from ITPS and how the data is processed to ensure consistency. To achieve this there has been a considerable simplification of the spreadsheets used to process the data which is explored further in section 4.5.2.

The implementation of ITPS caused considerable issues with the creation of this KPI. The levels of duplicate data meant that data for some TOCs were overwritten because of error with average data from previous periods. This problem had largely been resolved at the time of the last audit but had not yet impacted on the quality of the data and the KPI. Now, a year on, this is no longer a factor in the KPI process.

WTT compliance remains an indicator not an absolute measure. As highlighted at previous audits the proportion of Driver's schedules will be influenced by where the road transport portion is positioned in relation to the whole journey (i.e. if the bus portion is positioned at the beginning or end it will be 50% of the schedule, if it is in the middle it will equal 33.3%). It therefore remains a trend measure not an absolute measure.

4.5.2 Findings: Data Accuracy

ITPS data extraction macros

The data for this KPI has been considerably reduced compared to the process for producing it reported in the last issue of the report. The calculation has now been reduced from 3 macros to 1 macro in the WTT Compliance Production Tool v4.08.xls spreadsheet. This spreadsheet imports the PEX file for each TOC and produces a summary report (Week XX Summary.xls). The raw data was supplied

for checking and the process was successfully demonstrated at the Network Rail offices in Milton Keynes.

The output data from the Week XX Summary.xls spreadsheet is input into the WTT_Compliance_KPI_226229 v1 0E.xls spreadsheet which produces the graphical outputs for both the WTT Compliance and the Rail Replacement Bus Hours.

Although the process could not be checked in full detail from the input of the PEX data, a sample was checked through the calculation process shown in the WTT_Compliance_KPI_226229 v1 0E.xls spreadsheet and the data output does tally up with the data used to produce the graphs in the PIR.

4.5.3 General Observations

The production process for this measure has stabilised with the previous ITPS problems now eradicated. The procedures are well set out and the management of spreadsheets and macros has improved considerably, with only 1 macro now required to produce the output.

This remains a trend measure not a detailed absolute measure and should be used as such.

The accuracy checks revealed no concerns.

4.5.4 Conclusion

This is a well managed process which has shown solid improvement since last year assisted by a stable environment and the eradication of the ITPS problems.

4.5.5 Confidence Rating

This KPI has an assessed rating of B for reliability and 2 for accuracy. This reflects the ongoing improvement in the production process and the eradication of the ITPS problem. However, this is an indicator, not an absolute measure and the scores reflect this. The score has improved from B3 at the last audit. It is the Reporter Team's view that the highest achievable grading is B2 given the base calculation methodology.

4.6 Rail Replacement Bus Hours

The measure

Rail replacement bus hours measure the % of train schedules ran and disrupted (cancelled or replaced by buses vs. the permanent timetable) per weekend, per TOC.

The Rail replacement bus hours measure provides an indication of the extent of bus substitution at weekends.

Measure	Definition	Calculation
Rail replacement bus hours	Number of weekend rail replacement bus service hours operated due to possessions obtained by calculating scheduled arrival time - scheduled departure time using the Train Service Data Base code 'BR' summed over all TOCs.	Rail Replacement Bus Hours = (scheduled departure time - Scheduled arrival time) using TSDB code 'BR' summed over all TOCs.

4.6.1 Findings: Reliability – Process and Procedures

The procedure for this KPI is the same as that used for WTT compliance and as for that KPI, data is produced by the Operations Publications Team.

The calculation process remains unchanged. Each bus schedule is multiplied by the journey time to produce the KPI. The calculation takes no account of the number of buses planned by train operators (e.g. if a TOC provides one bus or six the calculation will assume one). This means it actually measures the number of schedule hours and not bus hours. However, this is a known factor in the calculation and has been consistently reported in this way since the beginning of the control period.

The number of macros and spreadsheets has reduced making the process simpler and less prone to error.

4.6.2 Findings: Data Accuracy

The comments made in Section 4.5.2 in respect of WTT compliance also apply to this measure, since the data are derived using the same process.

4.6.3 General Observations

The production process is robust using a well set out procedure and has benefited from an improvement in the data management through simplified macros.

The data checks revealed no concerns.

4.6.4 Conclusions

The procedures are good and the improvement in the extraction process a positive step forward.

4.6.5 Confidence Rating

The KPI is rated B for reliability and 3 for accuracy. This reflects a well documented, consistent procedure but the fact that it will never accurately record actual bus hours means it is only an indicator. The rating remains unchanged from last year. In the view of the Reporter Team, B3 is likely to be the highest achievable rating.

4.7 Possession Planning – Possession Notification Discount Factor

The measure

The Possession Planning - Possession Notification Discount Factor measures the percentage of disruptive passenger possessions notified in each of the three possession notification bands. A lower percentage of disruptive passenger possessions notified after T-12 weeks reduces the number of changes to the public timetable. The aspiration is for all possessions to be notified within the informed traveller timescales (T-12).

Measure	Definition	Calculation
Possession Planning - Possession Notification Discount Factor	Possession Planning - Possession Notification Discount factor measures the percentage of disruptive passenger possessions notified in each of the three possession notification bands: 1. Possessions notified by First Working Timetable (%): Number of disruptive possessions incorporated in the First Working Timetable (for which is received the biggest discount) 2. Possessions notified by T-12 Timetable (%): Number of disruptive possessions entered into the National Timetable database at least 12 weeks before the date of the possession 3. Possessions notified Post T-12 Timetable (%): Number of disruptive possessions entered into the National Timetable database within 12 weeks before the date of the possession (for which is received the smallest discount, if any)	Possession Planning - Possession Notification Discount factor = Number of disruptive passenger possessions that were entered into National Timetable database within 12 weeks before the date of the possession. Further splits for number of disruptive possessions in each of the three bands

4.7.1 Findings: Reliability – Process and Procedures

The data for this KPI is sourced from S4CS by the Schedule 4 Compensation Team in Milton Keynes.

The process is set out in the Network Availability Measures: Data and Computational Process (ver 2.1) and in more detail in the Schedule 4 User Guide.

The requirement is that all possession notifications are compensated at the appropriate rate based on when the possession was notified to the operator. Any notifications that are at either mid range or minimum discount factors require checking at the local planning office to check that this is correct. However, whilst it is apparent that some checks are taking place the Reporter Team did not see comprehensive evidence of these checks being recorded fully.

4.7.2 Findings: Data Accuracy

The source data for the Possession Notification Discount Factor comes from the following PDF documents provided:

- 244_Possession_Notification_2011_2012 P03.pdf;
- 244_Possession_Notification_2011_2012 P04.pdf; and
- P05_11_12_KPI_244_Possession_Notification.pdf PDF.

The data within these comes from the KPI Dashboard – ID 244. The data presented in the bottom section of the PDF is copied and pasted into the P03_11_12_KPI 244 graph.xls, P04_11_12_KPI 244 graph.xls and P05_11_12_KPI 244 graph.xls spreadsheets for the National option, which in turn produce the data for the PIR.

The data contained within the PDFs has been checked to the data supplied in the KPI-244-2010-2011-P10.xls spreadsheet and a check of the totals in this confirm the input from the PDF to be correct.

The contents of the two sets of data have been compared and found to be consistent.

4.7.3 General Observations

The provision of a User Guide has improved the process since the last audit, and the data recording has remained stable.

Validation checks cover all possessions not achieving full discount factors but it was not possible to verify this always happens. An external verification process is provided by Operators through their commercial challenge if payment is incorrect.

4.7.4 Conclusions

The process is basically sound and the publication of the User Guide has strengthened this.

4.7.5 Confidence Rating

The KPI is rated B for reliability and 2 for accuracy. This reliability score reflects the better documented process within the new user guide but the lack of record keeping on checks is still an issue. This impacts on the accuracy rate as 2 is the maximum score. The rating remains unchanged from last year's audit. This measure should be able to achieve A1 in the Reporter Team's view.

4.8 Late and Very Late Possession Changes

The measure

The Late and Very Late Possession Changes indicator measures the number of changes that cause the disruptive element of the possession to be increased or reduced (i.e. a new, cancelled, curtailed or extended possession) for the following time periods, respectively:

- Between the issue of the Confirmed Period Possession Plan (CPPP) and Weekly Operating Notice (WON); and
- After the issue of the Weekly Operating Notice (WON).

The measure is expressed as a percentage of the total number of possessions recorded in the relevant period.

Measure	Definition	Calculation
Late Notice Disruptive Possessions	Number of new, cancelled, curtailed or extended disruptive possessions that were agreed between the CPPP and the WON (to T-10 days)	Number of new, cancelled, curtailed or extended disruptive possessions that were agreed between the issue of the CPPP and before the issue of the WON, that caused the disruptive element of the possession to be increased or reduced, divided by the total number of possessions recorded in the relevant period
Very Late Notice Disruptive Possessions	Number of new, cancelled, curtailed or extended disruptive possessions that were agreed after the issue of the WON (T-10 days)	Number of new, cancelled, curtailed or extended disruptive possessions that were agreed after the issue of the WON, that caused the disruptive element of the possession to be increased or reduced, divided by the total number of possessions recorded in the relevant period

4.8.1 Findings: Reliability – Process and Procedures

The process for collating and providing the data for this KPI has changed considerably since last year. Previously data were gathered by the Area Planning Managers (Delivery) at local level and provided to a central point for compilation into the report.

Last year's audit report highlighted several weaknesses with this process. These included the lack of a common definition of what a disruptive possession is, meaning that Area Planning Managers reported inconsistently.

To overcome this, the reporting point changed in Period 9 2010/11 to the Engineering Access Planning (EAP) Manager in Milton Keynes. This was because all disruptive possession changes are authorised by this manager.

The change control process for all possessions is contained in the procedure Engineering Access and NDS – Supplied Resource Planning: NR/L2/NDS/202. Section 7 of this procedure sets out how changes must be managed. This specifies the use of a change form (Access & Resource Plan Change Request – ARPCR) which must be used to record all changes. However, whilst the procedure is still

current the ARPCR forms proved to be very unwieldy to use. As a result a new process called the Disruptive Access Form (DAF) was introduced. This was done in April 2011 via a briefing document supplied to all planners and to possession requestors. This is designed to be a simpler procedure to encourage greater use. However, at present the procedure is not up to date and does appear to be causing some confusion about exactly when a DAF is required. The revised procedure should be reissued as soon as is practicable.

The DAF must be signed off by EAP after they have negotiated any changes with the affected Operators. The procedure does not contain any definition of a disruptive possession and the area visits revealed that despite last year's recommendation Area Planning Managers (Delivery) still do not give a consistent definition when asked.

The EAP Manager now collates all Late Disruptive Possession Changes which his team authorises. Since this is a central function this ensures a consistent interpretation of disruptive possessions. The figures reported in the KPI pack now record all Late Disruptive Changes made between T-26 weeks and T-10 days that are authorised by the EAP and records refer consistently to the period in which they are authorised, rather than the period to which they apply.

This latter point made it very difficult for the Reporter Team to verify the accuracy of the numbers recorded by means of checking local planning office records. This is because all three of the Area Planning Managers (Delivery) visited keep their records by possession weeks. These difficulties were exacerbated by the differing ways in which records are kept. Most rely on email trails, but since standard headers for late access are not used, it was almost impossible in the time available to fully verify that all Late Disruptive Changes were being passed to the EAP.

However, a more fundamental process flaw was revealed when the accuracy of Very Late Disruptive Possession Changes was reviewed. These are defined as any changes made less than ten days before the possession takes place. These were previously recorded and supplied by the Area Planning Managers (Delivery). However, when they stopped reporting Late Changes they also stopped reporting Very Late Changes. The EAP do not see most Very Late Changes and therefore cannot report them. As a result no Very Late Changes have been reported since Period 8 2010/11.

The three planning offices visited all had differences in how they dealt with Very Late Changes. In reality, most are driven by defects which must be fixed quickly. Some are passed to the EAP but most are not and many are dealt with via Control offices. There is no formal guidance or instruction on exactly how these should be managed hence the variation. One very important difference is whether or not these are input into PPS. Of the three periods of data checked at Sussex, Bristol and Manchester there were records for eight Very Late Possession Changes. These were all input into PPS but it was stated that this is not always the case and certainly is not a requirement if the access is negotiated by Control.

There is a clear requirement for clear procedures to set out exactly how Very Late Changes should be managed and recorded, and these should be briefed out to planning managers, possession requestors and Control offices. If the recording of Very Late Changes is an ongoing requirement, then a robust process for data capture should be implemented quickly. However, it should also be noted that

these Very Late Changes are nearly always used for defect rectification, and do not reflect on the overall quality of work and possession planning.

Very Late Possession changes form part of the PDI-P measure and it was possible that the lack of reporting could have had an impact on the regulatory measure. To attempt to clarify this, details of four of the Very Late Changes were passed to the S4CS team to check. A Very Disruptive event at Victoria was passed through the EAP and was therefore picked up by the S4CS team and would have been included in PDI-P. Three less disruptive very late changes in Manchester were also checked. In each of these cases the work actually proved less disruptive than the plan and S4CS showed no mileage changes, almost certainly due to the Control office managing the impact on the night. However, since there is no definitive way of handling very late changes, the Reporter Team cannot rule out the fact that some may fail to be correctly identified. However, the proportion of these possessions is very small and such errors would have a very small impact on PDI-P. This has been reflected in the confidence grading of PDI-P.

4.8.2 Findings: Data Accuracy

The source data for the three 2011/12 periods which were checked are contained in the following spreadsheets:

- ‘Period 03 EAP Late Change Counts.xls’;
- ‘Period 04 EAP Late Change Counts.xls’; and
- ‘Period 05 EAP Late Change Counts.xls’;
- ‘P03 WON Possessions by period 1112 by NR Route.xls’;
- ‘P04 WON Possessions by period 1112 by NR Route.xls’; and
- ‘P05 WON Possessions by period 1112 by NR Route.xls’;
- The ‘Period 03 EAP Late Change Counts.xls’;
- ‘Period 04 EAP Late Change Counts.xls’; and
- ‘Period 05 EAP Late Change Counts.xls’ which contain the data received in the ‘Week 9 EAM LDP Weekly Data 300511.xls’ to ‘Week 20 EAM LDP Weekly Data 300511.xls’ spreadsheets.

Four sets of weekly data are copied into the corresponding ‘Period XX EAP Late Change Counts.xls’ spreadsheet. It is not clear from the data supplied where the data in the ‘P03 WON Possessions by period 1112 by NR Route.xls’ spreadsheets comes from.

The values produced in the above are input into the following spreadsheets:

- ‘P03_Late_Notice_Disruptive_Possessions.xls’;
- ‘P04_Late_Notice_Disruptive_Possessions.xls’; and
- ‘P05_Late_Notice_Disruptive_Possessions.xls’.

The results produced here are consistent with the results produced in the PIR. The biggest issue with the data is the lack of results for Very Late Changes, which are not recorded.

4.8.3 General Observations

The revised data capture process has, whilst standardising the recording of Late Changes, completely omitted the recording of Very Late Changes. Consequently these have not been reported since P8 2010/11.

The way change data are kept locally means that it is very difficult to verify the EAP figures. The three offices visited all had different processes.

The change control process should be updated as quickly as possible and it should include a clear procedure for dealing with Very Late Possession Changes. This will require a standard approach with Control offices across Britain.

All Very Late Possession Changes should be entered to PPS to ensure the S4CS process picks them up correctly. There is currently no clear standard approach.

The checks into S4CS for Very Late Possession Changes did not indicate any failure to identify disruption in accordance with the PDI-P measure but the reporter team cannot rule out the possibility that some may have been missed. That said the number is small and unlikely to have any material affect on PDI-P.

The definition of a disruptive possession should be included in the revised procedure.

4.8.4 Conclusions

The process for recording Late Possession Changes has been improved from last year by using a single point to record the data. However, the change in process has led to a complete loss of reporting Very Late Changes. The Reporter Team found records for eight Very Late Disruptive Possessions across three areas over three periods which were not reported. This clearly shows that the process is not working as it should.

4.8.5 Confidence Rating

Last year this KPI was rated as D4. As a result of this year's findings this has been rated as D for reliability and X for accuracy. Whilst considerable improvements have been made to the process for reporting Late Possession Changes, the reliability grade reflects the fact that the process has no way of capturing Very Late Possession Changes. The X for accuracy is because no data is being captured at all. This process needs urgent attention.

4.9 Possessions involving Single Line Working

The measure

The Possessions Involving Single Line Working (SLW) indicator measures the number of possessions planned for engineering work with the adjacent line open.

The measure includes the number of planned possessions that leave an adjacent line that is signalled for bi-directional operation or SIMBIDS open, and the number of planned possessions where single line working was implemented. SIMBIDS - Simplified Bi-Directional Signalling - signalling is provided at some locations to allow trains to run in the 'wrong' direction during engineering work / line blockages etc. without resorting to pilot men.

Measure	Definition	Calculation
Possessions Involving Single Line Working	Number of possessions planned for engineering work with the adjacent line open.	Count of number of possessions shown in PPS showing SLW, BiDi and SIMBIDS

4.9.1 Findings: Reliability – Process and Procedures

The process has remained largely unchanged since the previous audit and it is still collected by the Systems Team within Planning and Performance.

The data capture relies on a word search of the Weekly Operating Notices (WONs) to identify all instances of single line working, bi-directional working or the use of SIMBIDs (Simplified Bi-Directional Signalling). There has been a programme to standardise language within the WONs which will aid this. At the time of the last audit a plan to develop a new system called Engineering Access Reporting System (EARS) was described. It was expected that this would improve this process. However, this has now been overtaken by a longer term development project so any improvement is likely to be some time in the future.

4.9.2 Findings: Data Accuracy

The data for this KPI are contained in the spreadsheets 'PX 2011 to 2012 report auto update raw data revised.xls', which contains multiple worksheets, each containing data for the four weeks comprising a Period, which are aggregated to produce Periodic results. The Periodic data are fed to a summary worksheet ('Data National A4 3 charts'), which in turn is used as the source for the charts contained in the PIR.

It is a little confusing how the source data relates back to the period data received from the team producing this KPI. Further discussions with NR have given some clarity into the differences contained in the raw data provided and the source data, which involves further cleaning of the raw data to produce the source data.

Checks were conducted on the data aggregation and chart generation processes, and the data and processes used to generate the corresponding elements of the PIR were found to be accurate.

4.9.3 General Observations

Nothing has changed in the way this KPI is recorded. It is still likely that the use of bi-directional signalling may not always be recorded.

4.9.4 Conclusion

The data are probably as accurate as they can be given the process used. This is unlikely to change in the near future until the longer term development project comes on line. It is understood that this is in the early stages of development.

4.9.5 Confidence Rating

The KPI is rated B for reliability and 3 for accuracy. The reliability score reflects the process which cannot be guaranteed error free which in turn impacts on the reliability score. This is the same score as last year and will only be improved by the introduction of a more automated process. In the Reporter Team's view this is likely to be the highest achievable score until the process is automated.

4.10 Possession Incidents – Delay minutes due to possession overrun

The measure

The Delay minutes due to possession overrun value for a period shall be the total number of delay minutes per 100 train kilometre run due to possession overruns lost by revenue earning trains at or between monitoring points. A lower score means less impact to train services caused by possession overruns.

Measure	Definition	Calculation
Delay minutes due to possession overrun	The indicator is defined as the Delay minutes per 100 train kilometre run due to possession overrun.	Total delay minutes attributed to possession overruns divided by scheduled train-km. The measurement unit is "delay minutes per 100 train-km" expressed as a number with three decimal places

4.10.1 Findings: Reliability – Process and Procedures

The delay data is derived from the standard process for compilation of all performance data. This process is controlled by the National Performance Team in Milton Keynes and has been subject to separate detailed audits, the last of which was in Q4 2010/11. These have shown this process to be robust and have not been repeated during this audit in agreement with ORR.

4.10.2 Findings: Data Accuracy

Detailed accuracy assessments on the underlying performance processes have not been undertaken.

The source data for the delay minutes due to possession overrun is contained in the:

- 'P03_11_12_delay cancel graph.xls';
- 'P04_11_12_delay cancel graph.xls'; and
- 'P05_11_12_delay cancel graph.xls'.

The data within these is imported from the:

- '232_Delay_Minutes_due_to_Possession_Overrun_2011_2012 P03.pdf';
- '232_Delay_Minutes_due_to_Possession_Overrun_2011_2012 P04.pdf'; and
- '232_Delay_Minutes_due_to_Possession_Overrun_2011_2012 P05.pdf',

which are produced by the KPI Dashboard- ID 232. The spreadsheets contain instructions on how to import the data from the PDFs. This is a copy and paste process which automatically produces the graphs in the spreadsheets. The data from the PDFs is copied into the 'convert pdfs to values' tab with both the delay and cancellations going into the same tab. It would be better if two separate areas were created to distinguish the difference between the data.

4.10.3 General Observations

The delay data production is a small subset of the overall performance process. This is a highly automated process and there are no areas of concern in relation to possession overruns.

4.10.4 Conclusions

The delay data recording processes are sound.

4.10.5 Confidence Rating

The KPI is ranked A for reliability and 1 for accuracy in line with last year's Q4 audit. This is a well documented process with a high degree of automation producing the base data from which this KPI is generated. The rating remains unchanged from last year.

4.11 Possession Incidents – Cancellations due to possession overrun

The measure

The number of equivalent deemed minutes per 100 train kilometre run caused by cancellations due to possession overruns. The aim is to achieve lower scores as a low score means less disruption has been caused to passengers by possession overruns.

Measure	Definition	Calculation
Cancellation minutes due to possession overrun	The number of equivalent deemed minutes per 100 train kilometre run caused by cancellations due to possession overruns	(Delay_Minutes)/(Train_km*100)

4.11.1 Findings: Reliability – Process and Procedures

The cancellation data is derived from the standard process for compilation of all performance data. This process is controlled by the National Performance Team in Milton Keynes and has been subject to separate detailed audits. These have shown this process to be robust and have not been repeated during this audit in agreement with ORR.

4.11.2 Findings: Data Accuracy

The data for the Cancellations is contained in the same spreadsheet as the Delay Minutes and the same problems with the supply of the data from the pdf and the updating of formulas as stated in Section 4.10.2 apply to the cancellation spreadsheet.

4.11.3 General Observations

The cancellation data production is a small subset of the overall performance process. This is a highly automated process and there are no areas of concern in relation to possession overruns.

4.11.4 Conclusions

The cancellation data recording processes are sound.

4.11.5 Confidence Rating

The KPI is ranked A for reliability and 1 for accuracy. This is a well documented process with a high degree of automation producing the base data from which this KPI is generated. The rating remains unchanged from last year.

4.12 Possession Incidents – Temporary Speed Restrictions

The measure

Planned TSRs tracks the trend of TSRs planned to happen and for which consultation has been provided with train operators through the rules of the route process.

Unplanned TSRs are those speeds which effectively come as a surprise to the train operator and are mainly condition driven.

The aim of this measure is to reduce the numbers of unplanned TSR and ensure that TOCs are informed of TSRs due to happen.

Measure	Definition	Calculation
Planned and Unplanned TSRs	The number of TSRs planned and unplanned TSRs in place at the end of each period	No calculations applied

4.12.1 Findings: Reliability – Process and Procedures

The process for collating unplanned TSR data has changed considerably since the last review. The manager responsible for this data previously has since retired. The data is now collated in London by the Project Manager (TSR).

The previous process, whilst effective, relied on a very manual process. The opportunity to automate the procedure was provided by the change in responsible manager. There was no handover between the previous and current managers since there was an interim manager in place until April this year. The actual collation process was not well documented although definitions are contained in long standing publications.

The base TSR data is provided by the Infrastructure Maintenance Performance Managers (IMPMs) on a weekly basis. This is required by Tuesday each week. To help improve the discipline of the process it has been necessary to lay down much stricter guidelines on how data is recorded to make it more straightforward to collate data nationally.

The process has inbuilt checks which are run on a weekly basis. This includes an automated check between the TSR database and PPS which shows all of the published TSRs nationally. It produces an error report which is checked and any discrepancies raised with the appropriate IMPM. These are usually data errors rather than any actual count errors.

Emergency Speed Restriction (ESR) data are provided initially by Route Control Offices. This is generated from the information set out by Controls when they "wire" out the ESR. These are all sequentially numbered by each control but not in any standard format. Checks are carried out to ensure that all ESR data is captured but these are very manual and only happen currently on a random basis.

If all Controls used a standard format to send out and record ESRs it would ensure a much more robust process with less room for error.

4.12.2 Findings: Data Accuracy

The Data extraction for TSRs has been automated using an Excel Macro in a TSR Processing Tool which produces the 'MBR SummaryRecord.xls' and 'SummaryRecord.xls' spreadsheets. The information in the 'MBR SummaryRecord.xls' is passed over to the Milton Keynes team.

This process was tested on a machine external to Network Rail in Excel 2003 and produced the correct data outputs. The source data for periods 3, 4 and 5 was requested from the Milton Keynes team and was compared against the outputs produce by the TSR Processing Tool spreadsheet. The data produced accurately represented the data provided in the PIR and checks revealed that the generated charts provided a 100% accurate representation of the underlying data.

However, Period 3 of the Source data does show a small difference in the Planned MBR Track records compared to the data calculated in the TSR Processing Tool. However, this is not reported on in the PIR and further discussions with NR clarified that the difference was due to a change in the reporting process. The macros in the TSR Processing Tool have not been checked during this commission.

4.12.3 General Observations

The overall process is now much more automated than previously. This has allowed the automation of inbuilt checks and helped to improve the discipline of data capture.

The previous process relied heavily on the experience of the responsible manager but the new arrangements are much less dependent on a single person, with better documentation and a more structured process.

The lack of standardised data capture of ESRs is causing some problems with data quality and in the view of the Reporter Team requires a more standardised approach from Control offices.

The overall number of TSRs has shown an increase compared to last year when the process was more manual. This was cited as a reason why collating the numbers had become easier and therefore supports the need for a better process.

4.12.4 Conclusions

The move towards a more automated process with inbuilt checks is good. The ESR process is not as robust and would benefit from a standard approach in Control offices.

4.12.5 Confidence Rating

The KPI is rated B for reliability and 2 for accuracy. The reliability score reflects that whilst the process is now more automated than previously it has exposed a weakness with the capture of ESR data. This impacts on the accuracy score. This score has reduced from A1 at last year's audit. In the Reporter Teams view A1 is achievable for this measure.

5 Confidence Ratings

The KPIs in this report have been graded for reliability and accuracy using the following confidence rating defined in Tables 5.1 and 5.2. These definitions are the same as used in last year's report of these KPIs (Q2 2010-11 Data Assurance Report: Network Availability).

Tables 5.1 and 5.2 describe the revised descriptions used to assess the KPIs in this report:

Reliability Band	Description
A	Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment. Appropriate levels of internal verification and adequate numbers of fully trained individuals
B	As A, but with minor shortcomings. Examples include old assessment, some missing documentation, insufficient internal verification, undocumented reliance on third-party data.
C	Some significant shortcomings in the process which need urgent attention.
D	Major shortcomings in all aspects of KPI: process unfit for purpose

Table 5.1: Confidence Grading System: Reliability

Accuracy Band	Description
1	Calculation processes automated (to a degree commensurate with dataset size); calculations verified to be accurate and based on 100% sample of data; external data sources fully verified. KPIs expected to be accurate to within ±1%
2	KPIs expected to be accurate to within ±5%
3	Shortfalls against several attributes: e.g. significant manual input to calculations or incomplete data verification or less than 100% sampling used. KPIs expected to be accurate to within ±10%
4	KPIs expected to be accurate to within ±25%
5	Calculation processes largely manual with significant errors; data inconsistently reported and unverified; KPI based on small data sample or cursory inspections and verbal reports. KPIs unlikely to be accurate to less than ±25%
6	No longer used
X	KPI is calculated on a very small sample of data, or accuracy cannot be assessed for some other reason (to be qualified in text of report)

Table 5.2: Confidence Grading System: Accuracy

The ratings for the Network Availability KPIs are as follows:

Possession Disruption Index – Passenger

The PDI-P measure has been rated at B for reliability and 2 for accuracy. This reflects improvements brought about by more formalisation within the Schedule 4

process and the implementation of NARS but the need for manual data transfer between spreadsheets. The accuracy score reflects the removal of the detrimental impact of ITPS but the manual transfer of data still risks data errors. The score has improved from B3 at the last audit. In the view of the Reporter Team B2 is likely to be the highest achievable score for this measure.

Possession Disruption Index – Freight

The PDI-F measure has been rated as B for reliability and 2 for accuracy. The reliability score reflects the ongoing improvements in process brought about by the implementation of NARS but that the underlying procedures will never fully accurately reflect the impact of possessions on Freight. The accuracy score reflects the fact that the data is taken directly from NARS and very little processing is required, providing the data is copied and pasted correctly. The score has improved from B3 at the last audit. The highest achievable confidence rating in the view of the Reporter Team is B2.

WTT Weekend Compliance

This KPI has an assessed rating of B for reliability and 2 for accuracy. This reflects the ongoing improvement in the production process and the eradication of the ITPS problem. However, this is an indicator, not an absolute measure and the scores reflect this. The score has improved from B3 at the last audit. It is the Reporter Team's view that the highest achievable grading is B2 given the base calculation methodology.

Rail Replacement Bus Hours (Weekend)

The KPI is rated B for reliability and 3 for accuracy. This reflects a well documented, consistent procedure but the fact that it will never accurately record actual bus hours means it is only an indicator. The rating remains unchanged from last year. In the view of the Reporter Team, B3 is likely to be the highest achievable rating.

Possession Planning - Possession Notification Discount factor

The KPI is rated B for reliability and 2 for accuracy. This reliability score reflects the better documented process within the new user guide but the lack of record keeping on checks is still an issue. This impacts on the accuracy rate as 2 is the maximum score. The rating remains unchanged from last year's audit. This measure should be able to achieve A1 in the Reporter Team's view.

Late Possession and Very Late Possession Changes

Last year this KPI was rated as D4. As a result of this year's findings this has been rated as D for reliability and X for accuracy. Whilst considerable improvements have been made to the process for reporting Late Possession Changes, the reliability grade reflects the fact that the process has no way of capturing Very Late Possession Changes. The X for accuracy is because no data is being captured at all. This process needs urgent attention.

Possessions Involving Single Line Working

The KPI is rated B for reliability and 3 for accuracy. The reliability score reflects the process which cannot be guaranteed error free which in turn impacts on the reliability score. This is the same score as last year and will only be improved by the introduction of a more automated process. In the Reporter Team's view this is likely to be the highest achievable score until the process is automated.

Possession Incidents - Delay Minutes due to Possession Overrun

The KPI is ranked A for reliability and 1 for accuracy in line with last year's Q4 audit. This is a well documented process with a high degree of automation producing the base data from which this KPI is generated. The rating remains unchanged from last year.

Possession Incidents - Cancellations (deemed minutes) due to Possession Overrun

The KPI is ranked A for reliability and 1 for accuracy. This is a well documented process with a high degree of automation producing the base data from which this KPI is generated. The rating remains unchanged from last year.

Possession Incidents - Temporary Speed Restrictions

The KPI is rated B for reliability and 2 for accuracy. The reliability score reflects that whilst the process is now more automated than previously it has exposed a weakness with the capture of ESR data. This impacts on the accuracy score. This score has reduced from A1 at last year's audit. In the Reporter Teams view A1 is achievable for this measure.

These ratings are summarised in Figure 5.1, and the equivalent 2010/11 ratings are shown in Figure 5.2, for reference.

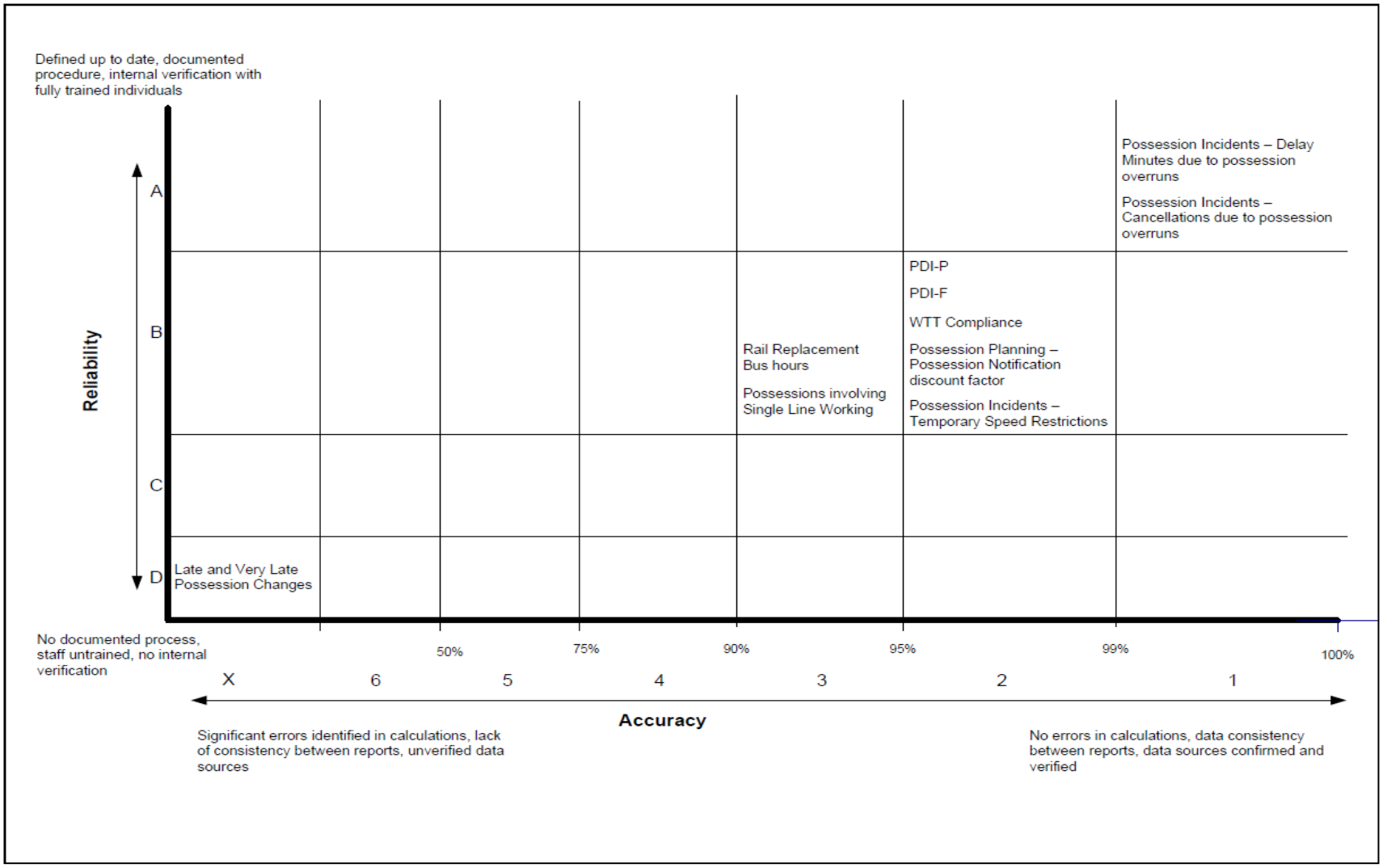

Figure 5.1: Summary of 2011/12 Confidence Ratings for Network Availability KPIs

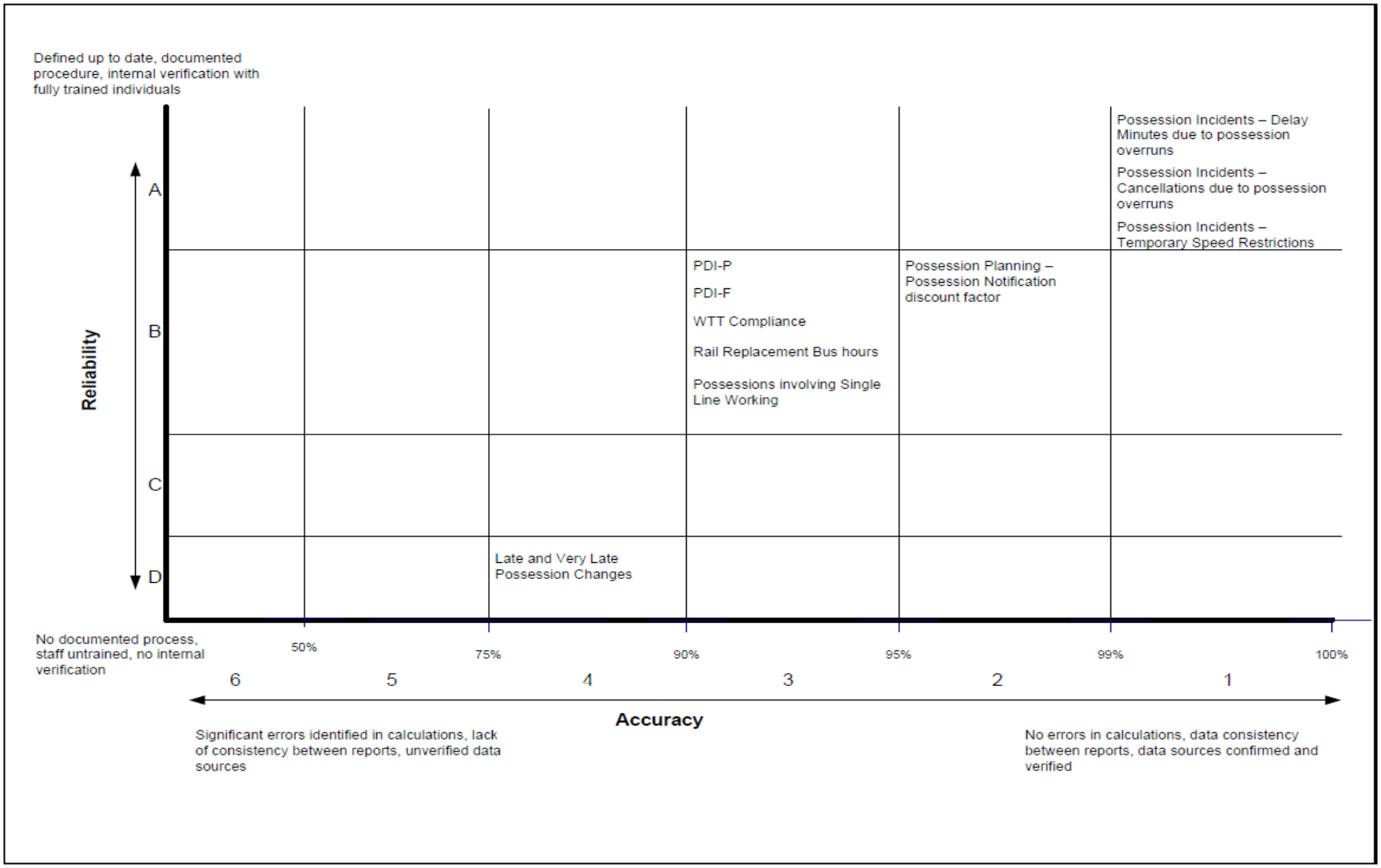

Figure 5.2: Summary of 2010/11 Confidence Ratings for Network Availability KPIs

6 Recommendations

Table 6.1 contains the outstanding recommendations from 2010/11, and also the additional recommendations arising from this year's Network Availability KPIs. The new recommendations are numbered 2012.4.1, 2012.4.2, etc., to reflect the (end of the) current year and the Network Availability KPI number.

Table 6.1: Recommendations

No	Recommendation to NR	Section	NR Champion	Date
2012.4.1	Set out a clear specification for all internal data integrity checks, by measure, stating what needs checking, by who, frequency and what records should be kept.	3	Programme Manager (Change)	February 2012
2012.4.2	Update the change procedure for managing possession change and include: Process for Late Changes Process for Very Late Changes Disruptive possession definition Data capture requirements Specify recording requirements for planning managers to provide simple audit trail	4.8	To be agreed with Programme Manager (Change)	December 2011
2012.4.3	Set up a standard reporting protocol for ESRs across all NR control offices	4.12	Project Manager	March 2012
2012.4.4	The guides for compilation of the Network Availability KPIs should be reviewed and ensure the purpose is made clear including who they apply toand properly briefed to all those responsible.	4.2	Programme Manager (Change)	February 2012

The following suggestions are made to Network Rail to consider implementing:

- The number of spreadsheets used in the production of both the PDI-P and the PDI-F KPIs should be reduced to reduce the error factor associated with copying and pasting data from one spreadsheet to another;
- In the 'P0X_11_12_delay cancel graph.xls' spreadsheets, replace the hard coded values with the formula contained in Cell AB54 of the 'Delay-min-Chart' worksheet to keep consistency in the spreadsheet and make tracking of the values used more transparent; and
- Also in the 'P0X_11_12_delay cancel graph.xls' spreadsheets, provide separate tables for the Delay Minutes and Cancellations when importing the PDF into the spreadsheets ('Convert PDF to Values' tab) to clarify the definition of the values being input.

Appendix A

Glossary of Terms

ALW	Adjacent Line Working
Bi-Di	Bi-Directional Signalling
EAP	Engineering Access Planning
EARS	Engineering Access Reporting System
ESR	Emergency Speed Restriction
ITPS	Integrated Train Planning System
MBR	Monthly Business Review
NARS	Network Availability Reporting System
NDS	National Delivery Service
ODT	Operating Day Template
PALADIN	Network Rail Performance Database
PDI-F	Possession Disruption Index – Freight
PDI-P	Possession Disruption Index – Passenger
PEX	ProBoard Executable Program
PIR	Possession Indicator Report
PPS	Possession Planning System
S4CS	Schedule Four Compensation System
SIMBIDS	Simplified Bi-Directional Signalling
SLW	Single-Line Working
Supplementary	Late Notice Possession notification
WiP	Work in Progress
Wire	Very Late Notice Possession notification
WON	Weekly Operating Notice
WTT	Working Timetable

Appendix B

Mandate

Mandate for Independent Report Part A – Data assurance 2011-2012, Q2 Network Availability

Audit Title:	Data assurance 2011-2012, Q2 Network Availability
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Network Rail reviewer:	Strategic Planning Mgr and Strategic Planner

Authorisation to proceed

ORR	Business Intelligence Manager	
Network Rail	Strategic Planner	

Purpose

This mandate sets out the scope of work for the Part A Independent Reporter (Arup) to review Network Rail's (NR) network availability data. As a regulated target, it is critical that ORR has assurance of the quality of this data.

Background

Arup last reviewed NR's network availability data in Q2 (August – October) 2010-2011. The review highlighted a number of concerns regarding an inconsistency of processes, documentation and definitions across NR's regions. The review also drew attention to problems with the implementation of ITPS, and the need to revisit this in the future. Finally, the review pointed out that the introduction of NARS should lead to an increase in the confidence in network availability data.

In May – July 2011, Arup conducted a specialist review of NARS. The review found that the system accurately reports PDI-P and PDI-F data, and concluded that the interim SDG model can now be phased out in favour of NARS.

Scope

This review should assess the accuracy and reliability of the following KPI's:

- 4(a): Possession Disruption Index - Passenger (PDI-P)
- 4(b): Possession Disruption Index - Freight (PDI-F)
- WTT Weekend Compliance
- Rail Replacement Bus Hours
- Possession Planning - Possession Notification Discount factor
- Late and Very Late Possession Changes
- Possessions Involving Single Line Working
- Possession Incidents - Delay Minutes due to Possession Overrun
- Possession Incidents - Cancellations (deemed minutes) due to Possession Overrun
- Possession Incidents - Temporary Speed Restrictions

The review should:

- comment on the reliability, quality, consistency, completeness and accuracy of the reported data
- present a confidence grade for each KPI and comment upon the direction of travel since last reviewed in Q2 2010-2011
- report on progress against recommendations made in Q2 2010-2011 and make appropriate recommendations where necessary

In addition to reviewing the above KPI's, the review (as proposed in the Q2 2010-2011 report) should:

- confirm that all impacts of the implementation of ITPS on the Network Availability KPIs have been successfully addressed and removed

The Reporter must not duplicate any activity undertaken during the NARS review, but should draw on its findings.

Methodology

The Reporter should meet with relevant Network Rail employees to understand any procedural changes [to the processes used to report the above KPIs] since the Q2 2010-2011 report. The Reporter should also review all relevant documentation and systems, and comment upon their quality and fitness for purpose.

Deliverables

The Reporter should provide a publishable report, including findings, conclusions and recommendations. The report should be prepared in draft form and sent electronically to Network Rail and ORR, at the same time. The Reporter should facilitate feedback (via a tripartite feedback session if appropriate) and provide a revised report with track changes. This should be followed by a final report for publication on ORR's website.

Timescales

A fully costed proposal for this work is required by 9 August 2011. Work is expected to commence shortly after following approval by NR and ORR. A draft report is required by 14 October 2011 and a final report is required by 11 November 2011.

Independent Reporter remit proposal

The Independent Reporter shall prepare a fully costed proposal for review and approval by NR and ORR on the basis of this mandate. The approved remit will form part of the mandate and shall be attached to this document.

The proposal will detail methodology, tasks, programme, deliverables, resources and costs.