OFFICE OF RAIL REGULATION

Office of Rail Regulation investigation report: Network Rail's delivery of its regulated performance targets in Scotland 2014-15

August 2015

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Executive Summary

This evidence report sets out the findings of ORR's investigation to establish whether Network Rail (NR) did everything reasonably practicable to meet its licence obligations in relation to its performance obligations to Scotland in 2014-15.

In Scotland[1] NR accepted ORR's PR13 for performance outputs (PPM) for CP5. There is no Cancellations and Significant Lateness (CaSL) regulatory target in Scotland for CP5.

At the end of 2014-15 the PPM Moving Annual Average (MAA) in Scotland was 1.5 percentage points (pp) below its regulatory performance target of 92.0%. This resulted in 71,492 ScotRail trains failing PPM.

Passenger satisfaction

Overall Satisfaction of Scotrail passengers declined by 3 percentage points (pp) as did satisfaction with punctuality and reliability[2].

Our investigation has identified the following issues relating to operational performance in Scotland:

Asset Management

We have considered whether asset management has been an issue in Scotland. Our analysis indicates that the reliability of the infrastructure has not played a significant part for ScotRail missing its PPM target for the year.

Rise in unexplained and uninvestigated delays

We have concluded that a large proportion of the rise in unexplained and uninvestigated delays can be attributed to the high levels of staff turnover experienced in 2014-15. NR Scotland has recognised that there is potential for a similar situation to occur in 2015-16 and have introduced an 'accelerated training plan' reducing the training period for new TRUST[3] Delay Attribution staff from six to three months. We note that NR Scotland Route has stated that the increase in unexplained delays may have also been linked to timetable issues.

[1] Performance in Scotland (PPM annual 92% and CP5 exit of 92.5%) is defined as ScotRail
[2] As highlighted by the Spring 2015 National Rail Passenger Survey compared to the Spring 2014 survey.
[3] a nested acronym standing for Train Running System on TOPS (Total Operation Processing System)

Timetable changes – May and December 2014-15

Planning delays worsened in 2014-15, being 9% worse than the previous year and representing 2% of the delay caused to ScotRail by NR. NR told us that in May 2014, the timetable change (the point at which the Cumbernauld route was electrified) resulted in a 2% reduction in PPM on the North Electric and Argyle lines. In December 2014, the timetable change (the point at which the Carmyle route was electrified) led to increased timetabling delays.

Our analysis of the December 2014 timetable has highlighted several avoidable operational planning errors and a number of tight timings. While better (and earlier) modelling, prior to the introduction of the new electric services, would have helped maintain performance levels, our investigation has concluded that Timetable Planning Rules (TPRs) issues were significant in NR failing to achieve its 2014-15 PPM target.

In particular, there were a number of issues with the modelling work undertaken prior to the introduction of electrified services in the Whifflet area which reduced the reliability of the timetable; including point to point timings between Whifflet and Rutherglen East Junction which were significantly reduced from 18½ to 15 (subsequently 15½) minutes in the westbound direction and 21½ to 17½ minutes in the eastbound direction, when compared to the previous diesel timings. The eastbound changes included the removal of station dwell time and two minutes recovery time which will have reduced the resilience of the timetable to recover in times of perturbation.

NR has confirmed to us that a review of the relevant TPRs is being progressed and will be complete by March 2016. NR recognised a number of areas for improvement, and has been, and is, taking steps to remedy these.

These latest timetable problems have resulted in impacts on performance although the specific errors that have caused them are different to those that were encountered following the December 2012 timetable change. These timetabling errors, although individually minor, had a cumulative impact on performance delivery. Performance has improved since NR addressed the issues initially through briefing to signallers and subsequently in the May 2015 timetable change.

Adjustments

We also considered factors which had a material impact on performance in Scotland during 2014-15 and made appropriate adjustments. We recognise that NR was not wholly

responsible for the delay minutes and subsequent PPM loss caused by fatalities and trespass events, and that it has worked constructively to reduce these incidents and mitigate their impact in Scotland. We also took into account the performance impact of the Glasgow Commonwealth Games, which we estimate to be 0.6pp on the end of year PPM (MAA). Both NR and ScotRail acted pragmatically during the Glasgow Commonwealth Games period to ensure the successful movement of passengers rather than prioritising performance.

1. Introduction

1.1. Background and purpose

1 Performance in Scotland started 2014-15 in a relatively strong position, with the Public Performance Measure (PPM) Moving Annual Average (MAA) exceeding the levels specified in the ScotRail[4] Performance Strategy (PS) during the first quarter of the year. Whilst the Glasgow Commonwealth Games (the Commonwealth Games) caused a performance dip in quarter 2, it recovered well enough by the end of the quarter for ScotRail's PPM MAA to be 0.1pp short of target. The latter half of 2014-15 however, saw a steady decline in performance and by the end of period 13 ScotRail's PPM MAA was 1.5pp below its regulatory performance target of 92.0%. There is no Cancellations and Significant Lateness (CaSL) regulatory target in Scotland for Control Period 5 (CP5).

2 In Scotland, unlike England and Wales, Network Rail (NR) accepted ORR's determination for performance outputs for CP5. This means that NR is required to achieve the PPM regulated outputs specified in the Final Determination.

1.2. Terms of reference of ORR's investigation

3 On 27 April 2015, we wrote to NR setting out our intention to formally investigate its delivery of the regulated performance targets in 2014-15. In summary, this investigation focused on NR's delivery of performance to Southern and GoVia Thameslink Railway (GTR) (see separate report) and Scotland, and whether there is evidence of any wider systemic issues relating to performance delivery.

4 Our investigation included analysis of a range of issues affecting performance in Scotland. They included, but were not limited to:

- weather;
- train planning;

[4] Franchise change from First ScotRail to Abellio ScotRail 1 April 2015. Operator will be referred to as ScotRail in this evidence pack.

- the Glasgow Commonwealth Games; and
- asset performance.

1.3. Context of the investigation

5 In order to conduct our investigation we considered the following:

- the CP5 Performance Plan and quarterly progress reports that we received throughout the year;
- NR's Quarter 4 Performance Report we received on 5 May 2015;
- views and further information from ScotRail regarding NR's performance and the factors they believe influenced performance in 2014-15;
- evidence provided by NR's Internal Audit Team looking at the effectiveness of Performance Strategies on Anglia Route;
- end of year performance data for ScotRail and Scotland Route; and
- customer satisfaction as reported in Transport Focus's National Rail Passenger Survey (NRPS).

6 As part of our analysis we have looked at a range of performance metrics; we have chosen to focus on ScotRail delay minutes and PPM failures. We have also looked at performance for Scotland Route in the Asset Management section.

7 PPM and CaSL failures are key industry performance metrics for CP5 but not every operator had agreed targets for these metrics in their 2014-15 Performance Strategies. Therefore, as part of the analysis undertaken for the investigation, we have created notional PPM and CaSL targets. These targets may differ to any internal NR/operator targets or Performance Strategy targets. Please refer to **Annex E** for details on the methodology used to develop these targets.

8 We have primarily focused our analysis on NR and Train Operating Company (TOC) on Self delays but have included any TOC on TOC delay of note. TOC on TOC analysis in this report refers to delays as victim (rather than perpetrator) and includes the impact of both TOC and Freight Operating Company (FOC) delays.

9 It should be noted that due to differing volumes of delay minutes and PPM and CaSL failures, scales may vary between across the charts in this document.

10 Some of the charts included within this report show data for Control Period 4[5] (CP4). Whilst this investigation focused on NR performance in 2014-15, we have included data prior to 2014-15 where necessary to provide greater analytical context and to show the longer term trends.

1.4. Conduct of the investigation

11 We have welcomed the co-operation from NR, and industry and passenger groups in providing a range of evidence and assisting us in carrying out our investigation. This includes industry review reports, meetings and passenger group data which have formed part of the evidence base for our review. A list of our engagement is provided in **Annex G**.

12 The analysis in this report reflects the most recent data supplied to ORR by NR and includes any data refreshes made up to the end of period 1, 2015-16. Any future refreshes/reattribution of the historical data may therefore not be reflected in the numbers quoted here.

[5] Control Period 4 set the outputs that NR had to deliver from 1 April 2009 to 31 March 2014.

2. Passenger experience - Customer satisfaction

2.1 Introduction

13 It is important that we take passenger satisfaction into account when considering what impact NR's failure to achieve its regulated performance targets has had on its passengers.

2.2 Customer Satisfaction

14 A key measure of how performance affects passengers in Scotland is the National Rail Passenger Survey (NRPS). As part of the investigation we considered the ScotRail Spring 2015[6] results, which showed a decrease in satisfaction for the majority of routes when compared to the results in Spring 2014.

15 ScotRail scored 87% for overall satisfaction, 3 percentage points (pp) lower than the Spring 2014 survey. This compares with an 85% result for the regional sector (of which ScotRail is part), which was 1pp lower than the Spring 2014 survey. For punctuality and reliability ScotRail scored 84%, 3pp lower than the Spring 2014 survey. This compares with an 83% result for the regional sector, which was unchanged from Spring 2014. At route / service group level, Spring 2015 results were as follows:

[6] Spring 2015 NRPS results are based on journeys between 18 January and 20 March 2015.
Those changes highlighted in red in the table represent a statistically significant decline since Spring 2014.

Table 1: Satisfaction with ScotRail services by route, Spring 2015

Route	**Description**	**Overall Satisfaction (%)**	Change from Spring 2014 (pp)	**Punctuality / Reliability Satisfaction (%)**	Change from Spring 2014 (pp)
Interurban	Long distance services	85	-4	84	-7
Rural	Rural routes/non-urban routes	93	+4	86	-6
Strathclyde	Glasgow suburban services	88	-3	84	-1
Urban	Non-Glasgow suburban services	84	-5	81	-2
All ScotRail routes		**87**	**-3**	**84**	**-3**

16 Of these results, only the Interurban route's punctuality and reliability score has shown a statistically significant decline compared with the Spring 2014 survey. On this basis, it would suggest that performance levels in Scotland have not been a significant driver of satisfaction. Therefore this should not be considered further.

3. Scotland Route Performance 2014-15

3.1 Introduction

17 This investigation focused on whether ORR considers that NR did everything reasonably practicable in Scotland to meet its performance obligations in 2014-15. In assessing this we considered a range of factors such as weather, TOC on Self delays and External events that may have impacted on NR's delivery of its performance obligations.

18 We have focused a large part of our investigation on delay minutes and PPM failures categories data and these are shown in the tables below:

Table 2: Top 6 PPM failure categories selected for analysis for ScotRail and Scotland Route

Responsible	Category	ScotRail 2014-15 PPM failures			Scotland Route 2014-15 PPM failures		
		Actual	Target	Variance	Actual	Target	Variance
TOC-on-Self	Stations	3,979	1,385	2,594	3,999	1,317	2,683
NR-on-TOC	Network Management / Other	9,802	7,448	2,353	9,480	6,997	2,483
NR-on-TOC	Non-Track Assets	12,552	10,946	1,605	12,293	10,036	2,258
TOC-on-Self	Traincrew	3,485	2,556	929	3,624	2,543	1,081
NR-on-TOC	Severe Weather, Autumn, & Structures	6,033	5,529	503	6,067	4,717	1,350
NR-on-TOC	Track	2,805	2,313	492	2,335	2,225	111

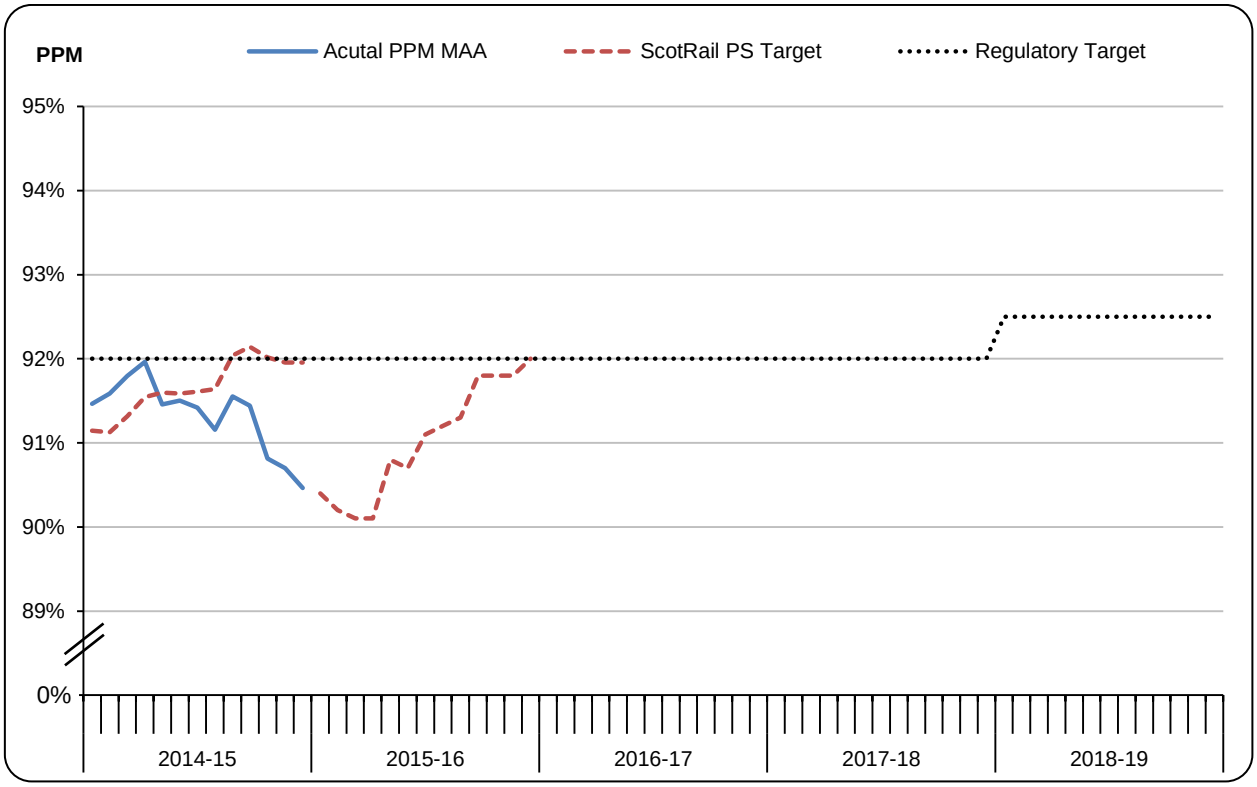
Table 3: Top 6 Delay minutes categories selected for analysis for ScotRail and Scotland Route

Responsible	Category	ScotRail 2014-15 delay minutes			Scotland Route 2014-15 delay minutes		
		Actual	Target	Variance	Actual	Target	Variance
NR-on-TOC	Network Management / Other	148,389	109,706	38,683	156,151	109,706	46,445
TOC-on-Self	Stations	49,374	22,320	27,054	51,472	22,320	29,152
NR-on-TOC	Non-Track Assets	161,436	137,436	24,000	179,245	137,436	41,809
TOC-on-Self	Traincrew	49,451	35,398	14,053	50,975	35,398	15,577
NR-on-TOC	External	63,960	57,672	6,288	68,723	57,672	11,051
NR-on-TOC	Track	38,979	36,090	2,889	35,562	36,090	528

3.2 Overview of 2014-15 performance

19 Performance in Scotland started 2014-15 in a relatively strong position, with PPM MAA exceeding the levels specified in the ScotRail Performance Strategy during the first quarter. Whilst the Commonwealth Games caused a performance dip in period 5, it was recovered well enough by the end of quarter 2 for Scotland's PPM MAA to be 0.1pp short of target. The latter half of 2014-15 however, saw a steady decline in performance and an increase in reactionary delays. By the end of the year, the PPM MAA in Scotland was 90.5%, 1.5pp below its regulatory performance target of 92.0%.

Figure 1: PPM MAA and Targets, ScotRail, 2014-15 to 2018-19



3.3 Summary of factors considered for adjustment

20 The table below summarises the areas we investigated as potential adjustments.

Table 4: PPM adjustment, ScotRail, 2014-15[7]

ScotRail		
Category	**Adjustment recommended?**	**PPM impact**
Commonwealth Games	✓	0.6pp
Severe Weather, Autumn and Structures	×	
External	✓	0.003pp
Traincrew	×	
Passenger Growth	×	

	Actual PPM MAA	**Adjusted PPM MAA**	**Variance to Performance Strategy target**
ScotRail	90.5 %	91.0 %	1.0pp

21 Analysis was not undertaken for Fleet as this category performed better than target for both PPM failures and delay minutes in 2014-15.

3.4 Commonwealth Games and Station delays

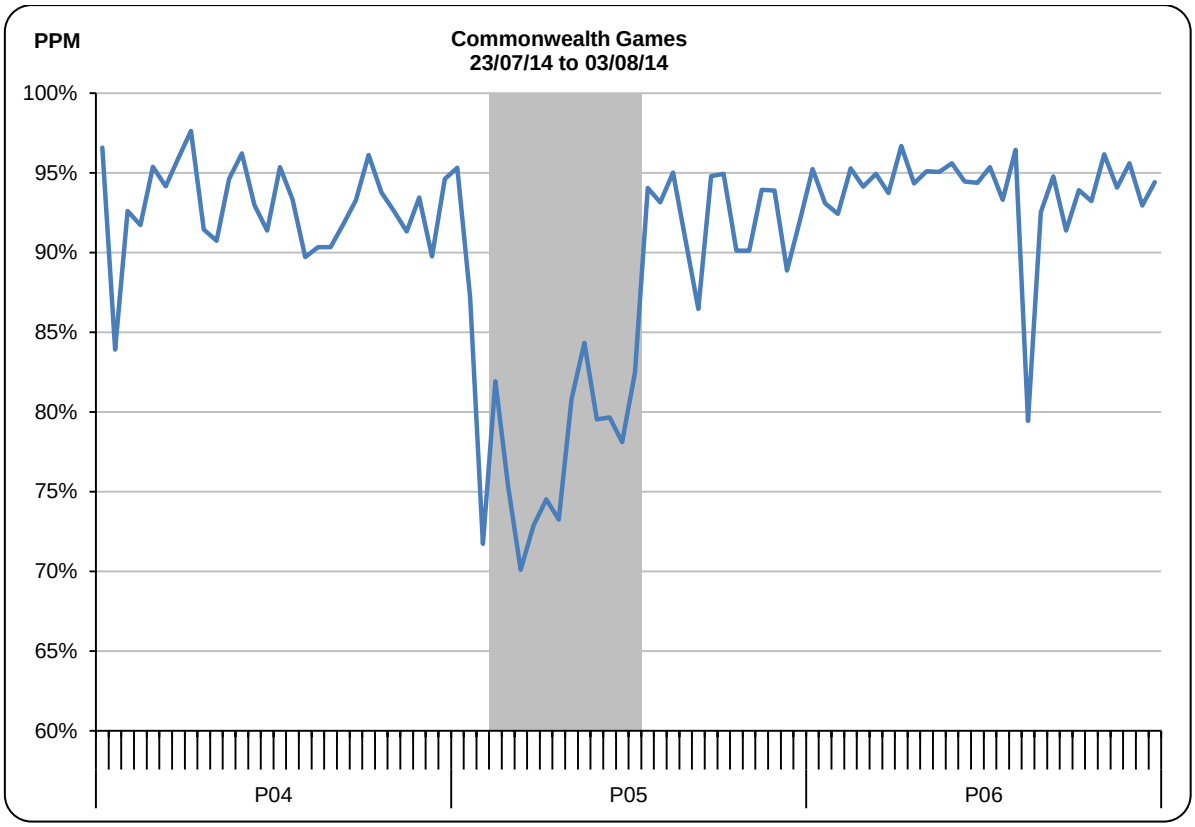
22 As part of our investigation we assessed the impact that the Commonwealth Games, held in Glasgow between 23 July 2014 and 3 August 2014, had on train service reliability and punctuality in Scotland. The full analysis is set out in a separate report contained in **Annex C**.

23 Passenger demand during the Commonwealth Games period resulted in higher than expected station delay. Approximately 24%[8] of the total delay minutes caused to ScotRail in period 5 were attributed to station delays. During the 12 day period of the Commonwealth Games, ScotRail's daily PPM reduced to an average of 77.7%. The average daily PPM for other days in period 5 was 90.8%.

[7] Figures may not sum due to rounding

[8] Delay minutes attributed to the Stations KPI category was 27,434 delay minutes in period 5.

Figure 2: ScotRail Daily PPM Scores, 2014-15 Periods 4 to 6



24 The impact of Stations-caused PPM failures in period 5 had a significant impact on 2014-15 performance. Our analysis has shown that PPM failures due to the Stations KPI category exhibited the greatest variance to target at the end of 2014-15, with 3,979 PPM failures being attributed to ScotRail during 2014-15 for this category.

Analysis/Conclusions

25 We recognise that both NR and ScotRail acted pragmatically during the Commonwealth Games period to ensure the successful movement of passengers rather than prioritising performance. We agreed to consider this during our investigation. However we note that there were also issues with the timetable that contributed to a reduced level of performance during this period. We calculate that the Commonwealth Games impacted ScotRail's PPM MAA by 0.6pp in the year end result.

3.5 Weather

26 Scotland experienced some strong winds and heavy rainfall during the year, in particular a major storm on 8 and 9 January 2014 which led to the implementation of an emergency timetable.

27 As part of the investigation NR told us that the Meteo Group forecast on 8 and 9 January was of a similar severity to other occasions when, due to anticipated weather conditions, service alterations had been implemented. NR and ScotRail therefore initially planned to operate a revised timetable, cancelling services only when it became apparent that conditions had considerably worsened since receipt of the forecast.

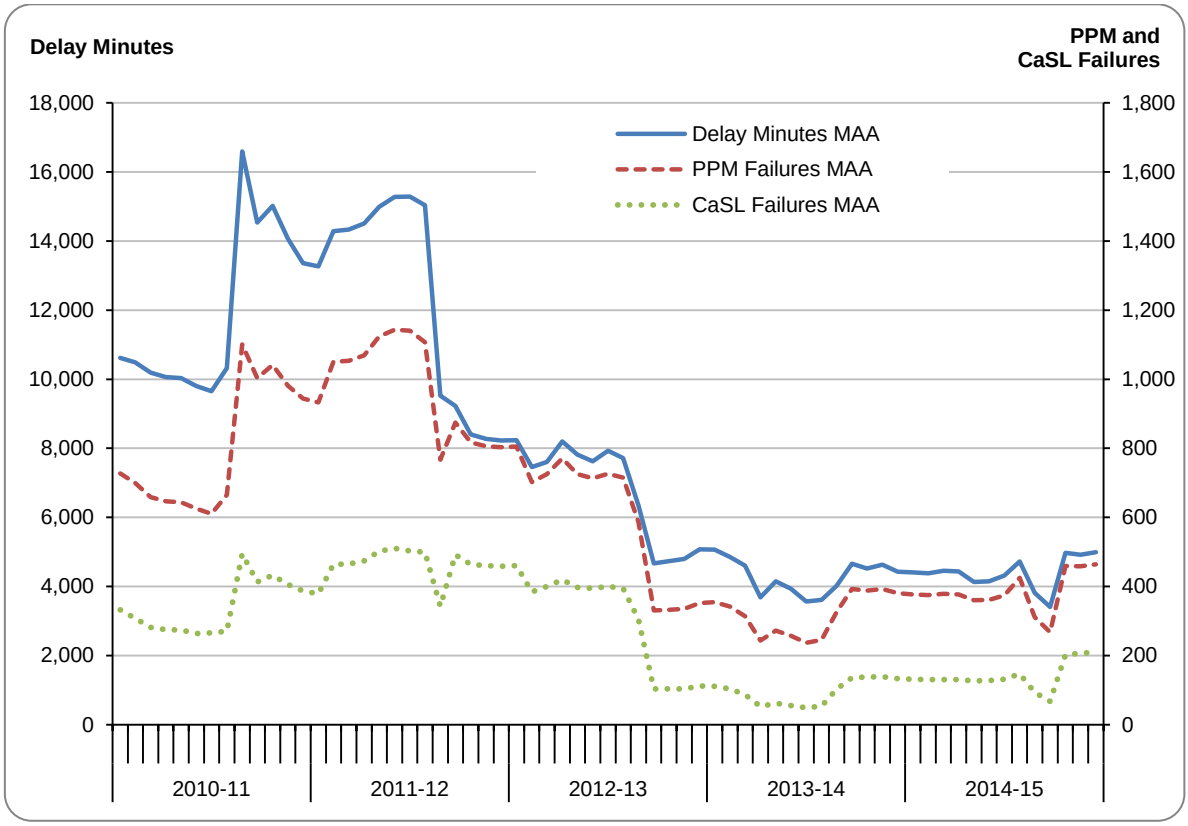
28 The cancellation of services was undertaken by the Route Control after the 22:00 deadline[9] and therefore counted towards the daily PPM figure. The daily PPM for ScotRail on 9 January 2015 was 31.4% in comparison to 10 December 2014, when a similar forecast was issued, which achieved a daily PPM result of 76.3%.

29 At the end of 2014-15 delay minutes caused to ScotRail services for the Severe Weather, Autumn and Structures KPI category totalled 64,921, an increase of 13% on the previous year and 1% worse than the 2014-15 target.

30 ScotRail experienced just over 6,000 PPM failures as a result of Severe Weather, Autumn and Structures in 2014-15, a 22% increase on 2013-14 and 9% worse than the 2014-15 target. There were 2,734 CaSL failures in 2014-15, with full cancellations making up the majority of this total. The number of CaSL failures in 2014-15 was 58% higher than the total for 2013-14.

[9] Punctuality is measured against the train plan that is contained in industry systems as of 22.00 the previous day.

Figure 3: Severe Weather, Autumn and Structures delay minutes, PPM failures and CaSL failures, ScotRail, 2010-11 to 2014-15



Analysis/Conclusions

31 Despite the volume of delay minutes and PPM and CaSL failures attributed to Severe Weather, Autumn and Structures in 2014-15, our analysis has not identified any extreme weather days in Scotland. When compared with previous years, the weather was relatively benign although delay minutes associated with this category group did increase by 13%.

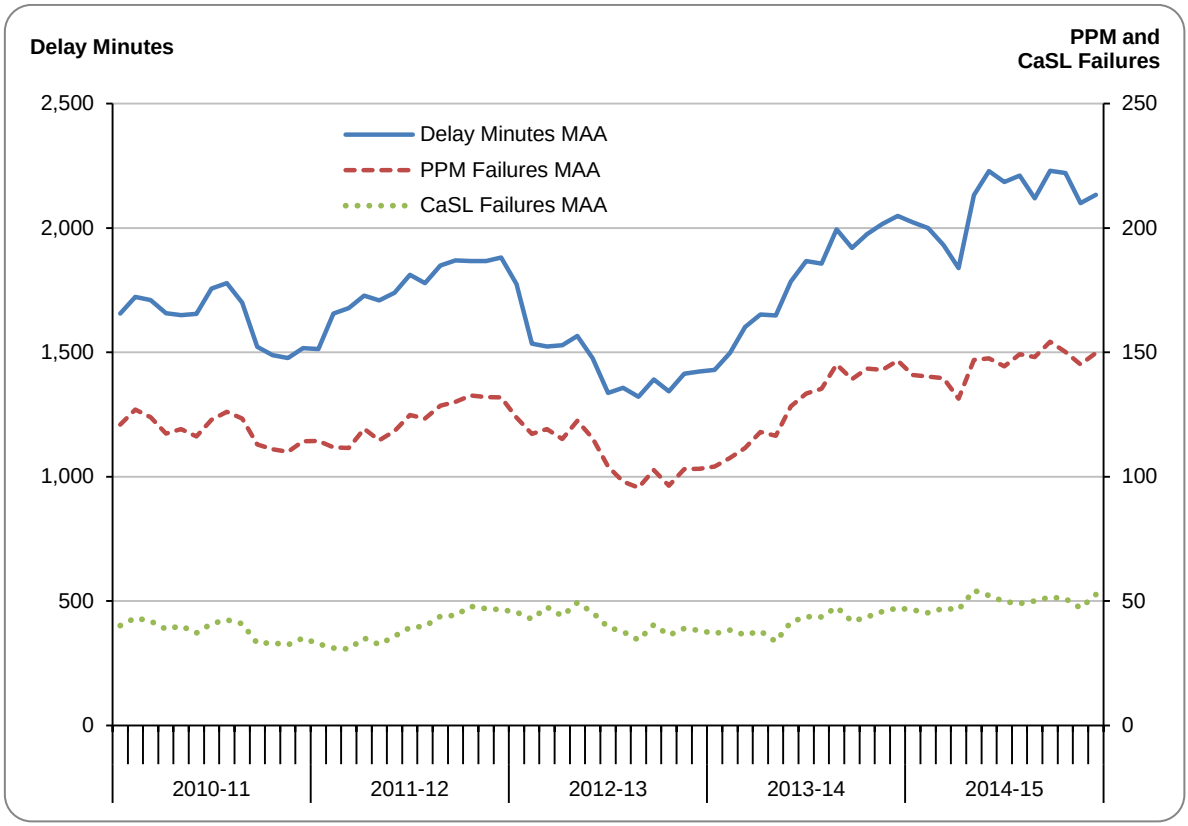
32 We have concluded that no adjustment should be made for weather in 2014-15.

3.6 Delay factors affecting performance: i) External and ii) Traincrew

i) External

33 Over the last two years delay minutes and PPM failures in the External KPI category have gradually increased. ScotRail ended 2014-15 11% worse than target with a total of 63,960 delay minutes.

Figure 4: Fatalities and Trespass delay minutes, PPM Failures and CaSL Failures, ScotRail, 2010-11 to 2014-15



34 Last year Fatalities and Trespass incidents accounted for the greatest amount of delay minutes and PPM failures in the External KPI category. At the end of 2014-15 delay minutes for Fatalities and Trespass incidents impacting ScotRail services stood at 27,740, which was 19% worse than the 2014-15 target. ScotRail experienced 1,947 PPM failures in 2014-15 due to Fatalities and Trespass incidents, 17% worse than target.

35 Despite the high volume of minutes and PPM failures, the number of incidents in Scotland has remained stable for the majority of 2014-15.

36 We have seen evidence of good practice in the area of fatality prevention, with Scotland Route working collaboratively with a number of agencies, such as the British Transport Police (BTP), the National Health Service, local authorities and the Samaritans.

37 We have seen evidence of Major Projects undertaking community engagement programmes in Scotland. For example, NR has liaised with Aberdeenshire Council to discuss how the Aberdeen to Inverness Improvement Programme is engaging with external organisations to promote health and wellbeing in areas where a more frequent train service will be introduced per hour due to the project. Additionally NR has stated that it is looking to implement in collaboration with the Scottish Football Association, 12 community hubs, along the line of the Edinburgh-Glasgow Improvement Programme (EGIP). These will provide coaching whilst implementing rail safety messages over a sustained period of time.

Analysis/Conclusions

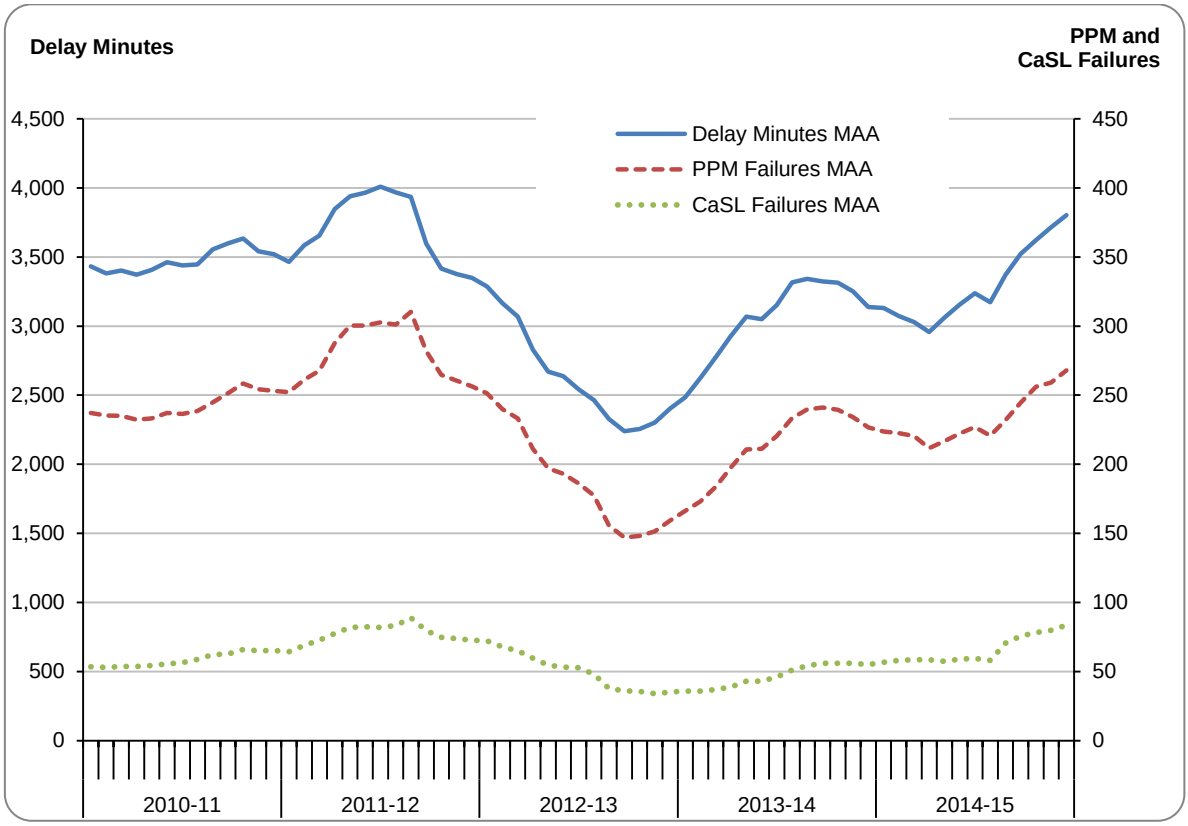
38 Overall delay minutes for the External KPI category exceeded target by just over 6,000 minutes (11%) We recognise the continued good work by NR on fatality prevention and that the impact of these incidents are not entirely within NR's control.

39 Based on the External delay minutes outturn at the end of 2014-15, our analysis estimates that External delay minutes above target account for a very small proportion (0.003pp) of ScotRail's overall PPM loss.

ii) Traincrew

40 At the end of 2014-15 delay minutes due to Traincrew on ScotRail services totalled 49,451, an increase of 21% on the level seen in 2013-14 and 40% worse than target. Traincrew delay minutes accounted for 6% of all delay minutes accrued during the year. ScotRail experienced 3,485 PPM failures due to Traincrew in 2014-15, an 18% increase on 2013-14 and 36% worse than target.

Figure 5: Traincrew delay minutes, PPM Failures and CaSL Failures, ScotRail, 2010-11 to 2014-15



41 As part of the investigation we noted the driver training requirements for the two routes that were electrified in 2014-15 along with general traincrew availability. Both contributed to the increase in the 2014-15 traincrew performance figures.

42 NR Scotland Route stated that it believed sub-threshold minutes also contributed to a rise in Traincrew delays in 2014-15. NR has stated that where there was '*no single delay and no obvious passenger/unit issue'* delays were '*allocated to traincrew but (were) most likely in reality the Timetable'*.

Analysis/Conclusions

43 Our analysis estimates that Traincrew delay minutes above target account for approximately 0.01pp of the total ScotRail PPM in 2014-15.

44 While there were Traincrew issues in 2014-15 in Scotland, NR has highlighted that some of the increase in Traincrew delays may be linked to data quality issues. We therefore do not consider this category warrants an adjustment for 2014-15.

4. Network Rail's performance planning, management and delivery

4.1 Introduction

45 In assessing whether NR has done everything it can to meet its performance obligations in Scotland for 2014-15, we considered a range of factors which may have affected performance; further to those set out in chapter 2. We considered the following issues:

- what NR considered to be the issues affecting its performance in 2014-15;
- whether NR did everything it said it would do in the CP5 Performance Plan;
- whether the performance improvements had the effect NR thought they would; and
- whether NR was up to date on its day to day maintenance of the network (including the organisation of maintenance work, asset renewals, track faults, signalling and power supply, overhead line electrification and the implementation of new technology).

4.2 Performance Planning

46 As part of the quarterly updates ORR receives for the CP5 Performance Plan, NR has stated that a number of milestones in Scotland have been delivered late or are forecast to be delivered late.

47 The table below shows the degree of adjustment, slippage and delivery for milestones in Scotland in 2014-15:

Table 5: Degree of Milestone Adjustment, Slippage and Delivery, Scotland, 2014-15

Status	Q1	Q2	Q3	Q4
On time (Complete)	-	3	4	5
Early (Complete)	1	-	-	-
Late (Complete)	-	10	10	12
On time (Forecast)	14	11	12	11
Late (Forecast)	11	3	6	4
On Hold	-	-	-	-
Abandoned	-	-	-	2
Total	**26**	**27**	**32**	**34**

48 At the end of quarter 4, 12 of the 17 milestones delivered in 2014-15 were delivered later than the targeted delivery date by an average of 53 days. The milestones completed late were targeting improvements in the Specification[10], Primary (delay), Seasonality, Extreme Days and Severe Weather PPM attrition categories.

Table 6: Milestones completed late in Scotland in 2014-15

Category	Programme Sub Group	Milestone Description	Completion Date		Days late
			Baseline	Actual	
Specification	Route / TOC Short Term Timetable Review and Change	Joint Resilient Timetable Review – Sectional Running Time (SRT) Review	21/06/14	01/10/14	-102
Specification	Route / TOC Short Term Timetable Review and Change	Agreement with ScotRail to use data received from Signal Box Monitor / Joint analysis of data, for quality and auditing purposes	21/06/14	01/10/14	-102
Specification	Route / TOC Short Term Timetable Review and Change	Use of NEXALA - Set up trial sites and verify accuracy / Joint analysis of data, for quality and auditing purposes / Set up rules within Spectrum to email Inverness Signalling Centre times of arrival /departure at specified locations for manual input to Trust / Implement new process	21/06/14	01/10/14	-102
Specification	Route / TOC Short Term Timetable Review and Change	Joint Resilient Timetable Review – Temporary Speed Restriction (TSR)/Permanent Speed Restriction (PSR) Review	11/10/14	01/01/15	-82
Specification	Route / TOC Short Term Timetable Review and Change	Joint Resilient Timetable Review - Reducing schedule errors through increased staff engagement, introduction of "competency standards" model and resultant action planning, increased and improved joint working with ScotRail and Timetable Planning Rules (TPRs) review as part of PPRP.	21/06/14	21/08/14	-61
Specification	Route / TOC Short Term Timetable Review and Change	Joint Resilient Timetable Review - Continuing Analysis	06/12/14	30/01/15	-55

[10] Reflects the underlying capability of the operational plan and timetable

Primary	Tactical Reliability Plan and Maintenance Campaigns	Project to redesign and renew targeted power cables based on risk assessment	21/06/14	10/08/14	-50
Seasonality	National Vegetation Management Plan	Removal of trees identified through Light Detection And Ranging (LIDAR) survey, improvements to Overhead Line trips, obscured signals and autumn. Complete specified clearance work / Introduce bush fighters to more effectively and efficiently deal with line side vegetation.	21/06/14	04/08/14	-44
Primary	Tactical Reliability Plan and Maintenance Campaigns	Migrate the TDM transmission to the Fixed Telecoms Network (FTN) network through accoda / Identification of Rogue Assets / Signal Lamp Conversion to LED	21/06/14	07/07/14	-16
Specification	Temporary Speed restriction Improvement	Identification of Temporary Speed Restrictions (TSRs) creating the highest performance impact / Develop plans for the removal of high impact TSR's	21/06/14	04/07/14	-13
Extreme Days	Other Network management Schemes	Contingency plans for controlled shutdown of small section of the network. Managed strategy for commissioning	21/06/14	27/06/14	-6
Severe Weather	Drainage and earthworks renewals	Flood prevention work at Dalmarnock, Greater Winchburgh and Queen St: Will be reviewed through the regular meetings of the Water Management Group	21/06/14	26/06/14	-5

49 Scotland Route has stated that at the end of 2014-15, Specification exhibited the greatest variance to plan and that the specification 'gap' had increased from 2.7% in December 2013 to 3.8% in May/December 2014. We have seen evidence suggesting that the six completed milestones exhibiting the greatest slippage targeted an improvement in the Specification KPI category along with one of the abandoned milestones. Whilst three additional Specification milestones were added to the CP5 Performance Plan in 2014-15, these are all planned for delivery in 2015-16.

50 The average delay for the four milestones forecast to be delivered late is 306 days. The milestones are spread across the Primary, Reactionary and Seasonality PPM attrition groups.

Table 6: Milestones forecast to be completed late in Scotland

Category	Programme Sub Group	Milestone Description	Completion Date		Days late
			Baseline	Actual	
Primary	Tactical Reliability Plan and Maintenance Campaigns	Fitment of 12 Uninterruptable Power Supply (UPS) systems at the following locations: Craigendoran, Dalmeny, Dalreoah, Finnieston, High St, Law, Lugton, Portobello, Winchburgh, Carstairs, Slateford and Lockerbie	06/12/14	30/05/15	-175
Reactionary	Service Recovery	Introduction of Automatic Route Setting (ARS+) on selected workstations within WSSC	31/03/15	31/03/16	-366
Reactionary	Service Recovery	Training of signallers and carryout acceptance testing	27/06/15	27/06/16	-366
Seasonality	RHTT circuits to be reviewed with better data from OTMR	Railhead Treatment Train (RHTT) circuits to be reviewed with better data from On Train Monitoring Recorder (OTMR)	21/06/14	02/05/15	-315

51 Scotland Route has also stated that at the end of 2014-15 Reactionary PPM loss was worse than target by -0.55pp. We have observed a high level of slippage associated with the four milestones forecast to be delivered late, two of which targeted an improvement in Reactionary delays and are forecast to be late by 366 days. Of the eight additional milestones in 2014-15, none relate to the Reactionary KPI category.

52 We wrote to NR on the 18 December 2014 stating that although we were continuing to monitor Scottish PPM during the first two years of CP5, we would '*expect to see evidence of the Performance Plan being adjusted if performance in Scotland continues to decline*' beyond the levels exhibited at the end of Quarter 2. At the end of period 7, the PPM (MAA) in Scotland was 91.4%, 0.6pp below the year-end target, in comparison to the end of 2014-15 when the figure was 90.5% 1.5pp below target.

53 At a meeting on the 11 May 2015, NR Scotland Route stated that the reporting of milestones in the CP5 Performance Plan in 2014-15 had been poor and that slipped and late milestones had not been adequately replaced through the Change Control process. Scotland Route confirmed that they have taken steps to address this issue.

54 ScotRail has confirmed that its 2014-15 Performance Strategy had realistic PPM, Right Time and cancellations targets.

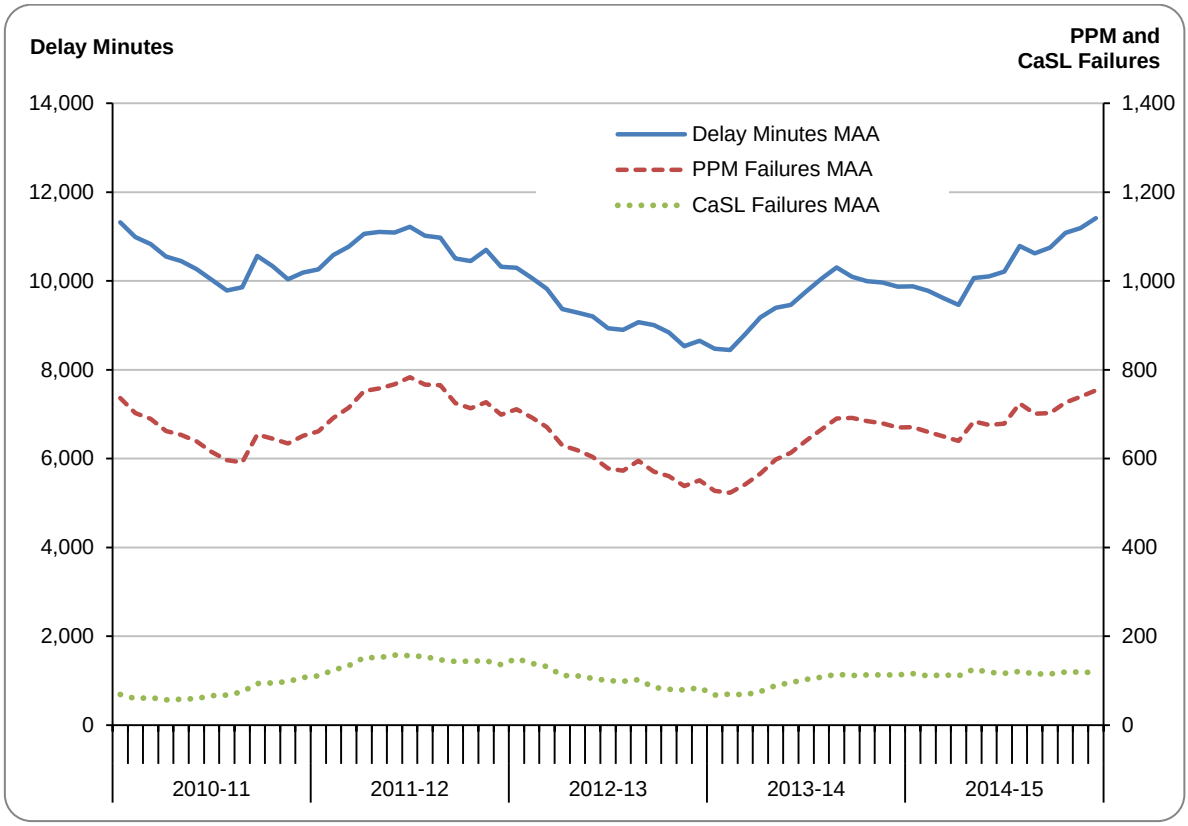
Analysis/Conclusions

55 At the end of 2014-15, the Specification PPM attrition group exhibited the greatest variance to target. The six completed milestones exhibiting the greatest slippage targeted an improvement in the Specification PPM attrition group. Reactionary (delay) was also worse than target and we have observed that two of the four milestones forecast to be delivered late are targeting an improvement in this attrition group. We therefore consider that there was not sufficient evidence of the CP5 Performance Plan in Scotland being adjusted to reflect changing circumstances in 2014-15. However, NR has admitted that milestones in the CP5 Performance Plan were not adequately adjusted through the Change Control process in 2014-15. The slippage seen in the CP5 Performance Plan therefore did not reflect the wider delivery of ScotRail's Performance Strategy milestones. NR has stated that it has taken steps to resolve the Change Control issues experienced in 2014-15.

4.3 Network Management and Other

56 Delays attributed to the Network Management and Other KPI category showed an increase in 2014-15 compared to the previous year. At the end of 2014-15, ScotRail delay minutes attributed to the Network Management and Other KPI category totalled 148,389 minutes, 16% higher than 2013-14 and 35% worse than target.

Figure 6: Network Management and Other Delay Minutes, PPM Failures and CaSL Failures, ScotRail, 2010-11 to 2014-15



57 ScotRail PPM failures caused by the Network Management and Other KPI category were worse than target by 2,353 PPM failures or 32%. In terms of variance to target, this was the second worse performing category in 2014-15.

58 The increase in Network Management and Other delays for ScotRail has been driven by the Operations, Takeback / Unexplained and Timetable Planning KPI sub-categories. All three of these sub-categories performed worse than target in 2014-15.

i) Timetable Planning delays

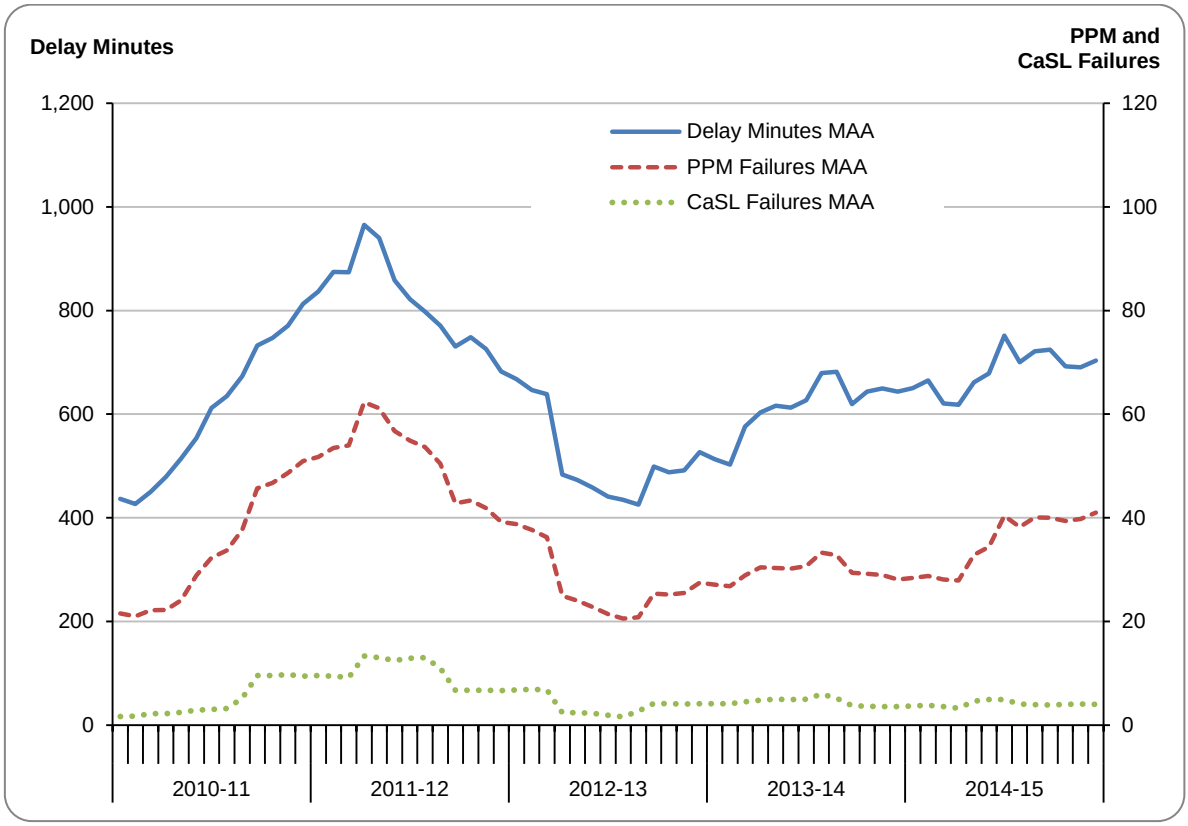
59 Timetable planning delays in Scotland worsened in 2014-15. At the end of period 13, delay minutes associated with timetable planning were 9% worse than 2013-14 and 2% of the total delay caused to ScotRail by NR. Whilst the proportion of delay minutes due to timetabling errors was relatively small, NR has confirmed to us that Specification performed significantly worse than target. The Specification attrition group reflects the underlying capability and resilience of the timetable and, when looking at the PPM attrition model, was the greatest loss of PPM to ScotRail services in 2014-15.

60 The electrification of the Cumbernauld and Carmyle lines led to two timetable changes in May and December 2014 respectively. The Cumbernauld electrification led to through services being operated between Cumbernauld and the North Electric line, while the Carmyle electrification resulted in services from the Whifflet area being operated as through services over the Argyle line to the North Electric line.

61 At a meeting on the 11 May 2015, NR Scotland Route stated that the May 2014 timetable change resulted in a 2% reduction in PPM on the North Electric and Argyle lines. In particular a number of issues became apparent with Sectional Running Times (SRTs) for newly electrified services in the Cumbernauld area.

62 Further analysis undertaken by NR has indicated that a full evaluation of the Timetable Planning Rules (TPRs) is required before they can be rectified in the Working Timetable (WTT). Whilst this exercise was originally planned to be undertaken for the May 2015 timetable change, NR told us that as there was no stable period of performance for the exercise to be undertaken, therefore the bid and offer deadlines for the May 2015 timetable change were missed. The TPRs evaluation has therefore been re-planned for completion in March 2016.

Figure 7: Timetable Planning delay minutes, PPM Failures and CaSL Failures, ScotRail, 2010-11 to 2014-15



63 NR has stated that delays associated with the Specification KPI category also showed an increase following the December 2014 timetable change. We have been told by NR Scotland Route that resilience of the timetable was reduced due to a high proportion of driver route familiarisation training being undertaken on operational services. Since the completion of driver training, NR has stated that there has been a performance improvement in the Specification KPI category.

64 ScotRail has informed us that the issues emerging following the May and December 2014 timetable changes indicate that the TPRs are not *'fit for purpose'* and 'act against the good running and performance of our services on the Glasgow suburban network'.
Whilst NR has identified a number of improvement plans, such as the retiming of trains between Motherwell and Whifflet where necessary, ScotRail has said that progress has been '*slow to date, but we are beginning to see an appetite to make this happen'*.

65 Our analysis has shown that the point to point timings between Whifflet and Rutherglen East Junction were significantly reduced from 18½ to 15 (subsequently 15½) minutes in the westbound direction and 21½ to 17½ minutes in the eastbound direction, when compared to the previous diesel timings. This appears to be greater than might be expected. The

eastbound changes included the removal of both station dwell time and two minutes' recovery time which will have reduced the resilience of the timetable to recover in times of perturbation.

Analysis/Conclusions

66 Whilst NR has recognised a number of areas for improvement, our analysis of the December 2014 timetable, summarised in **Annex D**, has highlighted several operational planning errors that could have been avoided. In particular, our analysis found a number of tight timings and we therefore believe that a comprehensive review of the TPRs is needed, with the Rutherglen and Hyndland Junctions areas especially in need of attention. NR has confirmed to us that a full review of the TPRs is being progressed and will be complete by March 2016.

67 The evidence shows that there were a number of issues with the modelling work undertaken prior to the introduction of electrified services in the Whifflet area which reduced the reliability of the timetable.

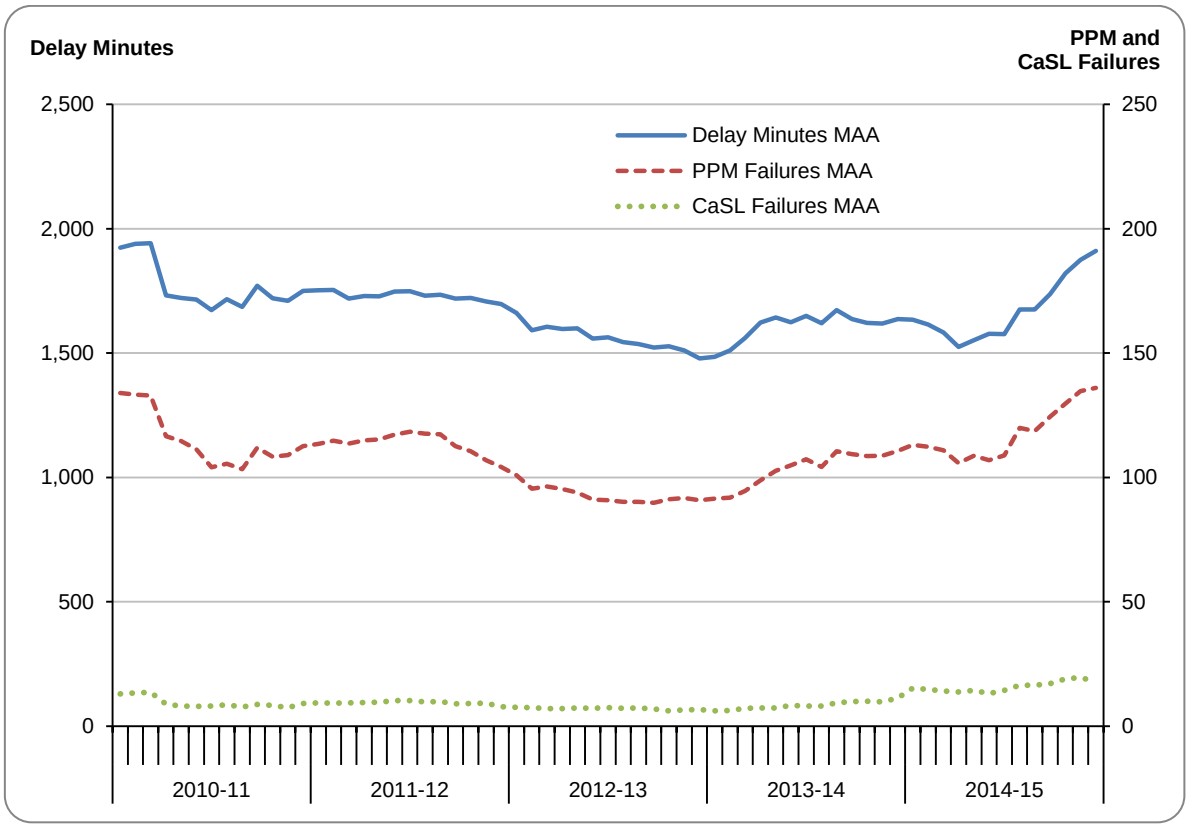
68 Our investigation has found the May and December 2014 timetable changes were significant factors behind NR's failure to achieve its regulated PPM target in 2014-15.

ii) Operations

69 Operational delays caused to ScotRail services increased in 2014-15. At the end of 2014-15, delay minutes associated with NR Operations[11] were 22% worse than 2013-14 and accounted for 7% of the total delays caused by NR to ScotRail services. Delay minutes associated with Signalling errors in particular increased by 17% and were 37% worse than target.

[11] Based on NR Operations for Signalling, Control, railhead conditioning trains and Other

Figure 8: Signalling Operations Delay Minutes, PPM Failures and CaSL Failures, ScotRail, 2010-11 to 2014-15



70 PPM failures for NR Operations signalling errors totalled 1,768 in 2014-15, which was 23% greater than the 2013-14 figure and 44% worse than target.

71 NR Scotland Route told us that whilst there has been no '*obvious trends*' that caused the rise in signalling delays, the trend was most noticeable at Motherwell Signalling Centre where: *'M399 signal at Platform 2 at Motherwell Station has been causing issues with poor regulating which may be partly due to the change of service. An alert has been issued to highlight this and relevant staff have been given coaching on improving performance for delays'.*

Analysis/Conclusions

72 Based on the evidence available we consider that NR is taking reasonable steps to address the rise in Signalling delays.

iii) Unexplained and Uninvestigated delays

73 Unexplained and Uninvestigated delays caused to ScotRail services have also increased in 2014-15. At the end of 2014-15, Unexplained delay minutes for ScotRail were 48% worse than in 2013-14 and 73% worse than target. Uninvestigated delay minutes affecting ScotRail services rose from 3,373 in 2013-14 to 18,555 in 2014-15, exceeding the year end of target of 2,882. At the end of 2014-15, PPM failures for unexplained delays totalled 1,854, 53% worse than the previous year and 79% worse than target. Uninvestigated delays totalled 1,408 in 2014-15, an increase of 1,164 failures compared to 2013-14, leading to ScotRail ending the year 575% worse than target.

Figure 9: Unexplained Delay Minutes, PPM Failures and CaSL Failures, ScotRail, 2010-11 to 2014-15

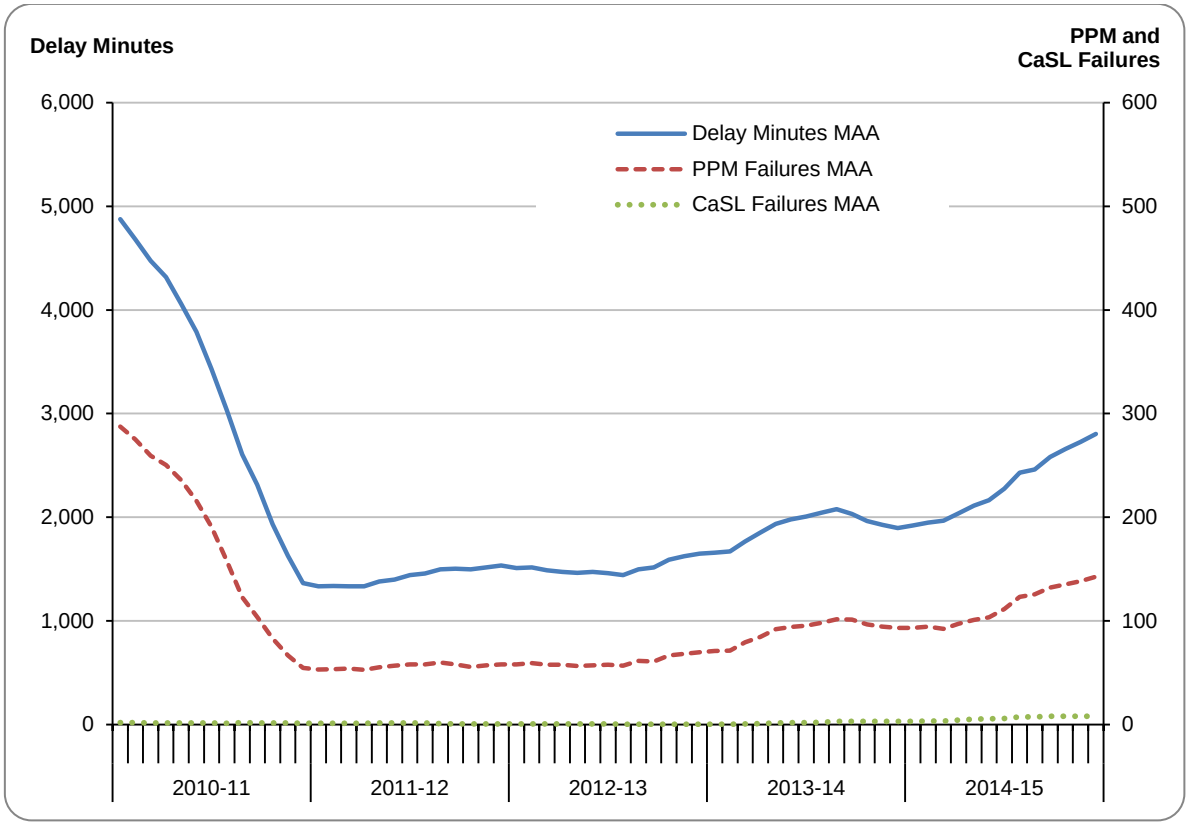
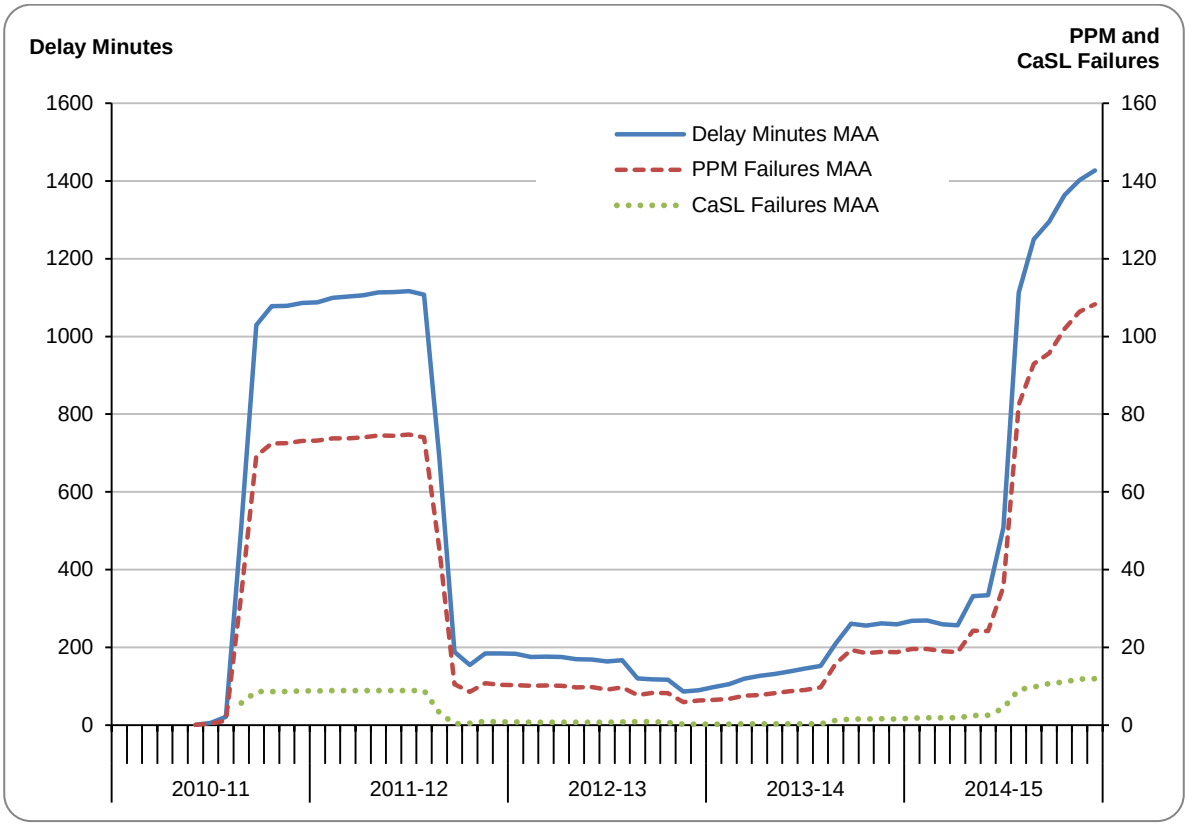


Figure 10: Uninvestigated Delay Minutes, PPM Failures and CaSL Failures, ScotRail, 2010-11 to 2014-15



74 NR stated to us that Unexplained delay minutes increased by 105% between 2013-14 and 2014-15. The most noticeable increase was in the Perth Delivery Unit (DU), where Unexplained delay minutes have increased by 122%. NR believes that much of this additional delay (in the Perth DU) has been generated '*from the timetable issues on the Far North line and the acceptance of all the delay by NR*'. We also understand that NR has experienced a period of high staff turnover and shortfalls in TRUST Delay Attribution (TDA) staff.

75 NR has also stated that a change of attribution policy was adopted in 2014-15 where, if an error was found for reattributions post-day 1, incidents were reattributed to Uninvestigated '*in a bid to improve overall quality, but this is a case of moving delay rather than fixing it so have action plans to remove from unexplained*'.

Analysis/Conclusions

76 We have concluded that a large proportion of the rise in Unexplained and Uninvestigated delays can be attributed to the high levels of staff turnover experienced in 2014-15.

77 NR has recognised that there is potential for a similar situation to occur in 2015-16 and have introduced an 'accelerated training plan' reducing the training period for new TRUST[12] Delay Attribution (TDA) staff from six to three months.

78 We note that NR Scotland Route has stated that the increase in Unexplained delays may have also been linked to timetable issues.

4.4 Asset Performance

Composite Reliability Index

79 The Composite Reliability Index (CRI) is part of the CP5 replacement for the previously used Asset Stewardship Indicator (ASI). The CRI is a proxy measure for the contribution we expect from asset reliability in order to deliver the required punctuality (PPM).

80 The CRI shows the percentage improvement of asset reliability compared to the baseline taken at the end of CP4 by assessing the component measures covering the key asset disciplines: track, signalling, points, electrical power, telecoms, buildings, structures and earthworks. Each component measure is given a weighting, calculated as the effective cost per failure, based on train performance and safety.

81 The train performance costs are broken down into the criticality of the route on which the failures occurred to give a more accurate analysis of impact. Route criticality is based on the breakdown of the railway into Strategic Route Sections (SRS). Five criticality bands are initially defined by the average historical cost per failure with band one having the highest level of cost and band five the lowest.

82 Therefore, failure to achieve the CRI targets will have a corresponding detrimental impact on performance (PPM). Although there may be a time lag between degradation in asset

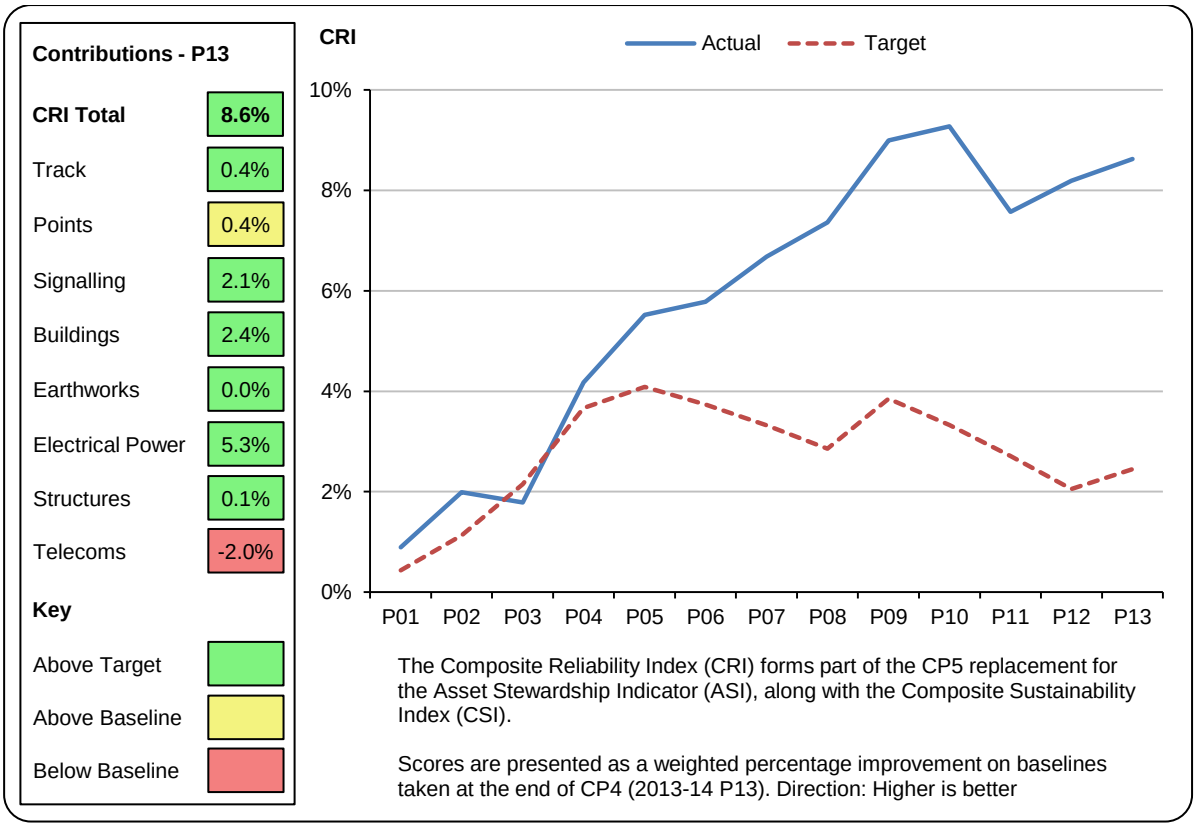
[12] a nested acronym standing for Train Running System on TOPS (Total Operation Processing System)

performance and impact on punctuality, there is a relationship between defects and delay minutes.

83 As the assets get older and condition degrades the likelihood of failure also increases. If interventions (maintenance and renewals) are not carried out in good time then the risk of failure increases and performance will generally also degrade over time. We therefore monitor the volume of maintenance and renewals activity in order to support performance and sustain both the condition and performance.

84 The CRI for Scotland Route improved in 2014-15 by 9% with all asset groups exceeding target except Telecoms and Points. This indicates a 9% improvement in asset reliability compared to the exit of CP4.

Figure 11: Composite Reliability Index, Scotland, 2014-15



Asset Condition Reliability

85 With the exception of Telecoms (+40%) and Points (+6%), all of the CP5 asset condition reliability indicators ended 2014-15 better than the targets contained in the CP5 Delivery Plan.

86 In terms of the asset sustainability (condition) indicators, Telecoms and Points performed worse than the Delivery Plan target. All other areas showed an improvement against target at the end of 2014-15.

Table 7: Asset Condition Reliability Indicators, Scotland, 2014-15

Asset	Description	2014-15	Delivery Plan
Track	Rail Breaks & Immediate Action Defects per 100km	2.57	6.65
	Poor Track Geometry (%)	1.77%	2.40%
	Track failures (service affecting)	366	381
Signalling	Signalling failures (service affecting)	1,722	1,824
Telecoms	Telecoms failures (service affecting)	298	213
Electrical Power	AC traction power failures (service affecting)	56	86
	Non traction power supply failures (service affecting)	32	42
Buildings	Buildings - Re-active Faults (2&24)	371	590
Structures	Structures open work items with a risk score >= 12	90	98
Earthworks	Earthworks failures	11	21
Points	Points failures (service affecting)	465	440

Track Assets

87 For plain line track renewals in Scotland a 30% shortfall compared to the delivery plan is forecast for 2014-15. The majority of this is slippage in refurbishment works and the lost volume has been re-planned for later years in CP5.

Table 8: Infrastructure Delay Incidents and Minutes, Scotland, 2013-14 and 2014-15

	Incidents			Minutes			Delays Per Incident		
	14-15	13-14	Variance	14-15	13-14	Variance	14-15	13-14	Variance
Track	**362**	**383**	**-5%**	**33,269**	**42,413**	**-22%**	**92**	**111**	**-17%**
TSRs Due to Condition of Track	25	76	-67%	1,301	16,452	-92%	52	216	-76%
Track Faults including Broken Rails	337	307	10%	31,968	25,961	23%	95	85	12%
Gauge Corner Cracking	0	0	0%	0	0	0%	0	0	0%
Non-track assets	**2,571**	**2,657**	**-3%**	**200,682**	**185,194**	**8%**	**78**	**70**	**12%**
Points failures	465	451	3%	56,106	39,521	42%	121	88	38%
Level crossing failures	177	138	28%	7,847	4,490	75%	44	33	36%
OLE/Third Rail faults	56	133	-58%	12,112	14,924	-19%	216	112	93%
Signal Failures	465	419	11%	17,274	14,648	18%	37	35	6%
Track Circuit Failures	327	399	-18%	23,881	30,224	-21%	73	76	-4%
Axle Counter Failures	58	98	-41%	10,462	10,404	1%	180	106	70%
Signalling System & Power Supply Failures	526	636	-17%	53,040	44,109	20%	101	69	45%
Other Signal Equipment Failures	146	97	51%	3,151	3,766	-16%	22	39	-44%
Telecoms failures	298	177	68%	9,462	5,141	84%	32	29	9%
Cable faults (signalling & comms)	53	109	-51%	7,345	17,967	-59%	139	165	-16%
Other	**556**	**607**	**-8%**	**37,181**	**40,181**	**-7%**	**67**	**66**	**1%**
Civil Engineering structures, earthworks & buildings	37	24	54%	4,459	3,448	29%	121	144	-16%
Other infrastructure	329	335	-2%	12,575	16,710	-25%	38	50	-23%
Track Patrols & related possessions	0	2	-100%	1	9	-87%	0	5	-100%
Mishap - infrastructure causes	124	184	-33%	13,107	14,945	-12%	106	81	30%
Fires starting on Network Rail Infrastructure	1	2	-50%	65	1,608	-96%	65	804	-92%
Bridge strikes	65	60	8%	6,974	3,462	101%	107	58	86%
Total infrastructure	**3,489**	**3,647**	**-4%**	**271,133**	**267,789**	**1%**	**78**	**73**	**6%**

Non-track Assets

88 At the end of period 13, signalling renewals were forecast to be 57% behind plan following delays completing several large re-signalling schemes. Work on civils also fell behind plan, with a 13% shortfall for underbridges but a 38% over delivery for earthworks.

89 Switches and Crossings (S&C) renewals at the end of 2014-15 were forecast to be 12% behind plan. The Points reliability index showed that Scotland Route was better than target, however the index fell below target for the later periods of the year following a high number of failures during period 11. Scotland Route finished 2014-15 with a Points Reliability Index of 2%, only slightly behind target.

90 Track Faults and Points failures contributed to 32% of the total delay minutes in Scotland in 2014-15.

91 Telecoms failures increased by 68% in 2014-15, although this was mainly associated with GSM-R (Global System for Mobile Communications – Rail) issues which was a systemic problem across the rail network.

Maintenance Volumes

92 For CP5 we asked NR to provide more detailed reporting on the volume of maintenance work delivered, broken down by key activities. According to the most recent information reported by NR, the volume forecast to be delivered in 2014-15 was generally in line with plan. However, track work is behind for ballast re-profiling (-22%), fencing (-44%), drainage (-52%) and Overhead Line Equipment (OLE) (-52%).

Examinations

93 During 2014-15 we noted an increased backlog of structures examinations, and in Q3 Scotland's backlog was greater than most of the other Routes. By the end of 2014-15, Scotland Route's backlog level had been significantly reduced although its position was relative to other Routes.

94 Earthworks failures can create substantial safety risk as a number of significant derailments in Scotland in 2013 demonstrated. In 2014-15 Scotland reported only 11 service-affecting earthworks failures, with all but one of these occurring between periods 7 and 11. We note, however, the weather during that period was generally drier than in recent years, which helps to explain the reduction.

Analysis/Conclusions

95 Overall, Scotland has improved the reliability of its assets compared with the previous year. Notwithstanding how well the target reflected the level of punctuality required, Scotland exceeded it reliability target.

96 Overall the number of infrastructure defects and delay minutes is in line with the previous year. Given the relatively mild winter the expectation might have been to see the number of defects and delay minutes fall to some extent.

97 Scotland has broadly delivered its maintenance and renewals plans although we note that track is 30% behind. Track fault delays and Points failures have increased and the delay minutes account for some 32% of the overall total.

98 In conclusion, although the reliability of the assets did improve, the evidence shows that the reliability targets were not sufficient to achieve the required punctuality. Also given that Scotland under-delivered its track renewals programme and a number of maintenance activities it could be argued that had all of the maintenance and renewals activities been completed that this could have reduced delay minutes.

4.5 Growth

99 NR has submitted a report to ORR entitled "The Impact of Passenger Growth on Train Performance". That report sets out the hypothesis that an observed increase in passenger journeys has caused station dwell times to increase and that has driven a reduction in PPM. The report focuses on growth in London and the South East (LSE) and contends that a 7% growth in passenger numbers there has caused a 4.9% reduction in morning peak PPM in LSE and a cumulative 1% impact on England and Wales PPM. No specific evidence is offered for growth in Scotland. Furthermore in our discussions with NR Scotland, it commented to us that, with the exception of the Commonwealth Games and Ryder Cup, it does not consider passenger growth and associated crowding to be an issue affecting performance in 2014-15.

100 ORR passenger km data[13] shows that between 2013-14 and 2014-15 growth in Scotland was 7%, compared with 5% for England and Wales.

101 We have therefore not taken passenger growth into account as a factor impacting on performance in Scotland.

[13] https://dataportal.orr.gov.uk/browsereports/12

5. Conclusions

5.1 Introduction

102 This chapter reviews the findings set out in the previous chapters and seeks to identify if there is any evidence to suggest that NR has not done everything reasonably practicable to achieve its regulated outputs in Scotland and performance commitments made to ScotRail. It will also consider whether any of the findings set out in previous chapters identify if there are any systemic issues affecting the delivery of performance.

5.2 Summary of conclusions

103 In Scotland, unlike England and Wales, NR accepted ORR's 2013 Periodic Review determination for performance outputs for CP5. This means that NR is required to achieve the PPM outputs specified in the Final Determination.

104 In the early part of 2014-15, performance is Scotland was good with PPM MAA exceeding the levels specified in the ScotRail Performance Strategy during the first four periods. The Commonwealth Games presented a challenge for performance, but these were largely recovered by the end of quarter 2 with Scotland's PPM MAA 0.1pp short of target. The latter half of the year saw a steady decline ending the year 1.5pp below the regulatory 92.0% target.

Factors affecting Performance delivery

Weather

105 The weather in Scotland was generally benign in 2014-15. Performance was impacted by a major storm on 8 and 9 January, as an emergency timetable was implemented late, resulting in a significantly lower PPM result than during similar weather events in 2014-15.

106 Our analysis has not identified any extreme weather days in Scotland in 2014-15. We have concluded that weather in Scotland in 2014-15 does not warrant an adjustment.

Commonwealth Games and Stations delays

107 Demand during the Commonwealth Games increased station delays with ScotRail's daily PPM reduced during the 12 days to an average of 77.7%, compared to 90.3% for other rest of period 5. We estimate Stations PPM failures in period 5 had a 0.6pp impact on the 2014-15 PPM result. We do recognise that NR and ScotRail acted pragmatically to ensure the successful movement of passengers, rather than prioritising performance, and agreed to consider this when assessing NR's 2014-15 performance delivery in Scotland.

Externals

108 The impact of Fatalities and Trespass has increased in Scotland, with delay minutes 19% worse than target, although the number of incidents has remained stable. We do note the good practice in fatality prevention, with Scotland Route working collaboratively with a number of external agencies.

Traincrew

109 Delay minutes caused by ScotRail Traincrew totalled 49,451 in 2014-15, an increase of 21% on the level seen in 2013-14 and 40% worse than target. This resulted in 3,485 PPM failures - 36% worse than target. NR advised us that in some cases delays allocated to Traincrew are likely to have resulted from timetable issues.

Passenger satisfaction

110 The Spring 2015 NRPS showed that 87% of ScotRail passengers rated the overall service positively/were satisfied. This is 3pp lower than Spring 2014 result (when 90% were satisfied). Satisfaction with train punctuality and reliability was 84% which was again 3pp lower than Spring 2014 (when 86% were satisfied).

Network Management and Other

111 PPM failures caused by the Network Management and Other category to ScotRail exceeded target by 2,353 PPM failures or 32% and was the second worse performing group in 2014-15.

112 Operational delays have increased in 2014-15 and were 22% worse than 2013-14 and represented 7% of the total delay caused by NR to ScotRail services. However, from the evidence provided, NR appears to be taking reasonable steps to address the rise in signalling delays.

113 Unexplained and Uninvestigated delays caused to ScotRail services have also increased in 2014-15 with Unexplained delay minutes 48% worse than in 2013-14 and 73% worse than target. Uninvestigated delays have also significantly increased between 2013-14 and 2014-15.

114 We consider that a large proportion of this rise in Unexplained and Uninvestigated delays was caused by high levels of staff turnover experienced in 2014-15. NR has recognised that there is potential for a similar situation to occur in 2015-16 and have introduced an 'accelerated training plan' reducing the training period for new TRUST Delay Attribution (TDAs) staff from six to three months.

Delivery of CP5 performance plan - Scotland

115 In respect of its CP5 Performance Plan NR advised us that a number of milestones in Scotland were delivered late in 2014-15 or are forecast to be delivered later than planned.

116 Scotland Route delivered 17 milestones in 2014-15; 12 of which were delivered later than target. The milestones completed late were targeting improvements in most PPM attrition categories, although six were for "Specification" delays. This latter category ended the year 1.1pp below the performance strategy target.

117 Reactionary PPM loss was also 0.55pp worse than target. Of the eight additional milestones in 2014-15, none relate to the Reactionary causation group. Our conclusion is therefore that the CP5 Performance Plan in Scotland was not adjusted to reflect changing circumstances in 2014-15.

118 For the remainder of CP5, Scotland Route has 15 milestones planned for completion; at the time of writing, four are forecast to be delivered late. These milestones are again spread across a range of PPM attrition groups.

Timetable planning

119 Planning delays worsened in 2014-15, being 9% worse than the previous year and representing 2% of all Scotland Route delay. In May 2014, the timetable change (the point at which the Cumbernauld route was electrified) resulted in a 2% reduction in PPM on the

North Electric and Argyle lines. In December 2014, the timetable change (the point at which the Carmyle route was electrified) led to increased timetabling delays.

120 NR has concluded that a full evaluation of the TPRs is required before identified issues can be rectified. This was originally intended to be complete by May 2015; the deadline was missed and completion is now cited for March 2016. Further, the resilience of the timetable was initially reduced due to a significant driver route learning on operational services. ScotRail has voiced concern over the TPRs and the pace at which they are being reviewed.

121 ScotRail has informed us that the issues emerging following the May and December 2014 timetable changes indicate that the TPRs are not '*fit for purpose'* and '*act against the good running and performance of our services in the Glasgow suburban network'* and that whilst progress is now being made to rectify issues it has been '*slow to date'.*

122 Our analysis of the December 2014 timetable, summarised in **Annex D**, has highlighted several avoidable operational planning errors and a number of tight timings. While better (and earlier) modelling, prior to the introduction of the new electric services, would have helped maintain performance levels, we do support NR's work to review the TPRs in Scotland. Our investigation has concluded that TPRs issues were significant in NR failing to achieve its 2014-15 PPM target.

Asset performance

123 The CRI for Scotland Route improved in 2014-15 by 8.6pp with all asset groups exceeding target except Telecoms and Points. Most asset condition indicators improved compared to the previous year. Renewals in many sub-categories under Track Assets and Non-Track Assets fell behind plan. Maintenance volumes were generally undertaken according to plan, while an increase in the backlog of asset examinations was recorded.

124 With the improvement witnessed in CRI, along with a reduction in the number of delay incidents attributed to infrastructure faults and failures, this would indicate that the reliability of the infrastructure has not played a significant part in ScotRail missing its PPM target for the year.

Growth

125 The NR Report "The Impact of Passenger Growth on Train Performance" provides no specific mention of issues relating to passenger growth in Scotland. Passenger growth in Scotland, according to the latest data available (2012-13 to 2013-14), is lower than in England and Wales. Therefore, we have not considered passenger growth to be a contributor to missed PPM targets in Scotland.

Overall conclusion

126 Our overall conclusions are therefore as follows:

- we should bear in mind the impact of the Commonwealth Games, which we estimate to have had a 0.6pp on the 2014-15 PPM (MAA);
- we also consider that NR was not wholly responsible for the delay minutes and subsequent PPM loss by trespass and suicide events, and that it has worked constructively to reduce these incidents and mitigate their impact;
- the impact of passenger growth on performance is not proven and whilst it is acknowledged as a potential issue, should not be mitigated against;
- weather has not been significantly challenging during the year, so should not be considered as a mitigation;
- there are no grounds to mitigate in respect of assets, or their maintenance or renewal;
- delays due to traincrew, performance planning and timetable do not warrant any mitigation.

127 The table below summarises the areas we have investigated as potential mitigating factors.

Table 9: PPM adjustment, ScotRail, 2014-15

ScotRail		
Category	**Adjustment recommended?**	**PPM impact**
Commonwealth Games	✓	0.6pp
Severe Weather, Autumn and Structures	×	
External	✓	0.003pp
Traincrew	×	
Passenger Growth	×	

128 We consider that NR has not done everything reasonably practicable to deliver performance in Scotland because Issues with the May and December 2014 timetable changes were significant factors behind NR's failure to achieve its regulated PPM target in 2014-15 and could have been avoided. We have previously investigated timetabling issues in Scotland, in particular the timetable change in December 2012 that reduced timetable resilience and resulted in a reduction in performance.

ANNEXES

Annex A – Glossary

ARS	Automatic Route Setting
BTP	British Transport Police
CaSL	Cancellations and Significant Lateness
CP4	Control Period 4 (2008 – 2013)
CP5	Control Period 5 (2014-2019)
CRI	Composite Reliability Index
EGIP	Edinburgh Glasgow Improvement Programme
EWAT	Extreme Weather Action Team
FOC	Freight Operating Company
FTN	Fixed Telecoms Network
GSM-R	Global System for Mobile Communications-Rail
GTR	Govia Thameslink Railway
JPIP	Joint Performance Improvement Plans
KPI	Key Performance Indicator
LSE	London and South East
LiDAR	Light Detection and Ranging
MAA	Moving Annual Average
NHS	National Health Service
NR	Network Rail
NRPS	National Rail Passenger Service
NTF	National Task Force
OLE	Overhead Line Equipment
ORR	Office of Rail and Road
OTMR	On Train Measuring Recording
PP	Percentage Point
PPM	Public Performance Measure
PR13	Periodic Review 2013
PSR	Permanent Speed Restriction
RHTT	Railhead Treatment Train
S&C	Switches and Crossings
SRS	Strategic Route Sections
SRT	Sectional Running Time
TDA	TRUST Delay Attribution
TPR	Timetable Planning Rules
TRUST	Train Running System on TOPS (Total Operation Processing System)
TSR	Temporary Speed Restriction
TOC	Train Operating Company
TS	Transport Scotland
WCML	West Coast Main Line
WTT	Working Timetable
UPS	Uninterruptable Power Supply

Annex B – Terms of Reference

Background

Enforcing Train Operating Companies (TOC) operational performance

Network Rail (NR) and train operating companies (TOCs) have the flexibility to work together to set the 'trajectory' to reach the 2019 outputs, using the industry led Performance Strategies (previously known as joint performance improvement plans (JPIPs)) process. We will intervene in certain circumstances, for example if an operator's PPM (MAA) appears likely to fall more than two percentage points below its agreed PPM output or CaSL MAA appears likely to increase more than 0.2 percentage points above target.

NR will need to explain each year how delivery of the individual Performance Strategies relates to delivery of the required national performance. We expect robust governance arrangements to be in place so that whenever the Performance Strategies taken together do not give us confidence the national requirements will be met, NR develops clear and convincing plans to bridge any gap, which it must then deliver.

There are established industry processes through which NR, TOCs and FOCs work together to deliver good train performance. While we can hold NR to account, funders can hold their operators to account. We work with the funders to ensure these performance management processes work well and we have a shared understanding of industry performance risks. We may intervene if called on by third parties such as an operator, a funder, Transport Focus or London TravelWatch. However we will not wait for a complaint if our own monitoring suggests action is needed to address performance issues.

In summary, we will intervene when:

(a) NR and a TOC cannot agree a Performance Strategy target; or

(b) NR's plans or actions to deliver at least 88% PPM for Virgin East Coast Trains and Virgin Trains West Coast (and First Great Western's high speed services), 92.5% PPM for Scotland and at least 90% PPM for every other franchised TOC in the last year of CP5 are inadequate; or

(c) NR's plans or actions to deliver the national performance outputs are inadequate (including where NR needs to bridge a gap between the sum of the Performance Strategy targets and the national outputs); or

(d) Performance for an individual TOC is, or is likely to fall more than 2 percentage points below its agreed end of year PPM (MAA) output or 0.2 percentage points above its agreed end of year CaSL (MAA) output.

(e) A concerned TOC requests that we do so where NR is unable to realise the deliverables that underpin the performance trajectory, or the outputs committed to in the Performance Strategy.

Where we intervene, we will follow a staged approach of review, investigation and escalation which may ultimately lead to formal enforcement action. We may require new or updated recovery plans, the formation of a recovery board, or some other form of assurance from NR.

In deciding whether and how to intervene we will focus on systemic and/or serious issues. We will work with the established industry processes, (for example National Task Force (NTF)), where possible, taking account of how the commitments made dealt with the greater uncertainty associated with forecasts at the TOC level.

Approach to performance targets in first 2 years of CP5 (England and Wales)

NR has stated that its exit position for its regulated performance outputs in CP4 means that it is unlikely to achieve its performance outputs in England and Wales in the first 2 years of CP5.

NR remains committed to achieving its performance outputs from the commencements of year 3 of CP5 and has produced a Performance Plan in order to ensure that it returns to the necessary trajectory to achieve its CP5 performance outputs from 2016-17. We monitor NR against the delivery of the inputs specified in this plan and therefore consider delivery of this plan, together with NR demonstrating flexibility to effectively adjust the plan through a robust Change Control process to meet changing circumstances, as evidence in assessing whether it is doing everything reasonably practicable to achieve its regulated performance outputs in the first 2 years of CP5.

We will intervene when;

(a) NR's plans or actions to deliver the national performance trajectory are inadequate and the inputs specified in the CP5 performance plan (which needs to bridge a gap between the sum of the Performance Strategies and the national outputs) show milestone slippage that has a material impact on the ability to commence the third year of CP5 on the profiled targets for PPM (MAA) and CaSL (MAA).

Scotland regulatory performance target PPM (MAA)) continues to be enforceable in 2014-15 and 2015-16.

End of 2014-15

ORR's Initial review of NR's 2014-15 performance

In March we assessed that a number of operators in England and Wales[14] could no longer achieve the threshold established in our Final Determination for either their PPM (MAA) and / or CaSL (MAA) Performance Strategy targets[15] and that a number of other operators were likely to miss this threshold.

We also assessed that Scotland was unable to meet its 2014-15 PPM regulatory target.[16]

Alan Price, Director Railway Planning and performance, wrote in February to the Managing Directors of all franchised passenger operators asking for their opinion on Network Rail (NR) performance delivery in 2014-15. Responses were requested by 17 April.

We have now received the final Period 13 figures from NR and they state that:

a. Scotland out turned at 90.5%, 1.5 percentage points (pp) below the 2014-15 regulatory target

b. The following operators missed their PPM (MAA) targets by greater than the 2pp threshold and / or their CaSL (MAA) targets by greater than the 0.2pp threshold:

	PPM MAA	Variance to target		CaSL MAA	Variance to target
Southern	83.1%	4.7pp	Southern	4.8%	1.9pp
GTR	85.2%	2.8pp	GTR	4.3%	1.3pp
FTPE	88.6%	2.4pp	Virgin Trains West Coast	5.0%	1.0pp
			AGA	2.5%	0.9pp
			FTPE	4.3%	0.8pp
			SWT	2.7%	0.6pp
			FGW	3.0%	0.4pp
			Southeastern	2.8%	0.3pp

Purpose of the investigation

To establish whether NR did or is doing everything reasonably practicable to meet its licence obligations in relation to achieving its regulated performance outputs.

This includes:

a. PPM targets in Scotland for the first year of CP5[17] (regulated performance target);

[14] England and Wales regulatory performance targets (PPM and CaSL) are not enforceable in 2014-15 and 2015-16, being instead monitored through NR's delivery of its CP5 Performance Plan.

[15] Threshold is defined as 2.0 pp below (PPM MAA) and 0.2 pp above (CaSL MAA) Performance Strategy target. Details are set out in ORR's final determination document - chapter 23

[16] Scotland regulatory performance target (PPM MAA) continues to be enforceable in throughout years 1-5 CP5.

b. performance delivery to Southern for the first year of CP5 (Performance Strategy targets);

c. performance delivery to GTR for the first year of CP5 (Performance Strategy targets);

d. ensuring that end of CP5 regulatory targets are met – including assessing whether there any systemic weaknesses relating to NR's operational planning, management and delivery of performance, such as timetabling.

Scope

The investigation will focus on NR's performance obligations in the four main areas addressed above.

Our initial review and analysis of performance in 2014-15 has raised concerns with performance in Scotland and a range of operators.

We will use NR performance in Scotland, and with operators Southern and GTR as the basis of this investigation because:

i) Scotland failed to meet its 2014-15 regulatory performance target and;

ii) Southern and GTR represent the worst performers in 2014-15. Southern and GTR performance in 2014-15 represents roughly a third of the England and Wales PPM (MAA) shortfall and roughly half of the CaSL (MAA) shortfall in England and Wales.

Our initial review has also highlighted a number of potential operational performance issues:

a. Scotland (PPM 2014-15 miss)

The December 2014 timetable contained planning errors which we need to investigate further in order to assess whether they could have been avoided.

Whilst we accept that there was a performance impact caused by the Commonwealth Games, we estimate this to account for 0.6pp of the shortfall in the PPM MAA in Scotland. Even allowing for this effect therefore, NR would have failed to meet its PPM (MAA) target.

We will carry out further assessment to confirm our initial view that the weather in 2014-15 was not beyond the level that Scotland Route is funded to deal with.

We will also carry out a further assessment of the delivery of ScotRail's Performance Strategy, noting that there was a relatively high degree of milestone slippage.

b. Southern (PPM and CaSL miss)

The disruption caused by the impact of the Thameslink programme, principally at London Bridge, and timetabling issues (leading to a reduction in peak services) has contributed to Southern's level of performance.

This has been further exacerbated by the performance of non-track assets and network management, CaSL impact of fatalities and trespass incidents and Southern traincrew issues.

We need to investigate further whether a number of the issues associated with the Thameslink Programme could have been avoided.

c. **GTR** (PPM and CaSL miss)

Disruption caused by the impact of the Thameslink programme and performance of non-track assets, network management and an increase in delay minutes related to fatalities and trespass have contributed to worsening performance.

Both PPM and CaSL have displayed consistently negative trends during the year – we have yet to have sight of any substantial plans to tackle this.

We need to investigate further whether a number of the issues associated with the Thameslink Programme could have been avoided.

Potential systemic performance failures - NR Performance delivery to other operators

We have concluded at this stage that we should not specifically investigate NR's performance delivery to other operators because:

i. In some cases operator issues have contributed to performance shortfalls

ii. our ongoing dialogue with operators has indicated that they are broadly satisfied with NR's performance delivery to them

iii. we are satisfied NR is making reasonable efforts to address performance-impacting issues

However we still have some concerns regarding NR's delivery to other operators *(First Great Western, Virgin Trains West Coast, Southeastern, South West Trains, Abellio Greater Anglia and First TransPennine Express)* and we will continue to monitor delivery of operational performance to these operators through our regulatory processes. We may also consider any relevant evidence provided by other operators which could highlight potential systemic operational performance issues.

NR Performance Plan (England and Wales)

At the end of quarter 3 (Q3) NR reported against delivery of the milestones in its Performance Plan. At the time we concluded that, although there had been some slippage, this was within the margins we would expect to see. NR is due to report progress on the Q4 milestones to us on 5 May 2015.

We will assess the Q4 report as a source of evidence in our investigation to help us determine whether there are any systemic performance issues which NR is not reasonably addressing.

We recognise there may be links between enhancements and performance, and will ensure in the conduct of this performance investigation to avoid duplication with our on-going enhancement investigation, which is subject to its own separate terms of reference.

Methodology

We will use the evidence gathered from our own monitoring, NR and industry to assess:

- Whether there are any mitigating factors which affected or are affecting performance in these specific Route (Scotland) / operators, for example factors such as weather and passenger growth.
- The steps, if any NR has taken or is taking to address performance issues and make improvements

In order to conduct our investigation we will consider the following sources:

- The CP5 Performance Plan
- The quarterly progress reports we received throughout the year
- The full end of year review we are due to receive on 5 May
- Any further evidence that NR ask us to consider
- Views and further information from relevant operators
- Evidence provided by NR's Internal Audit Team looking at the effectiveness of Performance Strategies,
- End of year performance data

Investigation team

This investigation is led by Alan Price as senior director Railway Planning and Performance, supported by ORR experts. The project team will include cross office representatives including Railway Planning and Performance, Legal and External Affairs. Governance arrangements are detailed in the project initiation document.

How the investigation will be conducted

In carrying out its investigation ORR expects to draw upon information and reviews already carried out internally as part of its usual regulatory roles. The review will engage primarily with NR, as well as affected operators [and funders].

Timescales

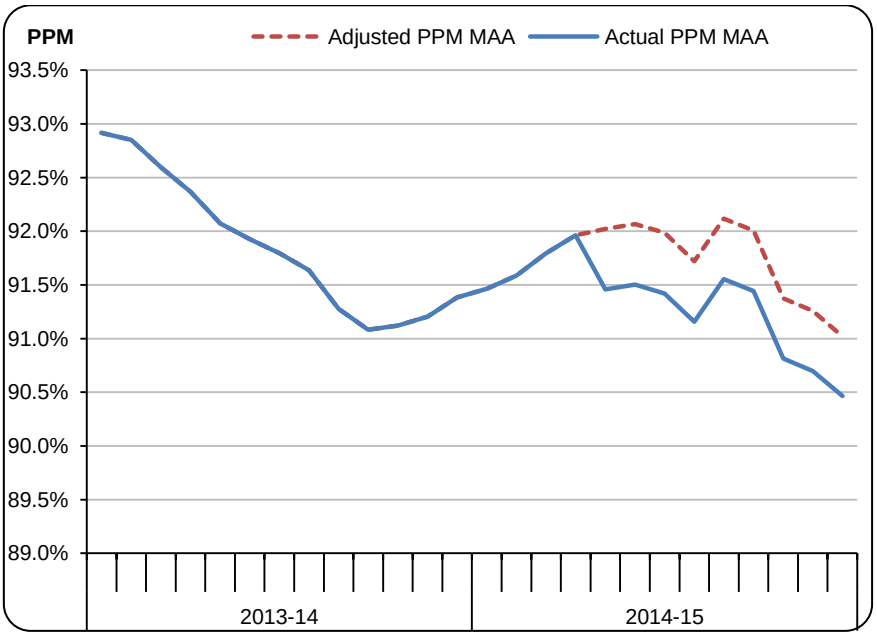
ORR aims to complete the investigation by the end of May 2015. It will then consider the investigation findings and decide the next steps in line with its economic enforcement process and policy. As part of these considerations, ORR will decide whether there are grounds to issue a case to answer letter to NR and then will make recommendations to ORR's Board on any licence breach, and if appropriate, enforcement action.

Annex C – Effect of the Glasgow Commonwealth Games on the PPM of ScotRail

The unadjusted PPM MAA for Scotrail was 90.5% in period 13; this is below the performance strategy target of 92.0% by 1.5 percentage points and 0.9 percentage points lower than the same period last year.

The chart below presents both the adjusted and unadjusted PPM MAA for ScotRail. This demonstrates that the effects of the adjustment continue to the year end. The adjusted PPM MAA for period 13 is 91.0%; 0.6 percentage points[18] higher than the unadjusted value. The adjusted MAA still represents a fall of 0.4 percentage points from the same period in 2013-14 and is 1.0 percentage points lower than the Performance Strategy target.

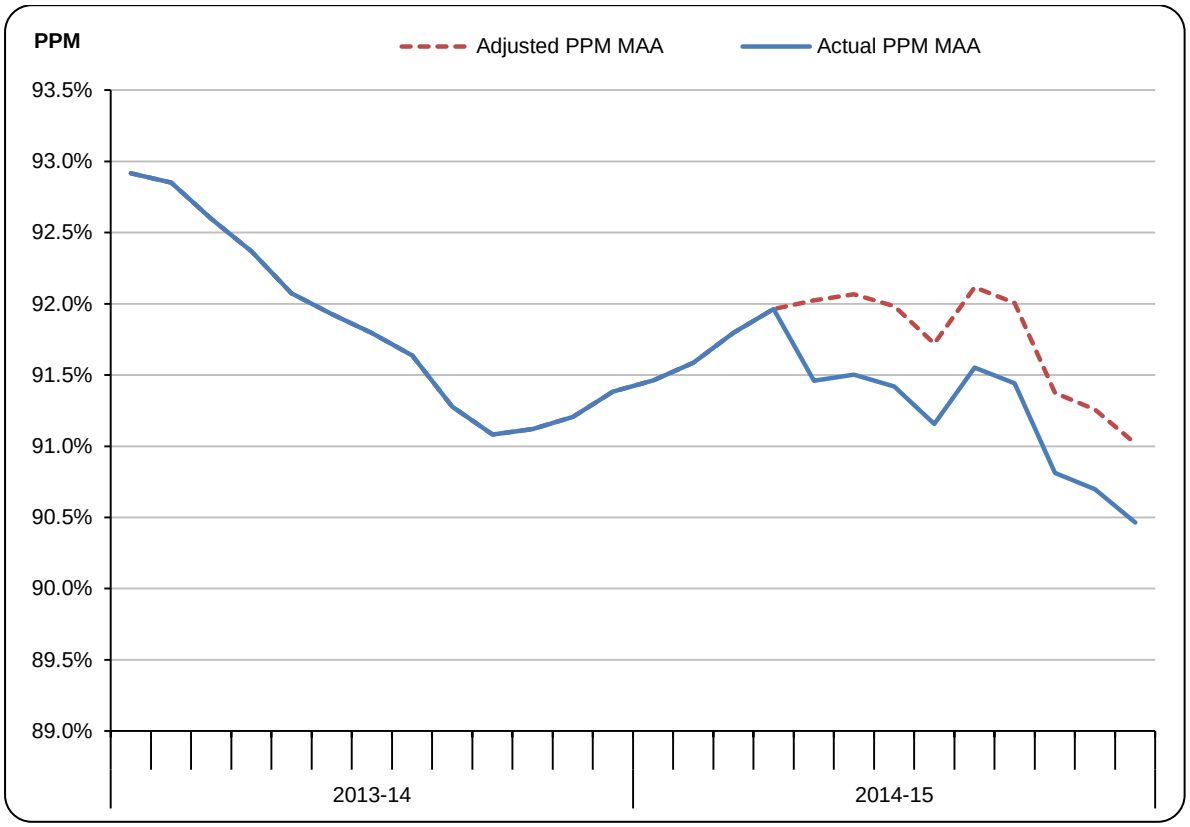
Figure 12: Glasgow Commonwealth Games PPM MAA adjustment, ScotRail, 2014-15



[18] Rounded to 1 decimal place

Effect of the Glasgow Commonwealth Games on the PPM of ScotRail

The Commonwealth Games 2014 were held in Glasgow between the 23 July and the 3 August 2014 and ran for 12 days during period 5 of 2014-15.



There was a large drop in the ScotRail PPM during Period 5 of this year, during which the PPM was 84.7%. This drop coincided with the Commonwealth Games during which there would have been increased traffic and demand on the network.

Table 10: ScotRail PPM in 2014-15 by Period

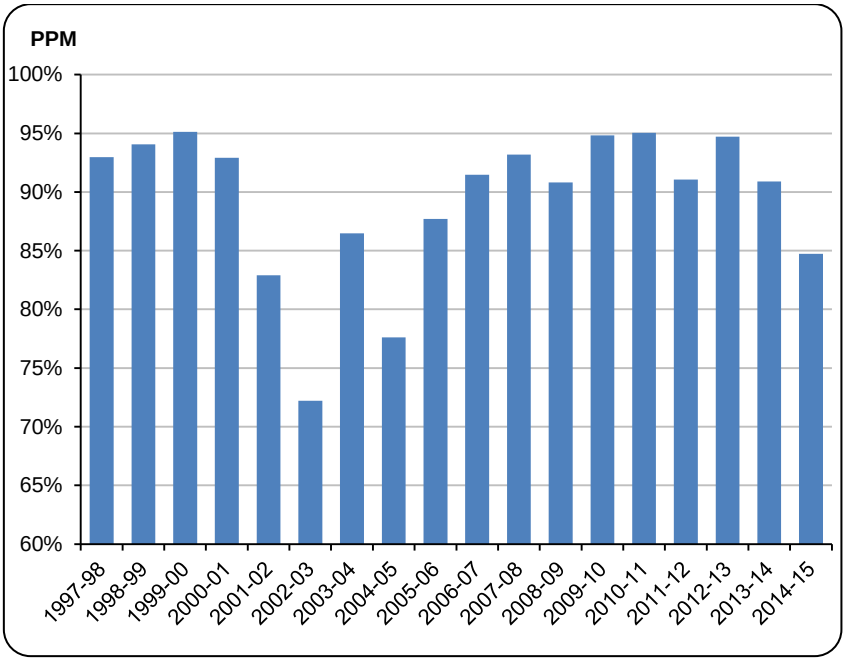
P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13
95.1%	95.3%	93.7%	92.6%	84.7%	93.8%	91.0%	84.9%	88.8%	86.6%	85.2%	92.6%	91.7%

In order to adjust for the effect on performance during the Commonwealth Games an adjustment will be made in the calculation of the end-of-year PPM MAA based on an adjustment to the period 5 performance.

Historic performance during Period 5

Between 1997-98 and 2005-06 ScotRail PPM was quite variable, falling as low as 72.2%. Since 2006-07 the period 5 PPM has been consistently between 90% and 95%. For this reason a period of five years has been chosen to provide data for the adjustment. This seems like a reasonable compromise between providing enough data for the analysis and not going so far back that the data is representing a very different railway.

Figure 13: Period 5 PPM scores, ScotRail, 1997-98 to 2014-15

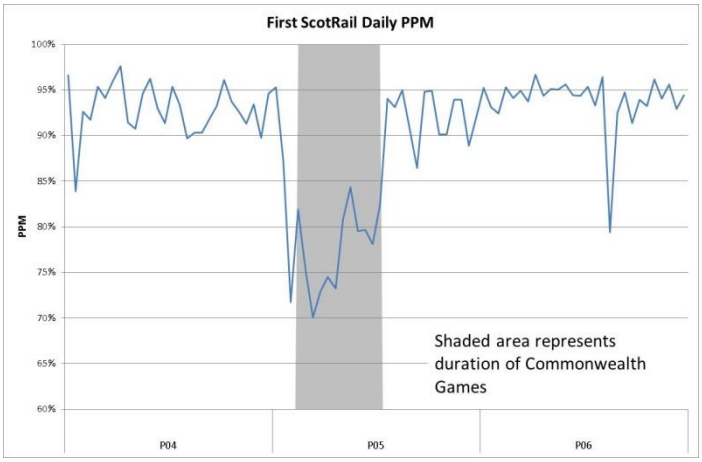


Adjusting only the days during the Commonwealth Games occurred is potentially advantageous in that it is adjusting less data overall and may prevent the revision of other issues that occurred in Scotland during period 5 which weren't related to the Commonwealth Games.

There is a clear drop in the daily PPM for the entire duration of the Commonwealth Games, and with the exception of the day immediately preceding the games[19], performance during the remainder of period 5 is more in line with performance in

[19] On this day there were multiple points failures at Glasgow Central which resulted in the suspension of all services into and out of the station, which led to around 300 PPM failures.

periods 4 and 6. During the Commonwealth Games the average PPM for ScotRail was 77.7% whereas the average PPM in the other days of period 5 was 90.8%.



The number of trains planned on each weekday and Saturday during the Commonwealth Games was approximately 200 trains greater than normal, with the increase even more pronounced on the Sunday when around 350 trains extra were planned. Looking at the daily records it appears that this increase in trains planned started two days before the start of the games on Monday 21st July 2014, but did not extend to any days after the end of the games.

Table 11: Average number of trains planned by ScotRail by day of the week, 2014-15 Periods 4 to 6

Day Type	Normal	Commonwealth Games
Weekday	2,257	2,440
Saturday	2,171	2,379
Sunday	962	1,329

To ensure the PPM changes are not having an unfair bias on the MAA calculations the trains planned between 21st July (two days prior to the games) and the 3rd of August will also be adjusted to be more in line with the regular 2014 timetable.

The table below shows the average Period PPM for the different days of the week during the last five years. As would be expected the weekend values are better than

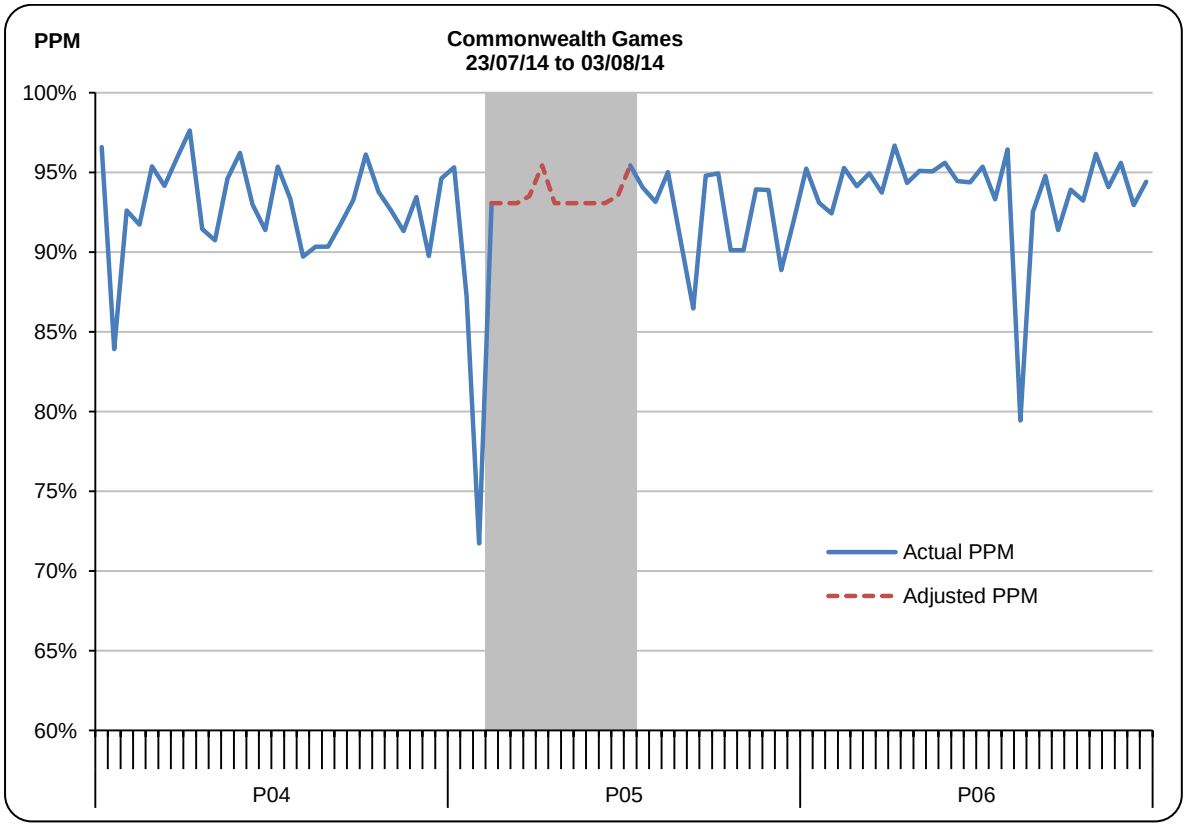
the weekday. The average values shown will be used for the adjustment of the performance during the Commonwealth Games.

Table 12: Average ScotRail PPM by day of the week for Period 5, 2014-15 Periods 4 to 6

	Weekday	Saturday	Sunday
Average PPM	93.1%	93.5%	95.5%

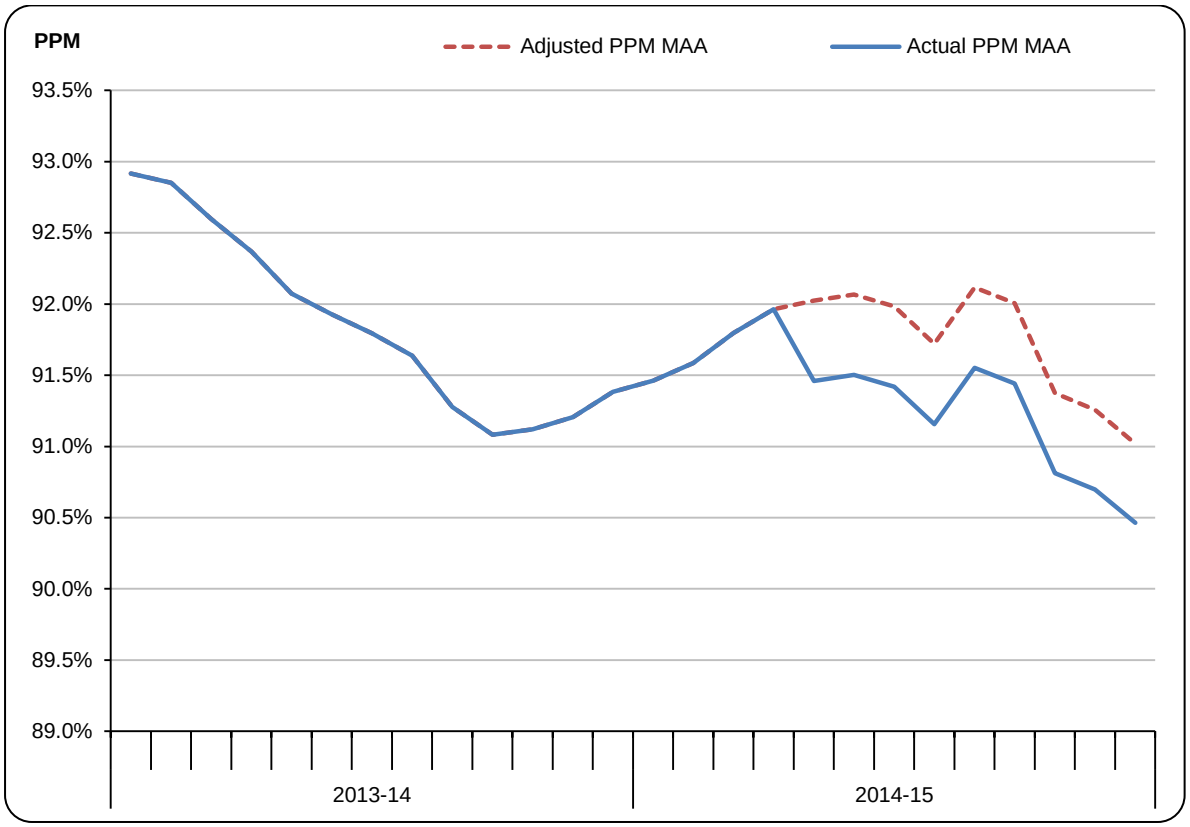
After these PPM substitutions the adjusted period 5 PPM is 91.7%, with a trains planned value of 57,674 (down from 60,568).

Figure 14: ScotRail Daily PPM scores, 2014-15 Periods 4 to 6



The PPM MAA at the end of period 13 after the adjustment of the daily PPM records is 91.0%; this is an increase of 0.6 percentage points in the PPM MAA and leads to ScotRail ending 2014-15 1.0 percentage points lower than their Performance Strategy

target. Figure 15: Commonwealth Games PPM MAA Adjustment Option 2, ScotRail, 2014-15



Appendix

The average weekday, Saturday and Sunday PPM for ScotRail for each of the last 5 years

Table 13: ScotRail Period 5 PPM by day of the week, 2009-10 to 2013-14

Year	Weekday	Saturday	Sunday
2009-10	94.7%	94.6%	97.3%
2010-11	94.8%	95.8%	96.1%
2011-12	90.5%	92.3%	95.4%
2012-13	95.2%	92.5%	94.0%
2013-14	90.3%	92.4%	94.4%
Average	**93.1%**	**93.5%**	**95.5%**

Annex D – Timetable analysis

Timetable issues (specific remarks are based on the weekday December 2014 timetable, so may have been resolved in the May 2015 timetable)

Background

Timetabling around Glasgow is complex, with several sections of single track and multiple flat junctions. The service plan is also very complex, attempting to link as many origin and destination pairs as possible. In some cases, especially the Lanark to Glasgow service, there are multiple interfaces with the West Coast Main Line (WCML). Consequently, it is essential that the Timetable Planning Rules (TPRs) accurately reflect the capability of the network, and are applied effectively. It is also essential that the train planning geography (which includes the locations at which passing times must be included in the working timetable) is fit for purpose.

Details of the timetable changes in 2014-15

May 2014

- The route from Coatbridge and Whifflet to Rutherglen East Junction was electrified ahead of the May 2014 timetable change.
- The diesel service from Motherwell and Whifflet to Glasgow Central High Level was replaced by services that operated through the Argyle Lines and Glasgow Central Low Level to the north Clyde coast. These replaced the service from Lanark (whose routing and destination varied each half hour).
- The Lanark service obtained a consistent routing, running instead into Glasgow Central High Level.

December 2014

- The route from Springburn to Cumbernauld was planned to be electrified in September 2014, ahead of a timetable change in December 2014 so that services from the north Clyde coast could be extended to Cumbernauld.
- The work was commissioned late, resulting in limited time being available to train the necessary traincrews over this section.

- New point-to-point times were modelled for electric trains over the newly-electrified lines. We consider that, on the Whifflet – Rutherglen section, these appear to be somewhat optimistic, with up to four minutes' acceleration compared to the previous diesel services.
- The overall effect of these changes was to alter the linkages between the southeast and east of Glasgow and the north Clyde area, with an overall increase in risk of reactionary delays. NR Scotland Route has stated that they believe these changes reduced resilience of the timetable.

General observations

Our analysis has highlighted a number of examples where train planning geography / TPRs have not been updated. Examples of this include the:

- name for the Royal Mail terminal at Shieldmuir, which changed operator a number of years ago, remains unchanged,
- lack of a timing point at Newton West Junction, which has become important with recent timetable changes,
- lack of a requirement to time all services at Rutherglen Central Junction, where the WCML interfaces with the Argyle (cross-city) Line.

Our analysis has also found that, despite all Scotrail services in the area operating at regular intervals (half-hourly or hourly), there were many minor variations to schedules. Due to interfaces with services that operate at less regular intervals, pathing time was added. The industry standard process for dealing with variations is to use what is called "advertising differentials", presenting the public with an apparently-regular service. This was seldom used, and may have resulted in potential traps for signallers. For example:

- a train from Lanark to Glasgow Central may have had extra time allowed approaching Shieldmuir, where it rejoins the WCML, for it to follow a long-distance service.
- Without advertising differential, if the WCML service is running late, the signaller may allow it to proceed, but the train will then have to stand at Shieldmuir until its advertised departure time.

- By this time, the WCML service may be standing behind it, being further delayed.
- With advertising differential, the Lanark service could have continued, and cleared the line at Motherwell for the WCML service to proceed without further delay.

We have noted that signalling delay minutes affecting ScotRail's performance in 2014-15 increased by 16.7%. NR Scotland Route has told us that they believe a significant proportion of the increase of signalling delays was attributed to Motherwell Signalling Centre and '*may be partly due to the change of service'*.

We have also found that, although pathing time was inserted into many schedules, it was not always shown as such in the working timetable ("WTT"). This will make it difficult for subsequent train planners to identify, and to confirm, whether pathing is still required.

The Lanark service

- The general comment about variation between services and non-use of advertising differentials applied.
- At Motherwell in the Up direction, trains were often held for significant periods of time – up to a maximum of six minutes – to create a semblance of regular interval working. This could have the same effect as the lack of advertising differentials mentioned above, resulting in an increased likelihood of incorrect regulation.
- Services on the Coatbridge line ran close together (Lanark services and the Hamilton Circle etc.). This would have increased the likelihood of delays being transmitted between service groups, including to north Clydeside.

Turning to specifics noticed in the SX December 2014 timetable:

- 0821 Lanark to Glasgow Central was the third of four successive trains entering Glasgow Central over the same line at two minute intervals. In this instance, they were a DMU (two or four coaches), a tilting Voyager (which could be a ten-car train), an EMU (three or six coaches) and an empty Pendolino (eleven coaches). At a maximum speed of 25mph then 20mph, it is extremely doubtful whether trains can enter the station at this interval. The

length of preceding services is a factor when considering how soon points can be reversed to allow a second train to follow. We therefore consider that a full examination of the TPRs is required.

- 1921 Lanark had a foul timing on the approach to Glasgow Central, arriving over the same track at the same time as 1S47, 0828 from Penzance.
- 2121 Lanark was foul at Motherwell behind 1S90, 1730 Euston to Glasgow (shown as arriving one minute after this Pendolino is shown to depart).
- 2351 Lanark was undertimed by a minute into its destination of Motherwell.
- 0650 Motherwell to Lanark was undertimed by half a minute to Lanark Junction.
- 0652 Glasgow Central to Lanark was shown as departing two minutes behind a Mark IV rake, over the same track. This seems unlikely to be achievable given the length of the VTEC train (eleven vehicles) and the 20mph then 25mph speed limit. Remarks regarding TPRs in this area are as above.
- 2220 Glasgow to Lanark was foul with 22+20 Glasgow to Polmadie (VWC), since both used the same track as far as Eglinton Street Junction.
- 1720 Glasgow, this was the fifth train in an unlikely sequence of trains at Law Junction:

1M18	**1M03**	**9M61**	**6O15 / 6V15**	**2B02**
1730 Glasgow to Euston Pendolino	1749 Shieldmuir Mail Terminal to Warrington (up to 12-car 325	1740 Glasgow to Birmingham, 5-or 10-car tilting Voyager	1727 Mossend to Eastleigh or Didcot freight	1720 Glasgow to Lanark EMU
17/49	17/54	17/57½	17/59½	18/03
	departed Shieldmuir immediately after a Down train crossed its path		Amount of recovery and pathing time included in the schedule meant that it attempted to get away from a standing start, to pass Law Junction 2	Schedule contained 4 minutes pathing time meaning that it came to a stand between Wishaw and Law Junction (although this pathing time was not shown)

			minutes after the previous service had passed,	

Reversing the order of the last two trains in this sequence would have minimal effect on the freight train, as it would still make its next stopping point – Beattock Up Loop – in time to be overtaken by the next Up train on the WCML, and this is likely to be a better option overall.

Given that all these and many other, lesser issues were identified in a cursory examination of the timetable, it is evident that there were fundamental errors in the timetable that could have been avoided.

Argyle and North Clyde, etc., services.

- There was a repeat of the Lanarks' constantly off-pattern service, as trains have pathing time inserted to allow off-pattern longer-distance trains to get through. The earlier comment on using advertising differential so that trains can depart on pattern if other services are late applies.

Rutherglen Junctions (see comment above re. timetable geography at this location, which makes it difficult to check crossing movements. Numbers in brackets are minutes of pathing time included in the schedule).

- 0633 Larkhall to Dalmuir, Rutherglen East Junction (RGE) 06/58FL, Rutherglen Central Junction (RCL) 06/59, crossed behind 0652 Glasgow Central – Lanark RGE 06/58½. The same occurred the next hour and appears to be an impossible timing.
- 0722, 1122 Motherwell – Milngavie both had (1) or (1½) approaching RGE and (½) approaching RGC. 1322, 2122 Motherwell – Milngavie both had (2) approaching RGC and RGE respectively. 1459 Whifflet – Milngavie had (1) approaching RGE. 1522 and 1622 Motherwell – Milngavie both had (½) approaching RGC. 1800 Whifflet – Milngavie had (2) approaching RGC. All these elements of pathing time had no obvious reason, and may have been historic leave-ins. Without the use of advertising differential, these trains would present themselves off-pattern at Finnieston East Junction, with

implications for the services through Glasgow Queen Street Low Level and on the north Clyde services in general.

- 0903 Glasgow Central - Edinburgh passed RGE at 09/10½. 08 13 Cumbernauld passed RGE 09/10½ and RGC 09/11½. This would appear to be an impossible timing.
- 0916 Motherwell – Dalmuir passed RGC 09/40½. 0828 Ayr – Edinburgh passed RGE 09/42. This would appear to be an impossible timing.
- 1025 Motherwell - Milngavie, passed RGE 10/48½, RGC 10/49. 0B26 1041 Polmadie – Mossend passed RGE 10/51 on the USL. 1028 Shields Depot – Edinburgh Haymarket passed RGE 10/53½. These timings were very tight.
- 1053 Glasgow Central – Lanark passed RGE 10/59½. 1033 Larkhall – Dalmuir passed RGE 10/58, RGC 10/59. This appears to be an impossible timing.
- 1603 Glasgow Central – Edinburgh passed RGE 16/10½. 1522 Cumbernauld – Dalmuir passed RGE 16/10½, RGC 16/11½. These timings were very tight.
- 1548 Edinburgh – Glasgow Central was shown FL from RGE, had a timing point at RGC, then was shown SL from Shawfield. It had to cross at RGC as there is no crossover at Shawfield. The move was to allow 1230 Euston – Glasgow Central to overtake. There was clearly unpublished pathing time between RGC and Shawfield, although the extra time would actually be taken after Shawfield, not before it.
- 2052 Glasgow Central – Lanark passed RGE 20/58½, 2033 Larkhall – Dalmuir RGE 20/58, RGC 20/59. This was clearly a conflicting movement.
- 20+46 Edinburgh Waverley – Polmadie passed RGE 22/11½, crossed to the SL at RGC (incorrectly shown after Shawfield again) 22/12½, then continued to GGC to reverse before returning to Polmadie. The reason for running SL was to allow 1225 Plymouth – Glasgow Central to overtake. However, 22+03FX Glasgow Central – Preston had (2½) and the 21+37FO (1½) approaching RGE 22/13. This looks to be a foul crossing move. (21+37FO Glasgow Central – Preston enterd the depot sidings at Polmadie Depot, with no timings shown to emerge at RGE 22/13, crossing onto the FL).
- 2159 Whifflet – Milngavie was shown FL from RGE, but there is currently no pointwork to make the move.

Hyndland East Jn.

- There were some considerable inconsistencies in the timetable. For example, a train off the Up Yoker Line (last stop Jordanhill, 11 chains from the junction) crossed behind a train to the Down Singer Line. Some schedules showed 1½ allowance for this move whilst other schedules show 2 or 2½. Given the very short distance from the platform starting signal at Jordanhill to the junction, there may not have been free acceptance into the platform at Jordanhill with a conflicting route set across the junction. There were occasions when it was apparent that a train was timed into Jordanhill before the conflicting movement left Hyndland. This would enable the points at the junction to be set towards the Down Yoker at the time, but is there then a time-out (a period of time that has to elapse, for safety purposes, at some locations where conflicting movements can take place, before points and signals can be changed) before the conflicting movement can be set? The TPR at this location need to be reviewed against the signalling capability, and appropriate values applied.

  The following are examples:

- 0535 Bathgate – Balloch, HEJ 06/34, 0623 Dalmuir – Larkhall 06/35½. (0554 Motherwell – Milngavie is then 06/37½).
- 0726 Airdrie – Balloch, HEJ 08/05, 0753 Dalmuir – Larkhall 08/06½ (0722 Motherwell – Milngavie 08/08½).
- 0856 Airdrie – Balloch, HEJ 09/36, 0924 Dalmuir – Larkhall 09/37½ (0859 Whifflet – Milngavie 09/09½). The same happens with the 1056, 1256, 1456½.
- 1326 Airdrie – Balloch, HEJ 14/04, 1353 Dalmuir – Larkhall 14/06.
- 1356 Airdrie – Balloch, HEJ 14/35, 1423 Dalmuir – Larkhall 14/37 (1359 Whifflet – Milngavie 14/39).
- 1556 Airdrie – Balloch, HEJ 16/35½, 1623 Dalmuir – Larkhall 16/37 (1559 Whifflet – Milngavie 16/39).

Milngavie single line

- There is a one-mile dynamic loop with two stations on it. The fifteen-minute interval service in each direction was timetabled to pass on this section in the December 2014 timetable. We note that there would not need to be much delay to an incoming train to result in reactionary delays to outbound trains.

Springburn

- There was a half-hourly Cumbernauld to Dalmuir service, which reversed at Springburn. Eastbound, the reversal took place in platform 2 from xx.18 and xx.48 to xx.23 and xx.53. Westbound, the reversal took place in platform 1 from xx.14 and xx.44 to xx.19 and xx.49. That meant that there was only 1 minute between the eastbound train arriving and the westbound train departing; this is a conflicting movement. Any delay to the former was likely to result in a corresponding delay to the latter.

Airdrie

- The Balloch to Airdrie service arrived at xx.10 and xx.40, with the Milngavie to Edinburgh three minutes behind. The former crossed to Platform 1, the bay platform on the south side of the station, crossing ahead of the Edinburgh to Helensburgh service, typically due into Platform 2 at xx.19½ and xx.50 (many are slightly off-pattern, with varying departure times from Edinburgh). Clearly, this would be a risk to the Edinburgh services in both directions. As with Hyndland East Junction, this may have meant that the Edinburgh – Helensburgh service could not be signalled, unchecked, into Platform 2 with a route set ahead of it into Platform 1. This is another location where the TPRs need to be checked against the signalling capability, and appropriate values applied.

Conclusion

Our analysis focused on the December 2014 timetable change. In summary our findings were:

- The timetable work was not undertaken in a manner that resulted in a robust working timetable.
- There were foul and impossible timings contained within the working timetable.

- The point-to-point timings for electric trains over newly-electrified sections appeared to be over-optimistic.
- The Timetable Planning Rules were either inadequate or were not applied properly in producing the working timetable.
- The Timetable Planning Rules omitted essential timing points, as a result of which it was not possible to be sure the working timetable was robust.
- A full review of the Timetable Planning Rules was required.

Annex E – Methodology used by ORR to develop targets

Please note all the data presented in this section are not based on actual figures or targets and are purely for illustrative purposes.

PPM failures targets

In order to derive targets for PPM failures in 2014-15, we used the established relationship between delay minutes and PPM.

We calculated the number of delay minutes per PPM failure in 2013-14 for each KPI (e.g. Non Track) and applied this to the 2014-15 delay minutes targets to derive an estimate of the 2014-15 PPM failures targets.

For example:

	2013-14 delay minutes		2014-15 delay minutes		2013-14 PPM failures		2014-15 PPM failures	
	Actual	**Target**	**Actual**	**Target**	**Actual**	**Target**	**Actual**	**Target**
Non Track Assets	100	150	200	250	50	75	100	125

Number of delay minutes per PPM failure:

= Actual delay minutes (2013-14) / Actual PPM failures (2013-14)

= 100 / 50

= 2

Therefore, the 2014-15 PPM failures target would be:

= Target delay minutes (2014/15) / Number of delay minutes per PPM failure

= 250 / 2

= 125

PPM failure targets for the individual delay categories (e.g. Points Failures) within the KPI group (e.g. Non Track) are based on the proportion of delay minutes that the individual delay category accounts for within the KPI for 2013-14.

For example:

Incident category/KPI	Proportion of 2013-14 Non Track delay minutes	2014-15 PPM failures target
Points Failures	20%	25
Track Circuit Failures	45%	56
Signal Failures	35%	44
Total Non Track Assets	-	125

2014-15 PPM failures target for Points Failures = 20% * 125 = 25

CaSL failures targets

Given that the relationship between delay minutes and CaSL is not as strong as the delay minutes and PPM relationship, CaSL failures were calculated using a slightly different method.

In order to work out the target for CaSL failures in 2014-15, we calculated the number of CaSL trains per failure in 2013-14 and applied this to the total number of CaSL trains needed to meet target in 2014-15.

For example

	2013-14	2014-15
CaSL trains	34	
CaSL failures	30	
CaSL trains per failure	1.13	
CaSL trains needed to meet target	15	21
Trains planned	750	745
CaSL MAA target	2.8%	2.8%

CaSL trains per CaSL failure:

= Total number of CaSL trains (2013-14) / Total number of CaSL failures

= 34 / 30

= 1.13

Therefore, the target for total number of CaSL failures (2014-15):

= Total number of CaSL trains need to meet target (2014-15) / CaSL trains per failure

= 21 / 1.13

= 19

As with the PPM targets calculation, targets for individual delay categories (e.g. Points Failures) are derived from the KPI target (e.g. Track) and based on the proportion that the individual delay category accounts for of the KPI in 2013-14.

Incident category/KPI	Proportion of 2013-14 CaSL failures	2014-15 CaSL failures target
Track assets	25%	5
Non track assets	40%	8
Network management	35%	7
Total track assets	-	19*

* Figures may not sum due to rounding

Adjustments

The mitigations for the different KPIs are based on the established relationship between delay minutes and PPM.

Using a regression model based on Network Rail and TOC caused delay minutes data from 2007-08 onwards, we produced a model that estimates PPM outturn. From that model, we can measure what effect changes in delay minutes have on PPM outturn for each category of delay minutes (NR on TOC, TOC on TOC, TOC on Self). For example, an increase of 1,000 NR on TOC delay minutes may result in a 0.2 percentage point (pp) fall in PPM whereas 1,000 TOC on Self delay minutes may only produce a 0.1pp fall in PPM.

From this, we calculated the effect that TOC on Self delay minutes had on PPM for each year back to 2007-08 and created a new model that measured the effect on PPM of delay minutes for each of the different KPIs within the TOC on Self group (Fleet, Operations, Stations, Traincrew and TOC other)

Essentially, this allowed us to say that if TOC on Self delay minutes as a whole reduced PPM by 3.0pp in 2013-14, we could break down that 3.0pp to tell us how much of that was down to Fleet, Traincrew etc.

We then fed back into the model the actual number of delay minutes and the target number of delay minutes to calculate expected PPM outturn which meant that we could identify what impact the excess minutes in each KPI had on PPM.

For example:

	Fleet	Traincrew	Stations	TOC Other	Operations	TOC on Self impact on PPM
Actual	-1.00	-0.50	-0.50	-0.30	-0.20	-2.50
Target	-0.80	-0.40	-0.30	-0.20	-0.40	-2.10
Effect of Excess minutes (Actual - Target)	-0.20	-0.10	-0.20	-0.10	0.20	-0.40

The estimates of the PPM impact quoted in this report are based on the operator meeting the delay minutes target for each KPI.

Annex F: Key supporting documents **-** reports, reviews and information considered as part of this investigation

- Renewals & Maintenance Volume, Q4 Assurance Review Period 11.5 Reforecast (RF11.5)
- Network Rail's Composite Reliability Index (CRI) Report Period 13 - 2014/15
- Quarter 4 Performance Report and tracker – NR Report
- Internal Audit Review into Train Service Delivery – Anglia
- Letters from stakeholders
- Meeting minutes from NR
- ORR Performance Dashboard - ORR
- National Rail Passenger Survey – Transport Focus
- The Impact of Passenger Growth on Train Performance – NR Report

Annex G: Meeting held as part of investigation

Organisation	Date	Industry attendees	ORR attendees	Subject
Network Rail	11/05/15	Ann Marie Harmon, Douglas Raity, Jon Haskins	Nigel Fisher, Sam McClelland-Hodgson, Dominic Wall, Stephanie Tobyn	Scotland Route Performance 2014-15

Annex H: Relevant Railways Act 1993 legislation

The Office of Rail Regulation (ORR) must discharge the statutory duties placed upon it by section 4 of the Railways Act 1993 (as amended by the Transport Act 2000 and the Railways Act 2005).

Section 4 of the Railways Act 1993

(1) The Office of Rail Regulation shall have a duty to exercise the functions assigned or transferred to it under or by virtue of this Part or the Railways Act 2005 that are not safety functions in the manner which it considers best calculated —

(zb) to promote improvements in railway service performance;

(a) otherwise to protect the interests of users of railway services;

(b) to promote the use of the railway network in Great Britain for the carriage of passengers and goods, and the development of that railway network, to the greatest extent that [it] considers economically practicable;

(ba) to contribute to the development of an integrated system of transport of passengers and goods;

(bb) to contribute to the achievement of sustainable development;

(c) to promote efficiency and economy on the part of persons providing railway services;

(d) to promote competition in the provision of railway services for the benefit of users of railway services;

(e) to promote measures designed to facilitate the making by passengers of journeys which involve use of the services of more than one passenger service operator;

(f) to impose on the operators of railway services the minimum restrictions which are consistent with the performance of its functions under this Part or the Railways Act 2005;

(g) to enable persons providing railway services to plan the future of their businesses with a reasonable degree of assurance.

(2) Without prejudice to the generality of subsection (1)(a) above, the Office of Rail Regulation shall have a duty, in particular, to exercise the functions assigned or transferred to it under or by virtue of this

Part or the Railways Act 2005 that are not safety functions in the manner which it considers is best calculated to protect—

(3) the interests of users and potential users of services for the carriage of passengers by railway provided by a private sector operator otherwise than under a franchise agreement, in respect of—

(a) the prices charged for travel by means of those services, and

(b) the quality of the service provided, and

(4) the interests of persons providing services for the carriage of passengers or goods by railway in their use of any railway facilities which are for the time being vested in a private sector operator, in respect of—

(a) the prices charged for such use; and

(b) the quality of the service provided.

The Office of Rail Regulation shall be under a duty in exercising the functions assigned or transferred to it under or by virtue of this Part or the Railways Act 2005 that are not safety functions—

[23] to take into account the need to protect all persons from dangers arising from the operation of railways; and

[24] to have regard to the effect on the environment of activities connected with the provision of railway services.

Sections 3A, 3B and 4 relate to the Secretary of State and the Scottish Ministers]

The Office of Rail Regulation shall also be under a duty in exercising the functions assigned or transferred to it under this Part or the Railways Act 2005 that are not safety functions—

(a) to have regard to any general guidance given to it by the Secretary of State about railway services or other matters relating to railways;

(aa) to have regard to any general guidance given to it by the Scottish Ministers about railway services wholly or partly in Scotland or about other matters in or as regards Scotland that relate to railways;

(ab) in having regard to any guidance falling within paragraph (aa), to give what appears to it to be appropriate weight to the extent (if any) to which the guidance relates to matters in respect of which expenditure is to be or has been incurred by the Scottish Ministers;

(b) to act in a manner which it considers will not render it unduly difficult for persons who are holders of network licences to finance any activities or proposed activities of theirs in relation to which the Office of Rail Regulation has functions under or by virtue of this Part or that Act

(whether or not the activities in question are, or are to be, carried on by those persons in their capacity as holders of such licences);

(5) to have regard to the funds available to the Secretary of State for the purposes of his functions in relation to railways and railways services;

(ca) to have regard to any notified strategies and policies of the National Assembly for Wales, so far as they relate to Welsh services or to any other matter in or as regards Wales that concerns railways or railway services;

(cb) to have regard to the ability of the National Assembly for Wales to carry out the functions conferred or imposed on it by or under any enactment.

(6) to have regard to the ability of the Mayor of London, [25]and Transport for London to carry out the functions conferred or imposed on them by or under any enactment.

(5A) Before giving any guidance for the purposes of subsection (5)(a) above the Secretary of State must consult the National Assembly for Wales.

(5B) In exercising its safety functions, other than its functions as an enforcing authority for the purposes of the Health and Safety at Work etc Act 1974, the Office of Rail Regulation shall be under a duty to have regard to any general guidance given to it the Secretary of State.

[25] In performing its duty under subsection (1)(a) above so far as relating to services for the carriage of passengers by railway or to station services, the Office of Rail Regulation shall have regard, in particular, to the interests of persons who are disabled.

[26] Without prejudice to the generality of paragraph (e) of subsection (1) above, any arrangements for the issue and use of through tickets shall be regarded as a measure falling within that paragraph.

(7ZA) Where any general guidance is given to the Office of Rail Regulation for the purposes of subsection (5)(a) or (aa) or (5B)—

- it may be varied or revoked by the person giving it at any time; and

- the guidance, and any variation or revocation of the guidance, must be published by that person in such manner as he considers appropriate.

(7A) Subsections (1) to (6) above do not apply in relation to anything done by the Office of Rail Regulation in the exercise of functions assigned to it by section 67(3) below ("Competition Act functions").

(7B) The Office of Rail Regulation may nevertheless, when exercising any Competition Act function, have regard to any matter in respect of which a duty is imposed by any of subsections (1) to (6) above, if it is a matter to which the Office of Fair Trading could have regard when exercising that function.

(8) In this section—

"the environment" means all, or any, of the following media, namely, the air, water and land (and the medium of air includes the air within buildings and the air within other natural or man-made structures above or below ground);

"notified strategies and policies", in relation to the National Assembly for Wales, means the strategies and policies of that Assembly that have been notified by that Assembly for the purpose of this section to the Office of Rail Regulation;

"the passenger transport market" means the market for the supply of services for the carriage of passengers, whether by railway or any other means of transport;

"railway service performance" includes, in particular, performance in securing each of the following in relation to railway services –

a. reliability (including punctuality);

b. the avoidance or mitigation of passenger overcrowding; and

c. that journey times are as short as possible;

"safety functions" means functions assigned or transferred to the Office of Rail Regulation-

i. under this Part;

ii. under or by virtue of the Railways Act 2005; or

iii. under or by virtue of the Health and Safety at Work etc Act 1974;

so far as they are being exercised for the railway safety purposes (within the meaning of Schedule 3 of the Railways Act 2005) or for purposes connected with those purposes.

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