ORR Performance Investigation Report

Network Rail's delivery of its Scotland regulated performance targets 2013-14

June 2014

Contents

Glossary

Acronym	Definition
CCF	**Control Centre of the Future**
CP4	**Control Period 4**
DPI	**Delay Per Incident**
FSR	**First ScotRail**
GS&W	**Glasgow South & West**
IEEC	**Integrated Electronic Control Centre**
NRG	**National Reliability Groups**
NRIG	**National Reliability Improvement Groups**
NRPS	**National Rail Passengers Survey**
OLE	**Overhead Line Equipment**
PPM MAA	**Public Performance Measure Moving Annual Average**
PSP	**Police Service Plans**
RRV	**Road Rail Vehicle**
SAK	**Stirling Alloa Kincardine**
TOC(s)	**Train Operating Companies**
TSR	**Temporary Speed Restriction**
WMG	**Water Management Group**

Part A - Executive summary

1. The regulatory target for Scotland (PPM/MAA) in 2013-14 was 92%, with outturn at the end of Period 13 at 91.4%. Performance was strong in 2012, but fell back following the December 2012 timetable change.
2. Network Rail's (NR's) Q4 report identified the following issues that had caused the decline in performance:

- congestion/conflict at Newton Junction;
- lack of resilience to deal with temporary speed restrictions (Aidrie-Bathgate and S-A-K); and
- non track asset failures – embankments, vegetation and drainage**.**

3. In response, NR implemented the following constructive solutions:

- it voluntarily (and in collaboration with First Scotrail (FSR)) produced and implemented a Further Improvement Plan (FIP):
- it addressed timetable resilience through its December 2013 timetable change and doubling of Newton Junction to increase capacity and reduce conflicts; and
- it made £63m of investment in recovering performance.

4. Performance recovered significantly in Q4 of 2013-14, with period 11 attaining 93.3%, period 12 – 94.1% and period 13 - 94.7%. This meant that the target was ultimately missed by a relatively small amount (0.6 percentage points). Performance has also continued to be strong at the start of 2014-15.
5. In its Q4 report NR stated that *"we believe that we have, in the main, taken such steps as were reasonably practicable to deliver our CP4 targets".*
6. We concur with this statement. We could further investigate the potential past breach for the errors that occurred prior to the December 2012 timetable change but, given that NR has identified the issue and taken effective action to remedy the problem we do not believe this would achieve anything. Furthermore, Keith Brown MSP, wrote to NR Scotland on 14 April noting its recent strong performance.

Part B - Introduction

1. Terms of reference of the investigation

7. On 25 March 2014, we wrote to NR stating our intention to formally investigate its delivery of regulated performance targets in 2013-14. In summary, this investigation focused on NR's sector (see separate report) and Scotland performance in 2013-14 and an assessment of whether it did everything reasonably practicable to achieve its regulated outputs.
8. Our investigation included an analysis of a range of issues affecting performance. They included, but were not limited to:

- weather (its impact and how NR dealt with it);
- asset management; and
- train planning.

2. Consideration of issues

9. This investigation focused on whether we thought NR did everything reasonably practicable in Scotland to meet its performance obligations in 2013-14. In assessing this we considered the following issues:

- what NR considered to be the issues affecting its performance in 2013-14 in Scotland;
- whether NR did everything it said it would do in its Further Improvement Plan (FIP);
- the application of the performance funding and FIP initiatives;
- whether the performance improvements had the effect NR thought they would;
- the impact of 'operator on operator' / 'TOC on self delays' and external factors on NR
- 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);
- the effect train planning had on performance; and
- what other activities NR were planning for 2013-14 to improve performance.

3. Context of the investigation

10. We reviewed NR's original Scotland FIP, and the subsequent Performance Assessment of 2013-14. We engaged with NR to understand the reports and plans it provided, to answer any questions we had and to discuss any further information it thought may be relevant to our investigation.
11. We sought views and further information from relevant Train Operating Companies (TOCs) to ascertain whether they were satisfied that NR was doing everything reasonably practicable to meet its requirements. We also discussed what main factors they believe influenced performance in 2013-14 in Scotland.
12. We finished our investigation at the beginning of June. At that stage we considered the issues raised in the evidence provided to us and decided whether any further enforcement action needed to be taken.

Part C - Performance Summary: 2013-14

1. Overview of CP4 targets

13. The table below shows NR's regulatory targets throughout CP4 in Scotland:

	Scotland		
	Actual PPM MAA (%)	**Target PPM MAA (%)**	**Variance to target**
2009-10	90.6	90.9	-0.3pp
2010-11	90.1	91.3	-1.2pp
2011-12	90.7	91.7	-1.0pp
2012-13	93.0	91.9	1.1pp
2013-14	91.4	92.0	-0.6pp

Table 1 – CP4 targets & actual PPM MAA achieved throughout CP4

14. This table shows that NR's actual performance for Scotland in 2013-14 was 0.6pp below its regulated target.
15. The table below shows Scotland's actual PPM per period in 2013-14:

	Actual PPM period (%)
2013-14 P1	94.0%
2013-14 P2	93.7%
2013-14 P3	91.0%
2013-14 P4	90.4%
2013-14 P5	90.9%
2013-14 P6	93.2%
2013-14 P7	92.1%
2013-14 P8	88.3%
2013-14 P9	83.5%
2013-14 P10	88.2%
2013-14 P11	93.3%
2013-14 P12	94.1%
2013-14 P13	94.7%

Table 2 – CP4 actual PPM per period.

Part D - Passenger satisfaction

16. An important measure of how performance affects passengers across the sector is the National Rail Passenger Survey (NRPS).
17. Based on the autumn 2013 NPS results, which were published on 21st January 2014, the proportion of passengers travelling in Scotland who were overall satisfied or good was 87%. This was not significantly different compared to autumn 2012, when 90% were satisfied overall. In relation to train punctuality/reliability, satisfaction was 82%, which is 5 percentage points lower than the autumn 2012 results.
18. This shows that in general, there was not a statistically significant decline from 2012-13 to 2013-14.

Part E - NR evidence and Our Assessment

19. NR stated in its 2013-14 Scotland Route performance assessment that it accepts responsibility for its part in non-delivery of performance outputs, but the report also stated that *"we believe that we have, in the main, taken such steps as were reasonably practicable to deliver our CP4 targets"*
20. In its report, NR addressed the principal evidence and causal factors it believes might be the reasons for missing its Scottish regulatory target:

The Further Improvement Plan (FIP)

Implementation of the FIP

21. In the latter half of 2011-12 and into 2012-13, performance was strong in Scotland and appeared to be on course to achieve its end of CP4 target.
22. However, following a timetable change in December 2012, performance started to fall backwards. This caused ScotRail's PPM MAA to decrease from an all-time high of 93.2% at the end of period 12 of 2012-13 to a low of 91.1% at the end of period 10 of 2013-14.
23. This decline in PPM was caused by a reduction in timetable resilience following the December 2012 timetable change which resulted in an increased impact from Temporary Speed Restrictions (TSRs). In addition poor asset reliability in key signalling categories caused a number of highly disruptive events, which were difficult to recover. The weather conditions during the year proved challenging and resulted in a further deterioration of performance, in particular the long and difficult autumn season and the challenging wet and windy weather in early December.
24. After a considerable delay, on the 23 December 2013, in response to its declining performance NR provided us with its FIP. We assessed this and concluded that it was fit for purpose. Network Rail confirmed to us that, despite the delay in receiving the final copy authorised by NR and First ScotRail (FSR), that the actions in the FIP were being implemented in advance of receipt of the final copy.
25. Since publication of the FIP and co-incident with the December 2013 timetable change, performance in Scotland improved markedly, beating its period performance target in the last three periods of 2013-14. The strong performance delivered in periods 11, 12 & 13 meant that that the end of year target was only missed by 0.6pp. This strong performance has continued into 2014-15.

Our Assessment

26. NR Scotland has been clear in its responsibility to develop recovery plans and the need to understand the true cause of under delivery against its performance targets. Detailed analysis was therefore undertaken, which led to the creation and development of the FIP.
27. As the above evidence demonstrates, NR managed to turn around performance in Scotland in the final periods of 2013-14, which has continued into CP5.

Performance Funding

28. The table below shows NR targeted additional expenditure on improving asset resilience in Scotland for the last 12-18 months of CP4:

Fund (Total Expenditure)	Detail	Allocated expenditure (£)
Resilience (£51 million)	Structures, Safety	3.6m
	Asset condition	6.5m
	Earthworks, Rock fall prevention and slope stability	10.6m
	Flood prevention	7.2m
	Track, fencing	3.0m
	Track ASI recovery	3.7m
	Track resilience including drainage	5.9m
	Electrical Power, Signalling power resilience	4.5m
	Point heating	0.1m
	OLE resilience	0.9m
	Signalling, TDM migration to FTN and WCML tail cables	2.6m
	Line side building security including Perth Depot	2.4m
Out Performance Fund (6.1 million)	Wet weather	0.2m
	Asset performance: (cables, monitoring equip, rapid response at key locations)	2.2m
	Off-track: (LiDAR survey and subsequent vegetation management and fencing)	3.7m
The Area Directors Asset performance fund (£1.1 million)	Signalling asset reliability: issues identified by Area Directors, to address issues such as multi and FTM cables, high performance risk relays and monitoring equipment.	624k
	E&P asset reliability: issues identified by Area Directors, to address cable theft, OLE reliability and distance to fault recording on WCML	460k
Area Directors OPEX fund (£0.8 million)	West Area additional vegetation management	400k
	East Area hot weather and track quality issues	400k
Vegetation management (£2.7 million)	Additional spend across route for vegetation management	2.7m
Track Quality 12/13 into early 13/14 (£1.6 million)	Additional tamping etc. to tackle track quality issues	1.6m

Table 3 - NR targeted additional expenditure on improving asset resilience in Scotland for the last 12-18 months of CP4

29. In summary, Network Rail advise us that the total spend was **£63.3m.**
30. Of the above spend, £24.7 million was allocated to weather resilience measures, namely:

- earthworks, rock fall prevention and slope stability;

- flood prevention;
- off-track (LiDAR survey and subsequent vegetation management);
- additional spend across route for vegetation;
- West Area additional vegetation management:
- wet weather; and
- East Area hot weather prep

Our assessment

31. It is our view that this investment has been effectively targeted to areas that will support performance improvement and is broadly consistent with the key improvement areas identified in its FIP.

Reduction in Timetable Resilience

NR's Submissions

32. In its Q4 Scotland Route performance assessment report, NR stated that one of the primary causes for its failure to reach its regulated target in Scotland was the overall reduction in timetable resilience. NR stated that this was the result of the number of TSRs across the route and the December 2012 timetable change.
33. NR admitted that the timetable change was driven by a change in train planning values. The modelling of the new timetable was incomplete, and the geographical impact of it was underestimated. The timetable change reduced overall timetable resilience by 7% PPM. This resulted in an overall PPM figure decrease.
34. Further, NR stated that the TSR numbers throughout 2013-14 was high. However, three of these TSRs were implemented as a result of insufficient sighting distances at level crossings. The other TSRs were implemented due to track formation and geotechnical issues on the Airdrie to Bathgate and Stirling to Alloa-Kincardine lines.
35. The chart in Annex A illustrates the impact of the December 2012 and December 2013 timetable changes on Argyle PPM and Right time performance.
36. Furthermore, NR has stated that it reviewed its processes in the light of the errors that occurred in implementing the 2012-13 change. It has subsequently advised us (in an email from Anne-Marie Harmon, Route business development manager, Scotland) that:

"The initial modelling for the Argyle line change centred on a small geographical area and did not extend to Larkhall, Hamilton and Hyndland in the other direction. The initial modelling assumed that the change of reordering at Newton would effectively reorder the trains and reduce the delay out of Glasgow Central Station. BUT the data within the model was unrealistic and did not reflect reality on the old TT. In addition the modelling was late and by the time the model was complete the timetable had been bid and offered.

My [Anne-Marie Harmon – Business Improvement manager – Scotland route] comments related to the supporting processes and procedures that our Joint Resilience Timetable Group now use in terms of timetable evaluation. For any major TT change we have now agreed that the modelling would be required to be done earlier in the process and model the entire geography affected. The model would then be validated using real lateness information from DAS/OTMR systems which uses the actual late running in seconds rather than TRUST systems which round to one minute. In a similar manner the extent of the sub-

threshold late running would be tracked across the network and reviewed against model outputs. To aid that model validation we are currently perusing mapping reactionary delays through the PPRP system to visually represent the impact.

At this stage we would agree whether the model was deemed realistic and then on the basis of improved predicted results implement the TT change.

All of the above should improve the modelling and prevent us from introducing a poor timetable. However as a precaution we have also now invoked a new monitoring process in conjunction with train planning after each timetable change. The performance teams produce a TT report every week which looks at late running in the TT change area. In addition OTMR data is also reviewed to understand the changes to delay which maps lateness to the second. We can now react to change much faster than before, we will then review contingency planning and will look to make train specific changes if the data highlights an issue.

If the data suggests that we need to make a structural correction then we will plan this for the next available TT change.

We still use Railsys modelling for general TT evaluation but are now more sensitive to the results, as an Industry we are looking to other alternatives but so far have not utilised any Railsys modelling since December 2012 TT change in Scotland."

37. NR's area directors also chair a fortnightly review of actions to remove TSRs and have delivered a significant reduction in speed restrictions on Glasgow South and West (GS&W) and Stirling to Alloa-Kincardine lines. It has also strengthened the process supporting condition of track registers.

Our Assessment

38. It is clear that NR's analysis identified the issues behind the timetable errors and it developed a solution and implemented it in the December 2013 timetable change. Co-incident with this, there was a marked turn-around in performance. NR and FSR have implemented a joint timetable strategy and coupled this with infrastructure enhancement at Newton Junction.
39. Our investigation has concluded that the timetable change in December 2012 was the most significant factor behind NR's failure to achieve its regulated PPM output in 2013-14. It is clear that errors occurred in implementing the 2011-12 timetable change, which is outside the period covered by this review; however we believe it had a continuing effect on performance into 2013-14.

Non-Track Assets

40. In its Q4 report, NR recognised that benefits from its Intelligent Infrastructure were not being fully realised, with the dedicated system support only being utilised during office hours. The route quickly established the need to support the system at all hours. However, issues with national union consultation and local issues prevented this action plan from

progressing. Coverage at all times commenced during May 2014 and will provide further improvements. As yet, it is too early to confirm if these improvements have been delivered.

41. In addition, work is also being undertaken on extending the scope of coverage for new failures modes on assets already fitted, point's failure is a prime area under development.

Signal Systems and Power

42. In its Q4 Scotland Route performance assessment report, NR stated that:

"Within this category there are various issues surrounding interlockings and location cases, operating panels and lever frames. During Period 4, there were a number of SSI module failures, shown to be influenced by the hot weather; these gave us circa 1.5k of delays.

The top causalities have been:
- *33% were caused by component failures such as SSI modules and fuses,*
- *27% of total minutes delay due to incidents of an unknown cause. The exact cause of failures is difficult to identify due to the complicated nature of interlocking and associated circuitry and the fact the fault clears before arrival, or during testing. These failures will be caused by similar reasons as recorded for the rest of the category.*
- *24% of total minutes delay due to relays failures*
- *16% of minutes due to various power supply issues (distribution fuses, UPS, standby batteries etc)"*

43. NR has confirmed that National Reliability Groups (NRGs) have also been formed to tackle emerging issues contributing to poor performance in this sub-category, in relation to areas such as relay reliability and panel equipment resilience.
44. Relay testing is now implemented before installation. There is also a new National Forum that has been set up with NR experts, manufacturers and test centre staff to develop an understanding of the failure modes, the reasons and subsequent action plans to address the critical causations of these delays.

Points

45. NR has identified a number of positive indicators within the point's category in its Q4 Scotland Route performance assessment report:

- *"The overall number of points failures decreased in comparison to last year,*
- *The number of 'rogue assets' (defined as assets which have failed twice or more in 91 days) has decreased*
- *Remote condition monitoring (RCM) has positively affected performance in this category with increase in mean time between service affecting failures*
- *Maintenance campaigns to address specific failure modes have been a success as these failure modes have reduced*
- *Critical assets (defined as key operational points on the network) are showing reliability improvements"*

46. However NR also notes that although there has been no significant change to response times or time to fix, delays from points failures did not meet the delay minute target and delay per incident (DPI) has risen. There have been some significant failures on key parts of the network and rural areas have improved more than the central belt of the network.

47. In response, NR has implemented changes to realign points and reconfigure within tolerance, which it considers has been successful. In addition, enhanced component replacement at key junctions has improved overall asset resilience, such as Switches and Stability Plates. In addition £0.1m has been invested in delivering additional point heating in 2013-14.

Axle Counters

48. In its Q4 Scotland Route performance assessment report, NR states that

"The axle counter population within Scotland has increased considerably over CP4, with assets commissioned in many key areas such as Waverley to Haymarket and as part of the Glasgow South Suburban Signalling Resignalling Project. There has been a mix of new installation failures, repeated digital card and system issues at key locations such as the E to G, at Dalmeny and on Glasgow South Suburban.

There have also been repeat failures at older installations such as Craigendoran, Kilmarnock, Hilton and Dyce. Kilmarnock is due to be replaced with reconditioned equipment, which has been removed from the Forth Bridge. At Dyce, the local team has developed a new method of working under perturbation to reduce the impact on delays.

The renewals strategy during CP4 has been targeted to systematically improve the most problematic assets and improvements have been seen where work has taken place. Further major signalling renewals programmes are planned for areas of known poor reliability, most notably the re-control of Motherwell Signalling Centre, and the renewal of the Polmadie to Rutherglen Interlocking system."

49. In response, National Reliability Improvement Groups (NRIGs) have been set-up and the manufacturers have been actively involved in troubleshooting reliability problems. Axle counters are inherently more reliable than track circuits as a means of train detection, so even after the bedding-in issues have been resolved, it is anticipated that axle counters in Scotland will offer the best whole-life reliability and performance.

Overhead Line Equipment (OLE)

50. In its Q4 Scotland Route performance assessment report, NR stated:

"The significant influence in this category has been the increased number of trips with no fault found with 48 incidents in 12-13 (1,159 minutes) and 102 incidents in 13-14 (2,558 minutes)."

51. NR has undertaken a correlation exercise between OHL trips and data from the LIDAR surveys with problem vegetation, has concluded that there is a direct correlation between areas of large vegetation growth and high numbers of OHL trips. The output from the LIDAR survey / TRIP comparison study has informed and prioritised the vegetation removal workbank to tackle high risk areas first.

52. Over £5m additional resilience has been delivered in 2013-14, which will deliver benefit in the latter parts of 2013-14 and in to CP5.

Cables

53. In its Q4 Scotland Route performance assessment report, NR states:

"This category finished the Year 2.2K over target, due to a number of Power Cable incidents on the East Coast Mainline and E & G, which due to their nature, proved difficult to rectify in sufficient time in which to minimise the time lost."

54. In 2012-13 NR created a cable management group, led by an Area Director, which had senior representatives from E&P, Signalling and Telecoms teams. The group focussed on the indicators for cable derogation such as bender readings and the number of jointed cables. The group have then invested money to replace cables and install further resilience into the signalling systems, delivering benefits in the latter parts of 2013-14 and in to CP5.

Level Crossings

55. In its Q4 Scotland Route performance assessment report, NR states:

"Performance minutes and reliability incidents have been very poor compared to the previous year. The introduction of the MCB-OD equipment at Kirknewton contributed significant performance delays, this technology has now been optimised and the asset is performing well.

There were reliability issues at Hoy, Murthly and Nigg in the early part of the year with failures associated with treadles and micro-switches."

56. NR applied new and upgraded data logging equipment, which appears to have reduced the number of repeat failures being experienced. In the Far North, the restrictions on barrier tip weight have been relaxed to mitigate the open nature of the landscape for these crossings and the higher wind speeds.
57. A more rigorous rogue asset management regime has been applied to level crossings to reduce the number of repeat failures.

Our assessment

58. It is clear from the above that NR has taken active steps in order to address delays caused by non-track assets. We consider these to be an appropriate response, even if performance benefits are yet to be fully realised.

Network Management

59. In its Q4 Scotland Route performance assessment report, NR stated:

"Delays in the Commercial Takeback category fall under distinct pots, the current Commercial Deal in place to cover when the RHTT did not run and the acceptable of additional delay in the Newton Area caused by the Dec 12 timetable change. The significant delay impacts were 3,738 minutes and 8,664 minutes respectively.

Unexplained and Un-investigated delays were affected by a poor and extended autumn, staff shortages and heavy workload days. Delays attributed to this category have now recovered to previous levels."

60. NR has advised us that a significant collaborative effort have been made with FSR to use all available information (TRUST, CCF, Spectrum/Nexala and Driver Advisory System) to analyse and understand unexplained delay and potential timetable robustness issues. It confirms that this was successfully used for the December 2013 timetable changes where, together with the doubling of the North connecting line at Newton, it has seen improvements in the Network Management/Other Category Group. This process is being used on other routes to feed into future timetable improvements.
61. Additional delay attribution staff have been recruited, minimising the risk of further overloads and the inability to understand the true cause of delay.
62. Train planning delays centres on short notice planning errors, which are predominately freight paths. Action plans are focused on recruitment, people training and the system issues.
63. Possession management - RRV breakdowns and late communication between site and control was an issue during the early part of the year. Action plans centred on reviewing plant, a thorough run through of the ballast train timings and the driver hours as well as a rigorous communication plan on site and back to control, have addressed this issue.
64. Additionally, large screens have been deployed into the IEEC and Control, to live link with CCF to assist in perturbation. Additional Vegetation clearance and fencing programmes are also in place.

Our assessment

65. It is clear from the above that NR has taken active steps in order to address this significant issue and we consider these to be an appropriate response.

Externals

66. In its Q4 Scotland Route performance assessment report, NR states:

"Vandalism and theft – there had been issues with sabotage and repeat cable theft areas during the early part of the year. Vandalism however remains the biggest issue and although there has been a slight decrease in the number of incidents, delays have increased (by almost 60%).

Fatalities and trespass – whilst there have been fewer incidents due to fatalities on the Scottish network this year so far compared to last the delays generated have increased by c.40%. Delay due to trespass are the biggest influence on this category. Compared to last year, incidents have increased by 25% whilst delays have risen by 73%. Analysis confirms the random nature of these events; there are no repeat locations or hotspots for fatalities.

External Other comprises mostly of animals on the line, and the failure of power supply companies to Network Rail infrastructure. The most common types of animal incursion are from deer, birds (striking trains and OHLE), cows and sheep. Repeat areas are those on the more rural lines and involve either sheep on the line or deer strikes. The other main influencing factor on this category has been failures associated with our external power supply companies."

67. NR has advised that the following response to external issues has been made:

- The mitigations in place to tackle cable theft, such as trembler units, CCTV cameras and DNA grease at the key hotspots are proving successful as arrests have been made and the run rate of incidents has reduced. Strategic meetings continue with the British Transport Police on a four weekly basis with further Police Service Plans (PSPs) for two locations, and others developed as required.
- Mitigation measures to tackle the threat of suicides include the installation of a large number of Neath Gates on the top of platform ramps; dedicated metal signs advertising the Samaritans telephone number, posters and intervention training for staff members. Most of the suicides in Scotland have occurred where access has been gained from places other than at stations that have made prevention difficult although a rethink of the strategy in Scotland has seen the rollout of signs at Level Crossings and Access Points. In total, some 500 signs have been deployed across the Scotland Route.
- NR identifies North Bridge Waverley as a hotspot. In response, NR hopes that the delivery of proposed mitigation measures for Union Street Bridge at Aberdeen, which is of similar construction to the North Bridge, and has similar planning restrictions, will eventually help to address and fix the problem at Waverley.
- The Route's fencing plans continue to tackle the risk posed by animal incursions, as well as trespass. In addition to the planned renewals being delivered (27,882m), additional funding was provided and a further 90,175m has been renewed/upgraded this year. Going forward, there is a further 324,034m planned for 2014-15. There is a significant and sustained increase of fencing renewals planned during CP5. NR is also currently revising its Five Year Programme in order to realise the benefits associated with these renewals, which it will complete in the first three years of the Control Period. This is also the case for Vegetation works.
- To tackle birds striking OLE, measures taken include deflectors and secondary insulation at known risk sites, the use of bird repellent gel, netting some OLE structures to prevent nests being built and nesting patrols.

Our assessment

68. We believe that all of the above approaches are an appropriate and proportionate response to the issues that NR has identified.

Track

69. In its Q4 Scotland Route performance assessment report, NR states:

"Track narrowly missed target due to the TSRs associated with SAK and Airdrie Bathgate lines and the subsequent reactionary delay. The number of broken rails was 18 (2013/14) compared to last year of 26 (2012/13)."

70. The route has confirmed that its response has been to implement a stronger focus on holistic and sustainable asset management. Key initiatives such as replacement of pre 1976 rail, reduction of L2 and Poor Track Geometry, and rail joint removal have all contributed to delivering the performance minutes targets.
71. It has delivered almost £12m of spending, which includes:

- £5.9m on track resilience including drainage;
- £3.7m on track ASI recovery; and
- £1.9m on track quality 12/13 into early 13/14, to tackle TQ issues, (tamping, etc).

Our assessment

72. We believe that this approach is an appropriate and proportionate response to the issues that NR has identified.

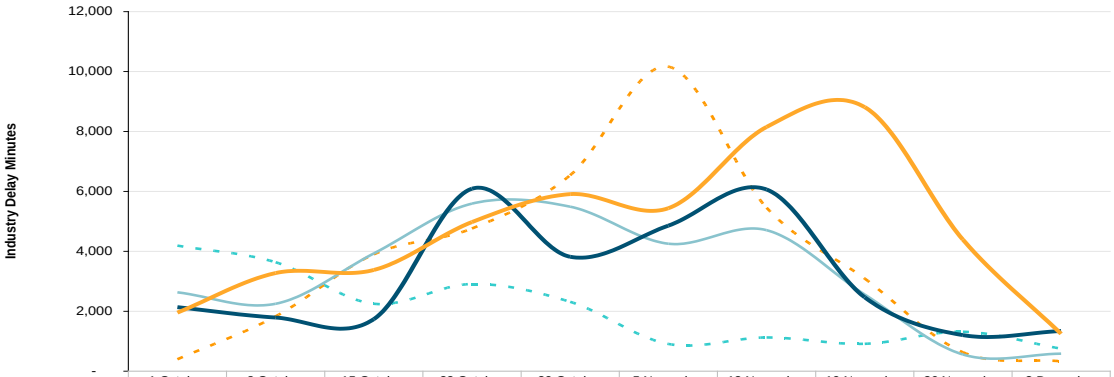
Severe Weather, Autumn & Structures

73. In its Q4 Scotland Route performance assessment report, NR states:

"Severe Weather is the largest is of category in this grouping, this category ended the year better than target and is testament to the work that is being delivered by the water management group and the amended timetable process initiated on receipt of a bad weather forecast.

Low adhesion delays during autumn were 57% worse than target and was driven by significant increases on key lines of route. Delays on the North Electrics line of route increased by 43% with the same number of incidents as last year; delays on the Ayr lines (to Ayr and Largs) increased by 44% and 49% respectively, while the E&G saw incidents reduce by 34% but delays reduce by only 6%. In addition, there were 591 more incidents than last year and delay per incident rose slightly.

Further, autumn was a more prolonged season than previous years as shown by the graphs below showing autumn delays by week:



	1 October	8 October	15 October	22 October	29 October	5 November	12 November	19 November	26 November	3 December
2009/10	4,190	3,634	2,249	2,908	2,314	906	1,125	912	1,317	748
2010/11	395	1,828	3,900	4,759	6,539	10,162	5,455	3,090	630	328
2011/12	2,632	2,251	3,928	5,592	5,488	4,254	4,705	2,557	558	583
2012/13	2,137	1,791	1,735	6,088	3,818	4,856	6,062	2,466	1,204	1,339
2013/14	1,953	3,275	3,376	4,975	5,909	5,437	8,149	8,811	4,391	1,247

Graph 1: October- December Scotland delay minutes 2009-10-2013-14

There were two distinct peaks over the course of 6 weeks and cumulative delay follows a similar trend to last year up until 5th of November. Delays tailed off at this point last year but grew more so in 2013 than at any other time in the previous 5 years.

Whilst the prolonged autumn period affected this category, it also resulted in a negative impact on the Network Management Other category as a result of the Commercial Deal being applied."

74. Overall the weather in autumn/winter 2013-14 was not as severe as in the rest of the UK. Notwithstanding this, data supplied by the UK Met Office, shows the record levels of rainfall experienced across the Route, during Period 10 2013-14. Despite this, NR had a strong performing period with minimal flooding across the Route, which it believes is a demonstration of the success of the Water Management Group (WMG).

75. It has continued the work of the cross-functional WMG and in 2013-14, it addressed 20 of the most problematic sites, delivering works that mitigate the risk of flooding of the network and has plans either in place or being developed for a further 40.

76. NR has deployed 100 weather stations across the route to provide real time information to control regarding wind speed (gust and mean), wind direction, precipitation levels, air temperature and rail temperature. NR continues to progress work on commissioning these with the majority now functional. The weather stations will be fundamental to the processes for managing the effects of high winds and rainfall on the infrastructure.

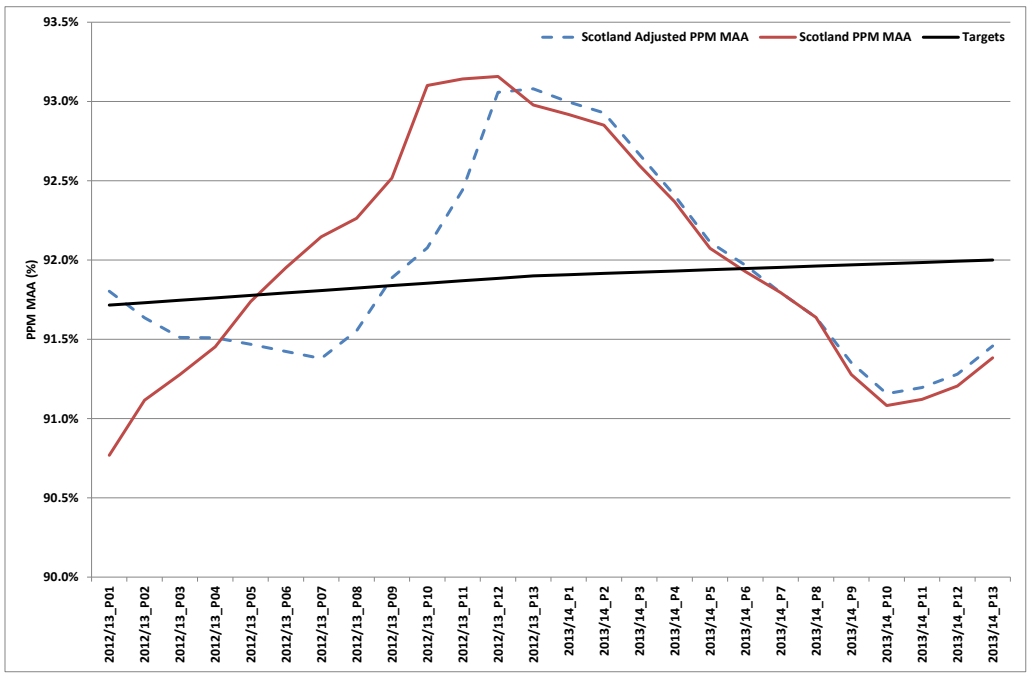
77. In addition, the route is currently producing a Climate Change Adaptation Plan to be submitted to us in September 2014, which will review assets to determine the likely effects of climate change and its predicted impacts on weather patterns and sea levels.

78. In terms of Structures, in the latter part of CP4 resilience funding was used to underwrite work at a number of structures carrying heavy freight with the intention of preventing sudden deterioration, which had in the past prompted the imposition of year long speed restrictions as severe as 10mph. The route has also taken measures to manage water ingress through structures at certain key location where this has caused performance issues with other asset types.

Adjustments: weather

79. We have developed a methodolgy for adjusting performance for the impact of severe weather beyond the level that it feels NR is funded to deliver. However, in Scotland the impact of extreme weather was marginal in 2013-14 (as only 6 days were adjusted) and performance exceeded all expectations.

80. Despite Scotland ending CP4 0.6pp worse than regulatory target, extreme weather in Scotland is not considered a factor in our investigation. The chart below shows the adjustment to PPM in Scotland that would have occurred had we applied the same methodology we used to adjust for weather in England and Wales.



Graph 2: Scotland PPM (MAA and weather adjusted PPM (MAA) for 2013-14

Our assessment

81. Whilst the weather was relatively mild in Scotland, we believe that NR has taken appropriate steps to mitigate the risks in relation to extreme weather.

Traffic growth

82. In Scotland, NR has not identified traffic growth as an issue affecting performance in Scotland.
83. In 2010-11 the total passenger journeys were 80,775,240 and by 2013-14 this had increased to 85,994,975. We therefore aknowledge that passenger growth was sustained throughout CP4.

Part F – Industry Engagement Feedback

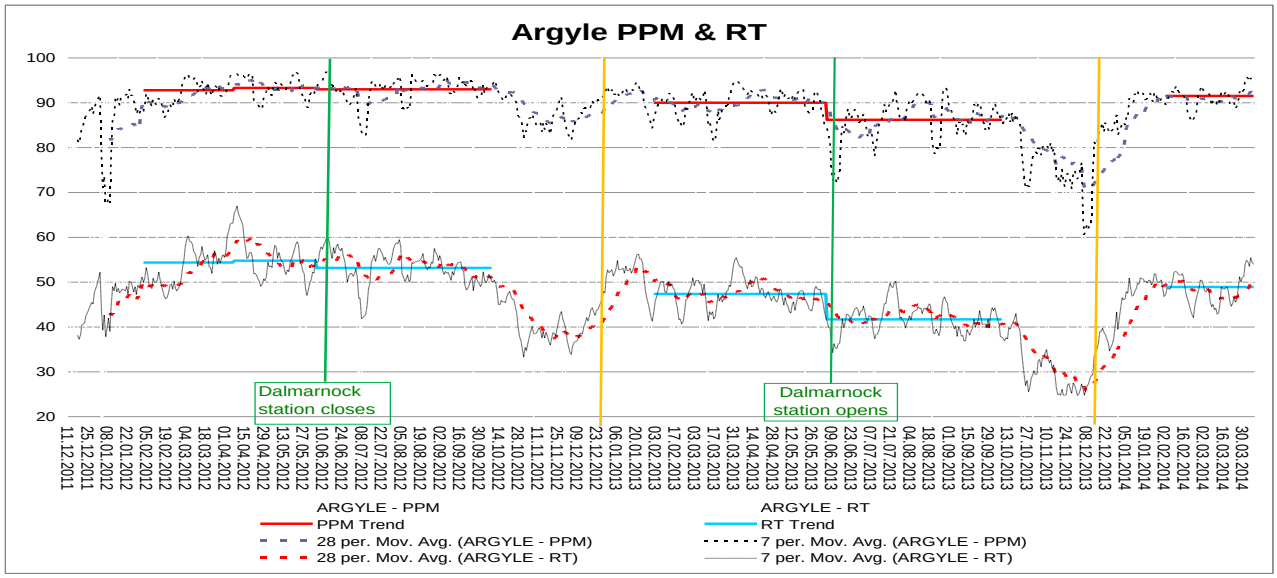
84. We obtained the views of Dan Blake who is the head of performance at FSR. He stated that he would not like to see us take action in relation to NR's failure to attain its regulatory targets. In his view the problems experienced in 2012-13 were resolved in the December 2013 timetable change and consequentially current performance was very good. Whilst he acknowledges that NR let them down in December 2012 with the errors in that timetable, he feels that the new timetable, plus other improvement to the infrastructure and operation had stood NR in good stead with them.

Part G - Summary and conclusions

85. Clearly performance following the December 2012 timetable change was dissappointing and the negative affect it had on performance, along with other issues such as ongoing TSRs, meant that NR could not recover to the level required to achieve its end of year targets.
86. However, NR's response to these issues was appropriate. It worked pro-actively with FSR to develop a further improvement plan, which the above review has indicated was largely implemented as planned. It also delivered an effective focus on non-track assets, weather resilience and externals.
87. In the last three period of 2013-14, externals recovery improved the delay minute target, but significant issues (including vandalism) earlier in the year meant that the target was missed overall.
88. The route did benefit from a relatively benign winter (with the exception of the "Xavier" storm in December) and improved the total number of delay minutes for severe weather, autumn and structures by almost 10,000 minutes, when compared to last year (Scotland route 28.0% better than target).
89. In December 2013, NR adopted a pragmatic approach to the timetable change, which together with associated junction improvements at Newton and removal of TSR restrictions, resulted in a significant upturn in performance in the last three periods. Furthermore, delay minutes also recovered to beat target in the last three periods of the year, although total delay minutes in Scotland route increased by 12.2% across the year as a whole when compared to last year (Scotland route 8.2% adrift of target).

Annex A

Argyle PPM and Right time, showing the impact of December 2102 and December 2013 timetable changes.



Source: NR's Q4 Scotland Route performance assessment repo

Annex B - Scotland Route performance assessment 2013-14

Scotland Route

Performance Assessment of 2013/14

Foreword

The route acknowledges that the regulatory target of 92% PPM for Control Period 4 was missed and the year-end result of 91.4%, although in line with trajectories agreed as part of the Further Improvement Plan (FIP), was unacceptable.

The Scotland route has been clear in our responsibility to develop recovery plans and the need to understand the true cause of under delivery. Detailed analysis was undertaken with responsible managers and engineers, which lead to the creation and development of recovery plans.

The ScotRail PPM MAA decreased from an all time high of 93.2% at Period 12 of 2012/13 to a low of 91.1% at period 10 of 2013/14. This reduction in PPM was caused by a reduction in timetable resilience due to increased levels of TSRs coupled with the December 2012 timetable change. In addition poor asset reliability in key signalling categories caused a number of highly disruptive events, which were difficult to recover. The weather conditions during the year proved challenging and resulted in further deterioration of performance, in particular the long and difficult autumn season and the challenging wet and windy weather in early December.

A significant number of projects to increase overall network resilience and address long standing off track issues such as embankments, vegetation and flooding were undertaken by the route. A total of over £63m has been spent on recovering performance and delivering a solid foundation for CP5 during the last 12-18 months. In addition major enhancement works have been undertaken across the network, most notably at Newton junction that was doubled, the associated timetable change has dramatically improved underlying performance.

PPM recovered during the last quarter of 2013/14, with a record breaking last quarter – a clear demonstration of our understanding of the problems that afflicted the route, and our determination to address these issues. The strong performance delivered in Period's 11, 12 & 13 meant that we exited only 0.6% adverse to target.

This strong positive trend moving into CP5 provides a solid foundation from which to drive further improvements. The CP5 improvement plan has been created using the principles of the Performance Planning Reform Programme (PPRP). Our plans centre on further timetable resilience improvements, maximising the benefit of Remote Condition Monitoring and key renewals across the network. Enhancement activity provides both a challenge to delivery as well as an overall long-term improvement to the Scottish network.

Close and collaborative working is a critical aspect to success and throughout the development of our recovery and CP5, planning there has been active engagement with our industry partners and key stakeholders. By working together and focusing all of our combined efforts to deliver safe and effective performance, PPM has returned to acceptable levels and the challenge is now to drive forward to achieve and then maintain 92% PPM in the coming years.

David Dickson
Route Managing Director (Acting)

Executive Summary

In preparing this report, the route acknowledges the failure to meet the regulated Control Period 4 target of 92% and as a result, will start CP5 at a lower level of performance than anticipated. Our resolve to correct a poorly performing year was underlined by our readiness to implement a Further Improvement Plan (FIP), with First ScotRail, to redress the under-performance and return the route to a compliant trajectory, at a level that it had enjoyed in previous years.

One of the main causes of the failure to deliver the required PPM target was the ***overall reduction in timetable resilience*** caused by TSRs on key lines such as SAK and A2B and the December 2012 timetable change to the North Electrics and Argyle lines. The timetable change was driven by a change in train planning values and utilised the same methodology that had proved successful in the past. However, the modelling of the new timetable was incomplete, the geographical impact was underestimated, and the new Timetable resulted in a decrease in timetable resilience. The introduction of the December 2013 Timetable and doubling of Newton has had a positive impact on performance, allowing greater service recovery, and has contributed towards a record breaking last quarter. Proposals for December 2014 timetable have been submitted to build on this, and more wholesale changes to the Argyle and Whifflet timetables, which will reduce conflicting moves around key nodes.

Throughout 2013/14, we have had mixed success, with our ***Non-Track Asset*** category. Some assets such as signal failures performed very well with improvements in both delays and incidents. However most signalling based categories showed worse levels of delays and associated increased delay per incident. The continued introduction of Intelligent Infrastructure, and 24/7 coverage of Remote Condition Monitoring from May 2014 coupled with some key renewals will address performance issues.

The ***Network Management Other*** category showed a positive trajectory until autumn 2013, when Takeback and Unexplained delays rose sharply due to Network Rail acceptance of the additional delays associated with the December 2012 Timetable change. The timetable change in December 13 and doubling of Newton Junction has increased resilience of the timetable.

The ***External*** category ended the year adverse to target, primarily as the result of external power supply and vandalism issues, and remains an important area of focus for the route. We believe that mitigation plans in place for Cable Theft, Vandalism, Fatalities and Trespass, and periodic meetings with our colleagues at the British Transport Police, will allow us to return this important category to a more positive trajectory early in 2014/15.

The ***Track*** Asset category, narrowly missed target, largely due to the TSRs associated with the Stirling-Alloa-Kincardine & Airdrie to Bathgate Lines. The speed restrictions on the Stirling-Alloa-Kincardine and G&SW lines have been reduced and are targeted for removal early in 2014/15. The holistic approach that the route has adopted to TSR management and accountability has been recognised as an effective means of attributing the ownership and focusing efforts on TSR removal.

Severe Weather, autumn and Structures ended the Year, **25K** delay minutes ahead of Target. This is despite record rainfall in Scotland during December 2013 and low adhesion delays during autumn, which were 57% worse than target, driven by significant increases on key lines of route. Although our Rail Head Treatment Train (RHTT) circuits will remain largely unchanged for next year, we are looking at how to more effectively deliver treatment.

Whilst Network Rail recognises its part in under-delivery, we have also led a substantial response programme. In doing so, we believe that we have, in the main, taken such steps as were reasonably practicable to deliver our CP4 targets.

Outputs

This section details the Scotland Route position at the end of 2013/14, the tables below reflect the route PPM, and the Route Delay Minutes throughout 2013/14, broken down by period.

PPM

Current Year	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	MAA
Target	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	92.7%	89.0%	89.0%	89.5%	91.6%	93.0%	93.2%	92.0%
PPM	94.0%	93.7%	90.9%	90.4%	90.9%	93.2%	92.1%	88.3%	83.5%	88.2%	93.3%	94.1%	94.7%	91.4%
Variance	1.0%	0.7%	-2.1%	-2.6%	-2.1%	0.2%	-0.6%	-0.7%	-5.5%	-1.3%	1.7%	1.1%	1.5%	-0.6%

Timetable Resilience

PPM struggled to deliver in the early part of the year; similar incidents on the Strathclyde Network were attracting higher level of disruption than previous years. Analysis revealed that the December 2012 timetable changes coupled with the re-opening of Dalmarnock Station in May had resulted in deterioration in timetable resilience. This had a consequential detrimental impact on North Electric services where they merged at Finnieston and, in times of perturbed working, through to Newbridge Junction affecting services across Central Scotland. The timetable change introduced in December 2013 coupled with the doubling of Newton junction has improved the resilience and delivered strong PPM and Right Time results.

Network Rail

Current Year	1	2	3	4	5	6	7	8	9	10	11	12	13	Full Year
Target	27,026	26,810	26,866	27,097	26,884	26,814	26,854	37,745	39,780	35,012	27,459	26,792	26,856	381,995
Minutes	23217	26644	38557	38654	38697	23507	30518	45632	62992	45723	25139	25731	22392	447,403
Variance	3,809	166	-11,691	-11,557	-11,813	3,307	-3,664	-7,886	-23,212	-10,711	2,320	1,060	4,464	-65,409
% Variance	14.1%	0.6%	-43.5%	-42.6%	-43.9%	12.3%	-13.6%	-20.9%	-58.4%	-30.6%	8.4%	4.0%	16.6%	-17.1%

Non-Track Assets

At the end of Period 6, when the FIP was first developed, the Non-Track Asset Category was 15K delay minutes over target. The category continued to worsen in Period 9, dropping to 24K delay minutes over target. There was no significant improvement at year-end, finishing the year **38.2K** adverse to target. There is a mixed picture between assets:

- Point's incidents were 8 under target and 37 better than previous year despite being 9.8K adverse in minutes. This is a rise in DPI of 30 minutes per incident.
- Signal Failures finished 0.7K, and 116 Incidents better than target.
- Telecoms Failures finished the Year 2.4K better than target but slightly worse in terms of incident numbers.
- Other Signalling equipment failures finished 0.3K better and 5 Incidents better than target.

There were however some notable areas of concern:

- Signalling System and Power Supply failures was 106 incidents adverse to target (49 worse than previous year). This group were 12.5K adverse for the minute's target.
- Track Circuits and Axle Counters (combined) missed an incident target by 19, and were 47 worse than previous year. In terms of minutes was 6k worse. The axle counter population within Scotland has increased considerably over CP4, with assets being commissioned in many key areas.

- OLE incidents were 67 worse than previous year and just over 3K minutes adverse for minutes.
- Cables finished the year 2.2K over Target, and 13 Incidents over target.
- Crossings incidents were 49 adverse to target and 53 worse than previous year as well as being 1.3K adverse in minutes.

Network Management Other

This category was performing in line with expectations and at the time of FIP publication was only 0.8k worse than target. As a result of network rail acceptance of the direct delays associated with the Dec 2012 timetable and a poor autumn period the year-end result was **25.3K** worse than target.

External

The External Category was 10.4k over target at the end of Period 6 when FIP was first developed. The category continued to worsen, taking a significant dip in P9 (mostly due to weather impact on our external power supply companies) and was 12.6K over target when the FIP was submitted in December. There was another significant dip in P10 due to vandalism of cables and material from a lineside neighbour that engulfed the railway taking the category to 18.8k, recovering in the last quarter and delivering each of the last quarter's period targets ending the year **17.3K** over target.

Track

The Track Category was 7.6K over target at the end of Period 6 when FIP was first developed. The category continued to worsen, dropping to 9.9K in P9 when the Further Improvement Plan was submitted in December (mostly due to the TSRs associated with SAK and A2B lines and the subsequent reactionary delay). The category recovered to **7.5K** worse than target at the Year-end.

Severe Weather, Autumn & Structures

Severe Weather, autumn and Structures has displayed a positive improvement throughout the Year. When the Further Improvement Plan was developed in Period 6, we were 13K better than target; when the FIP was submitted in December, this category had improved further to 17K better. At the end of the Year, this category had finished **22.8K** ahead of Target.

It should be noted that this was not due to the absence of bad weather as December had record levels of rainfall and 110 wind events. There is also 7.4K in External due to power outages caused by hydropower outages as a result of the bad weather.

First ScotRail

Current Year	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Target	18,209	18,208	18,501	18,332	18,157	18,246	19,333	29,401	30,837	31,039	26,135	22,071	21,531	290,000
Minutes	19,765	19,454	21,217	26,971	23,045	21,775	19,882	26,085	28,361	21,158	19,725	17,527	16,573	281,538
Variance	-1,556	-1,246	-2,716	-8,639	-4,888	-3,529	-549	3,316	2,476	9,881	6,410	4,544	4,958	8,462
% Variance	-8.5%	-6.8%	-14.7%	-47.1%	-26.9%	-19.3%	-2.8%	11.3%	8.0%	31.8%	24.5%	20.6%	23.0%	2.9%

First ScotRail's results demonstrate an improved overall Performance at year-end in line with that demonstrated by Network Rail. The results, however, mask a number of significant issues that have had a negative impact on performance throughout the year.

Delays attributed to Train Crew finished the year 4% over target, and delays attributed to Adhesion finished the year 61% over Target. While these two categories have finished adverse to target,

performance throughout the year have been affected by a number of issues, but have now returned to a more positive trajectory.

TOC on TOC

Current Year	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Target	4,737	4,737	4,737	4,737	4,737	4,737	4,737	7,594	7,594	7,442	4,737	4,737	4,737	70,000
Minutes	5,031	4,514	5,884	7,484	7,323	6,515	6,562	8,523	8,772	6,069	5,720	4,289	4,571	81,257
Variance	-294	223	-1,147	-2,747	-2,586	-1,778	-1,825	-929	-1,178	1,373	-983	448	166	-11,257
% Variance	-6.2%	4.7%	-24.2%	-58.0%	-54.6%	-37.5%	-38.5%	-12.2%	-15.5%	18.5%	-20.8%	9.5%	3.5%	-16.1%

Issues affecting TOC on TOC on ScotRail in 2013/14 have been characterised by a range of significant incidents and underlying timetable resilience issues around some headcodes/locations; efforts to address this throughout 2013/14 have focused on:

- Hunterston – Longannet freight flows; reducing the impact from TSRs (and hence resilience of the flow to incidents) and workstreams to improve RT departures in conjunction with freight operators and port/power station operators.
- Focus on regular offender freight headcodes
- Focus on Right Time starts/dwell time with East Coast
- A review of any major TOC/FOC on TOC incidents with operators to ensure that incidents had been effectively managed.
- Monitor specific headcodes by Control/NR customer team.

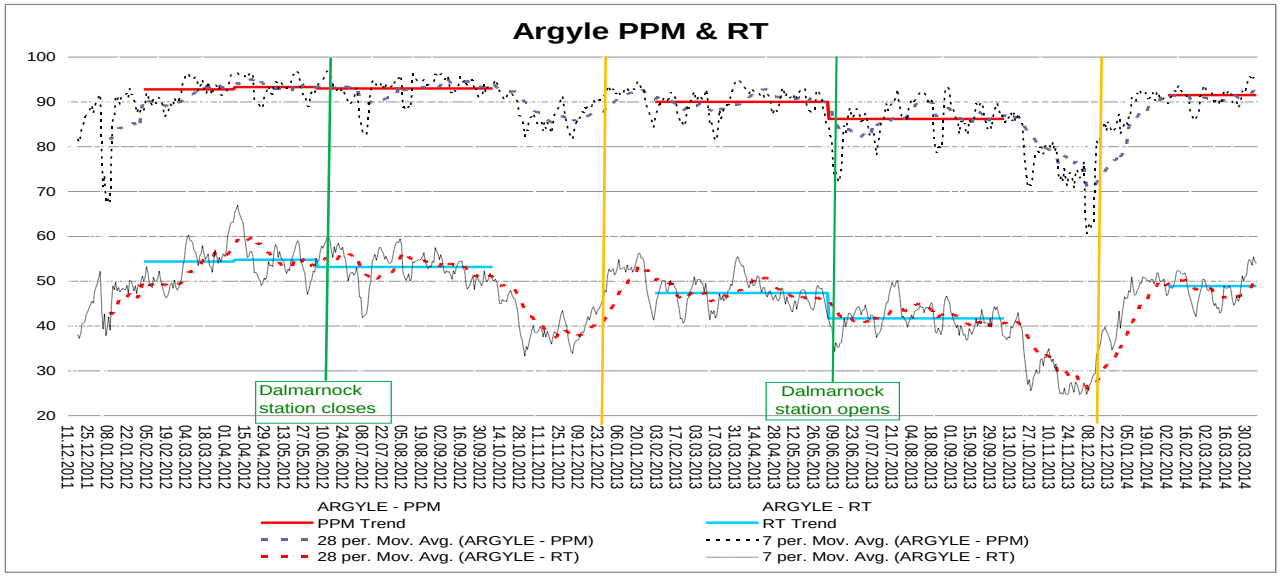
Causation

This section examines the evidence and causal factors for missing the regulatory target of 92% PPM.

Reduction in Timetable Resilience

One of the primary causes of our failure to deliver our PPM target, has been the overall reduction is in timetable resilience, as a result of TSRs on SAK & A2B; and the December 2012 Timetable change. The timetable change was driven by a change in train planning values and utilised the same methodology that had proved successful in the past. However, modelling of the new timetable was incomplete, and the geographical impact was underestimated

TSR numbers throughout the Year remained disappointingly high. However, 3 of these have been as a result of level Crossing Sighting due to Risk Assessments. The remainder have been due to track formation issues and geotechnical, on Airdrie-Bathgate and Stirling-Alloa-Kincardine lines.



The above chart illustrates average performance on the Argyle line aligned to Timetable Changes and the closing and reopening of Dalmarnock Station. The December 2011 Timetable performed on average at 93%, and the December 2012 on a like for like, performed at 86.2%, a 6.2% drop on

The change from the December 2011 and December 2012 Timetable, has reduced overall TT resilience by almost 7% PPM. This resulted in the overall PPM figure dropping, as these two key lines of route represent almost 21% of daily

Non-Track Assets

Signal System and Power

Within this category there are various issues surrounding interlockings and location cases, operating panels and lever frames. During Period 4, there were a number of SSI module failures, shown to be influenced by the hot weather; these gave us circa 1.5k of delays.

The top causalities have been:

- 33% were caused by component failures such as SSI modules and fuses,
- 27% of total minutes delay due to incidents of an unknown cause. The exact cause of failures is difficult to identify due to the complicated nature of interlocking and associated

circuitry and the fact the fault clears before arrival, or during testing. These failures will be caused by similar reasons as recorded for the rest of the category.
- 24% of total minutes delay due to relays failures
- 16% of minutes due to various power supply issues (distribution fuses, UPS, standby batteries etc)

Points

There are a number of positive indicators within the point's category:

- The overall number of points failures decreased in comparison to last year,
- The number of 'rogue assets' (defined as assets which have failed twice or more in 91 days) has decreased
- Remote condition monitoring (RCM) has positively affected performance in this category with increase in mean time between service affecting failures
- Maintenance campaigns to address specific failure modes have been a success as these failure modes have reduced
- Critical assets (defined as key operational points on the network) are showing reliability improvements

There has been no significant change to response times or time to fix, however points failed to meet the delay minute target and DPI has risen. There have been some significant failures on key parts of the network and rural areas have improved more than the central belt of the network.

Axle Counters

The axle counter population within Scotland has increased considerably over CP4, with assets commissioned in many key areas such as Waverley to Haymarket and as part of the GSSR Project. There has been a mix of new installation failures, repeated digital card and system issues at key locations such as the E to G, at Dalmeny and on Glasgow South Suburban.

There have also been repeat failures at older installations such as Craigendoran, Kilmarnock, Hilton and Dyce. Kilmarnock is due to be replaced with reconditioned equipment, which has been removed from the Forth Bridge. At Dyce, the local team has developed a new method of working under perturbation to reduce the impact on delays.

The renewals strategy during CP4 has been targeted to systematically improve the most problematic assets and improvements have been seen where work has taken place. Further major signalling renewals programmes are planned for areas of known poor reliability, most notably the re-control of Motherwell Signalling Centre, and the renewal of the Polmadie to Rutherglen Interlocking system.

OLE

The significant influence in this category has been the increased number of trips with no fault found with 48 incidents in 12-13 (1,159 minutes) and 102 incidents in 13-14 (2,558 minutes).

Cables

This category finished the Year 2.2K over target, due to a number of Power Cable incidents on the East Coast Mainline and E & G, which due to their nature, proved difficult to rectify in sufficient time in which to minimise the time lost.

Level Crossings

Performance minutes and reliability incidents have been very poor compared to the previous year. The introduction of the MCB-OD equipment at Kirknewton contributed significant performance delays, this technology has now been optimised and the asset is performing well.

There were reliability issues at Hoy, Murthly and Nigg in the early part of the year with failures associated with treadles and micro-switches.

Network Management Other

Delays in the Commercial Takeback category fall under distinct pots, the current Commercial Deal in place to cover when the RHTT did not run and the acceptable of additional delay in the Newton Area caused by the Dec 12 timetable change. The significant delay impacts were 3,738 minutes and 8,664 minutes respectively.

Unexplained and Un-investigated delays were affected by a poor and extended autumn, staff shortages and heavy workload days. Delays attributed to this category have now recovered to previous levels.

External

Vandalism and theft – there had been issues with sabotage and repeat cable theft areas during the early part of the year. Vandalism however remains the biggest issue and although there has been a slight decrease in the number of incidents, delays have increased (by almost 60%).

Fatalities and trespass – whilst there have been fewer incidents due to fatalities on the Scottish network this year so far compared to last the delays generated have increased by c.40%. Delay due to trespass are the biggest influence on this category. Compared to last year, incidents have increased by 25% whilst delays have risen by 73%. Analysis confirms the random nature of these events; there are no repeat locations or hotspots for fatalities.

External Other comprises mostly of animals on the line, and the failure of power supply companies to Network Rail infrastructure. The most common types of animal incursion are from deer, birds (striking trains and OHLE), cows and sheep. Repeat areas are those on the more rural lines and involve either sheep on the line or deer strikes. The other main influencing factor on this category has been failures associated with our external power supply companies.

Track

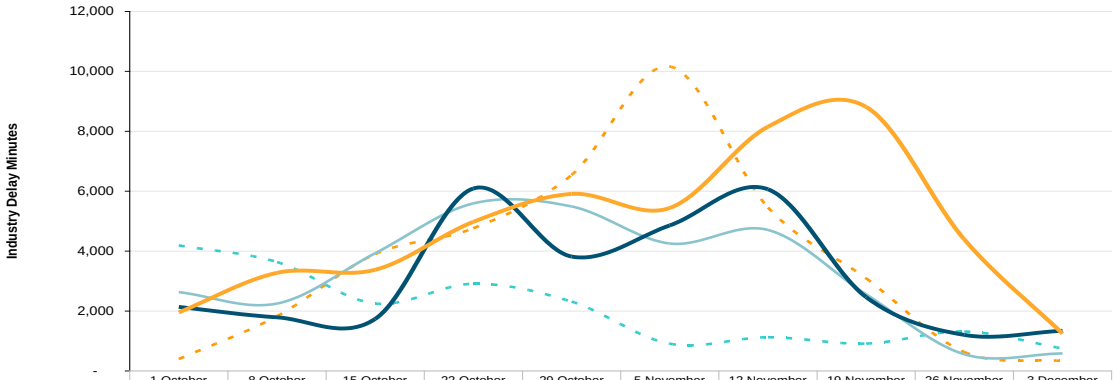
Track narrowly missed target due to the TSRs associated with SAK and A2B lines and the subsequent reactionary delay. The number of broken rails was 18 (2013/14) compared to last year of 26 (2012/13).

Severe Weather, Autumn & Structures

Severe Weather is the largest is of category in this grouping, this category ended the year better than target and is testament to the work that is being delivered by the water management group and the amended timetable process initiated on receipt of a bad weather forecast.

Low adhesion delays during autumn were 57% worse than target and was driven by significant increases on key lines of route. Delays on the North Electrics line of route increased by 43% with the same number of incidents as last year; delays on the Ayr lines (to Ayr and Largs) increased by 44% and 49% respectively, while the E&G saw incidents reduce by 34% but delays reduce by only 6%. In addition, there were 591 more incidents than last year and delay per incident rose slightly.

Further, autumn was a more prolonged season than previous years as shown by the graphs below showing autumn delays by week:



	1 October	8 October	15 October	22 October	29 October	5 November	12 November	19 November	26 November	3 December
2009/10	4,190	3,634	2,249	2,908	2,314	906	1,125	912	1,317	748
2010/11	395	1,828	3,900	4,759	6,539	10,162	5,455	3,090	630	328
2011/12	2,632	2,251	3,928	5,592	5,488	4,254	4,705	2,557	558	583
2012/13	2,137	1,791	1,735	6,088	3,818	4,856	6,062	2,466	1,204	1,339
2013/14	1,953	3,275	3,376	4,975	5,909	5,437	8,149	8,811	4,391	1,247

There were two distinct peaks over the course of 6 weeks and cumulative delay follows a similar trend to last year up until 5th of November. Delays tailed off at this point last year but grew more so in 2013 than at any other time in the previous 5 years**.**

Whilst the prolonged autumn period affected this category, it also resulted in a negative impact on the Network Management Other category as a result of the Commercial Deal being applied.

Response and Recovery Plans

This section examines all the plans that Network Rail initiated because of concerning asset resilience and performance trends. These actions and the considerable expenditure that was invested in the network demonstrate the commitment to return performance to acceptable levels.

Whilst Network Rail recognises its part in under-delivery, we have also led a substantial response programme. In doing so, we believe that we have, in the main, taken such steps as were reasonably practicable to deliver our CP4 targets.

Performance Funding

Listed below, is a breakdown of the additional expenditure that has been targeted at increasing our overall asset resilience across the network in Scotland. All of the aspects below were additional money that the route invested and spent in the last 12-18 months and as such further demonstrates our resolve to improve our overall capability to deliver safe performance

Resilience, 87 individual projects **(£51m).** (CAPEX)

- Structures, Safety (£3.6m), asset condition (£6.5m)
- Earthworks, Rock fall prevention and slope stability (£10.6m) and Flood prevention (£7.2m)
- Track, fencing (£3m), Track ASI recovery (£3.7m) and Track resilience including drainage (£5.9m)
- Electrical Power, Signalling power resilience (£4.5m), point heating (£0.1m) and OLE resilience (£0.9m)
- Signalling, TDM migration to FTN and WCML tail cables (£2.6m)
- Line side building security including Perth Depot (£2.4m)

Out performance fund (£6.1m) (CAPEX/OPEX)

- Wet weather (£0.2m flooding assessments)
- Asset performance (£2.2m, cables, monitoring equip, rapid response at key locations)
- Offtrack (£3.7m, LiDAR survey and subsequent vegetation management and fencing)

Area Directors Asset performance fund (£1.1m) (CAPEX)

- Signalling asset reliability. issues identified by Area Directors (£624k), to address issues such as multi and FTM cables, high performance risk relays and monitoring equipment.
- E&P asset reliability, issues identified by Area Directors (£460k), to address cable theft, OLE reliability and distance to fault recording on WCML

Area Directors OPEX fund (£0.8m) (OPEX)

- West Area £400k additional vegetation management
- East Area £400k Hot weather and track Quality

Vegetation management (£2.7m) (OPEX)

- Additional spend across route for vegetation management (£2.7m)

Track Quality 12/13 into early 13/14 (£1.6m) (OPEX)

- Additional tamping etc to tackle Track Quality issues

The total spend of **£63.3m** is split **£53.6m** CAPEX and **£9.7m** OPEX.

£24.7m of the above spend can be allocated to Weather resilience as follows:

- Earthworks, Rock fall prevention and slope stability (£10.6m) and Flood prevention (£7.2m)
- Off-track (£3.5m, LiDAR survey and subsequent vegetation management)
- Additional spend across route for vegetation (£2.7m)
- West Area £0.4m additional vegetation management
- Wet weather (£0.2m flooding assessments)
- East Area £0.1m hot weather prep

Timetable Resilience

The continuation of the joint FSR/NR timetable strategy team to resolve the current performance issues. The infrastructure enhancement at Newton Junction resulted in significant timetable changes in the December 2013 timetable to the Argyle and North Electrics services. The benefits in terms of underlying performance are already being realised and there are additional benefits in the form of better performance recovery. Greater Service Recovery, which with the previous timetable would have been impossible, is now achievable. Overall duration of incidents has been reduced and since 1st January, there have been on average 2 Significant Performance Incidents over 1,000 minutes per period, compared with the previous average of 6.

The Network Rail Area Directors chair a fortnightly discussion, which reviews the actions in place to remove TSRs, and an intensified management focus through the Route Reliability Improvement Group including a targeted action plan to reduce the unplanned speeds helped reduce the numbers from the 37 in P4 to 18 speeds on at the end 2013/14. The speeds restriction on the G&SW and SAK lines have also been significantly reduced, and the remaining sites are targeted with a renewed focus of resource to be removed early in 2014/15.

TSR risks continue to emerge. However, the introduction of a strengthened process associated with the review of the Potential Condition Of Track registers drives pro-active targeting of resource to mitigate against the introduction of TSRs. In addition a stronger focus on integrated planning associated with infrastructure renewals is designed to ensure that we delivery works such that we use engineering allowance in a more controlled manner.

Non-Track Assets

The route recognised that benefits from Intelligent Infrastructure were not being fully realised with the dedicated system support only being utilised during office hours. The route quickly established the need to support the system 24/7. However, issues with national union consultation and local issues prevented this action plan from progressing. Coverage on a 24/7 basis will commence during May 2014 and provide further improvements.

In addition, work is also being undertaken on extending the scope of coverage for new failures modes on assets already fitted, point's failure is a prime area under development.

Signalling System and Power Supplies

National Reliability Groups have also been formed to tackle emerging issues contributing to poor performance in this sub-category, in areas such as relay reliability and panel equipment resilience

Consideration has been given to upgrading all SSI modules but the National Suppliers do not have enough electronic chips left to be able to furnish this campaign and therefore action plan was agreed to replace SSI modules under fault conditions and sent to manufacture for repair and return.

As a result, the failures of new relay equipment direct from the manufacturer, relays testing is now implemented before installation. There is a new National Forum that has been set up with NR experts, manufacturers and test centre staff to develop an understanding of the failure modes, the reasons and subsequent action plans.

Around £10m has been spent in the last year, which includes:

- £4.5m on signalling power resilience
- £2.6m on TDM migration to FTN and WCML tail cables
- £2.2m on asset performance, including cables, monitoring equipment and rapid response at key locations.
- £624k on signalling asset reliability, to address issues such as multi and FTM cables, high performance risk relays and monitoring equipment

Points

Campaign changes to realign points and reconfigure within tolerance has been completed and has been agreed successful. In addition, enhanced component replacement at key junctions has improved overall asset resilience, such as Switches and Stability Plates. £0.1m has been invested in delivering additional point heating.

Axle Counters

National Reliability Improvement Groups have been set-up and the manufacturers are also actively involved in troubleshooting reliability problems. Axle counters are inherently more reliable than track circuits as a means of train detection, so even after the bedding-in issues have been resolved, it is anticipated that axle counters in Scotland will offer the best whole-life reliability and performance.

OLE

A correlation exercise between OHL trips and data from the LIDAR surveys with problem vegetation has concluded that there is a direct correlation between areas of large vegetation growth and high numbers of OHL trips. The output from the LIDAR survey / TRIP comparison study has informed and prioritised the vegetation removal workbank to tackle high risk areas first.

Over £5m additional resilience has been delivered including:

- £3.7m on LiDAR survey and subsequent vegetation management and fencing
- £0.9m on OLE resilience
- £460k on OLE reliability and distance to fault recording on WCML

Cables

The creation of the cable management group, led by an Area Director, has senior representatives from E&P, Signalling and Telecomms teams. The group focus on the indicators for cable derogation such as bender readings and number of jointed cables. The group have then invested money to replace cables and install further resilience into the signalling systems.

Level Crossings

The application of new and upgraded data logging equipment has reduced the number of repeat failures being experienced. In the Far North, the restrictions on barrier tip weight have been relaxed to mitigate the open nature of the landscape for these crossings and the higher wind speeds.

A more rigorous rogue asset management regime is also being applied to level crossings to reduce the number of repeat failures.

Network Management Other

A significant collaborative effort have been made with First ScotRail to use all available information (Trust, CCF, Spectrum/Nexala and Driver Advisory System) to analyse and understand unexplained delay and potential timetable robustness issues. This was successfully used for the December 2013 timetable changes where, together with the doubling of the North connecting line at Newton has seen improvements in the Network Management/Other Category Group. This process is being used on other routes to feed into future timetable improvements.

Additional delay attribution staff have been recruited, minimising the risk of further overloads and the inability to understand the true cause of delay.

Train planning delays centres on short notice planning errors, which are predominately freight paths. Action plans are focused on recruitment, people training and the system issues.

Possession management - RRV breakdowns and late communication between site and control was an issue during the early part of the year. Action plans centre on reviewing plant, a thorough run through of the ballast train timings and the driver hours as well as a rigorous communication plan on site and back to control have addressed this issue.

Additionally, large screens have been deployed into the IEEC and Control, to live link with CCF to assist in perturbation. Additional Vegetation clearance and fencing programmes are also in place

External

The mitigations in place to tackle cable theft, such as trembler units, CCTV cameras and DNA grease at the key hotspots are proving successful as arrests have been made and the run rate of incidents has reduced. Strategic meetings continue with the BTP on a 4 weekly basis with further Police Service Plans (PSPs) for 2 locations, and others developed as required.

Mitigation measures to tackle the threat of suicides include the installation of a large number of Neath Gates on the top of platform ramps; dedicated metal signs advertising the Samaritans telephone number, posters and intervention training for staff members. Most of the suicides in Scotland have occurred where access has been gained from places other than at stations that have made prevention difficult although a rethink of the strategy in Scotland has seen the rollout of signs at Level Crossings and Access Points. In total, some 500 signs have been deployed across Scotland Route. North Bridge Waverley in reality is our one and only hotspot. It is hoped that that the delivery of proposed mitigation measures for Union Street Bridge at Aberdeen, which is of similar construction to the North Bridge, and has similar planning restrictions, will eventually help to address and fix the problem at Waverley.

The Route's fencing plans continue to tackle the risk posed by animal incursions, as well as trespass. In addition to the planned renewals being delivered (27,882m), additional funding was provided and a further 90,175m has been renewed/upgraded this year. Going forward, there is a

further 324,034m planned for 2014-15. There is a significant and sustained increase of fencing renewals planned during CP5. In order that we can realise the benefits associated with these renewals we are currently revising our 5 Year programme to complete it in the first 3 Years of the Control Period. This is also the case for Vegetation works.

To tackle birds striking OHLE, measures taken include deflectors and secondary insulation at known risk sites, the use of bird repellent gel, netting some OLE structures to prevent nests being built and nesting patrols.

Track

Stronger focus on holistic and sustainable asset management has been a key driving force behind Track improvement. Key initiatives such as replacement of pre 1976 rail, reduction of L2 and Poor Track Geometry, and rail joint removal have all contributed to delivering the performance minutes targets.

Almost £12m of spending has been delivered which includes:

- £5.9m on track resilience including drainage
- £3.7m on track ASI recovery
- £1.9m on track quality 12/13 into early 13/14, to tackle TQ issues, (tamping, etc)

Severe Weather, Autumn & Structures

Figure 1 (below), supplied by the UK Met Office, shows the record levels of Rainfall experienced across the Route, during Period 10 2013/14. Despite this, we had a strong performing period with minimal flooding across our Route, a demonstration of the success of the Water Management Group.

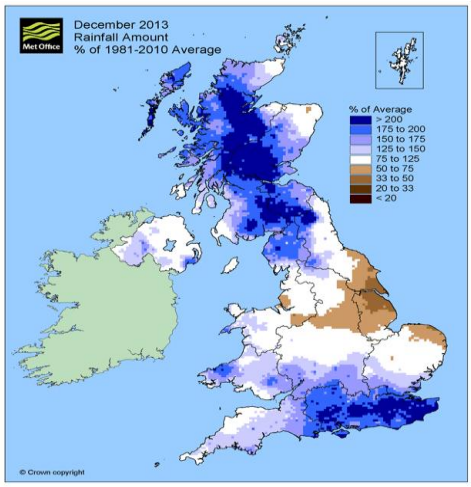


Figure 1 – December '13 Rainfall Totals

The work of the cross-functional Water Management Group continues in the route and in 2013-14, we successfully addressed 20 of our most problematic sites, delivering works that mitigate the risk of flooding of the network and have plans either in place or being developed for a further 40.

Scotland route has deployed 100 weather stations across the route to provide real time information to control regarding wind speed (gust and mean), wind direction, precipitation levels, air temperature and rail temperature. Network Rail continues to progress work on commissioning these with the majority now functional (green on map below, blue yet to be commissioned). The

weather stations will be fundamental to the processes for managing the effects of high winds and rainfall on the infrastructure.

Figure 2 – Locations of route Weather Stations

In addition, the route is currently producing a Climate Change Adaptation Plan to be submitted to the ORR in September 2014, which will review assets to determine the likely effects of climate change and its predicted impacts on weather patterns and sea levels.

Autumn 2014 plans have been shaped by the events of past autumn with continuing engagement with stakeholders. There are a number of suggestions/initiatives for 2014 being tracked through the monthly Seasonal Working Group. Reviews being undertaken by the Centre and an independent national review of autumn 2013 are underway with the aim of providing a better understanding of why autumn 2013 witnessed such poor performance and safety results.

As regards Structures, in the latter part of CP4 resilience funding has been used to underwrite work at a number of structures carrying heavy freight with the intention of preventing sudden deterioration, which had in the past prompted the imposition of year long speed restrictions as severe as 10mph. We have also taken measures to manage water ingress through structures at certain key location where this has caused performance issues with other asset types.

Going forward, investment levels and a new policy will address many of the structures in declining condition. This will be closely tracked by the appropriate condition marking indices.

There has also been increased spending on structures maintenance and repair, used to keep assets functional and fit for purpose between major interventions. This too will be tracked and reflected in the Robustness measure.

Geotechnics - £17.8m spend

- 40 rock cutting/ earthworks schemes delivered; 22 original sites and 18 additional sites
- £10.6m on earthworks, rock fall prevention and slope stability
- £0.2m on flooding assessment and £7.2m on flood prevention

Additional drainage sites progressed

- Dalmarnock – all works completed Feb 2014

- Winchburgh – upsizing of pipes to 12” in Craigton cutting area completed end March 2014. Design work ongoing for additional works.
- Drem – twin culvert increased in size and attenuation pond completed end March 2014
- Penmanshiel – siphon capacity increased and design work ongoing for attenuation pond
- Starlaw – work completed end March 2014

Structures - £10.1m spend

- £5.8m on spandrel ties for 8 viaduct sites: 4 sites complete and 4 ongoing
- Handrails – almost complete, £3.92m
- Additional scope to include drip shields in Haymarket South Tunnel – work completed, £0.38m

Preparing for CP5

Recent Performance

During the last quarter of CP4, Year 5 the Route delivered record-breaking performance. At the start of Period 11, the forecasted PPM MAA was only 90.6%. The impressive consistent performance delivered a year-end PPM of 91.4%. The consistency in delivery has been improving and during Period 13 PPM in excess of 95% was achieved on 16 days, 6 of which were in excess of 97%.

These results are a clear demonstration of our understanding of the problems that afflicted the route, and our determination to address these issues. By working together and focusing all of our combined efforts to deliver safe and effective performance, PPM has returned to acceptable levels and the challenge is now to drive forward to achieve and then maintain 92% PPM in the coming years.

PPM Attrition Table

Below is an extract from the year 1 performance strategy that contains the First ScotRail PPM Attrition Table. The table highlights where improvements are expected throughout Control period 5.

PPM Attrition Tool Summary for FSR	Current	Year 1	CP5
Total PPM	**100.0%**	**100.0%**	**100.0%**
Specification/ Operational Plan	-3.3%	-2.7%	-2.6%
Sustainable Maximum PPM (Best 5% weekdays)	**96.7%**	**97.3%**	**97.4%**
Primary PPM Loss	-1.2%	-1.0%	-0.8%
Reactionary PPM Loss	-2.9%	-2.0%	-2.1%
Current underlying PPM	**92.6%**	**94.2%**	**94.4%**
Extreme Days	-0.3%	-0.4%	-0.4%
Other severe weather	-0.3%	-0.4%	-0.4%
Seasonality	-0.8%	-1.1%	-0.8%
Expected Published PPM	**91.2%**	**92.3%**	**92.8%**
Additional Risk	0.2%	-0.3%	-0.3%
Final PPM	**91.4%**	**92.0%**	**92.5%**

Our plans centre on further timetable resilience improvements, maximising the benefit of Remote Condition Monitoring and key renewals across the network. Enhancement activity provides both a challenge to delivery as well as an overall lasting improvement to the Scottish network.