NetworkRail

Driving economic growth

Helping Britain run better

Network Rail is helping to regenerate Birmingham by transforming New Street. The project is about much more than simply redeveloping the station. It will create new jobs and help stimulate economic growth. Investment in rail is estimated to generate at least a 3:1 benefit ratio – a £750m investment will deliver some £2bn in economic benefits.

Changing the way we work

Intermodal transport links will be improved in the centre of the city. Our plans support the extension of the Midland Metro tram system that will run through the heart of the city, terminating at New Street station. The Moor Street link, a new walkway, will create a pedestrian route across the city centre and improve links between New Street and Moor Street stations.

A great place to do business. Station retail sales are outperforming the high street – Quarter 4 of 2011/12 (Jan, Feb, Mar) saw total sales in stations grow by 4.15 per cent while for the same period high street sales grew by 0.23 per cent as reported by the British Retail Consortium.

We are undertaking a major upgrade of the Pallasades shopping centre alongside the redevelopment of Birmingham New Street station. The refurbished shopping centre will consist of 450,000 sq ft of high quality retail space in the heart of the city which will include a new 250,000 sq ft John Lewis full line department store.

Up to 1,000 construction workers will be on site every day during the station redevelopment and Network Rail is working with Birmingham City Council's Employment Access Team to open up these job opportunities to local people. Network Rail's delivery partner Mace have pledged to create 100 apprenticeships and opened the Birmingham Gateway Construction Academy to provide support and training to the workforce during the redevelopment.

The new John Lewis store alone will directly create 650 new jobs and Birmingham City Council estimates that the store will boost the local economy by over £25m per annum.

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Introduction

This Annual Return reports on our achievements, developments and challenges during 2011/12, year three of Control Period 4 (CP4), and is the primary means by which we report progress in delivering outputs established in the Periodic Review 2008 (PR08).

The Annual Return is a public document that provides an important reference for stakeholders. This and previous editions of the Annual Return are available on the Network Rail website. In the interests of transparency, a summary of the historical data is also available on our website in a single document.

The Annual Return is divided into the following sections:

- operational performance and stakeholder relationships;
- network capability and network availability;
- asset management;
- activity volumes;
- safety & sustainable development; and
- enhancement schemes.

Expenditure and efficiency is separately reported in the Regulatory Financial Statements as well as the Annual Report and Accounts which are published separately and are available on our website.

For most measures we have provided information for Scotland and England & Wales together with the network total where appropriate, although there are some measures which only have network-wide information and cannot be disaggregated further. During 2011/12 we created a tenth operating route (Wales). Although this document does not include information for the ten operating routes, this more detailed information is available for most measures on the ORR website portal.

This Annual Return follows the agreed form as approved by the Office of Rail Regulation (ORR) in 2011 and is prepared in accordance with Condition 12 of our network licence.

There are some new measures and additional information included in this year's Annual Return. These are principally supporting measures which provide more detail to our high level outputs. The following are the new areas of information; occupational health measures, platform lengths, some asset condition measures, drainage renewals volumes and operational property expenditure.

Overall performance in 2011/12

While overall train performance is at an all time high with more trains arriving on time than ever before, we missed the train performance targets for London & South East, long distance and Scotland as well as for freight. Over the past year demand on the network has grown faster than predicted at the beginning of the control period and this provides more challenges on the network. We are balancing the sometimes conflicting aims of increased capacity, better train performance and cost reduction. In the past ten years, there have been over a million more train services a year, passenger numbers have increased by half a billion, despite this the number of passengers arriving on time has doubled.

In 2011/12 Network Rail changed how its routes are managed in order to give better customer service and to help all stakeholders work together more effectively to deliver a more cost effective rail industry. Accountability for the day to day management of various activities has now been devolved to the routes. Adapting the company's working practices and organisation, has increased accountability and ownership at a local level. We have established one "deep alliance" with South West Trains on the Wessex route as well as several framework alliance agreements. To further improve value for money and service, our Infrastructure Projects function has become a separate business unit within Network Rail.

Highlights for the year include:

- progress with our enhancements programme across the network;
- continued high investment on our assets while achieving further efficiencies;
- disruption to passenger and freight trains being lower despite the increased work on the network due to increased expenditure on enhancements and renewals work;
- overall PPM (i.e. trains arriving on time) being at its highest ever at 91.6 per cent

(although we did not meet the regulatory target);

- broken rails being at its lowest ever recorded; and
- the station stewardship measure being further ahead of the regulatory target for 2011/12.

A summary of the year's performance against our regulatory targets is shown in Table 1. Later sections of this Annual Return provide more detailed information on this.

Regulatory issues

In January 2012, ORR concluded that Network Rail was likely to miss both its 2011/12 and 2012/13 performance targets for long distance passenger services and was likely to breach Condition 1 of its network licence. ORR also concluded that Network Rail was in breach of the same condition as a result of our failure to achieve our regulatory target for freight performance. As a result ORR served enforcement orders on Network Rail in relation to each of these matters.

With our long distance performance, ORR required Network Rail to produce a plan setting out the steps it would take in the remainder of 2011/12 and for 2012/13 to deliver the outputs as specified in ORR's final determination to the greatest extent reasonably practicable, through operating and maintaining the network in a timely, efficient and economical manner and in accordance with best practice. This plan was delivered to ORR on 30 March 2012.

In relation to freight performance ORR required Network Rail to form a Freight Recovery Board (FRB) made up of industry stakeholders. The scope of the recovery board was to agree unanimously the reasonably practicable steps necessary to remedy the breach. The FRB has now presented its findings to ORR and Network Rail has accepted its recommendations. ORR decided that it was not appropriate to impose a penalty in this case.

In addition, ORR did not find us in breach of Condition 1 as a result of us missing our Scotland target.

Operational performance and stakeholder relationships

Although a number of targets have been missed during this year, PPM and delay minutes have improved compared to 2010/11. There have been improvements in most areas of poor performance. We are focusing on working with operators to improve performance against our regulatory targets for the London & South East sector. In addition, the number of infrastructure incidents causing delay has continued to decrease and is at its lowest for five years despite the challenges that the industry faces to reduce delay per incident.

For the first time we have developed two year Joint Performance Improvement Plans (JPIPs) with our customers which have now been finalised.

Table 2 provides a summary of the historic trends for the train performance KPIs.

The overall passenger satisfaction score from the latest survey commissioned by Passenger Focus remains at 84 per cent. The survey of customer satisfaction showed a fall in overall satisfaction with Network Rail in 2011/12 and the response rate was lower than in previous years. It appears that the lower customer satisfaction score is principally due to customers' dissatisfaction with Network Rail's delivery of core activities including train performance, track maintenance and train planning.

Network capability and network availability

Network Rail maintains, renews and enhances the network while at the same time providing an operational railway. This requires good possession planning to reduce any disruption to the network. We use the Possession Disruption Indices for passenger and freight (PDI-P and PDI-F) as the principal measures of the availability of the network to run trains.

For 2011/12 these measures were again ahead of the year end targets and continue to be ahead of the control period targets. This has been achieved whilst expenditure on enhancements and renewals increased in 2011/12. Reducing disruption on the network due to possessions has been a result of continued collaborative planning and delivery processes as well as new technology.

The Network Availability Reporting System (NARS) has been fully implemented and is used for both reporting and forecasting the PDI measures.

Table 3 shows this year's PDI results compared to the regulatory target.

Table 1: Performance against Annual and CP4 regulatory targets

Measure	*Target 2011/12*	*Performance in 2011/12*	*CP4 target*
Passenger safety indicator (MAA)	0.244	0.228	0.240
Workforce fatalities and weighted injuries (MAA)	0.110	0.136	0.090
	Regulatory target 2011/12	***Performance in 2011/12***	***CP4 target***
PPM (% MAA) England & Wales long distance	90.9	89.1	92.0
PPM (% MAA) England & Wales London & South East	92.4	91.7	93.0
PPM (% MAA) England & Wales Regional	91.5	92.5	92.0
PPM (% MAA) England & Wales Total	92.0	91.7	92.6
PPM (% MAA) Scotland Total (ScotRail)	91.7	90.7	92.0
Cancellations & significant lateness (% MAA) England & Wales long distance	4.2	3.99	3.9
Cancellations & significant lateness (% MAA) London & South East	2.1	2.38	2.0
Cancellations & significant lateness (% MAA) Regional	2.4	1.96	2.3
Delay mins – passenger (000's) England & Wales	5,430	6,517	4,980
Delay mins – passenger (000's) Scotland (ScotRail)	391	480	382
Delay mins per 100 train km – freight	3.18	3.57	2.94
PDI – passenger (MAA)	0.83	0.54	0.63
PDI – freight (MAA)	1.00	0.85	1.00
Station Stewardship Measure (by category)			
A	2.48	2.26	2.48
B	2.60	2.37	2.60
C	2.65	2.43	2.65
D	2.69	2.41	2.69
E	2.74	2.43	2.74
F	2.71	2.47	2.71
Scotland (all stations)	2.39	2.28	2.39

Network Capacity – Generally good progress, see section 6 for progress with the enhancement programme

Network Capability – No deterioration, see section 2 for details

Note: MAA is the Moving Annual Average

Table 2: Trends for train performance KPIs for the last seven years

	2005/06	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Public Performance Measure (PPM) (national)	86.40%	88.10%	89.90%	90.60%	91.50%	90.90%	91.60%
Total delay minutes (millions)	10.46	10.53	9.50	8.84	8.18	8.95	8.38
Passenger train delay minutes per 100 train km	1.92	1.91	1.74	1.59	1.42	1.56	1.42
Freight train delay minutes per 100 train km	4.36	4.61	4.33	4.01	4.02	4.29	3.57
Cancellations and significant lateness for England & Wales	3.12	3.08	2.80	2.76	2.58	2.76	2.39
Passenger and freight traffic (million train kms)	487	488	486	498	513	516	536

Table 3: Network availability measures

	Actual 2009/10	*Actual 2010/11*	*Actual 2011/12*	*2011/12 regulatory target*
PDI-P	0.63	0.52	0.54	0.83
PDI-F	0.82	0.89	0.85	1.00

Asset management

Although there are no regulatory targets related to our asset stewardship (except the Station Stewardship Measure), we have agreed monitoring measures. The asset measures are generally better overall than last year although we have fallen short on some of our targets. Track condition has been below target due to the impact of the long period of dry weather during 2011 and the resulting ground shrinkage. This position is now improving, reflecting recent improvements in track geometry and fewer rail breaks and serious rail defects. Our forecasts for the asset stewardship measures are consistent with delivering the required outputs in a way that is both sustainable and consistent with good long-term stewardship of our assets. In addition we have developed a joint understanding with ORR of what is required to achieve excellence in asset management as reflected in the "Network Rail success in CP4" document. Although we missed some of our targets last year, we do not believe that this impacts on the achievement of our CP4 commitments or our position to produce robust CP5 plans.

Table 4 provides a summary of our asset condition and reliability measures.

We are ahead of the CP4 regulatory target for the Station Stewardship Measure (SSM) as well as our internal target for the Light Maintenance Depot Stewardship Measure (LMDSM).

The lowest number of broken rails ever recorded reflects the continuing improvement that we are making in rail management.

The number of infrastructure incidents causing delay reduced this year, which shows continued improvement in the reliability of our assets. Although signalling failures and signalling system and power supply failures are still high compared to other asset related failures, these have reduced compared to 2010/11.

A summary of the volume of renewal activity is shown in Table 5. There has been a 23 per cent increase in plain line track renewals delivered and a five per cent increase in switches and crossings (S&C) delivered compared to 2010/11. This is slightly less than forecast in the Delivery Plan update for 2011. Also greater signalling renewal volumes were delivered than the previous year, as planned.

Table 4: Comparison of network asset measures with previous years

Measure	2007/08	2008/09	2009/10	2010/11	2011/12
Good track geometry	135.2	137.9	137.7	137	136.5
Poor track geometry	2.66	2.18	2.38	2.48	2.58
Intervention/ Immediate action geometry faults per 100km	45.3	38.2	40.3	39.7	41.3
Broken rails (No.)	181	165	152	171	127
Rail breaks and immediate action defects per 100km	-	6.8	5.8	4.49	3.8
Immediate action rail defects per 100 km	n/a	6.27	5.31	3.94	3.39
Condition of asset TSRs (No.)*	4,550*	4,436*	1,729	1,348	1,864
Civils – Assets subject to additional inspections (No.)	-	889	844	810	789
Earthworks failures (No.)	107	61	57	42	28
Tunnels condition	n/a	n/a	Bore 88	Bore 89	Bore 88
	(new measure for CP4)		Portal 92	Portal 92	Portal 89
Bridge condition score	2.09	2.08	2.08	2.1	2.1
Signalling failures causing delays of more than 10 mins. (No.)	19,924	19,607	18,324	16,501	15,638
Signalling asset condition	2.38	2.39	2.37	2.41	2.38
AC power incidents causing >500 minute train delays (No.)	63	66	46	61	50
DC power incidents causing >500 minute train delays (No.)	9	14	14	14	16
AC traction feeder stations and track sectioning points condition	3.53	2.78	2.7	2.56	2.64
DC traction feeder stations and track sectioning points condition	3.61	2.53	2.32	2.37	2.45
AC contact systems condition	1.7	1.6	1.6	1.6	1.6
DC contact systems condition	1.9	1.9	1.9	1.9	2
Telecoms condition	-	0.89	0.92	0.94	0.95
Points failures	7,828	8,048	7,130	5,815	5,166
Train Detection failures	6,554	6,470	6,061	5,226	4,923
Track failures	8,673	7,748	6,670	5,887	5,501
Power incidents causing train delays of more than 300 minutes	96	103	75	100	71
Telecom failures causing train delays of more than 10 minutes	873	817	770	689	633
Station stewardship measure					
Category A	2.48	2.44	2.38	2.3	2.26
Category B	2.6	2.47	2.46	2.4	2.37
Category C	2.65	2.52	2.52	2.47	2.43
Category D	2.69	2.52	2.54	2.47	2.41
Category E	2.74	2.57	2.58	2.5	2.43
Category F	2.71	2.55	2.56	2.5	2.47
Scotland (all categories)	2.39	2.39	2.39	2.33	2.28
Light maintenance depot stewardship measure (network)	2.49	2.52	2.5	2.48	2.43
Asset reliability (no. of infrastructure incidents causing delay)	54,760	52,270	46,091	42,135	40,415

Notes: For all measures in this table, except Good Track Geometry and Telecoms Condition, a lower figure indicates improvement. Some historical data has been restated due to refinement in the reporting systems.
*The process for calculating the condition of asset TSRs changed for CP4 which is why the results change so significantly from 2008/09 to 2009/10.

Table 5: Activity volumes

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Rail (km of track renewed)	816	1,120	1,028	1,039	1,206	810	587	774
Sleeper (km of track renewed)	670	744	738	763	735	438	445	567
Ballast (km of track renewed)	685	799	850	837	763	509	525	573
Switch & crossings (No. of full units replaced)	511	520	442	436	419	231	269	285
Signalling (SEUs)[1]	1,678	278	481	1,441	981	813	802	1,266
Bridge renewals (No.)[2]	333	157	154	201	358	248	340	261
Culvert renewals (No.)[2]	16	9	10	25	33	25	25	31
Retaining wall renewals (No.)[2]	10	10	7	8	15	5	11	10
Earthwork renewals (No.)[2]	106	76	68	107	157	113	103	117
Tunnel renewals (No.)[2]	38	39	19	22	44	24	49	48

Notes:
1. Signalling equivalent units are counted once a scheme is actually commissioned.
2. These measures refer to the number of renewal projects (above a threshold scheme value).

Table 6: Summary of safety measures

Measure	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Workforce safety – Fatalities and weighted injuries MAA	-	0.129	0.152	0.127	0.126	0.136
Infrastructure wrong side failures (No.)	66	60	50	67	85	46
Level crossing misuse – incidents MAA	26.38	28.46	31.31	28.38	29.38	31
Category A signals passed at danger (No.)	334	354	293	274	299	278
Irregular working – incidents MAA	70.85	57.38	32.61	21.69	17.69	21.38
Malicious acts per 100 route miles (No.)	6.285	5.539	5.220	4.418	4.416	4.36
Passenger Safety Indicator MAA	-	-	0.252	0.215	0.178	0.228

Note: MAA is the moving annual average
Some of the 2010/11 figures have been restated as all numbers are taken at a specific point in time and with further refinements during the year some of these numbers change.

Safety and environment

We have set out a very clear vision for safety where “everyone goes home safe, every day”.

We are putting a significant effort in improving safety culture within Network Rail. We have been encouraging a much more open and challenging dialogue about how we can improve safety which we believe will benefit other aspects of business performance.

We have also focused our effort on key risk areas. We have assessed the risk at level crossings and continue to develop and implement mitigations for the higher risk level crossings using the level crossings fund which we created using £89 million of our expected financial outperformance during CP4. Early indications of our programme of level crossings risk reduction show that a ten per cent drop in level crossing risk has been delivered since the end of CP3.

We have analysed the trends behind signals passed at danger (SPADs). In doing so we have identified signals around the country where further work and investment will make our network safer. We are also working with Train Operators to understand those SPADs which arise from driver error.

The industry target is to achieve a three per cent reduction in the risk of death or injury from accidents on the railway for passengers and rail workers over CP4. Network Rail’s part in achieving the above industry target is measured by the Passenger Safety Indicator and the Fatalities and Weighted Injuries measure. The results for these KPIs and the supporting measures are shown in Table 6.

In 2011/12 we achieved our passenger safety target recognising that passenger safety is now amongst the best in Europe.

Regrettably there was a passenger fatality at London Bridge in December 2011 when an elderly gentleman slipped on an escalator. We are continuing to identify ways of making our stations safer for all passengers.

During 2011/12, we pleaded guilty over safety breaches in relation to the fatalities at Elsenham level crossing in 2005 and the derailment at Grayrigg in 2007.

The safety of our employees and contractors is critically important to us and plays a key role in our operational performance. We experienced under-reporting of RIDDOR incidents (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations) in previous years. As a result our current performance is worse than both our target (which was set before the under-reporting was identified) and last year. However, we now understand where and when our incidents are occurring and are much better positioned to put in place targeted interventions.

During 2011/12 we established a new Safety & Sustainable Development function which is developing a company-wide sustainable development vision and strategy. Key aspects of our strategy will include identifying ways of adapting our infrastructure to the predicted effects of climate change, reducing the carbon footprint of the energy we procure, and improving the diversity and inclusion of our workforce.

More information is available on our website where our 2012 Sustainability Update is published.

Enhancements schemes

We have continued progressing the delivery of the enhancement schemes that we have committed to during CP4. Some highlights for the year include:

Line Speed Improvements - Wrexham to Marylebone: As an integral part of the Evergreen 3 project which includes linespeed improvements, journey times and travel opportunities between London (Marylebone) and Birmingham (Moor Street) have been improved, with Chiltern Railways now able to offer a 100-minute fastest journey time between these two cities.

Thameslink: Benefits have now been realised in two locations in Central London where the latest milestones have been completed at:

- **Blackfriars:** The upgraded ticket office booking hall and concourse is now open to the public, along with a new south-bank entrance, giving easier access to nearby offices and tourist attractions like the Tate Modern. Work continues on full integration with the enlarged Underground station, with the station due to be fully completed before the Summer Olympics, but already the new customer and staff facilities are a significant improvement.
- **Farringdon Station:** In February, we completed the upgrade of this grade II listed station with two new entrances in addition to the original restored entrance, new ticket gates and machines, two new ticket offices, and a new staircase and footbridge. Further improvements are scheduled to be delivered progressively to this key National Rail / Tube interchange.

A feature of the Thameslink programme was the introduction of 12 car services along the existing Thameslink route from Bedford to Brighton in December. Work undertaken through central London, with 12 car capable stations at St Pancras International, Farringdon, City Thameslink, Blackfriars and beyond means that services will be further boosted as new rolling stock is introduced in coming years.

Allerton Depot: The modernised depot now provides additional stabling for Northern's fleet as well as enhanced vehicle maintenance, cleaning and fuelling, together with better facilities for train crews. It was brought into operation for the December 2011 timetable change.

Access for all: This programme is designed to improve access to the railway for everyone through the installation of new lifts, footbridges and tactile platform paving. Continuing our work from last year, we have now upgraded a further 27 stations during the year 2011/12.

Reading: Reading is still one of the busiest parts of this country's rail network, and work continues to improve the complicated track layout around and passing through the station. Significant progress this year has seen the construction and commissioning of a new platform, an extension to another, and the widening of Vastern Road (George

Street) roadbridge. All existing platforms have been renumbered. Also, following extensive works during the Christmas period to replace the bridges spanning Cow Lane to the west of the station, the road passing underneath was reopened in January after the first phase of widening work. This part of the project will be fully completed in 2015.

North London / East London Line: Improvements to these routes have enabled frequent passenger services to be operated by London Overground round the periphery of Central London, whilst maintaining the existing loading gauge and capacity for freight traffic. As an example, a customer may now take a journey from Highbury & Islington to West Croydon in less than an hour on one train. These improvements all form part of the Olympics Transport Plan strategy.

Station Improvements at King's Cross and St Pancras: The King's Cross Station concourse is now complete. It offers a bright, spacious passenger circulation environment with new retail facilities. Additionally, there has been refurbishment of the east and west range offices, and the whole complex has been integrated with the London Underground development as well as the adjacent St Pancras International Station.

Cardiff Area Improvments: We have finalised plans to improve the track layout, signalling and selected stations in the Cardiff area that offer the potential for trains to run more frequently. This will benefit both business and leisure travellers in the busy areas around the City. Some of the work is subject to funding, but the combined projects are committed for delivery by December 2016.

Edinburgh Waverley: In January, the refurbished Waverley Steps at Edinburgh Waverley Station reopened as part of the first phase of the overhaul to the station's Princes Street entrance. The steps have been rebuilt and three banks of double escalators installed as part of a modernisation programme to improve access at the station. The thoroughfare is protected from the weather by a new canopy. Two lifts, providing step free access from Princes Street to the station, will be installed by summer 2012.

Introduction

The Annual Return 2012 reports on Network Rail's stewardship of the rail network in 2011/12.

A map of the network is included at the end of this section for information.

We have provided at least five years of data wherever this is possible and in some cases we have included data from the beginning of CP3 for trend and comparative purposes.

It should be noted that some of the year's figures are not final at the point of publication. As a result, a few of last year's figures have been subsequently updated. Where figures have been updated we have provided an explanation for this.

Scope of reporting against targets

The targets included within this Annual Return are either regulatory targets as determined in the Periodic Review 2008 and provided in the final determinations of Network Rail's outputs and funding for 2009 to 2012; or forecasts included in the Network Rail Control Period 4 Delivery Plan update 2011.

Most asset condition information is based on assessments from a sample of assets and, as more surveys are conducted each year compared to the year before, the reliability of the data reported for each asset category will improve.

Independent Reporter

Since October 2002, the company together with ORR has employed independent Reporters. The role of the Reporters is to provide independent technical audit services for ORR and Network Rail. Whilst undertaking this role, they are expected to deliver benefits to Network Rail through suitable recommendations about how we can improve our business processes. Arup has been appointed to review our outputs and the processes, systems and data related to the reporting of our performance throughout the year including data in this Annual Return. The Reporter has therefore been considering the quality, accuracy and reliability of the data and related processes that we use for reporting our performance during the year. The contract provides for audits throughout the year and for the Reporter to focus on specific areas each quarter. As well as this, their quarterly reports include an overview of overall progress in addressing agreed actions resulting from the recommendations. The Arup reports can be found on the ORR's website under "Network Rail Regulation" and "Independent Reporters".

Confidence reporting

As part of the Reporter reviews, a confidence grade for the measure and area that they are reviewing is provided. This confidence grade provides an indication of accuracy and reliability of the measure. During 2011/12 it was agreed that a slightly modified confidence grading system would be used from Autumn 2011.

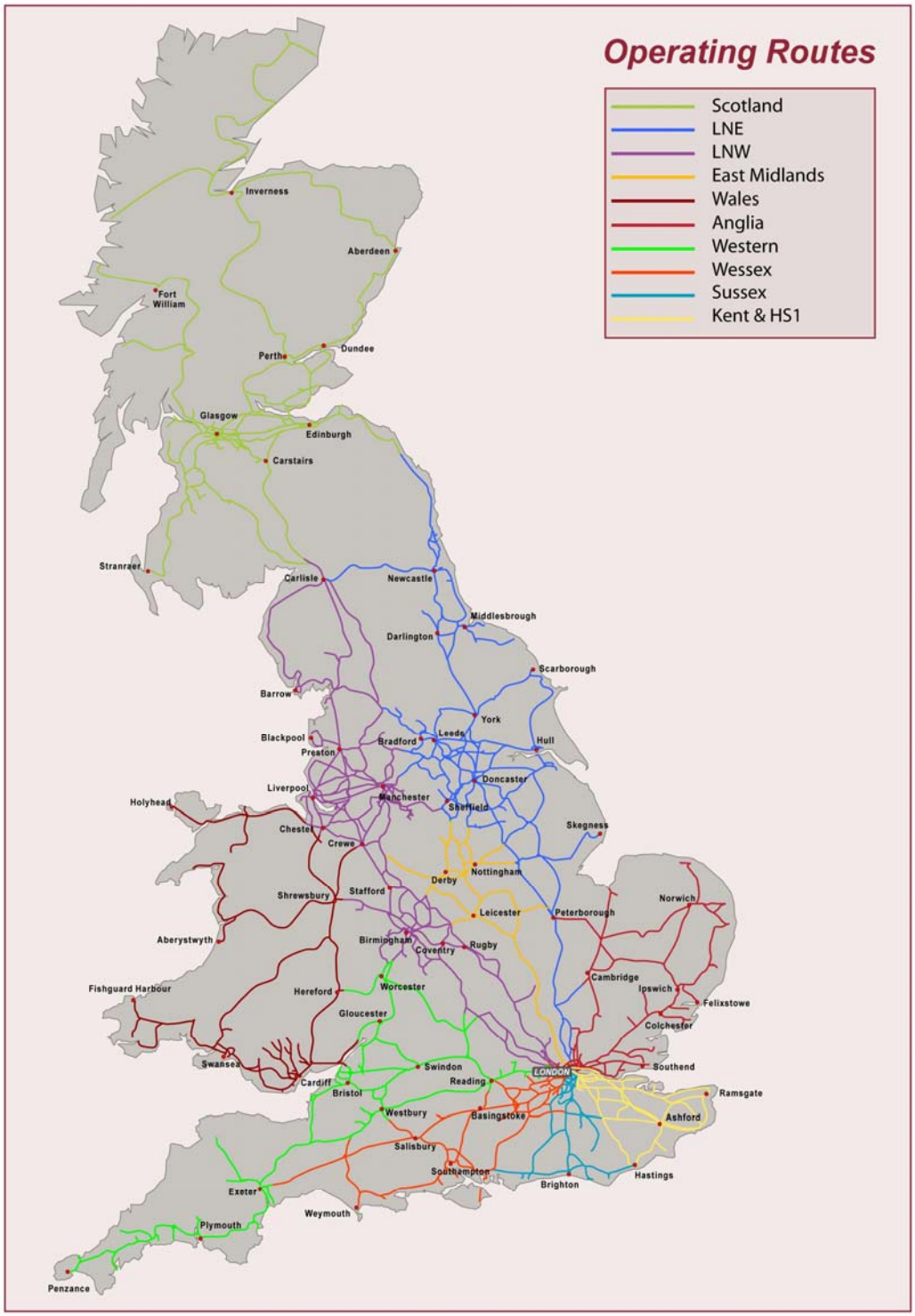
The following tables provide an explanation of the reliability and accuracy grades.

Table 9: System reliability grading system	
System Reliability Band	***Description***
A	Appropriate, auditable, properly documented, well-defined and written records, reporting arrangements, procedures, investigations and analysis shall be maintained, and consistently applied across Network Rail. Where appropriate the systems used to collect and analyse the data will be automated. The system is regularly reviewed and updated by Network Rail's senior management so that it remains fit for purpose. This includes identifying potential risks that could materially affect the reliability of the system or the accuracy of the data and identifying ways that these risks can be mitigated. The system that is used is recognised as representing best practice and is an effective method of data collation and analysis. If necessary, it also uses appropriate algorithms. The system is resourced by appropriate numbers of effective people who have been appropriately trained. Appropriate contingency plans will also be in place to ensure that if the system fails there is an alternative way of sourcing and processing data to produce appropriate outputs. Appropriate internal verification of the data and the data processing system is carried out and appropriate control systems and governance arrangements are in place. The outputs and any analysis produced by the system are subject to management analysis and challenge. This includes being able to adequately explain variances between expected and actual results, time-series data, targets etc. There may be some negligible shortcomings in the system that would only have a negligible affect on the reliability of the system.
B	As A, but with minor shortcomings in the system. The minor shortcomings would only have a minor effect on the reliability of the system.
C	As A, but with some significant shortcomings in the system. The significant shortcomings would have a significant effect on the reliability of the system.
D	As A, but with some highly significant shortcomings in the system. The highly significant shortcomings would have a highly significant effect on the reliability of the system.

Notes:
1. System reliability is a measure of the overall reliability, quality, robustness and integrity of the system that produces the data.
2. Some examples of the potential shortcomings include old assessment, missing documentation, insufficient internal verification and undocumented reliance on third party data.

Table 10: Accuracy grading system	
Accuracy band	***Description***
1*	Data used to calculate the measure is accurate to within 0.1%
1	Data used to calculate the measure is accurate to within 1%
2	Data used to calculate the measure is accurate to within 5%
3	Data used to calculate the measure is accurate to within 10%
4	Data used to calculate the measure is accurate to within 25%
5	Data used to calculate the measure is accurate to within 50%
6	Data used to calculate the measure is inaccurate by more than 50%
X	Data accuracy cannot be measured

Notes:
1. Accuracy is a measure of the closeness of the data used in the system to the true values.
2. Accuracy is defined at the 95% confidence level - i.e. the true value of 95% of the data points will be in the accuracy bands defined above.


Operating Routes
Scotland
LNE
LNW
East Midlands
Wales
Anglia
Western
Wessex
Sussex
Kent & HS1
Inverness
Aberdeen
Fort William
Perth
Dundee
Glasgow
Edinburgh
Carstairs
Stranraer
Carlisle
Newcastle
Middlesbrough
Darlington
Scarborough
Barrow
York
Blackpool
Preston
Leeds
Bradford
Hull
Doncaster
Liverpool
Manchester
Sheffield
Holyhead
Chester
Crewe
Skegness
Nottingham
Derby
Shrewsbury
Stafford
Norwich
Leicester
Peterborough
Aberystwyth
Birmingham
Coventry
Rugby
Cambridge
Ipswich
Felixstowe
Fishguard Harbour
Hereford
Worcester
Gloucester
Colchester
Swansea
Swindon
LONDON
Southend
Cardiff
Bristol
Reading
Ramsgate
Westbury
Basingstoke
Ashford
Salisbury
Southampton
Hastings
Brighton
Exeter
Weymouth
Plymouth
Penzance

Section 1 – Operational performance and stakeholder relationships

Introduction

The main cross-industry measure of operational performance for all passenger services is the Public Performance Measure (PPM), which is a measure of the overall punctuality and reliability of train services delivered to passengers. Network Rail is accountable for the reporting of industry train performance, and PPM figures are shown in this section at national and sector level.

Delay minutes remain a major operational performance measure underpinning the punctuality of passenger and freight train services in order to bring focus onto the causes of disruption and thereby enable performance improvement. Delays to train journeys experienced by passenger and freight companies are broken down into Network Rail attributed delays, and those attributed to train operators. Those attributable to Network Rail typically relate to infrastructure, timetabling and operation of the network, and also include external events impacting the network where Network Rail's role is to control or mitigate impacts. Those attributable to train operators typically relate to train operations, station operations, fleet reliability, problems with train crew resources, or external causes affecting the trains. The Annual Return provides data on Network Rail attributed delays only, with specific focus on infrastructure related delays. Figures are presented for 2011/12 in delay minutes, in minutes delay per 100 train kilometres, and with disaggregated results split by cause.

This section also reports on our stakeholder relationships, including information on our customer satisfaction results. We have also included the Passenger Satisfaction Survey results from the bi-annual survey conducted by Passenger Focus.

Public Performance Measure (PPM)

PPM combines figures for punctuality and reliability into a single performance measure covering all scheduled services operated by franchised passenger operators and the four open access operators as defined in the CP4 Delivery Plan. PPM measures the performance of individual trains against their planned timetable for the day, and shows the percentage of trains 'on time' compared to the total number of trains planned. PPM for the year is expressed as a moving annual average (MAA).

A train is defined as 'on time' if it arrives at its planned destination station within five minutes (i.e. 4 minutes 59 seconds or less) of the planned arrival time. For longer distance operators a criterion of arrivals within ten minutes (i.e. 9 minutes 59 seconds or less) is used. Where an operator runs a mixed service (shorter and longer distance), an aggregation of within five minutes and within ten minutes is used for 'on time' (i.e. taking the number of trains that actually arrive within the five minutes (short distance) and adding this to the number of trains actually arriving within ten minutes (long distance) and then dividing by the total number of trains booked).

Results

The overall network PPM for 2011/12 was 91.6 per cent. This is up from 90.9 per cent in 2010/11. This improvement equates to a reduction of eight per cent in the number of trains running late. It is underpinned by a decrease in total delays to franchised passenger operators (whether attributable to Network Rail or to train operators) of three per cent. This improvement was achieved at the same time as traffic increased during the year by four per cent. (Traffic volumes are measured in train kilometres run).

Table 1.1 compares the PPM for 2011/12 with previous years and Table 1.2 shows PPM by sector for 2011/12.

Table 1.1: Public Performance Measure (PPM) for franchised passenger services

	2006/07	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
PPM (%)	88.1	89.9	90.6	91.5	90.9	91.6

Table 1.2: PPM (%) by sector for England & Wales and Scotland		
Full year results 2011/12 (franchised passenger and open access operators)		
By sector	***PPM Actual***	***PPM Target***
London & South East	91.7	92.4
Long Distance	89.1	90.9
Regional	92.5	91.5
England & Wales (total)	91.7	92.0
Scotland	90.7	91.7

Commentary

Although overall PPM for 2011/12 was at the highest ever recorded, the regulatory targets for all sectors except Regional, were missed.

The under-delivery for Long Distance sector PPM has been a result of a number of factors including:

- higher traffic levels than forecast;
- timetable structure changes and improved journey times making PPM delivery less robust; and
- increased passengers and reduced resourcing which brought pressure to service recovery.

For London and South East sector services, it appears that the PPM regulatory target was missed as a result of higher than anticipated traffic levels and increased passenger numbers. As these services are already reaching full capacity, it is also making delay mitigation more difficult.

Significant operator level PPM impacts included:

- Stagecoach South West Trains: major increase in the level of delay caused by fatalities and a number of major incidents caused by infrastructure failures and cable theft;
- Virgin: it has been difficult to maintain good performance along the critical route section between London and Rugby due to track quality;
- First Great Western: it has been difficult to maintain good performance between London and Reading due to the major enhancement works taking place;
- Chiltern: difficulties completing the Evergreen 3 project to increase capacity and linespeeds, coupled with significant problems implementing the new timetable post-completion to develop the major service enhancement between London and the West Midlands;
- CrossCountry: general delivery worse than target due to a range of problems in infrastructure delivery and from delays caused by other operators.

During the year, we have been reviewing and analysing the reasons for the variance between delay minutes and PPM results for the same sector or route. For example, there may be reducing delay minutes on a route whilst at the same time PPM on the route worsens. With the Long Distance sector services, delay per 100 train kms was close to planned levels whilst PPM worsened. For London and South East sector services, it was the reverse situation. Understanding the reasons behind this will help us improve both PPM and reduce delays.

Delay minutes

The delay minutes data presented in the remainder of this section are Network Rail attributed delays affecting the main scheduled passenger train services (including four open access operators) and freight operators. This is similar to data presented for previous years and excludes delays to other types of operator (such as London Underground services, NEXUS Metro and charter operations), which account for a further 0.7 per cent of the total Network Rail attributed delays.

Results

Table 1.3 shows delays for all train services for 2011/12 compared to previous years.

Commentary

Network Rail attributed delays decreased by about 0.57 million minutes (six per cent) to 8.4 million minutes in 2011/12. With train miles run increasing by four per cent this led to a decrease in delay minutes per 100 train km of ten per cent.

Table 1.3: Delays to all train services

Network Rail-attributed delays	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Total delay minutes (millions) (incl. minor operators)	10.5	9.5	8.8	8.2	8.9	8.4
Train km (millions)	487.6	486.2	497.7	513.4	516.3	536.2
Delay per 100 train km	2.16	1.95	1.78	1.59	1.73	1.56

Notes:
- Total delay minutes include delays to a number of minor operators and some unallocated minutes, which are excluded from the main measure of major operators (passenger and freight). They are nevertheless included in the total Network Rail delay minutes. These include delays caused to LUL Bakerloo line services, NEXUS, charter operations and miscellaneous services.
- The number of train kilometres run excludes empty coaching stock movements, locomotive movements and engineering trains, and is as recorded in the performance database (PALADIN).
- The delay per 100 train km is based on total delay minutes, divided by the train kilometres run, multiplied by 100.

The reduction in delay minutes is mainly a result of less extreme weather this year (with the exception of Scotland and parts of Northern England). For example, we had better performance in the autumn resulting from more benign weather conditions and significant investment in mitigatory actions. Network Rail infrastructure delays also maintained a positive reduction in the number of delay incidents. This was broadly in line with asset stewardship targets.

Delays to passenger train services

Total Network Rail attributed delays to passenger trains decreased by five per cent. This resulted in a nine per cent decrease in delay minutes per 100 train km to 1.42 minutes. The trend since 2006/07 is summarised in Table 1.4.

The trends in delays to passenger trains (measured as delay per 100 train km) since 2005/06 is illustrated in Figure 1.1. This highlights the effects of the extreme weather experienced in 2010/11 in the winter period, which did not occur in 2011/12.

England & Wales delays to passenger train services

Total Network Rail attributed delays to passenger trains in England & Wales decreased in 2011/12 by five per cent. Traffic volumes increased by three per cent compared to 2010/11. This resulted in a combined impact of an eight per cent decrease in delay minutes per 100 train km to 1.45 minutes. The delays to passenger services were 20 per cent worse than the regulatory target. Delay per incident in the London and South East area was particularly high. The trend since 2006/07 is summarised in Table 1.5.

Scotland delays to passenger train services

Total Network Rail attributed delays affecting Scotland passenger services (First ScotRail) reduced in 2011/12 by three per cent. Traffic volumes increased by six per cent compared to 2010/11. This resulted in a combined impact of an eight per cent decrease in delay minutes per 100 train km, to 1.13 minutes. The delays to passenger services were 23 per cent worse than the regulatory target. The trend since 2006/07 is summarised in Table 1.6.

Scotland was again affected by extreme weather including flooding and severe winds, but this had less of an impact compared to previous years. However as the year progressed, our performance improved as a result of our joint work with First ScotRail and improvements to the timetable to strengthen capability to deliver good levels of service.

Table 1.4: Network-wide delays to passenger train services

Network Rail-attributed delays	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Delay minutes	8,403,701	7,695,360	7,208,574	6,700,700	7,400,705	6,997,245
Train km	439,123,839	442,271,678	454,798,388	470,714,609	475,060,899	492,317,818
Delay per 100 train km	1.91	1.74	1.59	1.42	1.56	1.42

Notes:

- The delay minutes totals are based on all PfPI (Process for Performance Improvement) delays, affecting applicable main scheduled passenger operators (franchised operators plus three open access operators Heathrow Express, Grand Central, and First Hull Trains). Wrexham & Shropshire figures are included until they ceased network operations during 2010/11. Note: prior to 2009/10 figures included delays and mileage for NEXUS Metro and Eurostar services; in 2008/09 these accounted for 12,059 minutes of delay.
- Train km run are for trains of applicable operators, excluding empty coaching stock movements and locomotives running "light", as recorded in PALADIN.
- Delays per 100 train km are based on all PfPI delay minutes, divided by the train kilometres run, multiplied by 100.

Figure 1.1: Delay minutes per 100 train km over time

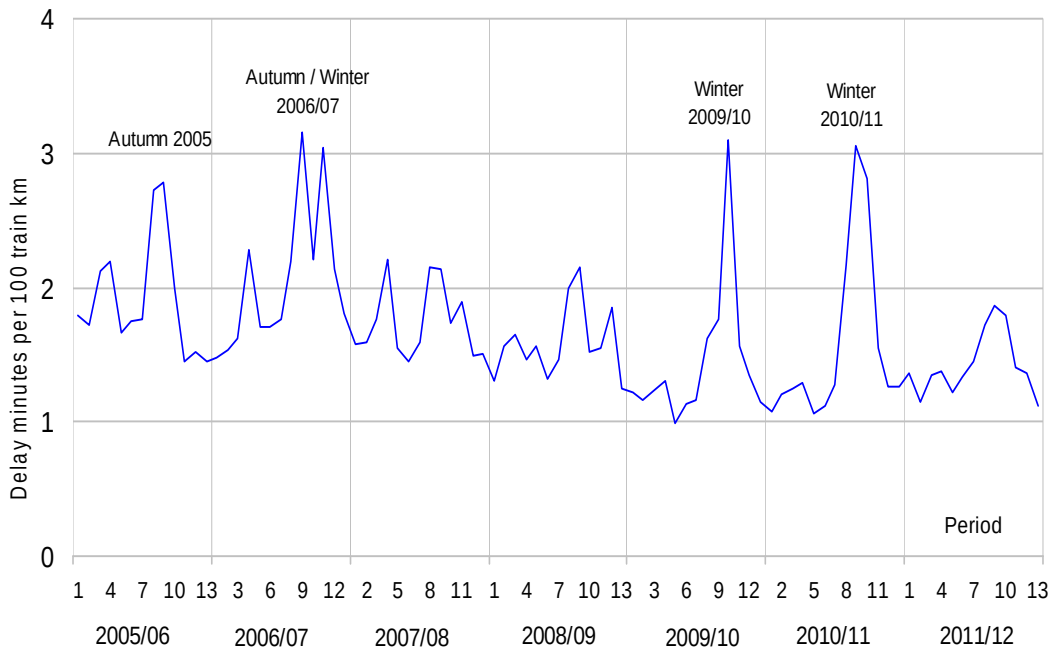


Table 1.5: England & Wales delays to passenger train services

Network Rail-attributed delays	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Delay minutes	7,854,848	7,223,137	6,701,324	6,152,260	6,859,224	6,517,432
Train km	402,115,175	404,921,582	416,828,459	431,295,163	434,795,367	449,704,866
Delay per 100 train km	1.95	1.78	1.61	1.43	1.58	1.45
Regulatory target (minutes)	–	–	–	6,270,000	5,790,000	5,430,000

Table 1.6: Scotland delays to passenger train services

Network Rail-attributed delays	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Delay minutes	548,853	472,223	507,250	548,440	493,791	479,814
Train km	37,008,664	37,350,097	37,969,929	39,419,446	40,265,532	42,612,952
Delay per 100 train km	1.48	1.26	1.34	1.39	1.23	1.13
Regulatory target (minutes)	–	–	–	436,000	410,000	391,000

Notes:

Improved technology and analysis led to an amended commercial agreement being reached in early 2011/12 for delay minutes in Scotland. This agreement was backdated to include the year 2010/11 following publication of the Annual Return for that year. The figures shown in the table above have therefore been refreshed for year 2010/11 for purposes of accurate comparison.

Delays to freight train services

Network Rail delay to freight services decreased by 17 per cent during the year to 3.57 minutes per 100 train km, although this was still 12 per cent worse than the regulatory target. The trend since 2006/07 is summarised in Table 1.7 and Table 1.8 shows delays to the individual freight operators for 2011/12.

The reduction in delays to freight train services was principally due to the less extreme weather conditions, improvements in delays caused by train planning, and reductions in delays caused by cable theft.

During the year, there has also been increased industry focus on reducing delays to freight services. Network Rail has been working with freight operators and has established a freight reform programme with the aim of providing a better product for freight customers. As part of reducing freight delays, Network Rail has also considered the specific nature and market conditions related to rail freight and moved towards more short term planning to optimise rail traffic to the market conditions.

Table 1.7: National delays to freight train services

Network Rail-attributed delays	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Delay minutes	2,088,205	1,762,932	1,568,106	1,421,333	1,504,142	1,329,303
Train km	45,258,631	40,700,435	39,086,440	35,395,805	35,044,683	37,276,094
Delay per 100 train km	4.61	4.33	4.01	4.02	4.29	3.57
Regulatory target (delay per 100 train km)	–	–	–	3.68	3.41	3.18

Notes:

- The delay minutes totals are based on all PfPI delays affecting applicable freight operators (major scheduled operators).
- Train km run are for trains of applicable operators, excluding locomotives running “light” and non-commercial traffic (such as engineering haulage trains). Source: Network Rail PSS data warehouse.
- Delay minutes per 100 train km are based on all PfPI delay minutes, divided by the train kilometres run, multiplied by 100.

Table 1.8: Delays to freight operators **in 2011/12**

	Delay minutes	*Train km (million)*	*Delay per 100 km*
Major Freight operators			
DBS	625,902	17.2	3.64
Freightliner Heavy Haul	214,732	6.1	3.55
Freightliner Intermodal	315,342	8.6	3.65
GB Rail Freight	128,078	3.2	3.98
DRS	45,250	2.2	2.10
Other Freight operators			
Colas Rail	14,615	0.4	3.72
Europorte	1,400	0.05	2.96
Devon & Cornwall	188	0.004	5.08
Total	1,345,507	37.7	3.72

Delay category

The trends in Network Rail delay minutes by cause category are described in this section as summarised category groupings and individual delay categories.

Results

Tables 1.9 and 1.10 show Network Rail delays by category grouping for 2011/12 compared to previous years. Tables 1.11 to 1.13 show Network Rail delays by detailed cause category.

Commentary

Delays caused by Network Rail decreased by six per cent, and delays due to operator causes were broadly static. This highlights that to enable delays to be further reduced more cross industry action is required.

The impact of less severe weather and our investment in autumn mitigation has reduced delays caused by severe weather in 2011/12. However delays caused by track defects and TSRs (temporary speed restrictions) increased and delays caused by non-track assets did not reduce as much as planned.

Delays caused by non-track assets were about 300,000 minutes worse than planned, mainly as a result of delays caused by train detection equipment. The West Coast Main Line was particularly affected by delays caused by track condition for which we have now focused investment to improve quality. Delays caused by TSRs also increased principally due to level crossing sighting problems and low soil moisture problems in embankments in clay soil areas.

Delays caused by external impacts was variable. Overall delays in this category rose due to the significant impact of fatalities. This is despite the reduction in delays caused by cable theft which has improved partly due to our investment in deterrent and remedial measures together with engagement from the rail industry to raise the profile of this issue and our work with other industries to influence legislation changes to the Scrap Metal Act of 1964.

Although delays caused by network management (i.e. operational planning) improved, the reduction in delays was less than planned. This is due to the need to plan freight services at short notice and the timetable becoming increasingly tight as a result of more trains operating on the network.

Table 1.9: Network delays to passenger and freight trains by summarised category groups (delay minutes)

Category group[1]	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Track defects and TSRs[2]	1,368,171	1,238,050	1,062,288	817,336	826,861	893,526
Other asset defects[3]	3,350,439	2,870,303	2,883,048	2,669,582	2,593,163	2,562,423
Network management/other[4]	2,746,575	2,634,263	2,331,438	1,967,533	2,529,963	2,366,235
Autumn leaf-fall and adhesion[5]	214,222	156,813	241,733	153,229	280,427	146,595
Severe weather/structures[6]	1,024,655	882,648	584,241	979,852	962,219	483,785
External factors[7]	1,787,843	1,676,215	1,673,932	1,534,501	1,712,214	1,873,985
Total minutes	10,491,906	9,458,292	8,776,680	8,122,033	8,904,847	8,326,549
Train km	484,382,470	482,972,113	493,884,828	506,110,414	510,105,582	529,593,912

Notes:

1. Delay totals are based on all delays recorded for attribution of responsibility to Network Rail, divided by train kilometres run where applicable.
2. Track defects and TSRs include broken rails, other track faults, speed restrictions for condition of track and rolling contact fatigue, and reactionary delay due to planned TSRs.
3. Other asset defects include points, track circuits, axle counters, signal and signalling system failures, overhead power/third rail supply etc.
4. Network management/other delays include possessions, signalling errors, timetabling, dispute resolution, unexplained, and un-investigated.
5. Autumn leaf fall and adhesion include leaf fall related delays and Network Rail's share of industry adhesion delays.
6. Severe weather/structures includes direct delays due to severe weather and all structures delays, which include weather related delays due to embankment instability risks and bridge scour. Heat-related speed restrictions are also shown within this category.
7. External factors include road-related incidents, fires, trespass and vandalism, cable theft, security alerts, suicides and other external events.

Table 1.10: Network delays to passenger and freight trains by summarised category groups (delay minutes per 100 train km)

Category group[1]	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Track defects and TSRs[2]	0.28	0.26	0.22	0.16	0.16	0.17
Other asset defects[3]	0.69	0.59	0.58	0.53	0.51	0.48
Network management/other[4]	0.57	0.55	0.47	0.39	0.5	0.45
Autumn leaf-fall and adhesion[5]	0.04	0.03	0.05	0.03	0.05	0.03
Severe weather/structures[6]	0.21	0.18	0.12	0.19	0.19	0.09
External factors[7]	0.37	0.35	0.34	0.3	0.34	0.35
Total	**2.17**	**1.96**	**1.78**	**1.6**	**1.75**	**1.57**

Notes:

1. Delay totals are based on all delays recorded for attribution of responsibility to Network Rail, divided by train kilometres run where applicable.
2. Track defects and TSRs include broken rails, other track faults, speed restrictions for condition of track and rolling contact fatigue, and reactionary delay due to planned TSRs.
3. Other asset defects include points, track circuits, axle counters, signal and signalling system failures, overhead power/third rail supply etc.
4. Network management/other delays include possessions, signalling errors, timetabling, dispute resolution, unexplained, and un-investigated.
5. Autumn leaf fall and adhesion include leaf fall related delays and Network Rail's share of industry adhesion delays.
6. Severe weather/structures includes direct delays due to severe weather and all structures delays, which include weather related delays due to embankment instability risks and bridge scour. Heat-related speed restrictions are also shown within this category.
7. External factors include road-related incidents, fires, trespass and vandalism, cable theft, security alerts, suicides and other external events.

Table 1.11: Network wide delays to passenger and freight trains by detailed cause category 2011/12 (delay minutes)

		Passenger Trains		*Freight Trains*		*Combined Total*	
No	***Category***	***Delay Mins***	***Delay per 100tr km***	***Delay Mins***	***Delay per 100tr km***	***Delay Mins***	***Delay per 100tr km***
101	Points failures	485,620	0.10	108,059	0.29	593,679	0.11
102	Problems with trackside signs including TSR boards	20,192	0.00	2,133	0.01	22,325	0.00
103	Level crossing failures	82,007	0.02	11,271	0.03	93,278	0.02
104A	TSR's due to condition of track	48,597	0.01	24,280	0.07	72,877	0.01
104B	Track faults (including broken rails)	596,508	0.12	124,828	0.33	721,336	0.14
104C	Rolling contact fatigue	4,368	0.00	241	0.00	4,609	0.00
104D	Reactionary delay to planned TSRs	77,892	0.02	16,811	0.05	94,703	0.02
105	Civil engineering structures, earthworks & buildings	44,458	0.01	14,144	0.04	58,602	0.01
106	Other infrastructure	193,145	0.04	39,169	0.11	232,314	0.04
106A	Track patrols & related possessions	23,779	0.00	6,386	0.02	30,165	0.01
107A	Possession over-run and related faults	137,123	0.03	35,498	0.10	172,621	0.03
107B	Other possession related delay	42,209	0.01	4,697	0.01	46,906	0.01
108	Mishap – infrastructure causes	138,074	0.03	21,789	0.06	159,863	0.03
110A	Severe weather	300,997	0.06	46,431	0.12	347,428	0.07
110B	Other weather	68,760	0.01	8,994	0.02	77,754	0.01
111A	Wheel slip due to leaf fall	23,715	0.00	3,998	0.01	27,712	0.01
111B	Vegetation management failure	18,066	0.00	2,096	0.01	20,162	0.00
112	Fires starting on Network Rail infrastructure	20,194	0.00	1,666	0.00	21,860	0.00
150	Low adhesion inc. autumn (Network Rail)	106,411	0.02	5,115	0.01	111,525	0.02
201	Overhead line/third rail faults	179,099	0.04	20,098	0.05	199,197	0.04
301A	Signal failures	201,436	0.04	28,678	0.08	230,114	0.04
301B	Track circuit failures	533,966	0.11	64,117	0.17	598,083	0.11
301C	Axle counter failures	62,429	0.01	9,839	0.03	72,267	0.01
302A	Signalling system & power supply failures	423,281	0.09	59,276	0.16	482,557	0.09
302B	Other signal equipment failures	57,649	0.01	7,503	0.02	65,152	0.01
303	Telecoms failures	49,510	0.01	5,567	0.01	55,077	0.01
304	Cable faults (signalling & comms)	137,891	0.03	35,128	0.09	173,019	0.03
305	Track circuit failures – leaf-fall	6,555	0.00	802	0.00	7,357	0.00
401	Bridge strikes	130,147	0.03	12,581	0.03	142,728	0.03
402	External infrastructure damage – vandalism/theft	407,293	0.08	123,935	0.33	531,228	0.10
403	External level crossing/road incidents (not bridges)	75,449	0.02	11,000	0.03	86,449	0.02
501A	Network Rail operations – signalling	325,079	0.07	61,709	0.17	386,788	0.07
501B	Network Rail operations – control	33,725	0.01	19,810	0.05	53,535	0.01
501C	Network Rail operations – railhead conditioning trains	36,028	0.01	2,341	0.01	38,369	0.01
501D	Network Rail operations – other	112,989	0.02	27,174	0.07	140,163	0.03
502A	Timetable planning	189,832	0.04	130,370	0.35	320,203	0.06
502C	Network Rail commercial takeback/other	215,711	0.04	59,759	0.16	275,470	0.05
503	External fatalities and trespass	687,792	0.14	80,545	0.22	768,336	0.15
504	External police on line/security alerts	10,510	0.00	1,405	0.00	11,916	0.00
505	External fires	34,470	0.01	10,832	0.03	45,302	0.01
506	External other	235,217	0.05	30,949	0.08	266,166	0.05
601	Unexplained	372,512	0.08	36,738	0.10	409,250	0.08
602	Un-investigated delay	46,557	0.01	11,536	0.03	58,093	0.01
Total Minutes		**6,997,243**	**1.42**	**1,329,298**	**3.57**	**8,326,541**	**1.57**
Train Kilometres (millions)		**492.3**		**37.3**		**529.6**	

Table 1.12: Network total delays to passenger and freight trains by detailed cause category (delay minutes)

No	*Category*	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
101	Points failures	829,316	729,623	744,297	657,883	643,408	593,679
102	Problems with trackside signs including TSR boards	41,673	41,779	26,232	17,564	28,193	22,325
103	Level crossing failures	115,817	107,863	100,534	95,240	101,294	93,278
104A	TSR's Due to condition of track	347,642	284,200	204,831	133,996	95,910	72,877
104B	Track faults (including broken rails)	924,108	835,024	727,716	614,542	654,269	721,336
104C	Rolling contact fatigue	9,253	15,616	22,450	11,867	11,196	4,609
104D	Reactionary delay to planned TSRs	87,168	103,210	107,291	56,932	65,486	94,703
105	Civil engineering structures, earthworks & buildings	124,324	126,433	77,833	78,289	61,894	58,602
106	Other infrastructure	263,356	282,233	232,442	155,880	188,630	232,314
106A	Track patrols & related possessions	81,290	77,838	67,900	33,693	33,164	30,165
107A	Possession over-run and related faults	277,269	271,206	155,781	132,324	159,050	172,621
107B	Other possession related delay	85,259	58,846	51,267	35,750	41,185	46,906
108	Mishap – infrastructure causes	160,143	160,757	194,577	153,580	156,450	159,863
110A	Severe weather (beyond design capability of infrastructure)	578,610	626,972	346,845	810,259	817,269	347,428
110B	Other weather (impact on infrastructure or network operation)	321,721	129,243	159,563	91,304	83,056	77,754
111A	Wheel slip due to leaf fall	51,160	54,085	76,451	45,110	130,110	27,712
111B	Vegetation management failure	13,056	16,289	22,836	25,023	18,894	20,162
112	Fires starting on Network Rail infrastructure	33,513	26,613	16,920	32,284	33,903	21,860
150	Low adhesion inc. autumn (Network Rail)	148,957	97,544	142,690	94,223	134,991	111,525
201	Overhead line/third rail faults	336,596	214,086	214,291	247,508	241,662	199,197
301A	Signal failures	345,314	288,006	308,811	242,661	205,593	230,114
301B	Track circuit failures	768,844	638,878	556,595	514,100	549,483	598,083
301C	Axle counter failures	49,517	77,458	142,373	105,824	66,671	72,267
302A	Signalling system & power supply failures	434,195	391,769	431,539	416,581	514,984	482,557
302B	Other signal equipment failures	91,911	67,560	62,157	64,552	68,182	65,152
303	Telecoms failures	50,901	66,026	66,387	69,825	53,156	55,077
304	Cable faults (signalling & comms)	175,480	173,706	143,717	168,587	148,728	173,019
305	Track circuit failures – leaf fall	14,105	5,184	22,592	13,896	15,326	7,357
401	Bridge strikes	255,753	221,268	171,195	143,567	163,105	142,728
402	External infrastructure damage– vandalism/theft	504,472	473,606	503,286	473,394	531,507	531,228
403	External level crossing/road incidents (not bridges)	80,857	79,180	76,050	70,320	83,380	86,449
501A	Network Rail operations – signalling	456,276	454,885	407,013	362,990	382,116	386,788
501B	Network Rail operations – control	88,754	86,460	83,925	65,927	72,555	53,535
501C	Network Rail operations – railhead conditioning trains	18,810	26,031	24,003	28,303	31,174	38,369
501D	Network Rail operations – other	172,499	207,412	175,761	119,526	125,421	140,163
502A	Timetable planning	316,823	281,035	241,090	243,465	414,138	320,203
502C	Network Rail commercial takeback/other	513,787	379,912	340,003	298,135	347,977	275,470
503	External fatalities and trespass	610,890	624,978	653,119	605,067	635,277	768,336
504	External police on line/security alerts	45,421	47,611	17,343	23,929	16,359	11,916
505	External fires	88,172	82,075	31,940	47,815	55,194	45,302
506	External other	260,295	190,081	271,487	190,217	193,489	266,166
601	Unexplained	318,599	335,711	353,547	330,101	361,378	409,250
602	Un-investigated delay (new category)	0	0	0	0	169,640	58,093
Total Minutes		**10,491,906**	**9,458,292**	**8,776,680**	**8,122,033**	**8,904,847**	**8,326,541**
Train Kilometres		**484,382,470**	**482,972,113**	**493,884,828**	**506,110,414**	**510,105,582**	**529,593,912**

Table 1.13: Network total delays to passenger and freight trains by detailed cause category (delay minutes per 100 train km)

No	*Category*	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
101	Points failures	0.17	0.15	0.15	0.13	0.13	0.11
102	Problems with trackside signs including TSR boards	0.01	0.01	0.01	0	0.01	0.00
103	Level crossing failures	0.02	0.02	0.02	0.02	0.02	0.02
104A	TSR's Due to condition of track	0.07	0.06	0.04	0.03	0.02	0.01
104B	Track faults (including broken rails)	0.19	0.17	0.15	0.12	0.13	0.14
104C	Rolling contact fatigue	0	0	0	0	0	0.00
104D	Reactionary delay to planned TSRs	0.02	0.02	0.02	0.01	0.01	0.02
105	Civil engineering structures, earthworks & buildings	0.03	0.03	0.02	0.02	0.01	0.01
106	Other infrastructure	0.05	0.06	0.05	0.03	0.04	0.04
106A	Track patrols & related possessions	0.02	0.02	0.01	0.01	0.01	0.01
107A	Possession over-run and related faults	0.06	0.06	0.03	0.03	0.03	0.03
107B	Other possession related delay	0.02	0.01	0.01	0.01	0.01	0.01
108	Mishap – infrastructure causes	0.03	0.03	0.04	0.03	0.03	0.03
110A	Severe weather	0.12	0.13	0.07	0.16	0.16	0.07
110B	Other weather	0.07	0.03	0.03	0.02	0.02	0.01
111A	Wheel slip due to leaf fall	0.01	0.01	0.02	0.01	0.03	0.01
111B	Vegetation management failure	0	0	0	0	0	0.00
112	Fires starting on Network Rail infrastructure	0.01	0.01	0	0.01	0.01	0.00
150	Low adhesion inc. autumn (Network Rail)	0.03	0.02	0.03	0.02	0.03	0.02
201	Overhead line/third rail faults	0.07	0.04	0.04	0.05	0.05	0.04
301A	Signal failures	0.07	0.06	0.06	0.05	0.04	0.04
301B	Track circuit failures	0.16	0.13	0.11	0.1	0.11	0.11
301C	Axle counter failures	0.01	0.02	0.03	0.02	0.01	0.01
302A	Signalling system & power supply failures	0.09	0.08	0.09	0.08	0.1	0.09
302B	Other signal equipment failures	0.02	0.01	0.01	0.01	0.01	0.01
303	Telecoms failures	0.01	0.01	0.01	0.01	0.01	0.01
304	Cable faults (signalling & comms)	0.04	0.04	0.03	0.03	0.03	0.03
305	Track circuit failures – leaf-fall	0	0	0	0	0	0.00
401	Bridge strikes	0.05	0.05	0.03	0.03	0.03	0.03
402	External infrastructure damage–vandalism/theft	0.1	0.1	0.1	0.09	0.1	0.10
403	External level crossing/road incidents (not bridges)	0.02	0.02	0.02	0.01	0.02	0.02
501A	Network Rail operations – signalling	0.09	0.09	0.08	0.07	0.07	0.07
501B	Network Rail operations – control	0.02	0.02	0.02	0.01	0.01	0.01
501C	Network Rail operations – railhead conditioning trains	0	0.01	0	0.01	0.01	0.01
501D	Network Rail operations – other	0.04	0.04	0.04	0.02	0.02	0.03
502A	Timetable planning	0.07	0.06	0.05	0.05	0.08	0.06
502C	Network Rail commercial takeback / other	0.11	0.08	0.07	0.06	0.07	0.05
503	External fatalities and trespass	0.13	0.13	0.13	0.12	0.12	0.15
504	External police on line/security alerts	0.01	0.01	0	0	0	0.00
505	External fires	0.02	0.02	0.01	0.01	0.01	0.01
506	External other	0.05	0.04	0.05	0.04	0.04	0.05
601	Unexplained	0.07	0.07	0.07	0.07	0.07	0.08
602	Un-investigated delay (new category)	0	0	0	0	0.03	0.01
	Total minutes	**2.17**	**1.96**	**1.78**	**1.60**	**1.75**	**1.57**

Asset failures

Infrastructure incidents causing delay

The number of performance incidents for various asset categories is shown in this section. These incidents are recorded for the purpose of identifying the cause and responsibility of delays and cancellations. This information also assists with focusing management decisions on where to maintain or renew assets. The records do not seek to represent a catalogue of every single physical component or system failure occurring on the network. Table 1.14 shows the number of infrastructure incidents (including category numbers) with delays attributed to them.

In a small number of cases more than one incident will be attributed for the same physical incident, to reflect different phases of an incident or responsibilities for contractual delay attribution purposes.

Commentary

There has been a reduction in the number of incidents across nearly all categories. This reflects our focus on improved maintenance practices together with the increasing impact of remote condition monitoring as equipment is fitted and alert levels are set to capture worsening component delivery in advance of failure.

Table 1.14: Network infrastructure incidents recorded for delay attribution (number)

No	*Category*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
101	Points failures	7,828	8,048	7,130	5,815	5,166
103	Level crossing failures	2,201	2,260	2,162	2,005	1,932
104A	TSR's due to condition of track	1,878	1,429	1,151	866	668
104B	Track faults (including broken rails)	6,721	6,149	5,392	4,955	4,787
104C	Rolling contact fatigue	74	170	127	66	46
105	Civil engineering structures, earthworks & buildings	492	391	438	385	280
106	Other infrastructure	6,741	5,496	3,557	3,380	3,709
106A	Track patrols & related possessions	3,144	3,365	2,568	2,269	1,948
108	Mishap – infrastructure causes	1,634	1,849	1,453	1,589	1,917
112	Fires starting on Network Rail infrastructure	230	197	221	249	257
201	Overhead line/third rail faults	1,358	1,370	1,241	1,279	1,259
301A	Signal failures	6,566	6,560	5,999	4,906	4,812
301B	Track circuit failures	5,985	5,375	5,150	4,580	4,240
301C	Axle counter failures	569	1,095	911	646	683
302A	Signalling system & power supply failures	3,943	3,750	4,018	4,413	4,202
302B	Other signal equipment failures	1,579	1,471	1,559	1,695	1,673
303	Telecoms failures	1,464	1,356	1,351	1,252	1,156
304	Cable faults (signalling & comms)	667	574	532	550	570
401	Bridge strikes	1,686	1,365	1,131	1,235	1,110
Total		**54,760**	**52,270**	**46,091**	**42,135**	**40,415**

Cancellations & Significant Lateness (CaSL)

Definition

CaSL is defined as the number and percentage of passenger trains (franchised and open access operators) which are cancelled in part or full, or which arrive at their final destination 30 or more minutes later than the time shown in the public timetable.

Commentary

In 2011/12, the percentage of trains which were cancelled or significantly late was 2.42 per cent for England & Wales which was better than the 2.75 per cent achieved in 2010/11. The regulatory targets for Long Distance (4.2 per cent) and Regional services (2.4 per cent) were met, however the target for London and South East (2.1 per cent) was missed.

As CaSL is strongly linked to PPM and delay, the approach to improvement in CaSL was part of an overall integrated performance improvement plan. Experience has, however continued to demonstrate the key value of CaSL as a metric of major disruption to passengers and the requirement for specific actions dependent on the needs of specific services. For example: the need to continue to run trains which might previously have been cancelled to enable swift service recovery due to strong passenger demand.

Table 1.15: Cancellations and significant lateness (%)

	2006/07	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
London & South East	2.64	2.32	2.50	2.53	2.61	2.38
Long Distance	5.99	5.73	5.21	4.64	5.00	3.99
Regional	3.24	2.98	2.58	2.10	2.44	1.96
England & Wales	3.08	2.80	2.76	2.58	2.76	2.39
Scotland[1]	2.33	2.17	2.03	2.42	2.65	2.69
Network Total	**3.00**	**2.73**	**2.68**	**2.56**	**2.75**	**2.42**

Notes:

1. CaSL in Scotland is not subject to a regulatory output specified by the ORR .

Customer satisfaction

Network Rail's Customer Satisfaction Survey (conducted by GfK) took place over a six week period during October and November 2011. This is a survey of the top managers from the train and freight operators in the UK, both franchised and open access. See Figure 1.2 for the key scores.

Overall satisfaction fell from 48 per cent (2010) to 43 per cent (2011). This score expresses the number of respondents professing themselves satisfied or very satisfied with Network Rail overall. On a scale of 1 to 5 (where 1 is very dissatisfied and 5 very satisfied) this equated to a score of 3.12 which was a small fall from 2010 (3.15). See Figure 1.3 on overall satisfaction.

Within this score, the score for TOCs was 3.09 (2010, 3.16) and for FOCs it was 3.43 (2010, 3.11). The main reasons for the fall in overall satisfaction are customers being dissatisfied with Network Rail's delivery of its core activities i.e. train performance, track maintenance and train planning.

There were improvements in the perception of Network Rail's delivery of important issues such as problem solving, and trust and honesty, but the predominant factor from the survey (and from that in 2010) is the delivery of reliable infrastructure in order to achieve the train service punctuality expectations of customers, see Figure 1.4 and Table 1.17.

Action plans are being developed by routes in conjunction with customers and encompass the development of alliances and other forms of collaborative working.

This year for the first time, respondents were offered an online option as well as a telephone interview. While many people took up the online option, several did not fully complete the survey which meant such submissions could not be included. Only fully completed surveys are eligible for inclusion in the results. This was a factor in the response rate falling from 80 per cent in 2010 to 69 per cent in 2011.

Network Rail is currently considering how the survey could be adapted for 2012 in the light of the significant changes arising during the last six months following devolution.

Figure 1.2: Customer satisfaction key scores

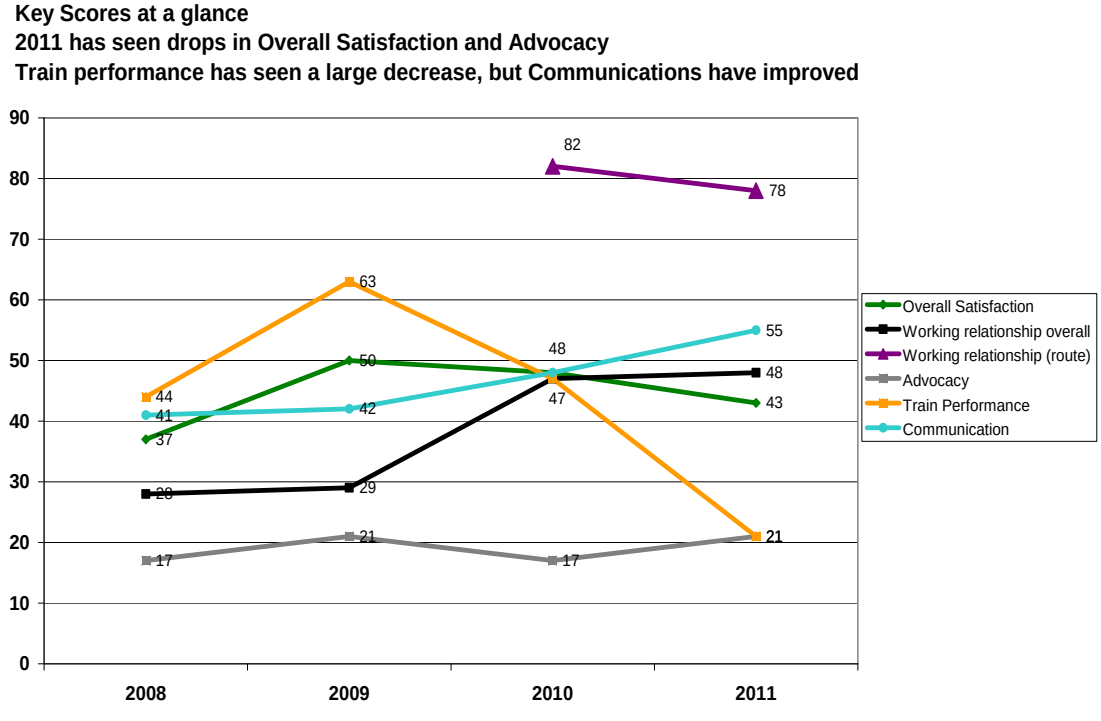


Figure 1.3: Customer satisfaction overall scores

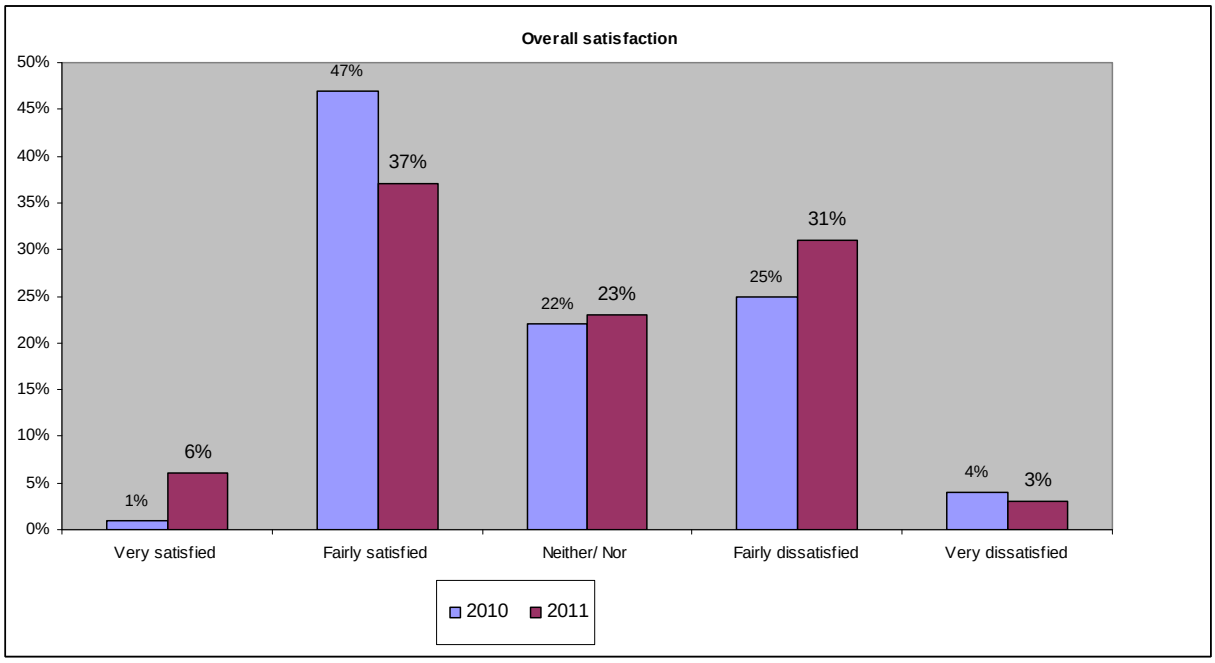


Table 1.16: Comparison of overall satisfaction

Satisfied with Network Rail	*2009*	*2010*	*2011*	*Change from 2010*
Satisfied	50%	48%	43%	-5%
Dissatisfied	17%	29%	34%	+5%
Neither	33%	22%	23%	+1%
Mean	3.32	3.15	3.12	-0.03

Figure 1.4: Overall satisfaction with train service performance

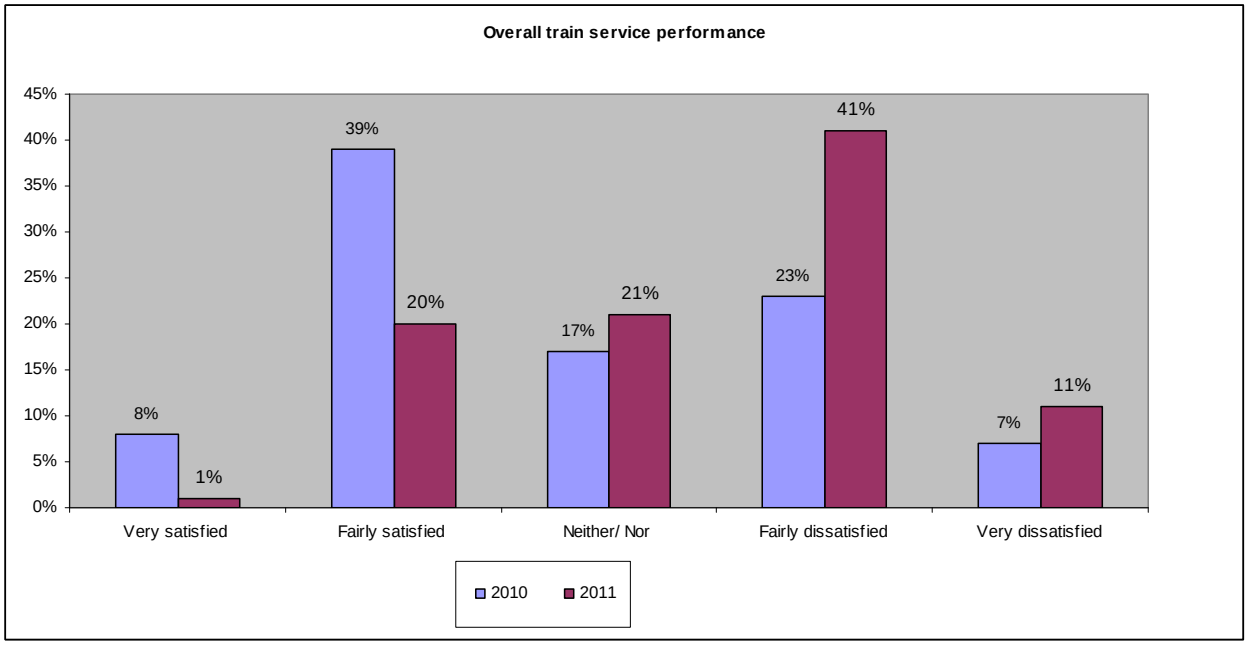


Table 1.17: Comparison of satisfaction with train service performance

Satisfied with Network Rail	*2009*	*2010*	*2011*	*Change from 2010*
Satisfied	63%	47%	21%	-26%
Dissatisfied	10%	30%	52%	+22%
Neither	21%	17%	21%	+4%
Mean	3.65	3.18	2.56	-0.62

Passenger satisfaction

The passenger satisfaction survey is commissioned by Passenger Focus. They conduct two surveys each year in Spring and Autumn. The latest results reflect the Spring 2012 survey. Data was gathered from over 28,000 respondents.

The results were broadly positive with more areas showing no change or an improvement compared with the previous surveys in autumn 2011 and spring 2011. The level of overall satisfaction decreased from 84 per cent to 83 per cent; overall satisfaction with punctuality increased to 81 per cent from 80 per cent. However neither of these changes were reported as being statistically significant. Thirteen of the categories being surveyed improved and one declined overall (value for money of tickets).

All sub sectors (regional, long distance, and London and South East) showed falls in the value for money category with only regional being statistically significant. Satisfaction with punctuality increased for long distance operators, which is counter intuitive given recent performance in this area, and the current workstreams focussed on improvement. While Network Rail is working closely with train operators to improve Passenger Information During Disruption (PIDD) the two categories most closely reflecting this from the survey broadly stayed the same. This may have been because there were no prolonged significant disruptions in the period leading up to the survey. There were no statistically significant falls for train operators in this area.

The report suggests that there is still significant room for improvement and, through its devolved structure, Network Rail will be working in partnership with the TOCs to improve delivery to the customer.

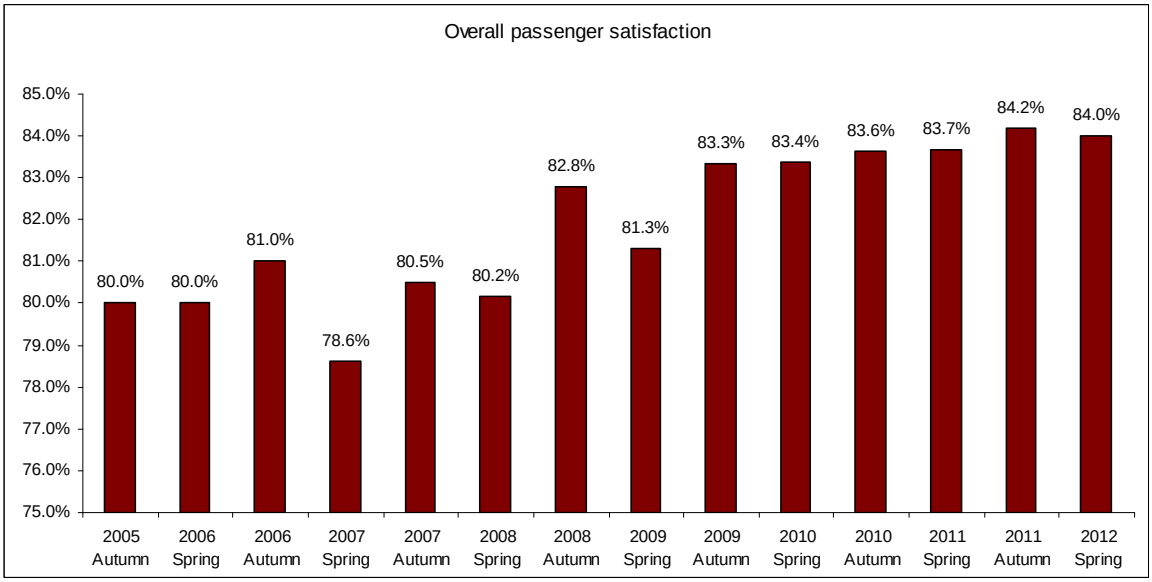
The NPS spring survey of Network Rail's Managed Stations, sampling views from over 10,000 passengers, showed overall satisfaction at 80% a slight fall of 1% from the last survey.

Environmental factors seem to be the key areas of concern; the cleanliness of the station, the overall environment, and the upkeep of the stations. Concerns were also expressed about availability and helpfulness of staff. Some of these concerns are related to station redevelopment and the inconvenience and disruption to passengers during the work.

However the stations are rated highly for information provision and ease of use of ticket gates. Network Rail's response to these recently published results will be considered by the routes as part of the devolution, alliancing and partnership strategies.

Figure 1.5 shows the Passenger satisfaction survey results over time.

Figure 1.5: Passenger satisfaction survey results



Section 2 – Network capability and network availability

Introduction

This section reports on the capability of the network through our linespeed, gauge, route availability, electrified track measures (C1 – C4), as well as network change and platform lengths information. We also include information on the availability of the network through our possession management.

Network capability

Data on four capability measures, and an explanation of changes during the year, are reported for:

- C1 – linespeed;
- C2 – gauge;
- C3 – route availability value; and
- C4 – electrified track.

The operational lines for network capability purposes are derived from around a quarter of a million GEOGIS records (GEOGIS is a major database of railway infrastructure assets containing information on the physical location and type of track). The capability data presented in this section includes actual changes to the network as well as changes as a result of data cleansing (review and subsequent amendment to data where necessary).

As part of reporting the capability of the network, we report on network changes (i.e. a change which is likely to have a material effect on the operation of the network or on the operation of trains operated on the network). We also report on platform lengths to illustrate the combined maximum length of train that may use each of the platforms at the passenger stations on the network.

Linespeed capability (C1)

Definition

This is a measure of the length of running track in kilometres in the following speed bands:

- up to 35 miles per hour;
- 40 to 75 miles per hour;
- 80 to 105 miles per hour; and
- 110 to 125 miles per hour.

The measure includes running lines and loops but excludes sidings and depots. Where differential speeds apply to a section of track, the highest line speed has been reported for that section.

Results

Tables 2.1 to 2.3 show linespeed capability for England & Wales, Scotland and the whole network for 2011/12 compared to previous years.

Commentary

The length of operational lines of the network has decreased by 45 track kilometres.

Additions include:

- most significantly the Cotswold Line re-doubling with 32 km of new track (mostly 40 - 75 mph band but also including 6 km at 100 mph);
- Paisley corridor improvements with 9 km (40 - 75 mph band);
- North London Line improvements (Olympics) with 2 km (mostly 40 - 75 mph band); and
- smaller enhancements, including a new Thameslink loop at West Hampstead, extra platforms at Birmingham Moor Street, and redoubling at Latchmere Junction.

The reductions include:

- Waterside (Benbane) branch closure of 15 km (0 - 35 mph band);
- 7 km of HS1 previously wrongly included as part of Network Rail;
- 3 km Haverton Hill, 2 km Swansea Docks, 2 km Ardingly Branch taken out of Network Rail maintenance;
- 2 km Angerstein Wharf reduced to sidings status; and
- a variety of similar, mostly low speed track, subject to data quality improvement initiatives.

Speed band changes to existing track were not extensive, except for almost 95 track kilometres from Neasden Junction to Princess Risborough which were formerly in the 40 - 75 mph band and are now predominantly 100 mph delivered as part of Project Evergreen.

Various sections of the Highland Line (total 33 km) have also been upgraded to the 80 - 105 mph band. These two initiatives principally account for the year-on-year increase for the 80 – 105 mph speed band in Table 2.1. Track content in the higher 110 – 125 mph band is, however, unchanged. Most of the reductions in speed band (total 15 km) relate to confirmation of Sectional Appendix entries.

Table 2.1: Linespeed capability (km of track in each speed band) Network-wide

Speed Band (mph)	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
Up to 35	3,786	3,783	3,763	3,684	3,653	3,561
40 – 75	16,856	16,890	16,836	16,829	16,806	16,728
80 – 105	7,489	7,450	7,479	7,479	7,571	7,696
110 – 125	2,932	2,959	3,043	3,081	3,078	3,078
Total	**31,063**	**31,082**	**31,119**	**31,073**	**31,108**	**31,063**

Table 2.2: Linespeed capability (km of track in each speed band) England & Wales

Speed Band (mph)	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
Up to 35	3,328	3,315	3,300	3,223	3,194	3,124
40 – 75	14,488	14,510	14,439	14,426	14,422	14,365
80 – 105	6,407	6,368	6,378	6,375	6,403	6,496
110 – 125	2,711	2,739	2,822	2,860	2,857	2,857
Total	**26,934**	**26,932**	**26,939**	**26,884**	**26,876**	**26,842**

Table 2.3: Linespeed capability (km of track in each speed band) Scotland

Speed Band (mph)	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
Up to 35	458	468	463	461	459	437
40 – 75	2,368	2,380	2,397	2,403	2,384	2,363
80 – 105	1,082	1,082	1,099	1,104	1,168	1,200
110 – 125	221	220	221	221	221	221
Total	**4,129**	**4,150**	**4,180**	**4,189**	**4,232**	**4,221**

Table 2.4: Linespeed capability (km of track in each speed band) England & Wales

Speed Band (mph)	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
Up to 35	3,328	3,315	3,300	3,223	3,194	3,124
40 – 75	14,488	14,510	14,439	14,426	14,422	14,365
80 – 105	6,407	6,368	6,378	6,375	6,403	6,496
110 – 125	2,711	2,739	2,822	2,860	2,857	2,857
Total	**26,934**	**26,932**	**26,939**	**26,884**	**26,876**	**26,842**

Gauge capability (C2)

Definition

This is a measurement of the length of route in kilometres capable of accepting different freight vehicle types and loads by reference to size (gauge). This measurement is reported against six standard gauges listed in the Railway Group Standard:'Requirements for the Application of Standard Vehicle Gauges'.

- W6 is the freight vehicle gauge for freight wagons;
- W7 is a gauge for ISO 8' 0" (2438mm) high containers, up to 2438mm wide;
- W8 is a gauge for ISO 8' 6" (2590mm) high containers, up to 2500mm wide;
- W9 is a gauge for UIC-S containers 9' 0" (2743mm) high, up to 2600mm wide;
- W10 is a gauge for up to ISO 9' 6" (2896mm) high containers, up to 2500mm wide; and
- W12 is a gauge for up to ISO 9' 6" (2896mm) high containers, up to 2600mm wide.

Reference to W6 in this report is actually to the W6A profile in the Standard. W6 or W6A, W7, W8 and W9 are broadly incremental.

Results

Tables 2.4 to 2.6 show gauge capability for England & Wales, Scotland and the whole network for 2011/12 compared to previous years.

Table 2.5: Gauge capability (km of route in each gauge band) Network-wide

Gauge Band	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
W6	4,746	4,670	5,049	5,406	5,597	5,562
W7	2,719	2,830	3,164	3,255	3,191	3,084
W8	5,496	5,407	4,851	4,318	4,084	4,144
W9	1,618	1,699	1,383	1,360	1,381	1,306
W10 and W6	6	6	6	0	0	0
W10 and W8	65	65	62	74	114	163
W10 and W9	1,054	1,054	1,170	1,210	1,275	1,348
W12	84	84	130	130	135	135
Total	**15,788**	**15,815**	**15,815**	**15,753**	**15,777**	**15,742**

Table 2.6: Gauge capability (km of route in each gauge band) England & Wales

Gauge Band	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
W6	4,629	4,546	4,924	5,284	5,479	5,461
W7	1,887	1,998	2,220	2,313	2,258	2,188
W8	4,305	4,240	3,721	3,187	2,974	2,997
W9	1,280	1,326	1,075	1,057	1,023	947
W10 and W6	6	6	6	0	0	0
W10 and W8	65	65	62	74	114	163
W10 and W9	892	892	1,008	1,039	1,105	1,178
W12	84	84	130	130	135	135
Total	**13,148**	**13,157**	**13,146**	**13,084**	**13,088**	**13,069**

Table 2.7: Gauge capability (km of route in each gauge band) Scotland

Gauge Band	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
W6	117	124	125	122	118	101
W7	832	832	944	942	933	896
W8	1,191	1,167	1,130	1,131	1,110	1,147
W9	338	373	308	303	358	359
W10 and W6	0	0	0	0	0	0
W10 and W8	0	0	0	0	0	0
W10 and W9	162	162	162	171	170	170
W12	0	0	0	0	0	0
Total	**2,640**	**2,658**	**2,669**	**2,669**	**2,689**	**2,673**

Commentary

The changes in the extent of the network reported in the linespeed capability measure are also reflected in Gauge capability with a net decrease of 35 route kilometres. Whilst the Paisley corridor improvements have added about 1 km of W9 and 2 km of W8 track there have mostly been reductions. These include 15 km of W6 for the Waterside (Benbane) branch line closure, 3 km Haverton Hill and 2 Km Ardingly W6 track taken out of Network Rail maintenance, and 2 km of HS1 that is not owned by Network Rail.

As regards existing track:

- 61 km from Ely to Peterborough is now cleared for W10 and W9 instead of only W9;
- 27 km from Helpstone to Manton Junctions is upgraded from W7 or W8 to W10 and W8, and similarly 15 km from Melton to Syston Junction from W7;
- 5 km from Leicester to Wigston continuing with another 25 km of W8 from W7 from Wigston to Nuneaton;
- Other works include 7 km of W6 near Allington is now W8,13 km Arpley to Ditton is W10 and W9 from W9, and 38 km Gretna Junction to Dumfries W8 from W7.

Route availability value (C3)

Definition

The route availability measure is used to check the compatibility of the weight of trains with the strength of underline bridges.

The route availability (RA) measure is a measurement of the length of track in kilometres capable of accepting different loaded vehicle types. The results are reported by individual RA value (since the 2010 Annual Return).

For infrastructure, the RA number represents the lesser of the maximum single axle weight or the maximum equivalent load effect of a whole vehicle for the capability of the underline bridges on a route. The RA number for a route is specified in the National Electronic Sectional Appendix.

Vehicles are able to utilise the capability of the infrastructure where the vehicle RA is less than or equal to the route RA. If not, it is necessary to consider more detailed information on the loading characteristics of the vehicle and detailed information on the strength of individual bridges to check compatibility.

This measure includes running lines on Network Rail's infrastructure but excludes sidings and depots.

Table 2.8: Structures route availability (km of track) for Network

Route availability band	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
(1)				89	81	63
RA1				19	19	19
RA2				36	7	0
RA3	2,295[2]	3,990[2]	3,558[2]	190	70	69
RA4				670	273	273
RA5				1,403	1,403	1,409
RA6				852	878	874
RA7				1,969	2,096	2,135
RA8	25,928[3]	25,061[3]	25,591[3]	21,594	21,941	21,882
RA9				2,150	2,149	2,146
RA10	2,840	2,031	1,970	2,101	2,191	2,193
Total	**31,063**	**31,082**	**31,119**	**31,073**	**31,108**	**31,063**

Notes:
1. RA value not reported, line Out Of Use, leased or status of line being checked
2. RA1–6 and not reported
3. RA7–9

Results

Tables 2.7 to 2.9 show the route availability for England & Wales, Scotland and the whole network for 2011/12 compared to previous years.

Commentary

Network alterations as reported for the linespeed capability measure are the principal reason for changes in RA tables. The 32 km of Cotswold Line re-doubling is RA7 and the Paisley corridor improvements add 5 km of RA10 plus 4 km of RA7. RA8 shows the greatest reduction including 15 km from the closure of the Waterside (Benbane) branch and 7 km from the HS1 section confirmed as not maintained by Network Rail. Other status and data quality issues also principally apply to RA8 track but there are also reductions in the length where RA value is not reported.

The elimination of RA2 content represents the only actual change for existing track. Following the completion of work on Charlestown Viaduct 5.6 km is restored as RA5 capability, and 1.2 km is now RA8 after work and speed changes on Paddock Viaduct.

Table 2.9: Structures route availability (km of track) for England & Wales

Route availability band	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
(1)				86	78	60
RA1				19	19	19
RA2				36	7	0
RA3	1,556[2]	2,856[2]	2,456[2]	72	32	32
RA4				670	273	273
RA5				464	469	475
RA6				845	871	867
RA7				1,759	1,873	1,907
RA8	25,292[3]	24,011[3]	24,418[3]	20,721	21,042	21,000
RA9				2,146	2,145	2,142
RA10	86	65	65	66	67	67
Total	**26,934**	**26,932**	**26,939**	**26,884**	**26,876**	**26,842**

Notes:
4. RA value not reported, line Out Of Use, leased or status of line being checked
5. RA1–6 and not reported
6. RA7–9

Table 2.10: Structures route availability (km of track) for Scotland

Route availability band	*March 2007*	*March 2008*	*March 2009*	*March 2010*	*March 2011*	*March 2012*
(1)				3	3	3
RA1				0	0	0
RA2				0	0	0
RA3	739[2]	1,134[2]	1,102[2]	118	38	37
RA4				0	0	0
RA5				939	934	934
RA6				7	7	7
RA7				210	223	228
RA8	636	1,050	1,173	873	899	882
RA9				4	4	4
RA10	2,754	1,966	1,905	2,035	2,124	2,126
Total	**4,129**	**4,150**	**4,180**	**4,189**	**4,232**	**4,221**

Notes:
7. RA value not reported, line Out Of Use, leased or status of line being checked
8. RA1–6 and not reported
9. RA7–9

Electrified track capability (C4)

Definition

This is a measure of the length of electrified track in kilometres in the following bands:

- overhead line at 25kV A.C.;
- overhead line at 1,500V D.C.; and
- 3rd rail 650/750V D.C.

The measurement includes the length of running track, including loops but excluding sidings and depots.

Lengths of track with dual electrification is separately identified. In addition, line that is not energised and permanently earthed is counted as non–electrified.

Results

Tables 2.10 to 2.12 show electrification capability for England & Wales, Scotland and the whole network for 2011/12 compared to previous years.

Table 2.11: Electrification capability (km of electrified track) Network-wide						
	March 2007	***March 2008***	***March 2009***	***March 2010***	***March 2011***	***March 2012***
25 kV AC overhead	7,981	7,975	8,000	8,016	8,059	8,049
3rd rail 650/ 750V DC	4,483	4,481	4,481	4,475	4,470	4,469
Dual AC, overhead/3rd rail DC	38	40	40	37	37	35
1500V DC overhead	39	39	39	39	39	39
Total electrified	12,541	12,535	12,560	12,567	12,605	12,592
Non-electrified	18,522	18,547	18,559	18,506	18,503	18,471
Total	**31,063**	**31,082**	**31,119**	**31,073**	**31,108**	**31,063**

Table 2.12: Electrification capability (km of electrified track) Scotland						
	March 2007	***March 2008***	***March 2009***	***March 2010***	***March 2011***	***March 2012***
25 kV AC overhead	1,253	1,250	1,253	1,255	1,302	1,310
3rd rail 650/ 750V DC	0	0	0	0	0	0
Dual AC, overhead/3rd rail DC	0	0	0	0	0	0
1500V DC overhead	0	0	0	0	0	0
Total electrified	1,253	1,250	1,253	1,255	1,302	1,310
Non-electrified	2,876	2,900	2,927	2,934	2,930	2,911
Total	**4,129**	**4,150**	**4,180**	**4,189**	**4,232**	**4,221**

Table 2.13: Electrification capability (km of electrified track) England & Wales						
	March 2007	***March 2008***	***March 2009***	***March 2010***	***March 2011***	***March 2012***
25 kV AC overhead	6,728	6,725	6,747	6,761	6,757	6,739
3rd rail 650/ 750V DC	4,483	4,481	4,481	4,475	4,470	4,469
Dual AC, overhead/3rd rail DC	38	40	40	37	37	35
1500V DC overhead	39	39	39	39	39	39
Total electrified	11,288	11,285	11,307	11,312	11,303	11,282
Non-electrified	15,646	15,647	15,632	15,572	15,573	15,560
Total	**26,934**	**26,932**	**26,939**	**26,884**	**26,876**	**26,842**

Commentary

Network size alterations as reported for the linespeed capability measure are the principal reason for changes in electrification tables. Whilst the 32 km of Cotswold Line re-doubling is not electrified, the Paisley corridor improvements add 9 km of OHL. The North London Line (Olympics) improvements add over 3 km of OHL but reduce third rail DC by 1 km. The re-doubling work at Latchmere Junction adds 0.7 km of DC whereas 0.4 km of track is currently removed in connection with the Reading station scheme. The 10 km of HS1 including St Pancras that is not owned by Network Rail removes OHL as does a further 6 km for Willesden & Crewe Yard.

Regarding existing track there are minor changes including changes to 2 km of dual AC/DC near Hackney Central which is now solely AC OHL. Sunderland / Pelaw remains the only 1500V DC overhead line included in the C4 measure.

Network change

Definition

A Network Change is a change which is likely to have a material effect on the operation of the network or on trains operated on the network.

Network Changes can either be physical (e.g. changes to the layout, configuration or condition of the network) or operational (e.g. the introduction of a speed restriction on a section of track or a change to the way Network Rail maintains track). Operational changes are only classed as Network Changes if they last, or are likely to last, for more than six months.

Reporting Method

This information is taken from the internal processes used for monitoring the establishment of Network Changes and covers the period from 1 April 2011 to 31 March 2012.

Results

Table 2.13 provides the number of Network Changes consulted, established and withdrawn in the past year (2011/12). The table also includes the number of no material effect changes issued in the past year. However, these are not classified as Network Changes and thus do not have a specific requirement to be recorded in the same way as Network Changes.

Commentary

In this Annual Return, summary numbers of permanent Network Change consulted and established are presented for the first time. Where the previous Infrastructure Capability Programme (ICP) generated Short Term Network Changes which resulted in a permanent change of capability, the corresponding Network Change consultation is reflected in the numbers reported here.

The number of Network Changes established has increased significantly since the 2011 Annual Return, due to the establishment of Short Term Network Changes related to individual infrastructure assets (such as sidings) which have been included in the numbers for the first time. The ICP, as a specific programme of work, has been completed and Network Rail Routes are addressing the differences between the actual and published condition of individual infrastructure assets in addition to review and ongoing management. The number of Short Term Network Changes resulting from ICP has remained consistent with the 2011 Annual Return.

Table 2.13 Network changes (2011-12)

Permanent Network Changes	*Established*	*Withdrawn*	*No Material Effect changes*
146	133	12	43

Discrepancies between actual and published capability

Definition

This information is taken from the Discrepancy Register, which is published alongside the National Electronic Sectional Appendix (NESA). The Discrepancy Register was established as part of the ICP to provide a comprehensive list of the differences between our published and actual capability.

Results

There are three discrepancies remaining from the ICP. One of which was reported last year but two Short Term Network Changes have expired without the former capability status being reinstated. The previously reported discrepancy (Pontefract Monkhill Down Goods Loop), in table 2.14, is subject to a Network Change which is currently being disputed through the Network Change process. The other two discrepancies will consult on extensions to the STNCs when timescales for completion of the works have been confirmed.

Commentary

This is the third year in which this data has been published in the Annual Return. This publication indicates that three of the discrepancies identified as part of the ICP have not been fully resolved through the establishment of Network Change or the restoration of the original capability. Discrepancies between published and actual capability arise from time to time and these are published in the Discrepancy Register pending resolution.

Table 2.14: Discrepancies between actual and published capability identified by the Infrastructure Capability Programme

Route	*Line of route*	*Section*	*Capability measure*	*Published status*	*Current status*
LNE	LN882	Pontefract Monkhill Down Goods Loop	Track	Out of use	Network Change NC/G1/2010/LNE/054 is currently in dispute – consultation is progressing.
LNE	LN914	West Parade Jn-Hull & Anlaby Road Jn-Hull	Gauge	W6A	STNC extension will be consulted when the timescales for conclusion of works are confirmed
LNE	LN646	Norton-on-Tees to Ferryhil	Gauge	W7	STNC extension will be consulted when the timescales for conclusion of works are confirmed

Ongoing short-term network change proposals

Definition

This information is taken from the internal processes used for monitoring Short Term Network Changes (STNCs) issued in connection with the ICP and the Network Change process.

Results

This is the third year in which this data has been published in the Annual Return. Table 2.15 provides the number of STNCs for England and Wales, Scotland and the network, and the dates by which they are due to expire.

Commentary

The number of STNCs has increased significantly for the second successive year. This is as a result of the inclusion of Network Changes which relate to the condition and capability of individual infrastructure assets, such as sidings, connections, crossovers and speed restrictions.

This year for the first time the numbers quoted include all Short Term Network Changes which were valid on 31 March 2012. These include Short Term Network Changes issued as a result of the ICP and in addition STNCs for the condition and capability of individual infrastructure assets.

Table 2:15 Number of Short-Term Network Changes

		Expiring by end March in each year					
	Total	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
England & Wales	38	8	13	10	4	0	3
Scotland	45	0	23	8	14	0	0
Network Total	**83**	**8**	**36**	**18**	**18**	**0**	**3**

Platform lengths

Definition

The operational platform lengths, reported in the Annual Return for the first time, represent the combined maximum length of train that may use each of the platforms at the passenger stations on the network. The length of each platform is added together to provide a total length of operational platforms for each route, including Scotland, England & Wales and for the network as a whole.

Individual station platform lengths are available on the Network Rail website, under the Timetable Planning Rules.

Results

Table 2.16 shows the combined lengths of all platforms at stations for England and Wales, Scotland, and for the whole network. Platforms at stations not on the Network Rail owned, operated and maintained network are not included. Platforms at stations on other rail networks, such as some platforms at Ashford, Ebbsfleet, and London St Pancras International stations, which are on the High Speed 1 network, or Heathrow International Terminals on the Heathrow Express network, are excluded.

Commentary

This information coincides with a programme of work Network Rail is currently undertaking to allow the operation of longer trains at a number of stations across the network. This has required platform extensions along with associated signalling, track, power supply and level crossing works at a number of stations. However, for some stations there have been minimal alterations to platforms with a Selective Door Operation (SDO) or Driver Door Operation (DOO) system solution enabling longer trains (up to 12 cars) to operate there.

Table 2.17 provides a sample of stations at which one or more platforms have been lengthened in 2011/12 as part of Train and Platform Lengthening programmes.

Table 2.16 Platform lengths

	Platform lengths (m)
Scotland	110,770
England & Wales	823,628
Network total	**934,398**

Table 2.17 Stations with platforms lengthened in 2011/12

Station	Route
Broxbourne	Anglia
Cambridge	Anglia
Cheshunt	Anglia
Dagenham Dock	Anglia
East Tilbury	Anglia
Grays	Anglia
North Fambridge	Anglia
Ockendon	Anglia
Pitsea	Anglia
Purfleet	Anglia
Rainham	Anglia
Sawbridgeworth	Anglia
Stanford le Hope	Anglia
Stansted Airport	Anglia
Stansted Mountfitchet	Anglia
Tilbury Town	Anglia
Barnehurst	Kent
Bexleyheath	Kent
Chelsfield	Kent
Erith	Kent
Knockholt	Kent
Mottingham	Kent
New Eltham	Kent
Slade Green	Kent
Welling	Kent
Bedford	East Midlands
Flitwick	East Midlands
Harpenden	East Midlands
Radlett	East Midlands
Loughborough	East Midlands
Elstree & Borehamwood	LNE
Harlington	LNE
Leagrave	LNE
Letchworth Garden City	LNE
Mill Hill Broadway	LNE
West Hampstead Thameslink	LNE
Whitlocks End	LNW
Widney Manor	LNW
Wythall	LNW
Yardley Wood	LNW
Brockley	Sussex
East Grinstead	Sussex
Forest Hill	Sussex
Honor Oak Park	Sussex
New Cross Gate	Sussex
Norwood Junction	Sussex
Oxted	Sussex
Sanderstead	Sussex
Sydenham	Sussex
Upper Warlingham	Sussex
West Croydon	Sussex
Ashford (Middlesex)	Wessex
Mortlake	Wessex
Vauxhall	Wessex
Whitton	Wessex
Windsor & Eton Riverside	Wessex

Network availability

Possession Disruption Index – Passenger (PDI-P)
Definition

The Possession Disruption Index for Passengers measures the value of the impact of possessions on excess journey time as experienced by passengers.

This is calculated as (excess journey time x busyness factor) x (no. of passengers x time of day weighting x economic value of time) divided by (total scheduled passenger km).

Possession Disruption Index – Freight (PDI-F)
Definition

The Possession Disruption Index for Freight measures track kilometre availability weighted by relative levels of freight traffic operated over each Engineering Line of Route.

This is calculated as - (average freight tonne km per SRS divided by average freight tonne km for network) x (Track km available divided by total Track km).

Results

Table 2.18 shows the PDI-P and PDI-F for 2011/12 compared to the DPu11 forecast and 2010/11.

Commentary

During 2011/12 Network Rail continue to be ahead of target with PDI-P standing at 0.54 and PDI-F at 0.85.

The PDI improvement is the combined result of a reduction in the total number of possessions taken together with a steady decline in the number of longer possession durations, which is driven by the delivery of track renewals against our control period commitments. There is also a small affect arising from the deferral of some items to later in the control period. The combination of collaborative planning and delivery processes, the introduction of new technologies and new ways of working has also enabled us to reduce our access requirements each year.

A further review of the methods used to collect the data for the PDIs and the supporting metrics was again undertaken by the Reporter during the year. The collection of the PDIs was rated as B2 in 2011/12, an improvement from the rating of B3 in 2010/11.

Network Availability Reporting System

The Reporter also carried out a detailed review of the Network Availability Reporting System (NARS) and concluded that NARS produced reliable results for the computation of the PDI-P and PDI-F metric as well as forecasting the impact of future scenarios. Some recommendations were suggested for possible enhancements and user improvements. Following the review, the interim model was phased out in favour of NARS for PDI computations.

The system is now used to calculate the actual PDI figures, to assess different access strategies for their relative disruptive impact and to forecast PDIs for later years (although accuracy is dependent on the level of detail available in future access plans).

Table 2.18: Disruptions to passengers and freight as a result of planned engineering possessions

	2008/09 Actual	*2009/10 Actual*	*2010/11 Actual*	*2011/12 Actual*	*DPu11*
Possession disruption index (Passenger) – (PDI- P)	0.87	0.63	0.52	0.54	0.83
Possession disruption index (freight) – (PDI-F)	1.16	0.82	0.89	0.85	1.00

Supporting initiatives

The route categorisation principles have been established within our access planning process, with the 2013 engineering access statements developed in line with these principles. Joint Network Availability Plans (JNAPs) were reviewed as a collaborative effort between the routes and all relevant operators to identify key routes and support the development of future access plans. Schemes that are designed to improve network availability were captured in the JNAPs, including those that are funded by the seven day railway fund. A single industry freight JNAP has been produced to provide a focus for activities that will improve access for the strategic freight flows that were identified through route categorisation at the start of CP4.

Seven Day Railway Fund

At the end of 2011/12 a total of 85 schemes had been identified for full or part funding through the Seven Day Railway Fund. These schemes had a total cost of £220 million and were forecast to deliver a PDI-P improvement of 0.167 and a PDI-F improvement of 0.030.

Of the 85 schemes:

- 17 schemes were completed including Loughborough Platform 3 extension, Bath to Bristol signalling enhancement, Cotswold line turnback facility, North London line access points and Paddock Wood Hook Switch;
- 60 schemes were authorised for £140 million for single option development and beyond (GRIP 4-8);
- 10 schemes were authorised for £46 million for development (GRIP1-3); and
- 14 schemes were closed following feasibility with a decision not to proceed further as insufficient benefits could be indentified. These schemes spent £1 million.

£33 million was authorised for performance improvement initiatives to support the delivery of cable theft, level crossing and other Network Rail improvement schemes.

Industry oversight during the year was based on regular industry discussions with operators, ORR, DfT, Transport Scotland, Welsh Assembly Government, ATOC, freight groups and Passenger Focus. The National Task Force also played an important role in facilitating industry dialogue and it routinely reviews network availability.

Supporting Metrics

Working timetable weekend compliance. The moving annual average (MAA) for this metric showed period on period improvement throughout the year, delivering an overall performance improvement of two per cent on the previous year.

Rail replacement bus hours. The moving annual average (MAA) of this metric ended the year with a six per cent reduction on 2010/11 total bus hours, continuing the period on period improvement compared with the previous year.

Possession notification discount factor. The metric delivered a significant reduction in the number of possessions compensated in the medium discount range, with an average of 98 per cent of possessions being compensated at maximum discount indicating an improvement in late notice possession planning in 2011/12.

Late and very late notice disruptive possessions. The late notice disruptive possession metric performed well with less than one per cent of possessions falling into this category throughout the year. Whilst considerable improvements were made to the process for reporting late notice disruptive possession, very late possession changes were not captured as part of the process for most of 2011/12. A new process was introduced to collate very late notice disruptive possessions data late in 2011/12 and reporting has since commenced.

Possessions involving single line working. The metric showed declining levels of single line working.

Delay minutes due to possession overrun. In the second half of 2011/12, the MAA for this metric showed steady recovery from the decline experienced in the first half of the year. A new possession overrun information capture (POIC) process to collect information from worksite in near real-time was rolled out across the business. The purpose of the process is to enable root cause analysis of overruns to provide more robust possession overrun management reports in future. The implementation of the new reporting process is scheduled for 2012/13.

Cancellation minutes due to possession overrun. This metric reported an increase in cancellation minutes due to possession overrun for most of 2011/12 compared to the same period the previous year. The POIC process has

been introduced to provide improved possession overrun management reporting to analyse and mitigate against future rises.

National unplanned TSRs actual vs target. This metric significantly underperformed against its target in each period of 2011/12. The reported unplanned TSR increase is due to the combination of higher TSR data collation accuracy delivered by improvements to the data capture process and an increase in condition of track and level crossing sighting speeds when compared to the record low year end figure of 2010/11.

Section 3 – Asset management

Introduction

This section reports on the condition and quality of our assets. It provides an indication of our asset stewardship and trends over time, as well as our performance against the Control Period 4 Delivery Plan update 2011 (DPu11) targets for 2011/12.

The following measures are reported in this section:

- broken rails;
- rail defects;
- track buckles;
- track failures;
- track geometry;
- track geometry faults;
- condition of asset temporary speed restrictions;
- earthwork condition;
- tunnel condition;
- bridge condition;
- signalling failures;
- signalling asset condition;
- points failures;
- train detection failures;
- telecoms condition;
- telecoms failures;
- AC traction power incidents;
- DC traction power incidents;
- AC traction feeder station and track sectioning points condition;
- DC traction substation condition;
- AC traction contact systems condition;
- DC traction contact systems condition;
- power incidents causing train delays of more than 300 minutes;
- station stewardship measure; and
- light maintenance depot stewardship measure.

Where historical data is available from the start of CP3 for these measures, and it is consistent with the current measure, we have included it in this Annual Return. However, all historic data, also going back further than the start of CP3, is available in the 'Historical record of Network Rail's stewardship', on the Annual Return page of the Network Rail website.

Where asset measures in the following section have been assigned a confidence grade by the Independent Reporter for output monitoring, this is provided. Some measures were assigned a confidence grade by the previous Independent Reporter for output monitoring, which have not subsequently been reassessed in this control period. We have clearly stated when this is the case. For measures where no confidence grade has been assigned by either the current or previous Independent Reporter we have excluded reporting confidence. Most of these are relatively new measures.

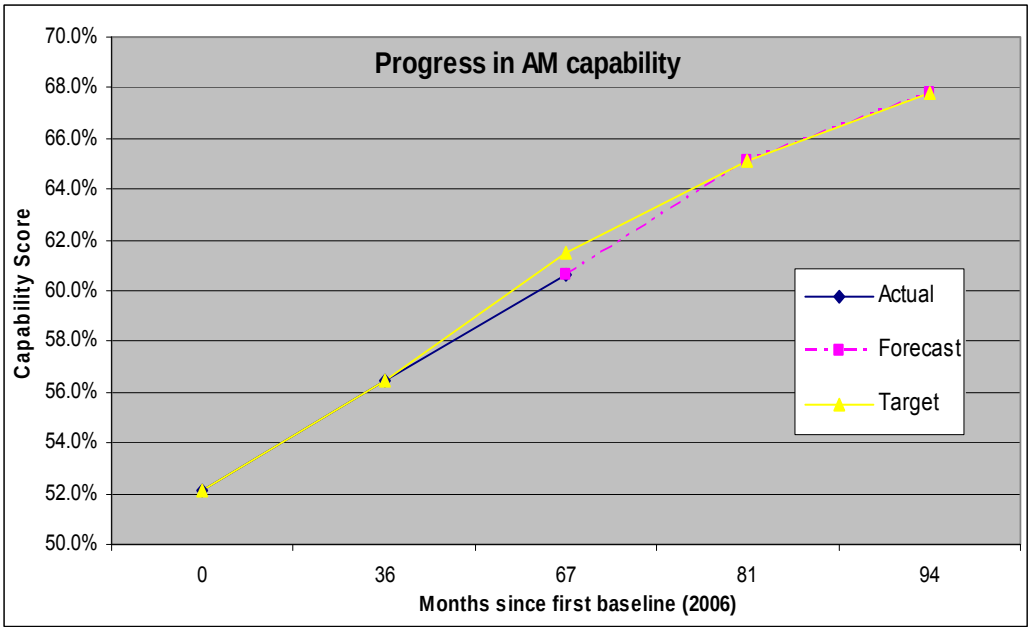
Excellence in asset management

Asset management of the railway infrastructure is fundamentally about delivering the outputs required by our customers, funders and other key stakeholders, in a sustainable way, for the lowest whole-life, whole-system cost.

The objective of our Asset Management Improvement Programme (AMIP) is to achieve a level of asset management capability that is comparable with best practice in Great Britain by the end of the current control period (March 2014). We measure our progress against this objective by using an independent Asset Management Excellence Model (AMEM) which is implemented through audits undertaken by the Independent Reporter for asset management. Progress is monitored against 23 activities for which targets have been agreed jointly between Network Rail and the ORR.

The first audits were undertaken in 2006. Figure 3.1 shows overall progress against target since 2006 and a forecast to the end of CP4. We are currently forecasting that we will achieve the end of CP4 target and, therefore, our best practice objective. The gap between progress and the target at the publication of the Initial Industry Plan (IIP) was due to delays in mobilising the competency workstream and progressing work on reliability centred maintenance. We are planning to recover progress against the target by the time the Strategic Business Plan is submitted in January 2013. The gap between progress and target at the publication of the IIP, in September 2011, was expected since the improvement programme was still being established. However, it is expected to be recovered by the time the SBP is submitted in January 2013.

Figure 3.1 High level trajectory of asset management capability from 2006-2013



The 23 activities in the AMEM model are grouped into six higher level categories. Progress over the last year in each of these categories is summarised below.

Asset management strategy and planning

Further to the publication of our asset management strategy and policy documents in February 2010, we have developed an asset management system and accountability framework. The framework identifies the components of the asset management system and their interdependencies, through which the line of sight can be drawn linking strategy to the execution of work. It also assigns responsibilities and accountabilities to individual asset management activities.

Whole life cost justification

The major focus over the past year has been on developing our asset policies, which specify the maintenance and renewal interventions necessary to deliver sustainable route outputs for the lowest whole life cost. The process for developing the policies and the consistency of the structure have been cited externally[1] as good practice. The policies were submitted with the IIP and are being further developed to justify the robustness, sustainability and efficiency of the interventions, with a particular emphasis on risk-based maintenance. In support of the policies, we have developed a sophisticated portfolio of lifecycle costing tools for our 'top 30' assets.

Lifecycle delivery

Lifecycle delivery includes activities such as the execution of maintenance work and incident response. We have continued to demonstrate a high level of maturity in this area with notable further improvements in resource and possession management and asset rationalisation and disposal.

Asset Information

During the past year we have embarked on a major ten-year programme, named ORBIS, to improve the way we collect, store and use asset information. The programme has been commended by ORR for its comprehensive approach and for meeting all its major milestones to date including early improvements in data quality to support the robustness, sustainability and efficiency of our asset policies.

Organisation and people

The initial focus was on developing the asset management competencies of a relatively small group of people working on the development of the CP5 Strategic Business Plan. We have now started to extend the

1 ORR's Quarter 4 Network Rail Monitor & Annual Assessment and AMCL and Arup independent reporter reports.

approach by establishing a full time team that will develop and implement a formal competency framework across all relevant parts of the business.

Risk and review

Since the first assessment in 2006, the external audits have acknowledged significant progress in embedding our Risk Management Framework and linking top-down and bottom-up risk assessments in accordance with guidance in ISO 31000. The ORR has also noted good progress with the issue of a new integrated risk management standard and by implementing lessons learned from severe weather performance impacts.

Overall Asset Measure Results

Table 3.1 provides comparisons of overall network asset measure results for the last five years, where available.

Table 3.2 provides a comparison of 2011/12 asset measure results against the condition and reliability forecasts as set out in Appendix 10 of the DPu11.

Table 3.1: Comparison of network asset measures with previous years

Measure	2007/08	2008/09	2009/10	2010/11	2011/12
Good track geometry	135.2	137.9	137.7	137.0	136.5
Poor track geometry	2.66	2.18	2.38	2.48	2.58
Intervention / immediate action geometry faults per 100km	45.3	38.2	40.3	39.7	41.3
Broken rails (no.)	181	165	152	171	127
Rail breaks and immediate action defects per 100km		6.80	5.80	4.49	3.80
Immediate action rail defects per 100 km	n/a (new measure for CP4)	6.27	5.31	3.94	3.39
Condition of asset TSRs (no.)	4,550*	4,436*	1,729	1,348	1,864
Civils – Assets subject to additional inspections (no.)		889	844	810	789
Earthworks failures (no.)	107	61	57	42	28
Tunnel condition	n/a	n/a	Bore 88	Bore 89	Bore 88
	(new measure 2009/10)		Portal 92	Portal 92	Portal 89
Bridge condition score	2.09	2.08	2.08	2.10	2.10
Signalling failures causing delays of more than ten minutes (no.)	19,924	19,607	18,324	16,501	15,638
Signalling asset condition	2.38	2.39	2.37	2.41	2.38
AC power incidents causing >500 minute train delays (no.)	63	66	46	61	50
DC power incidents causing >500 minute train delays (no.)	9	14	14	14	16
AC traction feeder stations and track sectioning points condition	3.53	2.78	2.70	2.56	2.64
DC traction feeder stations and track sectioning points condition	3.61	2.53	2.32	2.37	2.45
AC contact systems condition	1.7	1.6	1.6	1.6	1.6
DC contact systems condition	1.9	1.9	1.9	1.9	2.0
Telecoms condition		0.89	0.92	0.94	0.95
Points failures	7,828	8,048	7,130	5,815	5,166
Detection failures	6,554	6,470	6,061	5,226	4,923
Track failures	8,673	7,748	6,670	5,887	5,501
Power incidents causing train delays of more than 300 minutes	96	103	75	100	71
Telecom failures causing train delays of more than ten minutes	873	817	770	689	633
Station stewardship measure					
Category A	2.48	2.44	2.38	2.30	2.26
Category B	2.60	2.47	2.46	2.40	2.37
Category C	2.65	2.52	2.52	2.47	2.43
Category D	2.69	2.52	2.54	2.47	2.41
Category E	2.74	2.57	2.58	2.50	2.43
Category F	2.71	2.55	2.56	2.50	2.47
Scotland (all categories)	2.39	2.39	2.39	2.33	2.28
Light maintenance depot stewardship measure (network)	2.49	2.52	2.50	2.48	2.43
Asset reliability (no. of infrastructure incidents causing delay)	54,760	52,270	46,091	42,135	40,415

Note: For all measures in this table, except Good Track Geometry and Telecoms Condition, a lower figure indicates improvement. Some historical data has been restated due to refinement in the reporting systems.

*The process for calculating the condition of asset TSRs changed for CP4 which is why the results vary so significantly from 2008/09 to 2009/10.

Table 3.2: Comparison of 2011/12 asset condition and reliability results with Delivery Plan update 2011 (DPu11) forecasts

Measure	*DPu11*	*2011/12*
Track		
Good track geometry	137.4	136.5
Poor track geometry	2.38	2.58
Intervention / immediate action geometry faults per 100km	38.0	41.3
Rail breaks and immediate action defects per 100km	5.8	3.8
Civils		
Civils – Assets subject to additional inspections (no.)	840	789
Operational Property		
Station stewardship measure	2.48	2.44
Light maintenance depot stewardship measure	2.52	2.43
Signalling		
Signalling asset condition	2.39	2.38
Electrification		
AC traction feeder stations and track sectioning points condition	2.78	2.64
DC traction feeder stations and track sectioning points condition	2.53	2.45
AC contact systems condition	1.6	1.6
DC contact systems condition	1.9	2.0
Telecoms		
Telecoms condition	0.89	0.95
Reliability forecasts		
Signalling failures causing delays of more than ten minutes (no.)	16,168	15,638
Points failures	4,420	5,166
Detection failures	4,973	4,923
Track failures	6,504	5,501
Power incidents causing train delays of more than 300 minutes	87	71
Telecom failures causing train delays of more than ten minutes	721	633

Note: For all measures in this table, except Good Track Geometry and Telecoms Condition, a lower figure indicates improvement. Some historical data has been restated due to refinement in the reporting systems.

Broken rails (M1)

Definition

A broken rail is one which, before removal from the track, has a fracture through the full cross section, or a piece broken out of it, rendering it unserviceable. This also includes broken welds. Only broken rails occurring in running lines are included in this measure (sidings and depots are excluded).

Reporting method

The National Engineering Reporting Team issues a daily broken rail report based on data from the National Control Centre Daily Log. In parallel maintenance areas are responsible for reporting all broken rails to the 'Raildata' database which is used by the Engineering Reporting Team to produce period and annual reports. This data is checked against various information sources prior to reporting.

The Rail Defect Management System (RDMS) allows for standardised reports for the numbers and types of broken rail to be produced straight from RDMS. The procedure for collecting, confirming and collating the numbers of broken rails has been in place for seven reporting years, and has been supported by RDMS since the start of Control Period 4 (CP4).

Results

Table 3.3 provides the annual number of broken rails for England & Wales, Scotland, and the network total by route classification type.

Reporting confidence

The measure was assigned a confidence grade of A1 by the previous Independent Reporter for our output monitoring. This measure has not been reassessed in this control period.

Commentary

The final year-end figure for 2011/12 of 127 was a 26 per cent improvement over the previous year's total of 171.

Table 3.3: Number of broken rails by route classification

	Route Classification	*2004/05*	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
England & Wales	Primary, and key London & South East	158	129	88	94	77	71	87	65
	Secondary, other London & South East, and freight trunk	121	122	73	62	58	50	49	42
	Rural, and freight only	11	20	10	11	13	11	13	3
	Total	**290**	**271**	**171**	**167**	**148**	**132**	**149**	**110**
Scotland	Primary	8	16	7	4	4	7	7	7
	Secondary and freight trunk	23	29	14	9	13	13	15	8
	Rural, and freight only	1	1	0	1	0	0	0	2
	Total	**32**	**46**	**21**	**14**	**17**	**20**	**22**	**17**
Network Total	Primary, and key London & South East	166	145	95	98	81	78	94	72
	Secondary, other London & South East, and freight trunk	144	151	87	71	71	63	64	50
	Rural, and freight only	12	21	10	12	13	11	13	5
	Grand Total	**322**	**317**	**192**	**181**	**165**	**152**	**171**	**127**

The reduction has been largely driven by the mild winter particularly compared to the much harsher winter in 2010/11 when broken rails increased from 152 in 2009/10 to 171 in 2010/11. In addition to this a continued focus on improved rail management, the use of train-based ultrasonic testing on the network, with a specific focus on dip angles in switches and crossings (S&C) on primary track has also contributed to improvements. 127 was the lowest number of broken rails ever recorded and the mild winter resulted in similar reductions across all classes of routes.

Rail defects (M2)

Definition

A defective rail is one with any fault requiring remedial action (repair or replacement) to make it fit for purpose in accordance with Network Rail standards. This measure is reported as isolated defects (those defects with a length of less than one yard, such as mid-rail welds, isolated wheelburns) and continuous defects (those defects with a length of one yard or more, such as rolling contact fatigue, wheelburns, hydrogen shatter cracking, vertical longitudinal splits).

Results

Tables 3.4 – 3.9 provides the various results for measuring rail defects beginning with the overall number of defects identified, those removed or repaired, and those remaining at the end of the year. Further explanation of each of the measures is provided below in the commentary.

Reporting confidence

The procedure for reporting defective rails is now well established and this data has a confidence grade of A2, as assigned by the Independent Reporter. Difficulties surrounding the implementation of the new system for managing rail defects impacted on the initial efficiency and robustness of reporting this data. However, the procedure for collecting, confirming and collating the numbers of defective rails has now been in place for five years. As with the reporting of broken rails (M1) the Rail Defect Management System (RDMS) allows for standardised reports for the numbers and types of defective rail to be produced straight from RDMS for the year.

Commentary

Information in this year's Annual Return has been produced from RDMS which allows a detailed breakdown of defect data in a more consistent way across the whole network.

Table 3.4 shows a significant increase of 39 per cent in track defects remaining, although defects identified showed only a small increase of six per cent and the number of defects being removed increased by one per cent. The 39 per cent increase is primarily due to a reclassification of small squats which do not have a fixed removal timescale unless they grow in size. Previously all these very small defects would have been classified and removed in 13 weeks. Experience and trials have shown that these small defects either grow very slowly or, in some cases, are removed by the cyclic grinding programme in place on our main lines.

The reclassification was introduced to reduce the volume of small defects being removed unnecessarily early and allow resources to be better focussed on removing larger defects in the required timescales. The improvements in ultrasonic inspection technology have also enabled smaller surface defects to be detected earlier where previously they would not have been detected until they had grown to a larger size.

The increase appears to be the result of an increase in the use of retest codes, which are not excluded from the total. These small defects, below removal limits, are monitored through regular retests. The most significant variation in numbers of defects and their classification is in Scotland which showed a 61 per cent increase in the number of isolated defects remaining in track at the year end. Although defects identified increased by 31 per cent, defects removed increased by 25 per cent.

Table 3.5 is new in the Annual Return and shows the number of immediate action defects identified per 100km of track by specific route classification. Immediate action defects are those which require the immediate imposition of an emergency speed restriction due to their severity when identified. The table shows a significant reduction in immediate action defects per 100km on primary and secondary routes but an increase on rural and freight lines. The reductions have been achieved by more widespread use of ultrasonic test trains on the primary and secondary routes, and revisions to standards allowing earlier detection and identification of defects before a speed restriction is required.

Table 3.4: Isolated rail defects

	Defects identified	*Defects removed/ repaired*	*Defects remaining*	*Defects identified*	*Defects removed/ repaired*	*Defects remaining*
	2010/11	***2010/11***	***at 31/3/2011***	***2011/12***	***2011/12***	***at 31/3/2012***
England & Wales	15,827	14,460	6,127	15,936	14,001	8,057
Scotland	3,603	2,635	2,307	4,710	3,304	3,706
Network Total	**19,430**	**17,095**	**8,434**	**20,646**	**17,305**	**11,763**

Table 3.5: Immediate action isolated defects per 100km identified during the year by route classification

	Route Classification	***2008/09***	***2009/10***	***2010/11***	***2011/12***
England & Wales	Primary and key London & South East	8.14	6.37	5.05	4.32
	Secondary, other London & South East and freight trunk	5.67	4.50	3.48	2.92
	Rural and freight only	4.65	4.18	2.83	2.31
	Total	**6.62**	**5.29**	**4.08**	**3.46**
Scotland	Primary	10.91	5.33	3.80	4.20
	Secondary and freight trunk	2.23	4.20	1.87	2.33
	Rural and freight only	2.97	9.27	5.84	3.59
	Total	**4.02**	**5.47**	**3.05**	**2.94**
Network Total	Primary and key London & South East	8.31	6.30	4.97	4.31
	Secondary, other London & South East and freight trunk	5.04	4.45	3.18	2.82
	Rural and freight only	4.33	5.17	3.41	2.56
	Grand Total	**6.27**	**5.31**	**3.94**	**3.39**

Table 3.6: Lengths of continuous rail defects (excluding RCF data)

	Defects identified	*Defects removed/ repaired*	*Defects remaining*	*Defects identified*	*Defects removed/ repaired*	*Defects remaining*
	2010/11	***2010/11***	***at 31/3/2011***	***2011/12***	***2011/12***	***at 31/3/2012***
England & Wales	71,937	68,529	58,009	76,585	68,699	65,858
Scotland	8,683	9,273	34,274	15,415	14,451	35,292
Network Total	**80,620**	**77,802**	**92,283**	**92,000**	**83,150**	**101,150**

Table 3.7: Lengths of continuous rail defects remaining[1] (defects excluding RCF)

	2007/08	***2008/09***	***2008/09***	***2009/10***	***2010/11***	***2011/12***
Network total length (yards)	2,010,831	1,399,634	123,461	89,465	92,283	101,150
Network total length (km)	1,839	1,280	113	82	84	92

Note: Prior to 2009/10 continuous defects numbers included Rolling Contact Fatigue (RCF). RCF is a condition and not necessarily a defect or actionable and is now shown separately.

Table 3.8: Rolling contact fatigue in plain line classified as heavy or severe (yards)

	Classification	***2008/09***	***2009/10***	***2010/11***	***2011/12***
England & Wales	heavy	293,514	303,627	300,331	338,697
	severe	143,298	132,719	137,499	161,482
Scotland	heavy	33,246	28,947	32,242	40,687
	severe	8,300	14,506	16,518	19,543
Network Total	**heavy**	**326,760**	**332,574**	**332,573**	**379,384**
	severe	**151,598**	**147,225**	**154,017**	**181,025**

Table 3.9: Rolling contact fatigue in S&C classified as heavy or severe (number of components)

	Classification	*2008/09*	*2009/10*	*2010/11*	*2011/12*
England & Wales	heavy	1,307	1,560	1,566	1,884
	severe	1,179	1,112	1,481	2,231
Scotland	heavy	195	247	271	280
	severe	109	151	187	220
Network Total	**heavy**	**1,502**	**1,807**	**1,837**	**2,164**
	severe	**1,288**	**1,263**	**1,668**	**2,451**

Tables 3.6 and 3.7 show the lengths of continuous defects remaining excluding Rolling Contact Fatigue (RCF). These are rail defects greater than one yard long made up primarily of un-testable rail, lipping, wheelburns and hydrogen shatter cracking. The overall length of continuous defects across the network shows a decrease compared to previous years due to an increase in defective rail being removed or repaired. Significant increases were seen in the length of continuous defects in Anglia and Kent. Early detection of these defects, before they are actionable, in accordance with the standard, will enable longer term and programmed removal plans to be put in place. Western shows a significant reduction in continuous defects due to the removal of larger volumes of older, pre-1976 rail over the past year.

Table 3.8 is also a new table showing the volume of heavy and severe RCF in plain line[1] measured in yards. The introduction and national use of RDMS has enabled the lengths of RCF reported to be split by severity this year. Light and moderate RCF, which is managed through cyclic inspection and grinding and requires no additional actions, has been omitted. Only heavy and severe RCF, which requires enhanced inspections and more onerous actions, has been reported. The total length of both heavy and severe RCF across the network has shown a slight reduction over the previous year's figures. 2009/10 was the first complete year where RCF data had been produced directly from RDMS. The previous year's data for 2008/9 was produced using a combination of RDMS and pre-existing procedures for collecting the lengths of rail affected by RCF.

1 Plain line is a stretch of track that does not have any junctions, crossovers or points on it.

Table 3.9 shows the volume of heavy and severe RCF in S&C. This is counted as the number of components within the switches and crossings, such as switch rails, stock rails, closure rails and crossings that have a heavy or severe crack within the length of the component. The data shows a slight increase in the number of components affected by heavy RCF and a slight reduction in the number of components affected by severe RCF. This is the first complete year that this component data has been has been sourced directly from RDMS.

Track geometry quality – Good track geometry (M3)

Definition

The measure Good Track Geometry (GTG) is based on the proportion of track where the lateral and vertical alignment is categorised as 'good' or 'satisfactory'. The alignment is measured by track geometry measurement and recording vehicles. The measurement used is standard deviation (in mm). The values of standard deviation that need to be achieved for alignment to be categorised as good or satisfactory vary with line speed. It is possible to have a value of over 100 per cent for GTG, as there is a weighting for track categorised as 'good'.

Results

Table 3.10 shows GTG for England & Wales, Scotland, and the network total for each of the main route classifications; increasing values indicate improvement.

In recent years there have been improvements in measurement technology, changes to the way that the data is stored and processed, and changes to the rules for calculating GTG. Results for 2007/08 and 2008/09 have been recalculated to be consistent with the current methodology.

Results prior to 2007/08 are not shown to avoid misleading comparisons.

Reporting Confidence

The Good Track Geometry measure has been assigned a B2 confidence grade by the Independent Reporter for output monitoring. The track geometry measurement systems that provide the base data, and the data storage and processing systems used to calculate GTG are all well established and maintained.

Commentary

The predominant influence on track geometry during 2011/12 was the lack of rainfall in England over prolonged periods, with levels of drought higher than experienced in recent years. The resultant ground shrinkage, together with various operational factors, has led to a third year of deterioration in track geometry following several years of substantial improvement.

Over the last three years the weather pattern has had a profound effect on track geometry. In statistical terms, the weather has been exceptional, with combinations of drought and severe winter. The weather pattern, and its effect on track geometry, is described below.

Ground shrinkage over the summer regularly affects the southeast of England where there are extensive alluvial clay formations and embankments that are susceptible to shrinkage in drought conditions. Uneven changes in the ground affect the geometry of the track above it. Track geometry maintenance machines (tampers and stoneblowers) can be used to level the track, but such remedial action is less effective during the phase of active shrinkage.

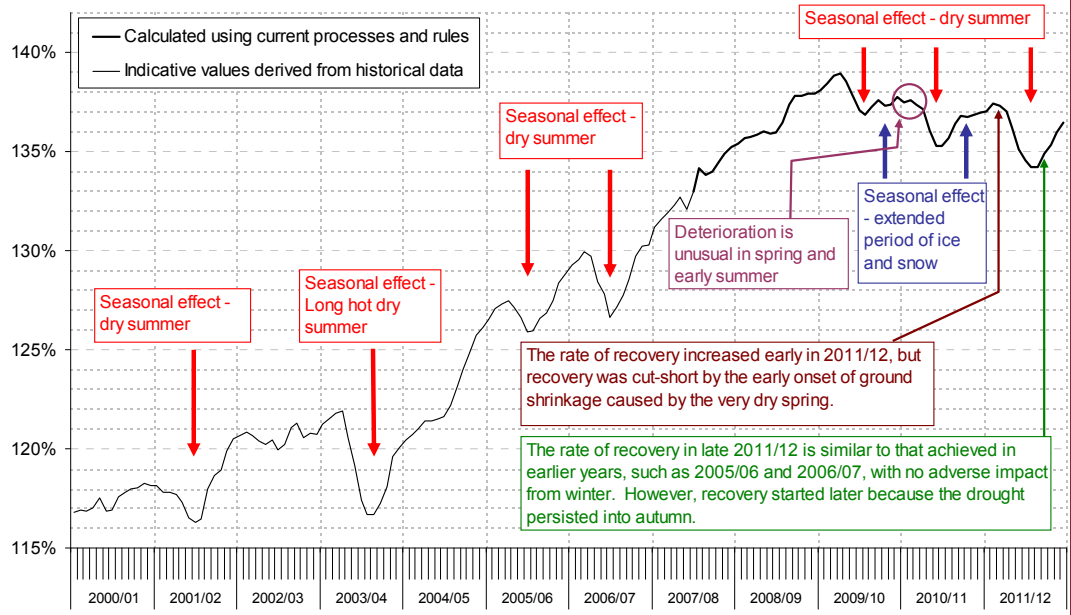
Additionally, disturbing the ballast during periods of higher temperatures increases the risk of a track buckle, which could lead to a derailment. Where work is done, precautionary speed restrictions have to be applied in order to reduce both the risk of a buckle, and the risk of a derailment should a buckle occur. However, such speed restrictions incur train delay.

Because of the implications for safety and train performance, and the reduced effectiveness whilst shrinkage is on-going, remedial action to correct the geometry is generally carried out during autumn and winter. Historically, where there has been deterioration in track geometry due to ground shrinkage over the summer, the remedial actions usually result in the full recovery of track geometry by the end of the year. This pattern can be seen in Figure 3.2, with examples in 2001/02, 2005/06 and 2006/07. Strong recovery was also evident in 2003/04, but the summer of 2003 was unusually hot and dry for an extended period and the degree of ground shrinkage was so severe that recovery of geometry to previous levels was not achieved until autumn 2004/05.

Table 3.10: Good track Geometry (%) by route classification

	Route Classification	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
England & Wales	Primary and key London & South East	135.7	138.5	137.7	137.0	137.0
	Secondary, other London & South East and freight trunk	137.0	140.0	139.8	139.4	138.6
	Rural and freight only	124.3	125.7	130.7	130.0	127.8
	Total	**135.0**	**137.9**	**137.8**	**137.2**	**136.7**
Scotland	Primary	140.2	142.0	141.5	139.9	139.5
	Secondary and freight trunk	143.5	143.3	143.4	141.7	142.0
	Rural and freight only	101.6	111.1	107.2	101.5	95.6
	Total	**136.5**	**138.2**	**137.4**	**135.3**	**134.5**
Network Total	Primary and key London & South East	136.0	138.8	138.0	137.2	137.2
	Secondary, other London & South East and freight trunk	138.3	140.6	140.5	139.8	139.3
	Rural and freight only	120.6	123.1	126.3	124.6	121.7
	Grand Total	**135.2**	**137.9**	**137.7**	**137.0**	**136.5**

Figure 3.2: Good Track Geometry (seasonal effects)



The droughts of 2009 and 2010 were not unusual. Drought occurs in roughly 50 per cent of years, and two successive years of drought are not uncommon. In both years remedial actions to address the problems caused by the ground shrinkage were implemented and there were clear signs of recovery in late autumn. The rates of recovery were similar to that achieved in 2005/06, and full recovery was expected by the end of the year. However, the winter of 2009/10 saw the most widespread and prolonged period of severe winter weather since 1981/82. Winter 2010/11 brought the coldest December since UK-wide records began 100 years ago. These exceptional winter conditions seriously hampered maintenance operations and, in some locations, triggered further geometry deterioration from the effects of freezing within the soil supporting the track.

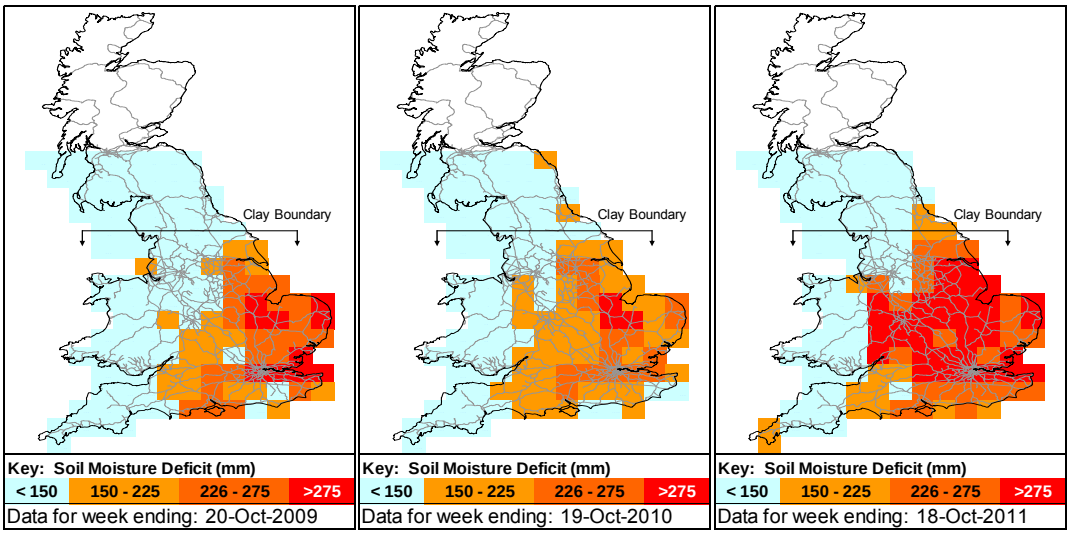
Environmental conditions naturally improved towards the end of winter, and the rate of geometry recovery increased early in 2011/12. This recovery was cut-short by the on-set of drought in 2011. The drought was exceptional in several ways. It was the third successive year with drought, and the degree and duration exceeded normal levels. The drought started earlier than normal, with the driest spring in England & Wales since 1893. Most areas of England had less than 50 per cent of average spring rainfall, with parts of the South-East and East Anglia having less than 30 per cent of average. Summer rainfall was average in most areas (except for the Midlands), but average rainfall in summer is low. However, autumn 2011 saw the return of unusual conditions with the driest autumn since 1978 in the Midlands, and the driest since 1985 in East Anglia and South-East England. Rainfall in these areas varied from 70 per cent down to less than 50 per cent of average. In the Midlands, East Anglia, and some parts of the South-East of England, the level of drought was much higher than that reached for many years (as illustrated in Figure 3.3). The combination of widespread drought of increased severity, coupled with the extended duration, gave rise to a degree of deterioration in track geometry that was the worst since 2003. The continuation of active shrinkage into autumn delayed the start of the recovery and thus, despite the rate of recovery being similar to that achieved in previous years, it meant that recovery was not achieved by the end of the year.

Some operational factors have also adversely affected the situation since the start of the control period in April 2009. Traffic volume has increased more than expected, with more trains operating on the network, for more hours per week. This has the two-fold effect of generating additional wear (including degrading track geometry), while reducing the time available for maintenance work.

Figure 3.3: Soil Moisture Deficit for mid-October by year

These maps illustrate the level of drought at mid-October for the last three years. They highlight the degree, geographic spread and extended duration of the drought in 2011.

The dryness of the ground is expessed numerically as Soil Moisture Deficit. SMD values of greater than 150mm regularly result in a deterioration in track geometry in those locations south of the clay boundary. SMD of greater than 225mm gives severe problems.



The time required to move people and equipment onto the track, and to restore the track to an operational condition at the end of intrusive work, means that actual work time can be disproportionally affected by extending train operating hours. Similarly, a higher frequency service disproportionally affects the time available for minor work between trains.

Increases to linespeeds have resulted in less track being categorised as good or satisfactory, as more stringent thresholds are applied. An assessment has shown that roughly 20 per cent of the deterioration in GTG since the start of CP4 is due to increases in linespeed.

Another significant influence is considered to be the resources allocated to maintenance activities. During Control Period 3 (April 2004 to March 2009) very substantial improvements were made to track geometry. The policy and funding for CP4 is for GTG to remain virtually unchanged. The strategic plan for provision of track geometry maintenance machines was modified to meet this policy based on the experiences of previous years. In normal circumstances, these resources should have been appropriate, but the seasonal effects have been exceptional.

The effect is most clearly seen in Figure 3.2 with the deterioration in track geometry that occurred early in 2010/11. Normally, the maintenance teams take advantage of the more stable conditions during spring and early summer to make steady improvements in track geometry. However, the initial allocation of track geometry maintenance machines was insufficient to recover the abnormal deterioration of track geometry that occurred during the summer and winter of 2009/10. Because of the lagging nature of track geometry measurement (see Track geometry measures note, below), GTG continued to worsen throughout spring 2010 as data was returned from sections of track with less frequent measurement cycles.

Increased machine allocation was made, but took time to implement. This and other action has resulted in the rates of track geometry recovery in autumn 2010, and in the spring, autumn and winter of 2011/12 being comparable with those achieved in 2005/06 and 2006/07. However, greater rates of recovery are required to overcome the cumulative effect of the exceptional weather over the last three years.

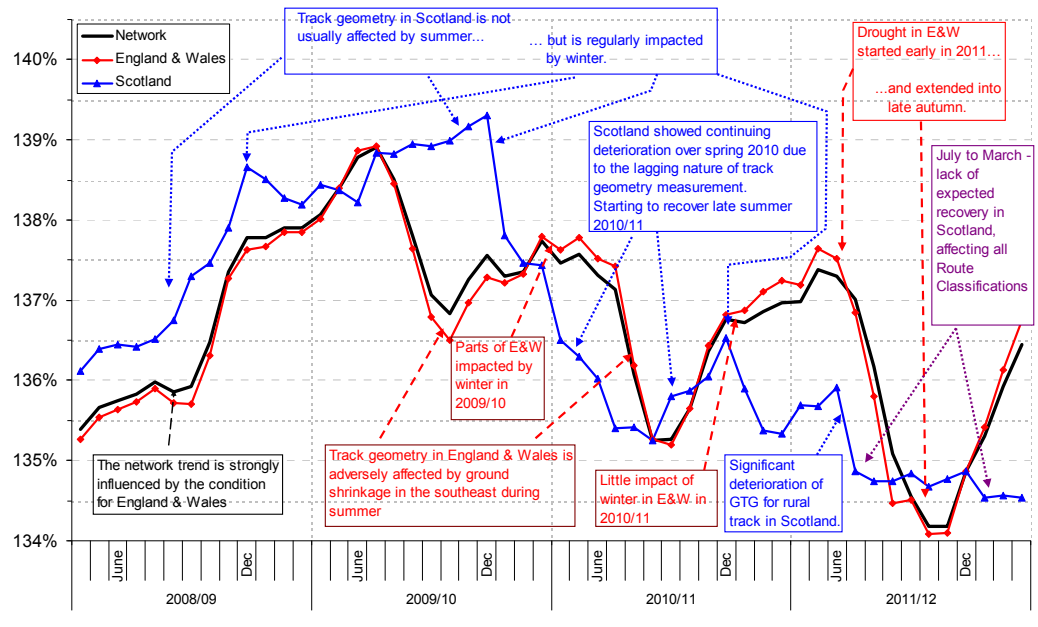
The trend in GTG for the network as whole is dominated by the trend for England & Wales. This is because 86 per cent of the track is located in England & Wales. The trend in Scotland (shown in Figure 3.4) is very

different, but is again driven by weather, geology and operational aspects. Scotland has higher rainfall and a limited extent of drought susceptible soils (mainly peat in highland areas). Because of these factors, track geometry in Scotland has tended to improve over the summer. However, winter in Scotland is generally colder than in other parts of the UK, and the resultant effect is clearly seen in the graph. In particular, the duration and severity of the winter in 2009/10 had a huge impact on track geometry, with the effects still being measured throughout spring and into summer 2010/11 as data was returned from sections of secondary and rural track that have less frequent measurement cycles. By late autumn 2010, geometry was improving rapidly in Scotland, but the extreme winter weather in December 2010 and January 2011 again triggered widespread deterioration.

The start of 2011/12 saw a partial recovery of GTG in Scotland from remedial work on Primary and Secondary track. However, there was a substantial drop on extensive re-measurement of Rural track in July 2011. This highlights another key aspect of track geometry in Scotland. For both Primary and Secondary track, the geometry in Scotland is better than in England & Wales, however, the geometry on Rural track is considerably worse, and this is depressing the overall statistics for Scotland. In July, GTG on Rural track in Scotland fell below 100 per cent, and remained there throughout the rest of the year. As with other parts of the network, increased linespeeds in Scotland have impacted Rural track. However, the degree of deterioration for GTG in Rural track in Scotland exceeds the effect of changes to linespeed.

As described above, over the course of the current control period, the use of track geometry maintenance machines has been reduced across the network. Although the reduction in Scotland has been proportionately less than in most other routes, the current level of tamping in Scotland is only 75 per cent of the network average. The severe winters of 2009/10 and 2010/11 resulted in a significant amount of deterioration that needed to be rectified. The lack of recovery achieved through the milder conditions seen in 2011/12 suggests that the present allocation of resources is not adequate, particularly on the rural sections. An evaluation of resources and their deployment is being undertaken. It is also recognised that increased traffic volume has affected Scotland, especially on the key West Coast route where time for maintenance work is very restricted.

Figure 3.4: Good Track Geometry by Region



Although the adverse effects of exceptional weather and the other factors described above present a challenge, the commitment remains to achieve the CP4 exit forecast for network GTG of 137.6 per cent. This is in line with policies for CP4 and the commitment to reduce maintenance costs, following the substantial improvement delivered in CP3.

Track geometry measures note

The track geometry measures always lag behind the actual situation on the ground. This note explains the reason and resultant effects. The principal purpose of track geometry measurement is to support track maintenance teams in the management of track condition. Track geometry measurement and recording is carried out on a cyclical basis, with the frequency of measurement being aligned to the type of traffic, tonnage and line speed. Typically, Primary track is re-measured every six weeks, Secondary every 15 weeks, and Rural every 28 weeks.

The measurement data is also used to compile the track geometry measures, Good Track Geometry, Poor Track Geometry and Track geometry faults. These are calculated from the national dataset of track geometry data at the end of each period. This dataset holds the last measurement result for each section of track. The dataset can only be updated from measurements made when a recording run takes place, therefore the dataset (and hence the track geometry measures) will lag both going into any problem phase and during the recovery phase. In a problem phase, the lag occurs when there has been deterioration on the ground that has not yet been recorded and entered into the dataset. Conversely, during the recovery phase, even after work has been carried out to restore track geometry, the dataset will continue to hold the measurements relating to the degraded geometry until the track involved has been re-measured. With the highest frequency of recording, any indications of change will first be seen in the statistics for Primary track. Because of less frequent measurement, change usually takes longer to become apparent in Secondary and Rural track, but is influenced by when the on-the-ground change occurs within the measurement cycle. With higher proportions of Secondary and Rural track, Scotland is particularly affected by the lagging effect.

Track geometry quality – Poor Track Geometry (M3)

Definition

The measure Poor Track Geometry (PTG) is based on the proportion of track where the lateral alignment and vertical alignment is categorised as ‘very poor’. The alignment is measured by track geometry measurement and recording vehicles. The measurement used is standard deviation (in mm). The threshold value of standard deviation at which track is categorised as very poor varies with line speed. The threshold values are specified in Network Rail standards. The formula for the measure has additional weighting for extreme values of standard deviation.

PTG reflects combinations of aged track, poor track bed condition, and/or undesirable geometrical features such as severely constrained junction layouts, with tight curves, or curves of irregular radii. Rectification can often only be achieved by significant design alterations, treatment of underlying ground and other environmental conditions, and wholesale renewal. Affected track is often in the vicinity of major junctions and switches and crossings. This compounds the complexity and the cost of remediation work, which may then be disproportionate to the benefits of such work, especially on rural and freight routes.

Results

Table 3.11 shows PTG for England & Wales, Scotland, and the network total for each of the main route classifications. Decreasing values indicate improvement.

In recent years there have been improvements to the measuring technology, changes to the way that the data is stored and processed, and changes to the rules for calculating PTG. Results for 2007/08 and 2008/09 have been recalculated to be consistent with current methodologies. Results prior to 2007/08 are not shown to avoid misleading comparisons.

Reporting Confidence

The Poor Track Geometry measure was assigned an A1 confidence grade by the previous Independent Reporter for output monitoring. This measure has not been reassessed in the current control period.

The track geometry measurement systems that provide the base data, and the data storage and processing systems that are used to calculate PTG, are all well established and maintained.

Commentary

Poor Track Geometry has been affected by the exceptional weather conditions experienced over the last three years in a similar manner to Good Track Geometry. Figure 3.5 shows the long-term trend for PTG, with substantial improvement over Control Period 3 (April 2004 to March 2009) followed by seasonal impacts in 2009/10, 2010/11 and 2011/12. The trend is virtually a mirror image of GTG, and clearly shows the effect of ground shrinkage from drought over several summers, and the strong level of improvement achieved over the last few months with the milder winter. The requirement for additional provision of track geometry maintenance machines to sustain or improve the rate of recovery is being assessed, (recognising that some uncertainty is introduced by the influence of future weather conditions).

As with GTG, Poor Track Geometry has been adversely affected by the restrictions and wear incurred by increased traffic volumes. Increases to linespeeds, with the associated application of more stringent thresholds, has also resulted in more track being categorised as very poor. However, this has a very small overall impact on PTG, accounting for less than five per cent of the deterioration over the control period. Another factor has been that more crossovers, loops and other slow speed track has been subject to measurement utilising advancements in the measurement equipment. These lesser used sections have a high proportion of poor track. Including this track in the statistics adversely affects PTG, accounting for another five per cent of the deterioration over the control period (for the whole network figure).

Figure 3.6 shows the recent seasonal trends for England & Wales, and Scotland. Overall, despite the deterioration of the last three years, Scotland has proportionately less 'very poor track' than England & Wales, but the level of year-on-year deterioration is worse. The reasons for this are similar to those described for GTG. Scotland has also been adversely affected by the increases to linespeeds and increased measurement of crossovers, loops and other slow speed track. This has disproportionally affected PTG in Scotland Primary track, where the total increase in PTG over the course of the current control period is matched by the increase arising from higher linespeed and additional measurement.

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Table 3.11: Poor Track Geometry (%) by route classification

	Route Classification	***2007/08***	***2008/09***	***2009/10***	***2010/11***	***2011/12***
England & Wales	Primary and key London & South East	2.73	2.24	2.43	2.49	2.48
	Secondary, other London & South East and freight trunk	2.63	2.08	2.4	2.53	2.59
	Rural and freight only	3.21	2.68	2.77	2.83	3.51
	Total	**2.75**	**2.23**	**2.45**	**2.54**	**2.62**
Scotland	Primary	2.05	1.64	1.55	1.63	1.74
	Secondary and freight trunk	1.67	1.68	1.88	2.01	2.16
	Rural and freight only	3.33	2.91	2.5	3.39	3.75
	Total	**2.05**	**1.85**	**1.88**	**2.12**	**2.29**
Network Total	Primary and key London & South East	2.69	2.19	2.37	2.43	2.43
	Secondary, other London & South East and freight trunk	2.44	2.01	2.31	2.44	2.51
	Rural and freight only	3.23	2.72	2.71	2.95	3.56
	Grand Total	**2.66**	**2.18**	**2.38**	**2.48**	**2.58**

Figure 3.5: Network Poor Track Geometry

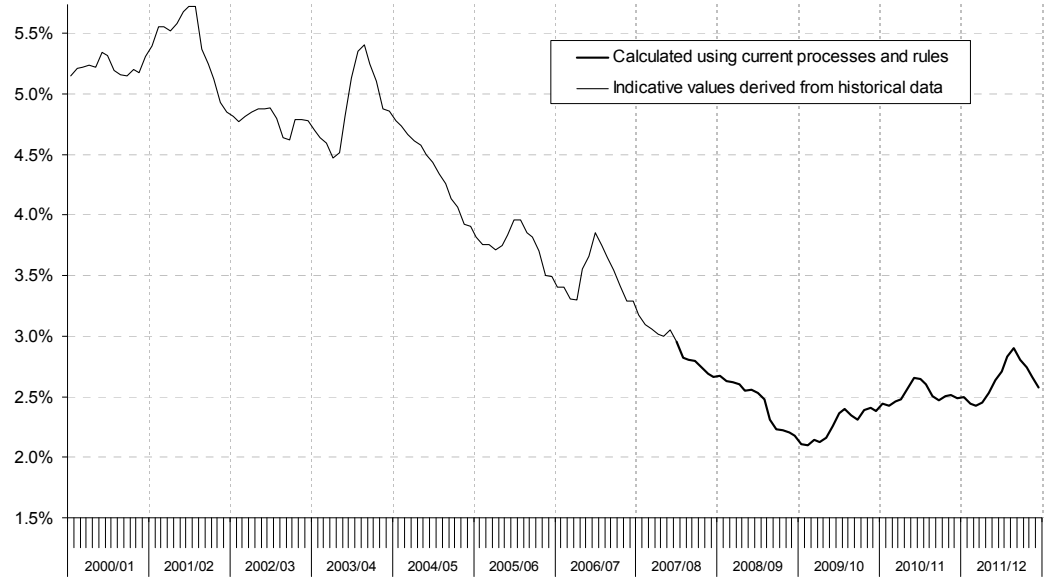
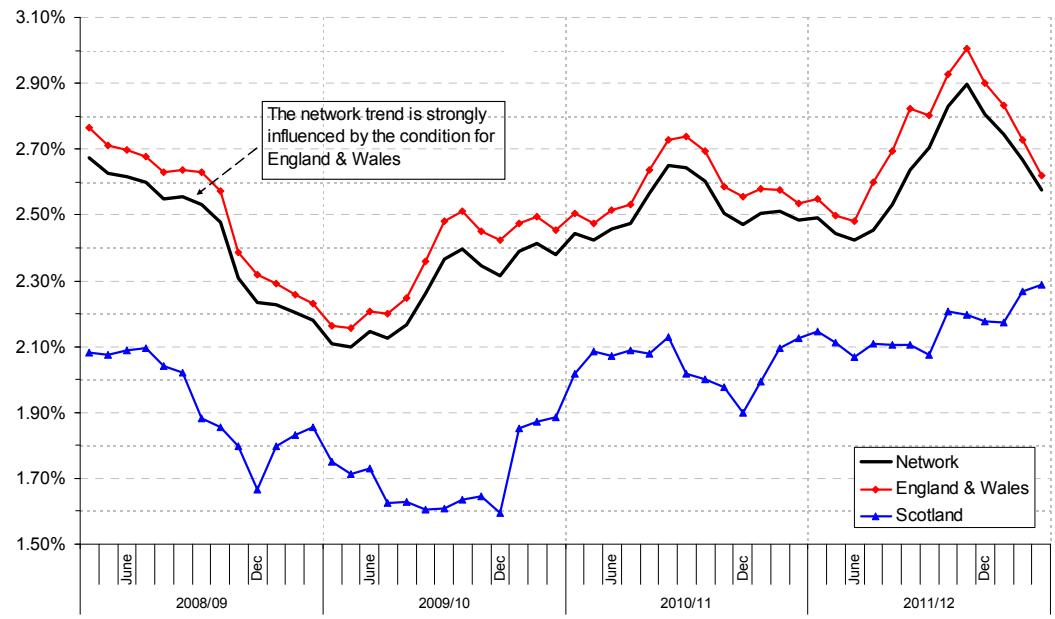


Figure 3.6: Poor Track Geometry by Region



The commitment is for network PTG to be 2.34 per cent or less at the end of CP4 in March 2014. This level is in line with the policies for CP4 and the commitment to reduce maintenance costs after the substantial improvement to PTG delivered in CP3. To achieve this we need to rectify the adverse effects of the exceptional weather whilst minimising cost.

Track geometry faults (M5)

Definition

This measure is based on discrete geometry faults identified against four principal parameters of vertical alignment, horizontal alignment, gauge (the distance between the rails) and twist (the relative vertical position across the opposite corners of a three metre bogie or vehicle). The presence of faults, their type and magnitude is given by the output of the track geometry measurement and recording vehicles. The full population of track geometry faults covers a wide range, from serious twist and gauge faults that require an immediate response (block the line or reduce speeds), to relatively minor alignment anomalies on low speed track that require only review and monitoring. This measure includes all those faults that require intervention and rectification to fixed timescales. Both the threshold values and the specified timescales are mandated in Network Rail standards. The measure is normalised as faults per 100 track kilometres to provide comparison across different parts of the network.

Results

Table 3.17 provides the track geometry faults per 100 track kilometres for England & Wales, Scotland, and the network as a whole for each of the main route classifications. Decreasing values indicate improvement.

Reporting confidence

The measure track geometry faults per 100km was assigned an A1 confidence grade by the previous Independent Reporter for output monitoring. It has not been reassessed in CP4.

The track geometry measurement systems that provide the base data, and the data storage and processing systems that are used to calculate the measure, are all well established and maintained.

Commentary

In common with the other major track geometry measures (Good Track Geometry and Poor Track Geometry), 2011/12 has seen a deterioration in the position on track geometry faults in England & Wales, and in Scotland. For England & Wales, the main factor was the wide-spread ground shrinkage due to the low rainfall, over an extended period. While there have been several step changes as a result of exceptional events, it is the reduction in maintenance activity under the policies for CP4 that is currently considered to be the main reason for the recent trend of deterioration in Scotland.

The long-term trend in geometry faults is shown in Figure 3.7. As with the other geometry measures, there is a correlation of geometry faults with summer ground shrinkage, but it appears to be less pronounced than for GTG or PTG. A big factor in this is the scaling of the graph, with the seasonal effects being masked by the very substantial improvement in the overall number of faults that was achieved over the period from 2000 to 2009. Another factor is that ground shrinkage mainly affects twist faults, with little impact on horizontal alignment and gauge faults. Additionally, the intervention faults covered by this measure are rectified as they are detected, thus moderating the extent of deterioration.

Contributory causes to the increase in track geometry faults across the network since the start of CP4 in April 2009 are the wear incurred by increased traffic volume, and that more cross-overs and loops have been subject to measurement. These lesser used sections have a high proportion of poor track, adversely affecting the statistics for track geometry faults in a similar manner to PTG. Overall, the effect of additional recording accounts for approximately 30 per cent of the increase in track geometry faults since the start of CP4.

At December 2009, the threshold values for different fault types were changed. Threshold values and action requirements for higher risk situations were made more stringent, but they were relaxed for low risk conditions. This was expected to have a broadly neutral effect on the total number of actionable faults, but appears to have incurred some overall increase.

The trend over the last four years is shown in Figure 3.8. This shows the impact of extreme winter weather on geometry faults, illustrated by the effects in Scotland. For 2011/12, the trend in England & Wales follows a pattern linked to the extended period of drought. This is very similar to the trend seen for Poor Track Geometry, with deterioration from June to November, and

recovery starting in December. The delayed start to the recovery has limited the level of improvement achieved by the year-end.

The trend for track geometry faults for the network as a whole has been influenced by the pattern in Scotland. Over the course of three years, track geometry faults in Scotland have deteriorated by 40 per cent, moving from being better than England & Wales to worse.

The deterioration in Scotland has been caused by a number of factors, the most obvious one being the correlation with extreme winter weather. As with other sections of the network, the change in the threshold values and action requirements for track geometry faults in December 2009 has incurred some increase in the total number of faults. However, when considered by route classification, another feature emerges. As for both GTG and PTG, the number of track geometry faults per 100km on primary and secondary routes in Scotland is better than for England & Wales. Furthermore, there has been an improvement in Primary track, and this improvement has occurred despite an increase in the amount of lesser used track that is being measured on these routes. This additional recording has disproportionately affected primary track. Without this the level of faults per 100km on primary track in Scotland would be better by around 2.5 faults per 100km; a significant extra improvement to that already achieved. Although the number of track geometry faults per 100km in secondary track in Scotland is better than in England and Wales, the rate of deterioration is higher. For rural routes in Scotland, the rates of deterioration are very much higher, and it is this that has resulted in the total for track geometry faults becoming worse than in England & Wales. While the overall deterioration seen in track geometry faults in Scotland has a correlation with the extreme winter weather events, the pattern of improvement on primary routes, and deterioration on secondary and rural routes supports a preliminary opinion that the balance of maintenance activity in CP4 is also a significant influence on the trends.

Table 3.17: Track geometry faults per 100 km by route classification

	Route Classification	***2007/08***	***2008/09***	***2009/10***	***2010/11***	***2011/12***
England & Wales	Primary and key London & South East	34.8	27.6	29.6	29.4	30.9
	Secondary, other London & South East and freight trunk	50.2	40.0	43.3	40.9	42.0
	Rural and freight only	78.1	73.6	69.5	66.2	65.7
	Total	**47.0**	**38.8**	**40.5**	**39.0**	**40.2**
Scotland	Primary	22.9	24.6	22.9	25.6	20.5
	Secondary and freight trunk	29.9	30.7	35.1	38.0	41.2
	Rural and freight only	54.9	55.0	62.0	78.3	96.3
	Total	**34.1**	**34.6**	**38.4**	**44.0**	**48.5**
Network Total	Primary and key London & South East	34.0	27.4	29.1	29.2	30.3
	Secondary, other London & South East and freight trunk	46.5	38.3	41.9	40.4	41.9
	Rural and freight only	73.4	69.9	68.0	68.7	71.8
	Grand Total	**45.3**	**38.2**	**40.3**	**39.7**	**41.3**

Figure 3.7: Network Geometry Faults per 100km

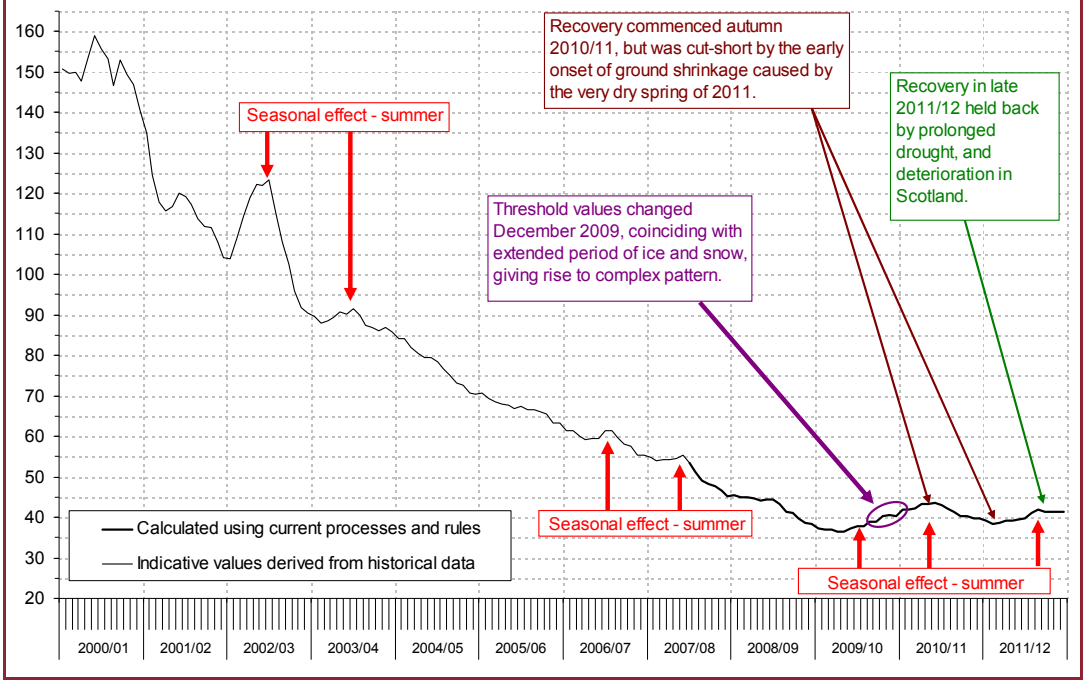
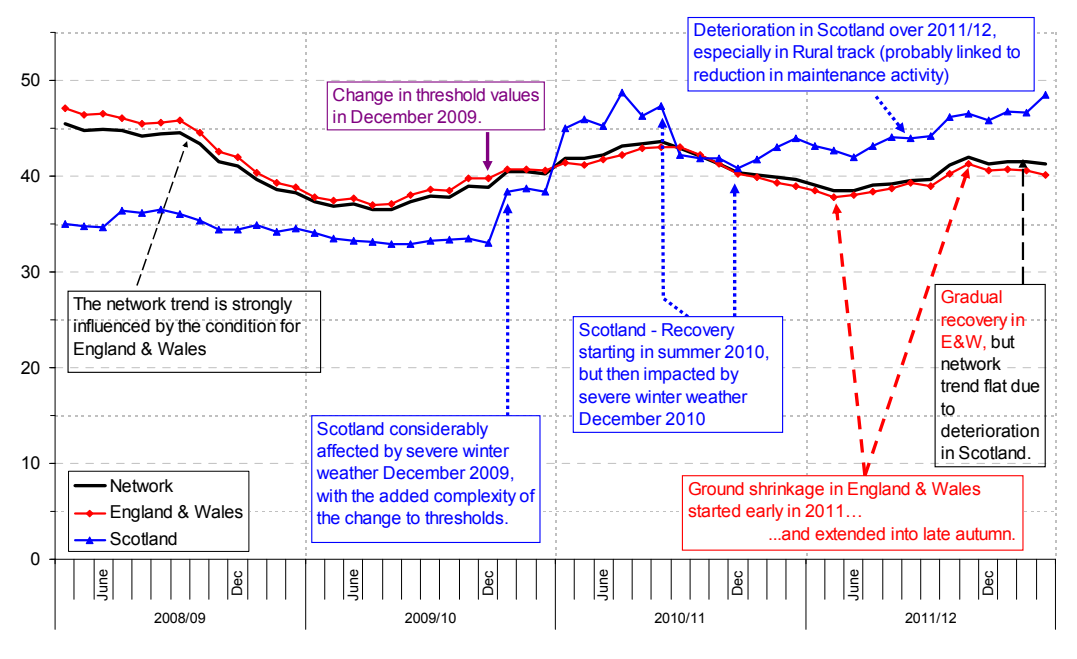


Figure 3.8: Network Geometry Faults per 100km by Region



For the network as a whole, the policy and commitment for CP4 is for a reduction in track geometry faults to 35.9 per 100km. The additional actions and resources to achieve this are being assessed.

The reporting of immediate action geometry faults

As described earlier, there are degrees of severity amongst the different types of fault. The most serious are classified as Immediate Action geometry faults. Actions to address these could be to block the line, impose a speed restriction, and/or correct within 36 hours. We have plans to produce a regular trend analysis of these particular faults. In order to do this in a consistent manner we need to enhance our current I.T. systems. Once these enhancements are completed, we will report the Immediate Action geometry faults in the Annual Return.

Track buckles

Definition

A track buckle is a track deformation, primarily caused by thermal expansion in the rail, which renders the line unfit for the passage of trains at line speed. The remedial work may consist of adjusting or cutting rails or slewing the track.

Results

Table 3.12 provides the number of track buckles per 100km of track for England & Wales, Scotland and for the whole network.

Commentary

A total of 12 track buckles occurred in 2011/12, a substantial improvement over the 29 buckles recorded in 2010/11. There were two significant factors behind this improvement; planned, preventative action and fewer hot days.

In a drive to reduce track buckles an enhanced programme of preparation work was undertaken early in spring 2011. This was supported by the publication and extensive briefing of a new guidance document for hot weather preparation and the management of track during hot weather. These actions were based on a detailed study into the underlying causes of the buckles that occurred in 2010/11. The effectiveness of the preparations was tested by the unusually hot conditions experienced in April 2011. For central England, Met Office records show that it was the warmest April for over 350 years, with daily maximum temperatures well above average (by as much as 6°C). A maximum temperature of over 20ºC was recorded on six days, a higher number than in any recent year. Additionally, there was less cloud cover during spring 2011. Reduced amounts of cloud cover will result in higher rail temperatures for equivalent air temperatures. From the experience of previous years such conditions so early in the year would be expected to result in more buckles than the three that did occur, although the number of buckles avoided cannot reasonably be quantified because of the small population and variables involved.

Part of the reduction in the number of buckles is attributable to there being fewer hot days throughout 2011/12. Technical studies show that while all buckles have multiple causal factors, when considering total numbers of buckles, there is a strong correlation to the number of days where the maximum daily temperature exceeds 20ºC. Although April 2011 was unusually hot, temperatures through June, July and August were much cooler than average.

As with 2010/11, the majority of buckles (nine) occurred in jointed track, seven of which had the older style bull head rail. Jointed track is not a modern construction form and generally remains only in low speed, low tonnage routes. Three buckles occurred in track with continuously welded rail (CWR), two of which occurred in tracks with higher speeds and tonnage (track categories 1A and 1). Seven of the buckles occurred in or close to sections of track containing S&C.

The cause of all track buckles is investigated. Of the buckles that occurred during 2011/12, eight involved tight joints or inadequate expansion gaps in jointed track. Two occurred following disturbance to the track system by maintenance or renewal work. One was due to a failure to correctly restore the stress to CWR track following the installation of two new rails at an S&C unit. The remaining buckle was caused by the combined circumstances of sub-standard ballast condition, a misalignment that was generated by heavy freight traffic exiting an industrial site, and an extremely high rail temperature.

As well as there being fewer buckles in 2011/12 than in 2010/11, the derailment risk arising from those that did occur was lower. This is because the buckles were generally of a lower magnitude (less lateral displacement per metre length), and a greater proportion (42 per cent) occurred in locations and/or at temperatures where precautionary speed restrictions had been applied, or watchmen were in place, to reduce the risk to trains should a buckle occur. Many sites across the network are routinely protected by such precautionary measures without buckles occurring. That a higher proportion of buckles in 2011/12 were covered in this way is due to the enhanced programme addressing more sites overall, and the guidance document leading to improved recognition of where the track was at risk of buckling.

Table 3.12: Track buckles per 100 km						
	2006/07	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
England & Wales	0.31	0.01	0.06	0.09	0.10	0.05
Scotland	0.00	0.00	0.05	0.05	0.02	0.00
Network total	**0.27**	**0.01**	**0.05**	**0.09**	**0.09**	**0.04**

Track failures

Definition

This measure reports the total number of train delay incidents that were attributed to track failures on Network Rail owned infrastructure. The measure uses data from TRUST (Train Running System). Track failures are those incidents that have a delay attribution category number of 104A (TSRs due to condition of track), 104B (Track faults including broken rails), and 104C (Rolling contact fatigue).

Results

Table 3.13 provides the number of track failures for England & Wales, Scotland and the combined network total.

Commentary

The general trend of reducing numbers of delay incidents for track failures results from the cumulative effect of improvements to the infrastructure and the inspection and maintenance processes over several years.

For the categories covered by this measure, the majority of incidents of train delay minutes arise from implementing safety precautions where there is a known fault, or where a serious track fault is suspected[1]. These safety precautions include the imposition of speed restrictions or the closure of sections of track, which then forces diversions.

The principal faults involved are:

- broken rails and fishplates;
- serious rail defects that could grow and result in a broken rail;
- track alignment or twist faults that present a risk of a derailment;
- 'rough rides' reported by train crew that are suspected of being a broken rail or geometry fault;
- faults with track components associated with points; and
- sections of aged track where the overall condition means that it is no longer capable of carrying traffic at the standard line speed.

These faults are mostly due to cumulative damage and fatigue over many years of service, or are the result of time-based processes such as corrosion or rotting. There are no quick fixes to reducing failures from such causes. The sustained year-on-year improvements have been achieved through long-term investment in renewal and maintenance of the infrastructure, and from the extension of processes such as rail grinding and train mounted ultrasonic testing of rail. Rail grinding removes shallow cracks and, more importantly, reprofiles the rails so that contact stresses from train wheels are spread more uniformly across the rail resulting in less cracking and the slower growth of any cracks that do form. Regular ultrasonic testing provides earlier detection of any cracks, enabling planned maintenance intervention before they grow to a size that requires safety precautions to be applied. We have been progressively increasing the extent of rail grinding and ultrasonic testing to reduce train delay and whole life cost.

Studies into the rate of crack growth in rail defects have increased engineering knowledge. This has lead to changes in how defects are managed. Over the last three years these changes have contributed to a reduction in the number of defects being classified as sufficiently serious to require speed restriction. Part of the reduction has been brought about by requiring earlier intervention on certain types of defect to prevent them rapidly growing to a size that requires the imposition of a speed restriction. Conversely, some defects with slower rates of crack growth have been recognised as posing a lower risk than previously assessed, and here the rules given in Network Rail standards have been amended to avoid the premature introduction of a speed restriction.

1 Around 12 per cent of delay incidents for track failure are incurred for suspicions that are classified as 'no fault found' after inspection and test at the location of the reported problem.

Other controls on speed restrictions are the processes applied in the management of aged track, especially those sites where a renewal or major refurbishment is planned in the short to medium term. The timing of renewals is important. Renewing too soon wastes useful life, but renewing too late may mean that a speed restriction becomes necessary. All sites that are at risk of requiring a speed restriction are logged in registers. The registers are kept under review and the sites concerned are subject to regular assessment. This process supports planning for the renewal to take place at the optimum time, while sustaining the current line speed by carrying out the appropriate maintenance intervention before it becomes necessary to apply a speed restriction.

The improvements in track geometry achieved over Control Period 3 (April 2004 – March 2009), together with an increased focus on the rectification of 'dipped joints', produced a smoother ride for trains. A smoother ride means that less dynamic load is applied to the track, resulting in less cumulative damage to the track system, especially to rails.

However, over CP4 the adverse effects of extreme weather have led to a general deterioration of track geometry[1]. This will have resulted in some additional dynamic load, but it is too early to know to what extent this will translate to increased numbers of failures in the future. An additional risk is that the increase in traffic levels running on the network will generate a higher level of cumulative damage in a shorter time period and will therefore work against the improvement initiatives that have been applied.

The pattern of track failures in Scotland differs from that seen in other parts of the network. Applying the measure of failure per kilometre, the level of track failure in Scotland is only 56 per cent of that in England and Wales. However, there has been an increase in Scotland for the past two years. This has taken the overall number of failures back to the level seen in the last three years of CP3.

Some of this is associated with the deterioration in track geometry in Scotland, with increases in train delay incidents for geometry faults and 'rough rides' that are treated as suspected rail or track faults until a track inspection is carried out.

Despite the counter pressures of additional traffic volumes, and the adverse effects of extreme weather on track geometry, the plan through CP4 is to further reduce the incidence of delay. This is to be achieved by continuing to apply the current policies, and by introducing new innovations for the inspection and maintenance of rail and track.

Condition of asset temporary speed restriction sites (M4)

Definition

The measure provides an indication of the quality of stewardship of track, structures and earthworks. It identifies the number of sites where asset condition has fallen sufficiently below that required for the route speed and traffic type, to require the imposition of a temporary speed restriction (TSR) or an emergency speed restriction (ESR). The number of unplanned restrictions indicates the number of sites where an ESR or TSR has been imposed for seven days or more due to any degradation in the condition of the asset (track, structure or earthworks). TSRs may be planned for safety and consolidation of works. Sites are excluded where an ESR or TSR has been imposed for less than seven days due to being part of the normal maintenance cycle. Following data cleansing and process improvement, the 2009/10 data has been restated.

Reporting method

Each TSR or ESR (imposed for seven days or more) is recorded on a weekly basis by operating route, by primary and secondary route, and individually for track, structures and earthworks. These reports form the database for the period-end reporting to the ORR, as well as for the M4 Condition of Asset measure.

The annual number of sites is reported by operating route, and individually for track, structures and earthworks. This report separates speed restrictions into 'unplanned' and 'planned' categories. An 'unplanned' TSR also includes an ESR which has been converted to a TSR, a TSR imposed within the 26 week Confirmed Period Possession Plan window, or speed restrictions with no removal plans. A 'planned' TSR refers to

1 See Good Track Geometry, Poor Track Geometry (M3) and Track geometry faults (M5).

any speed restrictions that the train operators are formally aware of through Rules of the Route (ROTR), the Confirmed Period Possession Plan (CPPP) and the Draft Period Possession Plan (DPPP). This means any speed restrictions imposed as part of the yearly renewals programme, all of which are discussed with train operators as part of ROTR discussions. This also means speed restrictions which have been imposed for a while and again which the train operator is aware (through the formal process above) but has dated plans to remove, even if they are in the following year's renewal programme. This explains why some areas have condition speed restrictions shown as planned.

Table 3.14: National Temporary Speed Restriction Summary – Unplanned and Planned

Network total	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
Unplanned	1040	795	902	761	724	450	738
Planned	3,837	3,599	3,648	3,675	1,005	898	1,126
Grand total	**4,877**	**4,394**	**4,550**	**4,436**	**1,729**	**1,348**	**1,864**

Table 3.15: National Unplanned Temporary Speed Restrictions Summary – Total 2011/12

	Classification	*Track*	*Structures*	*SP&C*	*Earthworks*	*Safety*	*Total*
England & Wales	Primary	473	11	0	28	54	566
	Secondary	62	5	1	5	19	92
Scotland	Primary	12	0	0	0	1	13
	Secondary	54	4	0	5	4	67
Network Total	Primary	485	11	0	28	55	579
	Secondary	116	9	1	10	23	159
Grand Total		**601**	**20**	**1**	**38**	**78**	**738**

Table 3.16: National Planned Temporary Speed Restrictions Summary – Total Speeds 2011/12

	Classification	*Track*	*Structures*	*SP&C*	*Earthworks*	*Safety*	*Total*
England & Wales	Primary	726	27	3	30	46	832
	Secondary	69	8	0	1	26	104
Scotland	Primary	60	6	2	0	0	68
	Secondary	114	6	0	1	1	122
Network Total	Primary	786	33	5	30	46	900
	Secondary	183	14	0	2	27	226
Grand Total		**969**	**47**	**5**	**32**	**73**	**1,126**

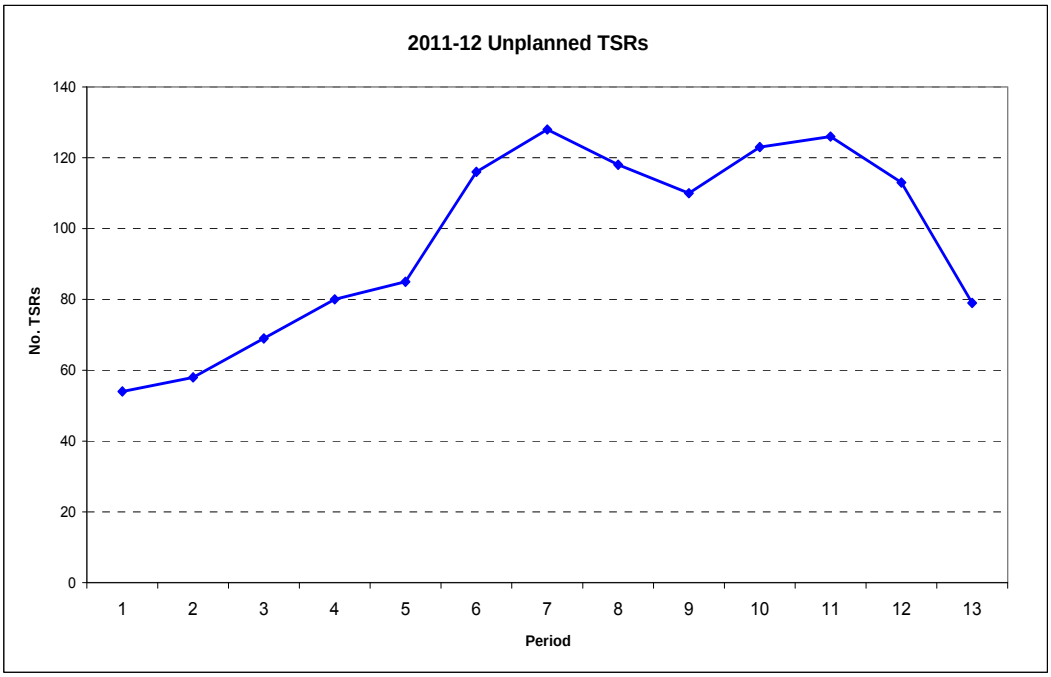
Results

Tables 3.14 to 3.16 summarise the unplanned and planned speed restrictions across the network. Figure 3.9 shows the actual number of unplanned temporary speed restrictions per period. Gauge Corner Cracking (GCC) is no longer included as a separate column in the results table for 'unplanned TSRs' as data has not been reported for this measure since the revised capture and reporting methodology at the start of CP4. GCC is included within the track figures.

Reporting confidence

The data collection process has remained unchanged and was previously awarded a confidence grade of B2 (in 2009) by the previous Independent Reporter for output monitoring. This measure has not been reassessed by the Independent Reporter for output monitoring for this control period.

Figure 3.9: National Unplanned TSRs (no. per Period)



Commentary

The total number of TSRs (planned and unplanned) for the year 2011/12 was 1,864. This represents a 38 per cent increase compared with last year. Planned speed restrictions increased by 25 per cent, and unplanned speed restrictions increased by 64 per cent compared with last year.

In 2011/12, 60 per cent of all speed restrictions were planned TSRs arising through scheduled maintenance and renewals work; these necessary speed restrictions are a reflection of good asset stewardship. Compared with last year, there was a reduction in speed restrictions attributed to structures, whereas speed restrictions attributed to earthworks, safety, signalling power and communications (SP&C) and track all increased.

Track

A combination of factors led to the increase in speed restrictions attributed to track, the most significant of these being the year on year deterioration in track geometry. The other significant factor was the imposition of speed restrictions to protect against the effects of rough ride reports from train operators. When a bump is felt and reported it often has a disruptive effect upon train services. Proactively applying small speed restrictions at known track bump locations minimises the impact the reports have on train performance whilst enabling remedial work to be planned in.

Safety

Network Rail has continued to review safety at level crossings, which has led to a number of additional speed restrictions being imposed. A programme of work was developed to identify and rectify sites where time available for pedestrians was below the recommended level. At sites where immediate remedial work could not be undertaken, speed restrictions were imposed to increase the crossing time available. These are being removed as work to improve the sighting is completed. Additionally, a number of speed restrictions have been imposed in the vicinity of signals, to mitigate against reduced sighting and breaking distances.

Earthworks

Many parts of the railway have experienced drought conditions throughout the year, with soil moisture deficit necessitating a number of speed restrictions in the vicinity of embankments.

Structures

The reduction in structures speed restrictions was largely a reflection of the change in work mix undertaken. The majority of structures speed restrictions are imposed to support bridge reconstruction work. There were fewer of these than last year.

Signalling Power &Communicaitons (SP&C)

Speed restrictions attributed to SP&C are rare (e.g. speed restrictions imposed due to poor signalling design, equipment awaiting renewal). Only six occurred throughout the year.

Earthwork failures (M6)

Definition

This measure reports the annual number of rock falls, soil slips, slides or flows in a cutting, natural slope, or embankment on running lines. Failures causing a passenger or freight train derailment are recorded separately.

Reporting method

All earthwork failures have been reported by the Route Geotechnical teams to the Principal Civil Engineer (Geotechnical), following occurrence and throughout the year. The Principal Civil Engineer (Geotechnical) annual record of failures is checked with each Route Geotechnical Engineer's records for data accuracy at the year end. Relevant incidents which have been reported in the daily national incident log are also peer reviewed, discussed with the Routes and recorded if they fall within the above definition.

Results

The total number of earthwork failures in 2011/12 is 28. This is a considerable improvement on last year's outturn of 42, and continues the steady improvement over the last five years. Table 3.18 shows the number of sites of earthworks failures disaggregated for England & Wales, Scotland, and for the whole network for the past five years.

Reporting confidence

The Earthworks Failure measure was assigned an A2 confidence grade by the previous Independent Reporter for output monitoring. The measure has not been reassessed in CP4.

Commentary

There were no train derailments due to earthwork failures in 2011/12. The total number of earthwork failures for 2011/12 was 28. This is the lowest recorded number of earthwork failures since this measure began. This increased level of asset performance has been achieved through targeted investment and favourable weather patterns. Weather over the last winter has been mild and relatively dry with the exception of Scotland.

Earthwork Condition (M33)

Definition

The measure covers the number of five chain lengths of Earthworks (embankments and cuttings) in the poor, marginal, and serviceable condition rating reported for running lines.

Reporting method

Earthwork condition is reported by five chain lengths for poor, marginal and serviceable condition rating split geographically. Earthwork condition is defined by a soil slope hazard index (SSHI), or a rock slope hazard index (RSHI). The condition bandings are shown in Table 3.19. Site inspections are carried out in accordance with the requirements of the Network Rail company standard for the examination of earthworks. An algorithm is used to produce the SSHI or RSHI scores from the field data gathered as part of the examinations.

Results

Table 3.20 provides the number of embankments, cuttings, and rock cuttings by condition category per five chains for England & Wales, Scotland, and overall network.

Commentary

This is the second year that this measure has been reported in the Annual Return. This report is a snapshot measure of earthwork condition recording the latest asset condition following completion of the annual examination cycle. The current examination standard, which prescribes an objective process to determine the condition grade of earthworks has not yet been applied to all earthwork assets. This will be achieved by April 2015, in accordance with the timescales set out in the company standard. There has been a decrease (improvement) in the percentage of poor condition earthworks from 5.4 per cent to 4.9 per cent between 2010/11 and 2011/12. The reasons for improvement include:

Table 3.18: Earthwork failures

	2004/05	2005/06	2006/07	2007/08	2008/9	2009/10	2010/11	2011/12
England & Wales	43	34	79	99	47	45	29	12
Scotland	11	7	11	8	14	12	13	16
Network Total	**54**	**41**	**90**	**107**	**61**	**57**	**42**	**28**

Table 3.19: Earthwork condition scoring

Earthwork Condition	SSHI Score	RSHI Score	Planned interval (years)	Permitted tolerance in interval (months)
Poor	≥ 10	≥ 100	1	4
Marginal	>6 to <10	>10 to <100	5	6
Serviceable	≤ 6	≤ 10	10	12

Table 3.20: Earthwork condition results per five chains for 2011/12

	Poor	Marginal	Serviceable	Total
England & Wales				
Embankments	4,416	33,473	36,612	74,501
Cuttings	2,064	22,796	26,347	51,207
Rock Cuttings	538	2,673	2,556	5,767
Total	**7,018**	**58,942**	**65,515**	**131,475**
Scotland				
Embankments	643	3,204	13,436	17,283
Cuttings	296	3,029	10,152	13,477
Rock Cuttings	160	1,221	583	1,964
Total	**1,099**	**7,454**	**24,171**	**32,724**
Network totals				
Embankments	5,059	36,677	50,048	91,784
Cuttings	2,360	25,825	36,499	64,684
Rock Cuttings	698	3,894	3,139	7,731
Grand Total	**8,117**	**66,396**	**89,686**	**164,199**

- the investment programme has been directed towards remediating the poorer earthworks; and
- the re-evaluation of poor condition earthworks have re-classified a small number of earthworks from poor to marginal or serviceable condition.

The number of assets and condition profile are sensitive to improvements in data management and collection processes. If the improvement in condition grade in Western and Wales, where there has been a significant volume of evaluation, is considered separately then the overall national condition grade is very similar to last year.

The number of earthwork five chain lengths listed in the examination database has increased from 155,219 last year to 164,199 in 2011/12. This increase in the earthwork asset number is due to the inclusion of assets / examinations in the central 065 database from bespoke route systems and the identification of additional earthworks by use of Light Detection and Ranging (LiDAR) remote sensing surveys gathered by aircraft.

Tunnel condition

Definition

The tunnel condition grade is a measure of the average condition of tunnel bores and tunnel portals. Both are recorded on a 100 point scale, with 100 representing the best condition and

zero the worst condition. The scoring system and resulting score is standardised and termed Tunnel Condition Marking Index (TCMI). The system, which was launched in 2009/10, covers all Network Rail managed tunnels that have brickwork or masonry linings. Scores are derived separately for the tunnel bore (including shaft eyes situated within the bore) and tunnel portal. The unlined sections in 32 tunnels do not attract a TCMI score.

Reporting method

Each tunnel asset is sub-divided into major and minor components. Major components comprise the tunnel bore and tunnel portal. It is the scores for these elements that form the TCMI measure. Tunnel bores are further broken down into 20m lengths termed tunnel sections. It is the average score from each of the tunnel sections that forms the score for a particular bore. Each time a detailed examination of a tunnel is undertaken, all the salient defects are coded for severity and extent. This in turn auto calculates a condition score for the major component. The scores range from100 for the best condition descending to zero for the worst condition. TCMI scores are derived for the major tunnel components of bores and portals separately and are, therefore, reported average condition scores of major components that received a detailed examination during 2011/12.

Further improvements to the reporting measure are planned during the course of 2012/13 to provide a greater level of condition granularity and improve monitoring of the resulting condition profile.

Results

Tables 3.21 and 3.22 show the TCMI scores for England & Wales, Scotland, and the combined network.

Commentary

The detailed tunnel examination reports that generate TCMI were first implemented in September 2009 with delivery to Network Rail commencing in the October 2009. Prior to the TCMI implementation date, tunnels were examined using subjective observation resulting in a tunnel rating of good, fair or poor. With the subjective nature of the former examination process there were limitations in the understanding of the relative condition of the tunnel stock across the country and from one year to the next. TCMI has started to bring about improvements in this area.

In 2011/12 the number of scores for bores reflects the differing frequency of inspections that exist under a risk based examination regime, with a number of tunnels being on two yearly examinations. Similarly, portals have examination frequencies that can vary by up to four yearly and can, therefore, also impact on the number of results obtained in 2011/12.

The average bore scores for England & Wales show a marginal reduction (worsening) in TCMI percentage points compared with 2010/11. This is partly attributable to natural degradation, with the remainder being influenced by variance in the tunnel stock examined. The TCMI average bore score for Scotland has remained virtually static.

The average portal scores for England & Wales and Scotland show a marginal reduction in TCMI

Table 3.21: Tunnel Condition Marking Index score 2010/11

	No. of bore scores out of total bores	*Average bore score*	*No. of portal scores out of total portals*	*Average Portal score*
England & Wales	255 out of 664	88	237 out of 1,192	92
Scotland	40 out of 80	93	54 out of 159	94
Network Average		**89**		**92**

Table 3.22: Tunnel Condition Marking Index score 2011/12

	No. of bore scores out of total bores	*Average bore score*	*No. of portal scores out of total portals*	*Average Portal score*
England & Wales	227 out of 664	86	122 out of 1,192	88
Scotland	69 out of 80	92	56 out of 159	91
Network Average		**88**		**89**

percentage points compared with 2010/11. Again, this is attributable to natural degradation and variance in asset stock examined.

As further TCMI scores are collated over successive years, the ability to make year-on-year comparisons will improve.

Bridge condition (M8)

Definition

The bridge condition grade is a measure from one to five, with one representing good condition and five poor condition. Each bridge is graded from a structures condition marking index (SCMI) value determined using the scoring tool set out in the SCMI handbook. The SCMI process is a marking methodology that grades the condition of each bridge on a 1–100 scale. It involves defining the elements of the bridge, and then determining the extent and severity of defects in each of the elements. The bridge scores are collated into five bands, as defined in Table 3.23.

Reporting method

The reported measure is presented as a distribution graph (Figures 3.10-11) showing the cumulative number of bridges assessed since 2000 on a 1–100 scale. Additionally, bridge mark data is collated into each of the five condition grades, and numbers of bridges reported by band. The dates relate to the period the examination was carried out. SCMI is not normally carried out on Major Structures, footbridges and some assets not deemed suitable for SCMI. These are typically concrete portals and large diameter Armco pipes. Due to the lag associated with submission of examinations, previous year's results are updated at each annual return submission to reflect the corrected position.

Results

Table 3.24 provides the number of bridges assessed for the year and the condition band to which those bridges have been allocated. Following a year of significant examination backlog recovery, there remain around 4,000 additional results to upload into the SCMI system. The numbers of assets within each band over the last six years differ from those previously reported. This is due to a data cleansing exercise that has been undertaken during the course of 2011/12, involving removal of some erroneous entries and concatenation of previously reported results at bridge span level to bridge asset level. Within the accuracies of the condition scoring system, the average condition grade of the bridge asset stock remains constant at 2.1.

SCMI distribution

The distribution of the different materials indicates that metallic structures have the lowest condition, which is one of the primary reasons for the increase in the volume of underbridge works referred to in Section 4 – Activity Volumes. The peak of SCMI score for masonry bridges at around 70 is due to the high proportion of assets with brick face spalling and loss of pointing. There appears to be a small anomaly in the scoring system that gives a disproportionate number of bridges a score of 70. This anomaly will be investigated further during 2012/13 and improvements made to the system where required.

Uses of SCMI outputs

SCMI was originally introduced to promote an objective examination process and reduce the subjectivity that previously existed with the good/fair/poor reporting system. The global score is generated from an algorithm and is used as an overall measure. The global score is considered useful when applied to a population of assets is primarily used as a trending tool.

SCMI is now being used for several management processes. On an individual asset it is used as part of a risk assessment to set detailed examination frequencies. Component scores are used to highlight areas of concern. The SCMI data has been extensively used to identify structures with particular generic features. This assists with improved risk management on a network-wide basis.

Reporting confidence

The confidence grades assigned by the previous Independent Reporter for output measures were C3. However, there has been no assessment of this measure in the current control period.

Second phase reports

There have been circa 9,000 second phase examinations with SCMI scores. During 2011/12 further analysis of this data has been undertaken to derive indicative deterioration rates for three primary material types of masonry, metallic and concrete. This is being utilised to estimate long term asset condition profiles and support future funding requirements.

The proportion of multi phase reports are shown in Figure 3.12. Again, the data cleansing

exercise undertaken during 2011/12 has resulted in corrections to previously reported multi phase SCMI scores. The graph indicates assets receiving a first time score has now levelled off as this first time scoring of assets approaches completion.

Table 3.23: Structures Condition Marking Index (SCMI)

Condition bands	*Condition score (the higher the core the better)*
1	100–80
2	79–60
3	59–40
4	39–20
5	19–1

Table 3.24: Bridge condition index results

Bridge Condition Grade	*Equivalent SCMI Value*	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
1	80–100	728	605	516	453	383	293	223
2	60–79	3,033	2,527	2,168	2,243	1,794	1,649	1,408
3	40–59	1,250	888	781	832	667	722	663
4	20–39	107	94	70	90	84	89	113
5	1–19	4	5	1	4	4	3	8
Total no. examined		**5,122**	**4,119**	**3,536**	**3,622**	**2,932**	**2,756**	**2,415**
Average condition grade		**2.14**	**2.07**	**2.08**	**2.09**	**2.09**	**2.09**	**2.10**

Figure 3.10: 2011-12 SCMI score distribution – 27,279 structures

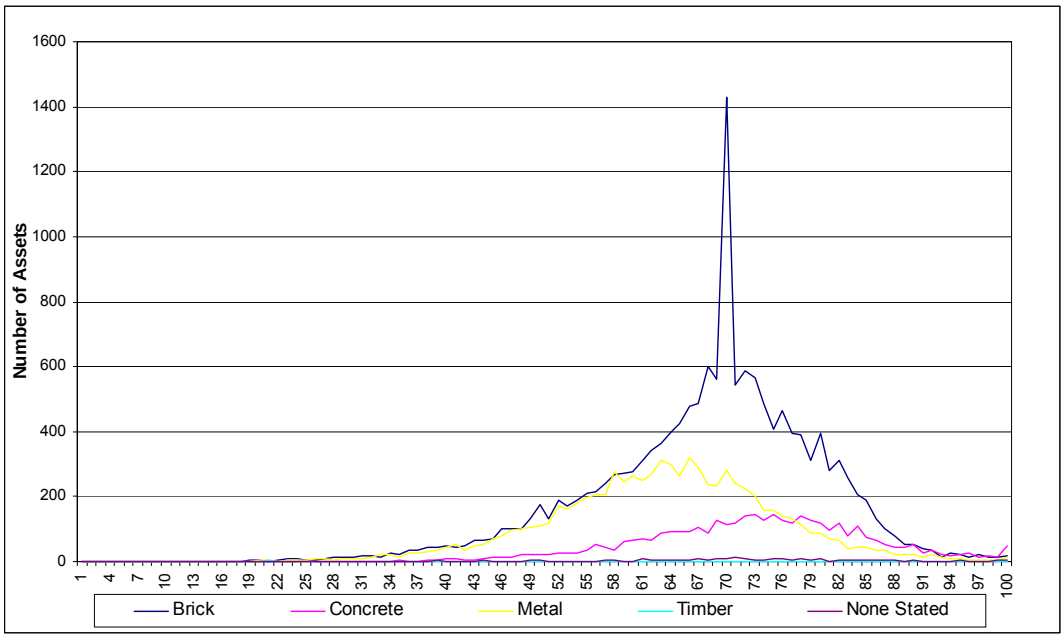
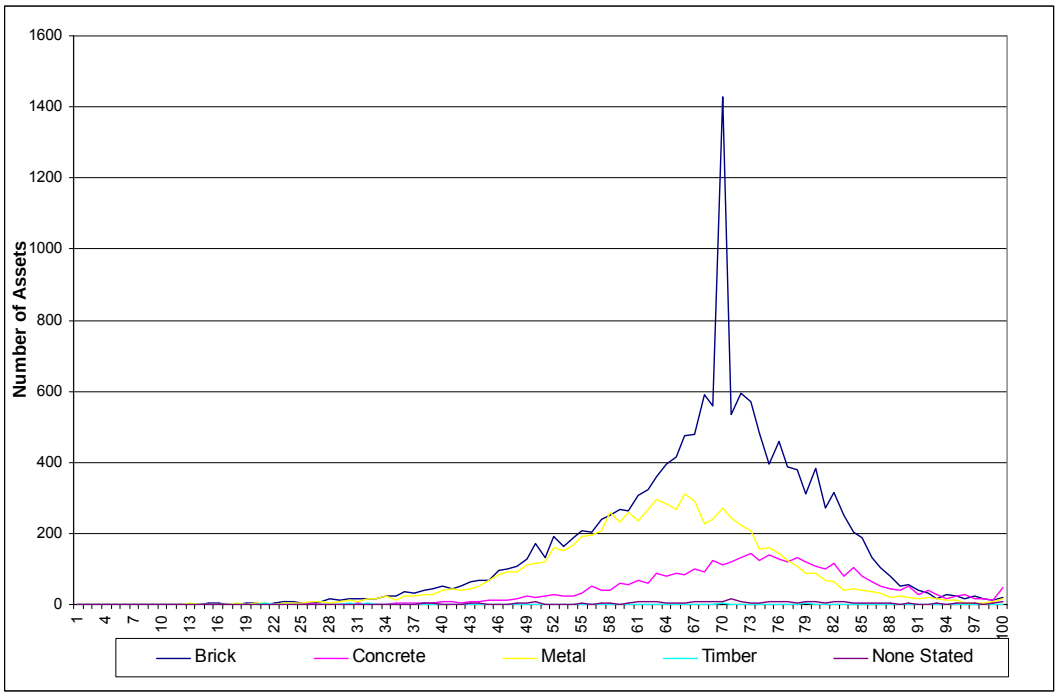


Figure 3.11: 2010-11 SCMI score distribution – 26,758 structures



Commentary

During the course of 2011/12 significant SCMI data cleansing has taken place. This has resulted in removal of some duplicate items and concatenation of previously reported bridge scores at span level to bridge asset level. In order to enable a comparison with previous year's reports the data cleansing has been applied retrospectively to data previously reported.

Figure 3.12 illustrates the emerging condition profile over time. Following the introduction of SCMI in 2000, there followed a period of scoring all bridge assets as part of a first cycle. This process continued through until 2008/09 at which point the majority of bridge assets had an initial SCMI score. The apparent fluctuating trend of condition during the first 8 years is a function of the order in which the asset stock received a condition score. From 2009/10 onwards the numbers of assets receiving a first time score was diminishing and the condition profile has remained virtually static within the overall accuracies of the scoring method. An area of focus for the next twelve months will be the continued analysis of SCMI data and system to further improve asset management processes.

Figure 3.12: SCMI score distribution – 2nd Phase vs Total

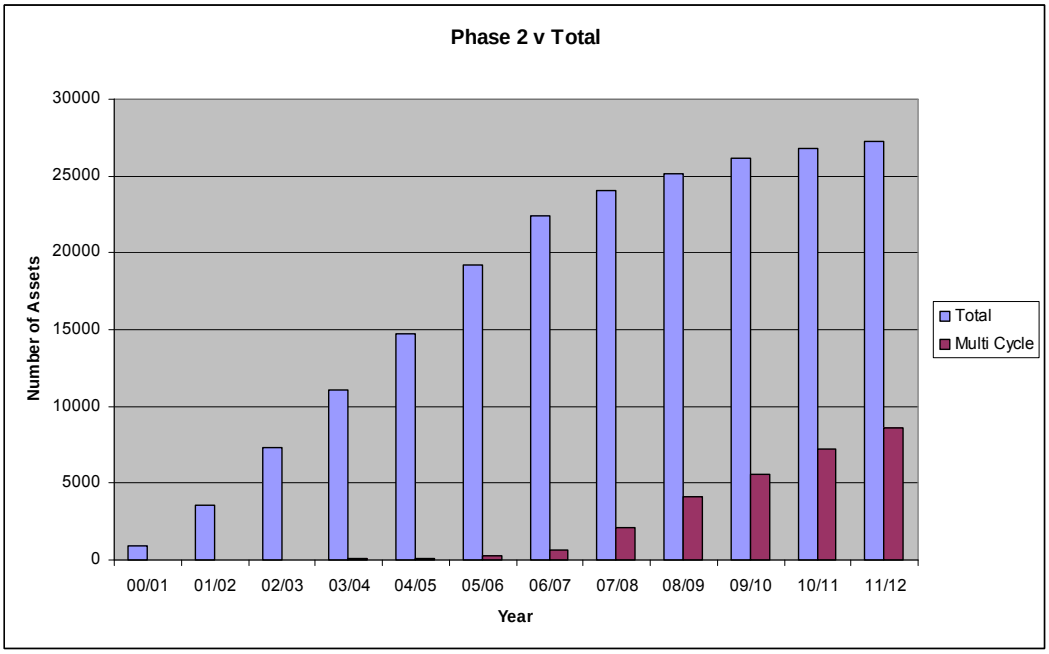
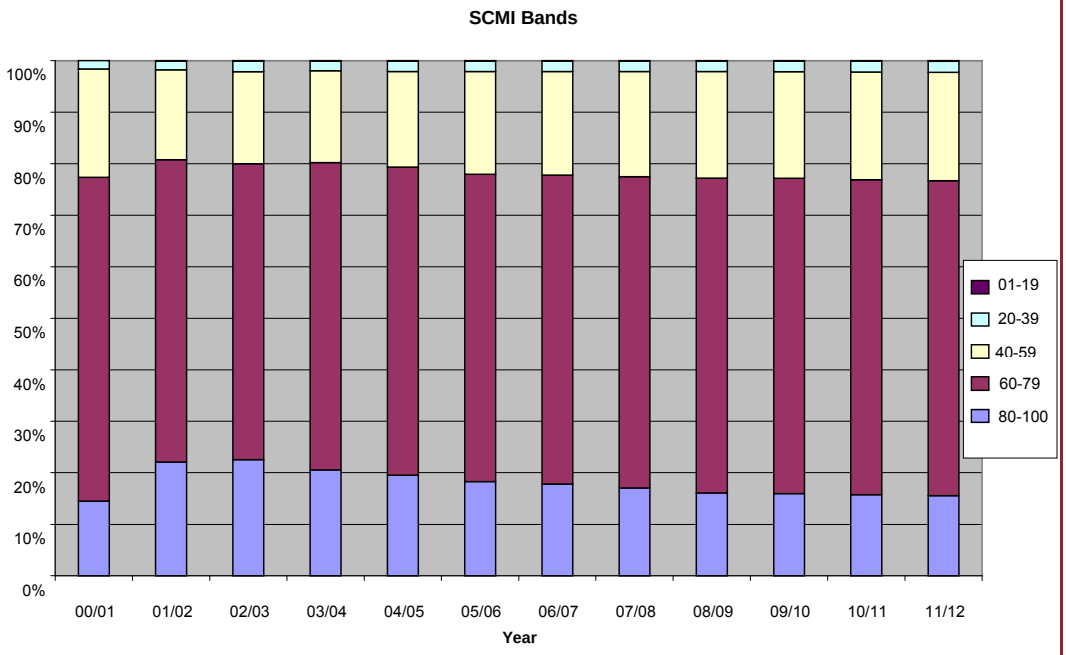


Figure 3.13: SCMI score distribution – trends



Signalling failures (M9)

Definition

This measure reports the total number of signalling failures causing a cumulative total train delay of more than ten minutes per incident, and only includes failures on Network Rail owned infrastructure.

Table 3.25: Number of signalling failures (> 10 mins)

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
England & Wales	21,982	20,547	20,046	17,754	17,500	16,325	14,874	14,050
Scotland	2,968	2,843	2,696	2,170	2,107	1,999	1,627	1,588
Network Total	**24,950**	**23,390**	**22,742**	**19,924**	**19,607**	**18,324**	**16,501**	**15,638**

Table 3.26: Number of signalling failures (> 10 mins) per million train km

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
England & Wales				43	39	33	30	28
Scotland	63	59	54	49	43	38	30	28
Network Total	**63**	**48**	**46**	**43**	**39**	**34**	**30**	**28**

Reporting Method

The data was compiled from TRUST (Train Running System) and shows the number of signalling failures where train delays in excess of ten minutes have been recorded. This data was merged with the reported train mileage then allocated to the business operating routes.

Results

Tables 3.25 and 3.26 show the total number and the number per million train kilometres of signalling failures per year for England & Wales, Scotland and the network.

Commentary

Network Rail continues to target improvements to its infrastructure performance as part of its overall aim of increasing train punctuality levels. Part of the improvement is focussed upon the reduction in signalling failures causing more than ten minutes delay. There has been a 5.2 per cent improvement (15,638 for 2011/12 compared with 18,323 in 2010/11). Following the success of the previous year, Route based asset management teams and the National Infrastructure Reliability Team have been instrumental in targeting a number of failure modes and trends, and implementing initiatives designed to drive sustainable improvements to the reliability of signalling and other assets.

Throughout the year, Network Rail has benefitted from specific reliability improvement plans and increased development and deployment of intelligent infrastructure systems. These will continue to strengthen our capability to proactively identify degrading asset capability thereby avoiding potential service impacting failures.

A renewed focus at the start of 2012/13 with maintenance service campaigns such as the Introduction of Teflon Lubricant for Points and the Elimination of IRJ Failures seek to build on last years success in order to sustain the continual decline in failure numbers, increase infrastructure reliability and make these have a positive impact on the industry's long distance train performance.

Signalling asset condition (M10)

Definition

The purpose of this measure is to assess the condition of signalling assets in terms of a 1 - 5 grading system, where a condition grade of 1 is good and 5 is poor. Condition grade is based on residual life of the equipment in a signalling interlocking area using the signalling infrastructure condition assessment (SICA) tool. While the assessment is dominated by the condition of the interlocking, the condition of lineside signalling equipment is also taken into account.

Reporting method

This Annual Return has been collated from the Signalling Infrastructure Condition Assessment (SICA) records stored in the Signalling Schemes Asset Data System (SSADS). This allows improved visibility of the results from SICA surveys, produces up to date SICA assessment schedules for the Route's use and has multiple reporting functions.

The total population of interlockings on Network Rail infrastructure is 1,630. Of these, 76 do not have a current SICA assessment as they have been renewed within the last five years. This

shows that Network Rail has 100 per cent SICA coverage. The overall average condition score for interlockings at the end of 2011/12 is 2.38. This number includes the 22.5 per cent pessimism factor currently reported for all primary SICA assessments. The pessimism factor is currently under discussion with the ORR and if it is agreed that it is no longer included then the average interlocking condition would be reported as 2.22.

The total population of signalled level crossings requiring a SICA assessment on Network Rail infrastructure is 1,588. Of these, 42 do not have a current SICA assessment as they have been renewed within the last five years. This leaves a balance of 1,546 level crossings with a valid SICA assessment which again shows that Network Rail has 100 per cent SICA coverage. The overall average condition score for level crossings at the end of 2011/12 is 2.25. This number includes the 22.5 per cent pessimism factor currently reported for all primary SICA assessments. As noted previously the pessimism factor is currently under discussion with the ORR. If removed the average level crossing condition would be reported as 2.08.

Reporting confidence

Reporting confidence has been assigned as B2 by the previous Independent Reporter for output monitoring. This measure has not been reassessed in the current control period.

Results

Tables 3.27 and 3.28 provide the number of interlocking areas with a SICA assessment condition grades from 2004/05 to 2011/12 for the whole network and a breakdown of the signalling condition index grades for 2010/11 and 2011/12 for England & Wales, Scotland and the whole network. Table 3.29 shows the total number of level crossings, the number surveyed and the assigned condition grades for England & Wales, Scotland and the combined network.

Commentary

The interlocking condition index has seen a slight improvement in the current year to 2.38 compared with 2.41 in 2010/11. This is slightly better than our CP4 Delivery Plan update 2011 target of 2.39. This reflects the completion of all planned renewal interventions within expected timescales.

Table 3.27: Total number of interlocking areas with a SICA assessment at end of each financial year

Condition grade	*Observed nominal residual life (in years)*	*2004/05*	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
1	>20	5	8	3	5	9	89	68	83
2	10 to 20	782	1,024	965	1,022	1,030	935	876	863
3	3 to 10	626	530	520	518	546	590	673	664
4	<3	97	51	20	15	24	24	21	15
5	At end of life	0	0	14	15	13	22	8	5
Average condition grade		**2.5**	**2.39**	**2.39**	**2.38**	**2.39**	**2.37**	**2.41**	**2.38**
Total number graded		**1,510**	**1,613**	**1,522**	**1,575**	**1,622**	**1,660**	**1,646**	**1,630**

Table 3.28: Signalling condition index

Condition grade	*1*	*2*	*3*	*4*	*5*	*Total 2010/11*	*1*	*2*	*3*	*4*	*5*	*Total 2011/12*
England & Wales	61	774	606	19	8	1,468	79	762	594	12	5	1,452
Scotland	7	102	67	2	0	178	4	101	70	3	0	178
Network Total	68	876	673	21	8	**1,646**	**83**	**863**	**664**	**15**	**5**	**1,630**

Table 3.29: Level Crossing condition index 2011/12 year total							
	Total LX Population	*Total LX Surveyed*	*Condition grade*				
			1	*2*	*3*	*4*	*5*
England & Wales	1,483	1,443	95	946	436	5	1
Scotland	105	103	2	57	44	2	0
Network Total	**1,588**	**1,546**	**97**	**1,003**	**480**	**7**	**1**

Points failures

Definition

This measure covers the total number of points failures resulting in disruption to train services.

Reporting Method

The data was compiled from the train running system (TRUST) and shows the number of points failures recorded.

Results

Table 3.30 shows the total number of points failures per year for England & Wales, Scotland and the whole network.

Commentary

The number of points failures impacting on train services fell again by 648, a reduction of 11 per cent on 2010/11. Key actions influencing this improvement have been the implementation of remote condition monitoring on over 5,000 point ends, the introduction of new lubricants and trialling new methods of S&C measurement and rectification. However, the introduction of the Reliability Centred Maintenance (RCM) programme was delayed. This is a major reason for the improvement being insufficient to meet the target for the year.

Table 3.30 Points failures - 2011/12			
	DPu2011	*2011/12*	*Variance*
England & Wales	n/a	4,607	n/a
Scotland	n/a	559	n/a
Network Total	**4,420**	**5,166**	**746**

Train detection failures

Definition

This covers a combination of track circuit failures and axle counter failures.

Reporting method

The data was compiled from TRUST and shows the number of train detection (track circuit and axle counters) failures recorded. All track circuit failures are also reported in the fault management system (FMS) and are allocated to delivery units (Routes). FMS is used to manage failures and produce data on the reasons for equipment failure. The reported values allow for any minor errors in attribution of data between Routes within the overall value given.

Results

Table 3.31 shows the total number of train detection failures per year for England & Wales, Scotland and the network.

Commentary

Track circuits and axle counters showed a combined improvement of six per cent. Track circuits improvements were influenced by the production of the insulated block joint (IBJ) guide to address a significant failure mode. This brought together information on the installation, management and repair of IBJs. Work on spares stock management and the spreading of best practice for specific track circuits has improved reliability.

Table 3.31 Train detection failures - 2011/12			
	DPu11	*2011/12*	*Variance*
England & Wales	n/a	4,421	n/a
Scotland	n/a	502	n/a
Network Total	**4,973**	**4,923**	**50**

Telecoms condition

Definition

This is a measure assessing the overall average condition of operational concentrator assets based on the observed asset condition and utilises the prioritisation factor generated by each asset specific assessment in the Telecoms Decision Support Tool (DST).

Individual asset scores are weighted against condition, maintainability, operability and reliability. The values are multiplied together in the DST to give a prioritisation factor which is then used to recommend the course of action to be taken for the particular asset. The prioritisation factor for the individual assets is interpreted as:

- Less than one - would lead to a reduction in remaining life;
- Equal to one - would have no impact on remaining life;
- Greater than one - would lead to an extension of the remaining life.

This means that the higher the number, the better the individual condition of the asset.

Reporting method

Asset condition inspections are carried out as part of the asset inspection regime. The output of these inspections is then input into the DST which determines the prioritisation factor and, when combined with the number of assets, derives the asset condition value.

Results

Table 3.32 shows the 2011/12 telecoms condition rating compared with the DPu11 target.

Commentary

The Telecoms Asset Condition measure was developed in 2008/09 to include Telecoms within the overall Network Rail KPI for Asset Stewardship. The measure has been used across CP4 to determine overall condition of operational assets that have a direct impact on the operational railway. The measure currently excludes a number of assets such as SISS or FTN/GSM-R network assets.

The Telecoms Asset Condition results for 2011/12 are ahead of target at 0.95 reflecting the stable level of investment in the operational concentrator assets across CP3 and into CP4. The concentrator systems have also benefited from the ability to replace, through a partial renewal, the Human Machine Interfaces (HMI) used by the signaller, which has improved overall asset condition.

Table 3.32: Summary Telecoms Asset Condition

Telecoms	*DPu11*	*2011/12*
Telecoms condition	0.89	0.95

Telecoms failures

Definition

This covers the total number of Telecoms incidents or failures causing train delay of more than ten minutes.

Reporting method

The information is derived from delay information sourced from TRUST that is attributed to assets via FMS. TRUST provides data for each recording point on the network and all information on current delay is ultimately sourced by the TRUST database.

Results

Table 3.33 shows the number of telecoms failures causing train delay of more than ten minutes from 2005/06. Table 3.34 shows the 2011/12 result against the DPu11 target.

Commentary

Telecoms failures greater than ten minutes ended with a total of 633 train delay attributed failures against a target of 661, which represents a four per cent improvement against target. This level of improvement in asset performance was attained in part from the ongoing programme of asset improvement initiatives. There are currently 22 telecoms initiatives of which nine have already been completed. These initiatives vary from

resilience in power arrangements at key sites, identification and management of network pinch points that could cause loss of service, to asset life extension through minor modern form changes.

One such initiative driving a performance improvement for telecoms has looked at telephone installations at the 30 worst performing user worked crossings. The analysis of the faulting data has demonstrated that by replacing the crossing telephones at these sites there has been an overall reduction in faults from 129 to 42 across a years worth of data. This initiative is now being applied across a second batch of selected crossings.

Further work streams being taken forward include monthly reviews of repetitive failures and applying either further investigation analysis or action plans to the top five worst performing assets for each route as well as the hardening of locations or assets identified as being within high vandalism or theft areas.

This measure predominantly reports incidents or failures on operational and network assets since SISS rarely has operational impact. A high number of telecoms specific failures are from telephone crossing faults leading to the cautioning of trains or from cable faults some of which is attributable to cable theft.

With both the FTN and GSM-R networks in an advanced state of deployment, handover and operational readiness and the growing adoption of GSM-R for in-cab voice communication, it is likely that we could see more failures in this area reflecting the higher number of assets and the criticality of service. Some initial analysis on current GSM-R failure data has demonstrated that as the core systems have matured and with a growing operational capability and competence, the number of failures experienced on the GSM-R network has been reduced with the growing overall asset population. This trend needs to be maintained over a challenging period of core system upgrades and the integration of further base stations into the network configuration.

Table 3.33: Number of Telecoms Failures (>10mins)

	2005/06	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
England & Wales	680	743	758	687	651	554	529
Scotland	87	79	115	130	119	135	104
Network total	**767**	**822**	**873**	**817**	**770**	**689**	**633**

Table 3.34: Number of Telecoms Failures (>10mins)

	DPu11	*2011/12*
Network total	**721**	**633**

Alternating current traction power incidents causing train delays (M11)

Definition

This measure reports the number of overhead line equipment (OLE) component related failures that lead to incidents that cause delays exceeding 500 train minutes. Incidents due to bird strikes and vegetation incursion are included but those proved to have been caused by defective train equipment, outside parties, vandalism and those arising as a direct result of extreme weather conditions are excluded.

Reporting method

The Asset Reporting Manager (ARM) monitors the failures reported in the Daily National Incident Report and at each period end the summary is sent to the mechanical and electrical (M&E) Maintenance Support Engineers for their review and verification. They investigate the cause of each traction power incident, and the verified figures are provided back to the ARM.

Results

Table 3.35 shows the proportion of identified root causes of AC traction power incidents causing train delays. Table 3.36 shows the annual number of AC electrification (overhead line

equipment) failures in England & Wales, Scotland, and the network total.

Reporting confidence

This measure was assigned a B2 confidence grade by the previous Independent Reporter for output monitoring. The measure has not been reassessed in this control period.

Commentary

During 2011/12 there were 50 incidents, down from the 61 incidents of the previous year. The overall trend is showing an improvement.

There has been a wide range of route-focused efforts to address the root causes of incidents and failures. These include undertaking programmes of condition based OLE renewals, campaign change items, and defect removals.

Delivery Units in London North Western (LNW) South have been carrying out enhanced high level inspection during which many defects have been identified and rectified. Bird strikes and vegetation has caused multiple catenary stranding, some of which has been discovered in trombone fittings. Heavily polluted insulators in tunnels have been replaced to mitigate the risk of tracking thus leading to short circuit failure. Stranded catenary wire in tunnels has been replaced with contenary. This regime has significantly reduced the number of incidents leading to catastrophic asset failure (dewirements).

During the winter months some areas were subject to snow and heavy build up of ice. The extreme cold weather led to tracking and burning of certain conductors which caused isolated dewirements. The overhead line is most vulnerable in tunnels due to ice formation. Therefore a strategy was adopted for managing seasonal events which mandates daily patrols, icicle removal in tunnels and low clearance structures.

Previously unidentified deficiencies in the MK1 OLE system have now resulted in remedial work programmes to verify the extent of these design problems and to eliminate them. In other areas the number of incidents has been reduced largely due to ongoing renewals investment.

Table 3.35: Root causes of failure

Asset Condition	32%
Equipment Design	30%
Construction Delivery	14%
Maintenance Delivery	12%
Maintenance regime	2%
Other	10%

Table 3.36: Electrification failures: overhead line

	2004/05	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
England & Wales	65	43	64	58	64	43	56	46
Scotland	6	6	5	5	2	3	5	4
Network total	**71**	**49**	**69**	**63**	**66**	**46**	**61**	**50**

Direct current traction power incidents causing train delays (M12)

Definition

This measure reports the number of conductor rail component related failures that lead to incidents of duration exceeding 500 train delay minutes. It excludes incidents caused by defective train equipment, outside parties, vandalism, animals and those arising as a direct result of extreme weather conditions.

Reporting method

The Asset Reporting Manager (ARM) monitors failures reported in the Daily National Incident Report and at each period end the summary is sent to the M&E Maintenance Support Engineers

for their review and verification. They investigate the cause of each traction power incident, and the verified figures are provided back to the ARM for collation.

Results

Table 3.37 shows the proportion of identified root causes of DC traction power incidents causing train delays. Table 3.38 shows the annual number of DC (conductor rail) electrification failures.

Commentary

There were 16 incidents during 2011/12 which was the highest figure in the last seven years.

However, the number of 300-minute incidents was significantly reduced.

The main cause of failures was, primarily, DC cable components. Increased train loads, particularly on Class 395 routes, have accelerated asset degradation and failure rates. However, redesigned and new components were made available to improve the position. There are also proposals for the re-enforcement of electrical track equipment on certain lines during CP5. Conductor rail joint failures are currently being managed by renewal or the welding of joints with approximately five per cent of the remaining population in the Sussex route to be addressed during CP4.

Table 3.37: Root causes of failure

Asset Condition	56%
Equipment Design	13%
Construction Delivery	6%
Maintenance Delivery	6%
Maintenance regime	6%
Other	13%

Table 3.38: Electrification failures: conductor rail

	2004/05	*2005/06*	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*
England & Wales	13	6	11	9	14	14	14	16
Scotland	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Network total	13	6	11	9	14	14	14	16

Electrification condition – AC traction feeder stations and track sectioning points (M13)

Definition

This is a measure of the condition of alternating current traction feeder stations and track sectioning points, on a scale of one to five, based on visual inspection and age, robustness of design, maintenance / refurbishment history and operational performance of the 25kV switchgear:

- Band 1: equipment is free from defects with negligible deterioration in condition;
- Band 2: evidence of minor defects and/or early stage deterioration that may require some remedial work to be undertaken;
- Band 3: defects and/or a level of deterioration that requires remedial work to be undertaken;
- Band 4: significant defects and/or a high level of equipment deterioration needing major repairs / heavy maintenance or complete renewal to be programmed; and
- Band 5: serious defects and deterioration of a level that, should the equipment still be in operation, has potential for service disruption.

The condition measure reports the percentage of feeder stations and track sectioning points falling within each of the defined condition grades.

Reporting method

The national report has been produced in accordance with the Network Rail Standard, first published in September 2009. The condition assessments are carried out through a combination of visual inspections and measurements at 25kV switchgear feeder stations and traction sectioning points. The condition assessment grade is a result of

weighted pre-determined questions that consider the robustness of the installation, fitness for purpose, and maintainability. The measure takes advantage of in-house maintenance and developments in technology to allow an element of non-intrusive measurement to be made. This reduces the subjectivity within the assessment.

Results

Table 3.39 provides the number and the percentage of alternating current traction feeder stations and track sectioning points within each of the condition bands for England & Wales, Scotland, and the overall network.

Commentary

The score in 2010/11 was 2.56 and this has slightly degraded to 2.57 in 2011/12. This slight decrease hides the significant improvement in the number of "poor" condition assets (condition grade 4 and 5). In 2010/11 this accounted for 24 per cent of the total but this has reduced to only 12 per cent of the total in 2011/12.

The change in condition score was not significant for some routes but deteriorating condition of the equipment in a single area primarily contributed to the deterioration in condition score in London North Eastern (LNE) from 1.99 to 2.27. This situation will improve as the equipment is replaced / refurbished in CP4 and CP5.

Improvements in condition were reflected on particular parts of the network due to the renewal of some of the 1958 oil switchgear with 25kV GIS. Also as part of the "Power Supply Upgrade" project some assets have been decommissioned and replaced with new substations and switchgear.

Scotland showed a significant improvement of 0.43 to 2.13. The main reason for the change is the inclusion of the electrification project from Airdrie to Bathgate, changing the age profile of the Scottish assets.

Table 3.39: Electrification condition – AC traction

	England & Wales		*Scotland*		*Network total*	
Condition grade	**No.**	**%**	**No.**	**%**	**No.**	**%**
1	33	13%	14	30%	47	16%
2	61	24%	19	40%	80	27%
3	124	49%	13	28%	137	46%
4	31	12%	1	2%	32	11%
5	2	1%	0	0%	2	1%
Average condition grade				2.13		2.57

Electrification condition – DC traction substations (M14)

Definition

This is a high level measure of the condition of direct current traction substations including track paralleling locations on a scale of one to five, based on visual inspection and the age, robustness of design, maintenance / refurbishment history and operational performance of the equipment. One indicates that the assessed equipment is in good condition with negligible deterioration whereas a measure of five indicates that the assessed equipment has significant deterioration and has the highest potential to disrupt train operations. A measure of two, three or four indicates intermediate conditions.

Reporting method

The national report has been produced in accordance with a Network Rail Standard. The condition assessments are done through a combination of visual inspections and measurements at feeder stations and traction sectioning points. The condition assessment grade is a result of weighted pre-determined questions that consider the robustness of the installation, fitness for purpose and maintainability. The measure takes advantage of having maintenance in-house and developments in technology which allows an element of non-intrusive measurements and therefore reducing the subjectivity within the assessment. The age and life expectancy of the equipment has also been incorporated into the scoring system for the first time.

Results

Table 3.40 illustrates the number of kilometres and proportional percentage of direct current substations for England & Wales, and the network total. There are no DC traction substations in Scotland so the England & Wales results are also the network results.

Commentary

There is a population of 672 DC substations. The score reported represents an average of the last available scores for each location that has had a condition assessment. The average condition score for 2010/11 of 2.37 was based upon a population of 291 units. The average condition grade of 2.45 for 2011/12 is a deterioration of the previous value but more correctly reflects the condition of the overall asset population.

In routes where there is a very small asset count the annual scores can be subject to significant variation depending on which location has had a condition assessment.

Equipment obsolescence is one of the main reasons for the deterioration in the scoring.

However, it is anticipated that the condition score will improve following planned equipment renewals in CP4. Where elements of renewal have taken place within the last 12 months but some assets are degrading gradually this mix is reflected in little change in the overall results for that route. Recent renewals of switchgear and transformer/rectifier are reflected in the improvement in condition for the Wessex route. Other factors in the worsening of the overall results for 2011/12 included a slight deterioration due to a delay in the scheduled delivery of certain elements caused by the complexity of the previous system design and changes in delivery strategy. These issues are now resolved and delivery of the shortfall has been reprogrammed into 2012/13.

Additionally, increased loadings on equipment, such as on the Brighton Main Line, is accelerating the decline in condition at some sites on the Sussex Route. There have also been some process errors in condition measurement experienced but further CP4 renewals are planned and CP5 proposals being reviewed to identify and address the assets affected.

Table 3.40: Electrification condition – DC traction

	England & Wales		*Scotland*		*Network total*	
Condition grade	***No.***	***%***	***No.***	***%***	***No.***	***%***
1	25	9	n/a	n/a	25	9
2	141	48	n/a	n/a	141	48
3	98	34	n/a	n/a	98	34
4	20	7	n/a	n/a	20	7
5	7	2	n/a	n/a	7	2
Average condition grade		2.45		n/a		2.45

Electrification condition – AC traction contact systems (M15)

Definition

This is a high level measure of the condition of Network Rail's AC contact systems, on a scale of one to five, based on physical wear of contact wire and visual inspection of key components including the contact and catenary wires, registration assemblies and structures. A condition grade of one is good and five is poor. This measure excludes all earthing, bonding and traction return circuits.

Reporting method

For this measure a condition assessment is undertaken of the overhead line equipment (OLE). During the reporting year there was a change in the process for reporting the condition assessments. The new system takes the information from Ellipse – a corporate asset database. This allows the use of a much larger data sample than before. The score reported is an average of the last five years data. The condition grade is as detailed in reporting methods for M13 and M14 above.

Results

Table 3.41 shows the number and percentage of the AC contact systems within the five condition grades.

Commentary

Last years condition assessment summary showed the condition profile distorted with nearly all of the assets being classed as condition grade 1 or 2, this was clearly not representative of the total population. This profile of the assets has changed to the current, more realistic, profile which has resulted in a very minor degradation of the condition from 1.6 to 1.62.

There has been a change in the assessment methodology with Ellipse data collected during routine patrols being used to determine the asset condition score. This is a different method from previous years so the data is not directly comparable with 2010/11. This change in methodology has facilitated an increase in the asset condition submissions with a larger amount of data captured and processed. The volumes include a mixture of data from sidings, new project sites, main lines and depots. The existence of new technology (Overhead line pole mounted camera) has made it easier for the teams to capture and record wire wear thus more assets scores have been submitted.

Although the sample of OLE that was condition scored during 2011/12 is still not fully representative of the total age profile within all Routes a more representative sample will be undertaken during 2012/13 to cover the smaller coverage in Anglia.

For Scotland the result is now 1.58. Previously there was a lack of asset condition data for OLE from the old data collection methodology. However, this has now provided Scotland the opportunity to review the way it monitors and reports asset condition data and a new methodology of asset condition assessment, in line with England & Wales, is being adopted for future years.

Table 3.41: Electrification condition − AC traction contact system 2011/12 year total

	England & Wales		*Scotland*		*Network total*	
Condition grade	***No.***	***%***	***No.***	***%***	***No.***	***%***
1	628	73	4	5	632	67
2	140	16	76	92	216	23
3	70	8	3	4	73	8
4	18	2	0	0	18	2
5	4	0	0	0	4	0
Average condition grade		1.62		1.58		1.62

Electrification condition – DC traction contact systems (M16)

Definition

This is a measure of the condition of DC contact systems, on a scale of one to five, based on physical wear measurement of the conductor rail. A condition grade of one is good and five is poor. The measure excludes any associated equipment such as insulators, anchor assemblies, and protective boarding.

Results

Table 3.42 show the percentage of the DC contact systems within the five condition grades.

Commentary

The condition of the DC traction contact system worsened slightly from the value last year of 1.90 to 1.96. The change is a reflection of the movement of asset conditions in the 1 to 3 bands of asset condition and the key poor condition assets of 4 and 5 remained constant at only three per cent of the total.

The condition of these assets reflects the steady state of the renewal activity addressing the locations which are in poor condition whilst preventing others from getting worse.

Improvements in the measurement where there was previously limited information has revealed an increased percentage of higher wear bands. This improvement in condition grade information has resulted in a short term worsening of the asset condition result.

Table 3.42: Electrification condition − DC traction contact system 2011/12 year total

	England & Wales		Scotland		Network total	
Condition grade	**Km**	**%**	**Km**	**%**	**Km**	**%**
1	1,025	31	n/a	n/a	1,025	31
2	1,464	45	n/a	n/a	1,464	45
3	671	20	n/a	n/a	671	20
4	109	3	n/a	n/a	109	3
5	7	0	n/a	n/a	7	0
Average condition grade		1.96		n/a		1.96

The basic level of asset deterioration has been addressed with interventions through asset renewal over 2011/12. These have included routes targeting renewals at:

a) localised accelerated wear at level crossings that has been caused by the change to EMU shoe-gear configuration, and

b) poorly performing sections of ASC rail in underground railway.

In other routes renewal activity has been focused at addressing locations with poor condition assets (condition 4 and 5) to maintain a stable condition score. Further targeted renewals are planned in the near future which should see the condition grade score start to improve.

Power incidents causing train delays of more than 300 minutes

Definition

This measure reports the number of:

- overhead line equipment (OLE) component related failures that lead to incidents causing delays exceeding 300 train delay minutes - incidents due to bird strikes and vegetation incursion are included.
- conductor rail component related failures that lead to incidents of duration exceeding 300 train delay minutes.

The measure excludes incidents proven to have been caused by defective train equipment, outside parties, vandalism, animals and those arising as a direct result of extreme weather conditions.

Reporting method

The Asset Reporting Manager (ARM) monitors failures reported in the Daily National Incident Report and at each period end the summary is sent to the M&E Maintenance Support Engineers for their review and verification. They investigate the cause of each traction power incident, and the verified figures are provided back to the ARM.

Results

Table 3.43 shows the annual number of power incidents causing train delays of more than 300 minutes. The table also includes our CP4 Delivery Plan update 2011 target for 2011/12.

Commentary

The number of power incidents causing train delays of more than 300 minutes has reduced significantly from 100 in 2010/11 to 71 for 2011/12. Within these figures, England & Wales incidents have reduced from 95 in 2010/11 to 66 in 2011/12.

Table 3.43: Power incidents causing train delays of more than 300 minutes (2011/12)

	2009/10	2010/11	2011/12	Delivery Plan 2011
England & Wales	69	95	66	n/a
Scotland	6	5	5	n/a
Network total	75	100	71	87

Station Stewardship Measure (M17)

Definition

This is the average condition rating of each station where Network Rail is the operator or the landlord.

The score is calculated by assessing the asset remaining life of elements of a station by visual inspection and combining these into an overall station score. The scale represents the remaining life, as a percentage of the expected life, of all measured assets at a station, on a scale of 1–5 as represented in Table 3.44. It has been adopted as a standard method for expressing the condition of a variety of asset types.

Regulatory target

We are required to maintain average condition scores within each station category A to F in England, Wales and Scotland and also across all stations in Scotland. This requirement relates to the maintenance and renewal of the asset but excludes the impact of enhancement activity funded by Network Rail or other station stakeholders. The categories were designed to reflect the different sizes and passenger throughput of the stations on the network. The minimum levels of average condition for each station category to be achieved are included in Table 3.45 as the regulatory target.

Results

Table 3.45 provides the SSM scores from 2008/09 to 2011/12. The results shown for 2008/09 and 2009/10 differ slightly from those reported in the Annual Return 2011. The scores for these years had been incorrectly calculated at route level rather than at overall network category level as had been the case in 2007/08, the first year that SSM was reported. However, the two calculation methodologies were directionally consistent.

Table 3.46 shows a comparison of SSM scores at completed NSIP stations and other stations.

Reporting confidence

The condition of each asset, based on an assessment of its asset remaining life, is uploaded to our Operational Property Asset System (OPAS). The Station Stewardship Measure scores are based on validated OPAS examination data and is generated automatically by the system. The confidence rating for Station Stewardship Measure is B2, up from B3 previously. This change was made following the Q4 2011/12 Data Assurance Report by the Independent Reporter.

Table 3.44: Definition of scoring in the Station Stewardship Measure

Remaining life as a percentage of expected full life	*Condition rating*
76% – 100%	1
46% – 75%	2
16% – 45%	3
1% – 15%	4
0%	5

Subsequent to the Q3 2010/11 Data Assurance Report minor changes have been made to a limited number of asset life expectancies used in the measure calculation. These changes made the values more accurate and coherent but have a negligible impact on the overall results of the Station Stewardship Measure. Additionally, a reporting anomaly relating to the presence of platform tactile surfaces and copers was identified. As the impact of rectifying this will be greater (possibly 2.5 per cent over the control period) this will be changed after the final CP4 results are reported in 2014 and before CP5 targets are baselined.

In the Q3 2010/11 Data Assurance Report the Independent Reporter suggested a pessimistic skew of the SSM of six per cent implying that the scores are showing condition to be worse than actual condition. Following the Q4 2011/12 Data Assurance work which included 57 station audits the Independent Reporter has concluded that the variance is significantly lower than six per cent. The comparable station by station variance is less than two per cent and at

station category level the variance is less than one per cent.

Commentary

The latest results show an improvement to the scores for stations in all categories. Although the score continues to improve (approximately 1.8 per cent overall in 2011/12) this is at a slower rate than in preceding years (2010/11 2.5 per cent). We believe that underlying condition remains broadly stable and that the reduction in the scores is driven by two main factors unrelated to maintenance and renewal activity.

Firstly, the continued progression of our programme of detailed surveys of locations where previously there had been 'ADC-lite' surveys. The 'ADC-lite' surveys were employed in an accelerated data collection phase which began on 2007. These surveys were focused on assessing the condition of the 20 per cent of our assets which drove approximately 80 per cent of our expenditure. ADC-lite surveys did not include the larger number of assets such as buildings and subways where expenditure is relatively low. The low expenditure items have consistently proved to be in better condition than others. This is also supported by analysis we have undertaken as part of our work for the Periodic Review 2013.

Secondly, we believe an emerging influence is network enhancement investment where the introduction of additional assets and the improvement of existing co-located assets are contributing to the improvement in the scores. This activity comprises enhancements such as platform lengthening, Access for All schemes and franchise commitments.

The National Stations Improvement Programme (NSIP) focuses on improvements to the passenger environment and addresses such matters as personal safety, access and the provision of information rather than the condition of the more substantive station infrastructure. New assets introduced at NSIP locations are expected to result in a very minor improvement of the overall average condition at those locations. However, due to the cyclical pattern of surveys the full impact of NSIP schemes completed will not be shown for a number of years.

Table 3.45: Station Stewardship Measure

Station Category	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*Regulatory target – max. average score at the end of CP4*
A	2.48	2.44	2.38	2.30	2.26	2.48
B	2.6	2.47	2.46	2.40	2.37	2.60
C	2.65	2.52	2.52	2.47	2.43	2.65
D	2.69	2.52	2.54	2.47	2.41	2.69
E	2.74	2.57	2.58	2.50	2.43	2.74
F	2.71	2.55	2.56	2.50	2.47	2.71
Scotland (all stations)	2.39	2.39	2.39	2.33	2.28	2.39

Table 3.46: Station Stewardship Measure – comparison of completed NSIP and non-NSIP stations

Station Category	*Regulatory Target – Maximum average score at end of CP4*	*Completed NSIP stations*		*All other stations*	
All network	*SSM*	*SSM*	*No. of stations*	*SSM*	*No. of stations*
A	2.48	2.46	1	2.25	25
B	2.60	2.48	11	2.35	53
C	2.65	2.39	34	2.44	205
D	2.69	2.45	31	2.40	261
E	2.74	2.44	17	2.43	645
F	2.71	2.51	9	2.47	1,186
Network Total	**n/a**	**2.44**	**103**	**2.45**	**2,375**

Note: 104 stations have had specific station improvements completed as part of the National Stations Improvement Programme (NSIP). Of these, one station (Lewisham) does not currently have a Station Stewardship Measure and is, therefore, excluded from the data.

Light Maintenance Depot Stewardship Measure (M19)

Definition

This measure assesses the overall average condition of Light Maintenance Depots (LMDs) where Network Rail has responsibility for the repair of assets by providing, at each year-end, the number of depots in individual average condition ratings of 1–5. Those leased to a Depot Facility Owner on a "full repairing basis" are excluded from the calculation.

Reporting method

The score is calculated by assessing the asset remaining life of elements of an LMD by visual inspection and combining into an overall LMD score. As with the SSM, the scale represents the remaining life, as a percentage of the expected life, of all measured assets at an LMD, on a scale of 1–5 as represented in Table 3.44. It has been adopted as a standard method for expressing the condition of a variety of asset types.

Reporting confidence

The condition of each of the elements is collected together with other relevant asset information by a competent surveyor. New surveys are uploaded to our Operational Property Asset System (OPAS) once certain validation checks have been performed. The LMD scores are based on validated examination data. The confidence rating for Light Maintenance Depot Stewardship Measure is C2. This is a significant improvement on the previous C4 rating.

Results

Table 3.47 shows the Light Maintenance Depot Stewardship Measure results for all years from 2006/07 as well as the CP4 targets for England & Wales, Scotland, and the whole network.

Commentary

The results for 2011/12 show a continuing improvement in the average score for all depots from 2.48 to 2.43. The underlying trend of condition is broadly stable with this improvement (two per cent) driven by further detailed data collection from an additional nine sites this year (12 per cent of the portfolio). This improvement in score is consistent with what is seen in the Stations Stewardship Measure as the data set is broadened. Although the score has dipped in Scotland in the last two years there is a slight improvement this year and it is expected that this trend will continue through to the end of CP4.

Table 3.47: Light Maintenance Depot Stewardship Measure

Light Maintenance Depots (LMDs)	*2006/07*	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*Delivery Plan target – Max. average score at end of CP4*
England & Wales	2.54	2.52	2.52	2.47	2.46	2.40	2.52
Scotland	2.61	2.57	2.56	2.65	2.67	2.66	2.56
All LMDs (network total)	**2.55**	**2.53**	**2.52**	**2.50**	**2.48**	**2.43**	**2.52**

Section 4 – Activity Volumes

Introduction

This section provides data on the level of renewal activity on the network. It reports volumes of work undertaken for each asset category, including 12 measures for track renewals, two for signalling, nine for telecoms, ten for civils and 13 for electrification and plant.

This year we are including volumes for drainage renewals. We have also included operational property expenditure as a proxy for renewal volumes.

There are no regulatory targets set for the volume of renewal activity.

Table 4.1 provides a summary of the renewals volumes for 2011/12 compared to the Delivery Plan update 2011 (DPu11).

Table 4.1: Delivery plan measures – Volume renewals			
Full year summary of results 2011/12			
	Plan (DPu11)	***Actual***	***Variance***
Track			
Rail (km)	850	774	(76)
Sleeper (km)	578	567	(11)
Ballast (km)	646	573	(73)
Composite / Plain line km	2,074	1,914	(160)
S&C (equivalent units)	361	333	(28)
Signalling			
Conventional SEU	1,031	1,055	24
ERTMS SEU	0	0	0
Crossrail accelerated (SEU)	165	211	46
Total SEUs	1,196	1,266	70
Level crossings (no.)	59	22	(37)
Telecoms - Station information and surveillance systems			
CIS (monitors)	301	449	148
Public address (speakers)	2,025	2,445	420
CCTV (cameras)	176	229	53
Clocks (no.)	72	11	(61)
Operational telecoms			
Large concentrators (no.)	9	2	(7)
Small concentrators (no.)	36	24	(12)
DOO CCTV (systems)	119	117	(2)
PETS (no.)	1	12	11
Voice recorders (no.)	1	1	0
Electrification			
Overhead Line			
Campaign changes (wire runs)	1,483	1,126	(357)
Re-wiring (wire runs)	79	49	(30)
Conductor rail (km)	25	17	(8)
AC distribution			
HV switchgear (no.)	64	32	(32)
GSP transformer (no.)	1	0	(1)
GSP cable (km)	4	0	(4)
Booster transformers (no.)	26	2	(24)
DC distribution			
HV switchgear (no.)	47	14	(33)
HV cabling (km)	23	20	(3)
LV switchgear (no.)	66	13	(53)
LV cabling (km)	63	7	(56)
Transformer rectifiers (no.)	39	32	(7)
Civils			
Overbridges (sq ms)	9,667	7,420	(2,247)
Underbridges (sq ms)	64,712	71,498	6,786
Bridgeguard 3 (sq ms)	6,709	8,882	2,173
Footbridges (sq ms)	2,036	1,852	(184)
Tunnels (sq ms)	25,712	28,998	3,286
Culverts (sq ms)	1,963	2,130	167
Retaining walls (sq ms)	7,503	12,451	4,948
Earthworks (sq ms)	528,653	493,323	(35,330)
Coastal/estuary defence (ms)	1,967	1,243	(724)
Other (including major structures) (sq ms)	36,221	26,719	(9,502)

Track renewals

With track activity volumes a degree of variance from forecasts (in the Delivery Plan) is expected, as details of planned work are refined during the year (for example, in response to more detailed site knowledge), and engineering priorities being adjusted to focus on key areas for improving asset condition and operational performance.

We usually consider plain line track renewal volumes in terms of composite kilometres (ckm), which measure the number of components included in a renewal. The components are rail, sleepers and ballast as reported in Table 4.2 to Table 4.10. During 2011/12, 1,914 ckm of plain line track was renewed (774 km of rail, 567 km of sleepers and 573 km of ballast). This was against an original plan for the year of 2074ckm. 247ckm were delivered by our in-house capital works team.

The shortfall of plain line track renewed was predominantly in England and Wales and was caused mainly by the slow introduction of the new High Output track relaying machine. There were also two major incidents of machine damage that reduced its capacity. Although there was over delivery of conventional plain line track renewals which offset some of this shortfall, it was not sufficiently significant enough to have an impact. Sleepers renewed had slightly less of a shortfall than rail and ballast, which will be recovered through additional work targeted in the last two years of the control period.

Notwithstanding the slight under-delivery against that planned in 2011/12, it remains the intention to deliver the planned CP4 total volume of 9,456 ckm over the control period as a whole. An increase of 357ckm on last year provides optimism that the above target can be reached.

The number of switches and crossings (S&C) renewals delivered in the year was 333 equivalent units, compared to the DPu11 number of 361 equivalent units. The under delivery of 28 units was due to the deferral of two major items in the programme.

Rail renewed (M20)

Definition

This is the total length of track in kilometres where re-railing has been carried out. This measure counts the total length of plain line track where both rails have been replaced. If one rail is replaced the length counts as half.

Results

Table 4.2 shows rail renewed for the year compared to the DPu11 forecast for 2011/12 and previous years.

Table 4.2: Rail renewed

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*DPu11 (km)*
England & Wales	635	949	909	895	1,049	730	532	698	770
Scotland	49	127	109	96	100	80	55	76	80
WCRM	132	44	10	48	57	n/a	n/a	n/a	n/a
Network Total	**816**	**1,120**	**1,028**	**1,039**	**1,206**	**810**	**587**	**774**	**850**

Sleepers renewed (M21)

Definition

This is the total length of track in kilometres where re-sleepering has been carried out.

Results

Tables 4.3 to 4.6 provide the total kilometres of sleepers renewed and the kilometres for different types of sleepers renewed.

Table 4.3: Sleepers renewed: all types (km)

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*DPu11 (km)*
England & Wales	485	595	658	658	605	403	401	510	524
Scotland	33	58	73	57	73	35	44	57	54
WCRM	152	91	7	48	57	n/a	n/a	n/a	n/a
Network Total	**670**	**744**	**738**	**763**	**735**	**438**	**445**	**567**	**578**

Table 4.4: Concrete sleepers

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*
England & Wales	289	361	461	437	398	310	305	397
Scotland	15	17	47	30	50	26	30	42
WCRM	148	91	7	48	57	n/a	n/a	n/a
Network Total	**452**	**469**	**515**	**515**	**505**	**335**	**335**	**439**

Table 4.5: Timber sleepers

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*
England & Wales	26	343	17	8	11	6	6	9
Scotland	0	2	1	1	0	1	1	1
WCRM	1	0	0	0	0	n/a	n/a	n/a
Network Total	**27**	**36**	**18**	**9**	**11**	**7**	**7**	**10**

Table 4.6: Steel sleepers

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*
England & Wales	170	200	179	213	197	88	90	105
Scotland	18	39	25	26	23	8	13	14
WCRM	3	0	0	0	0	n/a	n/a	n/a
Network Total	**191**	**239**	**204**	**239**	**220**	**96**	**103**	**119**

Ballast renewed (M22)

Definition

This is the total length of track, in kilometres, where re-ballasting has been carried out.

Results

Tables 4.7 to 4.10 provide the total kms of ballast renewed and the kms for the types of ballast renewed.

Table 4.7: Ballast renewed: all types

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*DPu11 (km)*
England & Wales	527	659	764	733	633	476	483	521	593
Scotland	36	59	74	56	73	34	42	53	53
WCRM	122	81	12	48	57	n/a	n/a	n/a	n/a
Network Total	**685**	**799**	**850**	**837**	**763**	**509**	**525**	**573**	**646**

Table 4.8: Full ballast renewal by excavation

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*
England & Wales	296	290	322	323	308	213	187	182
Scotland	18	20	21	16	35	18	7	13
WCRM	113	81	12	48	57	n/a	n/a	n/a
Network Total	**427**	**391**	**355**	**387**	**400**	**231**	**194**	**195**

Table 4.9: Partial reballast-automatic ballast cleaning

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*
England & Wales	68	147	264	191	175	140	198	224
Scotland	2	0	28	13	20	1	18	21
WCRM	***9***	0	0	0	0	n/a	n/a	n/a
Network Total	**79**	**147**	**292**	**204**	**195**	**141**	**216**	**245**

Table 4.10: Scarify-reballast with sleeper relay

	2004/05 (km)	*2005/06 (km)*	*2006/07 (km)*	*2007/08 (km)*	*2008/09 (km)*	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*
England & Wales	163	222	177	219	150	122	98	114
Scotland	16	39	25	27	18	15	17	19
WCRM	0	0	0	0	0	n/a	n/a	n/a
Network Total	**179**	**261**	**202**	**246**	**168**	**137**	**115**	**133**

Switches and crossings renewed (M25)

Definition

This measure records the total number of switches and crossing (S&C) units renewed. The tables include data on the numbers of full renewals, the number of abandoned (renewed or recovered) units and the number where asset life has been extended through partial renewal or reballasting.

Results

The DPu11 includes figures for S&C equivalent units to give an overall metric of total activity delivered. To convert the data in the following tables to equivalent units, we use a factor of 1.0 for a full renewal, 0.5 for an abandoned unit and 0.33 for a partial/reballasting renewal.

The total number of equivalent S&C units renewed during the year was 333 (compared to 361 in the DPu11).The three following tables illustrate that this comprises 285 full renewals equivalent units, 36 abandonment equivalent units and 12 partial renewals/ reballasting equivalent units, using the conversion factors given above.

Table 4.11 to Table 4.13 show the S&C renewed during the year compared to the DPu11 forecast for 2010/11 and previous years.

Table 4.11: S&C full renewals

	2004/05 (units)	*2005/06 (units)*	*2006/07 (units)*	*2007/08 (units)*	*2008/09 (units)*	*2009/10 (units)*	*2010/11 (units)*	*2011/12 (units)*	*DPu11 (units)*
England & Wales	322	356	362	334	310	206	240	247	243
Scotland	19	13	58	39	35	25	29	38	39
WCRM	170	151	22	63	74	n/a	n/a	n/a	n/a
Network Total	**511**	**520**	**442**	**436**	**419**	**231**	**269**	**285**	**281**

Table 4.12: S&C abandonment

	2004/05 (units)	*2005/06 (units)*	*2006/07 (units)*	*2007/08 (units)*	*2008/09 (units)*	*2009/10 (units)*	*2010/11 (units)*	*2011/12 (units)*	*DPu11 (units)*
England & Wales	13	26	62	94	76	61	61	62	92
Scotland	0	0	0	14	6	5	8	9	17
WCRM	0	0	0	0	0	n/a	n/a	n/a	n/a
Network Total	**13**	**26**	**62**	**108**	**82**	**66**	**69**	**71**	**110**

Table 4.13: S&C partial renewals/reballasting

	2004/05 (units)	*2005/06 (units)*	*2006/07 (units)*	*2007/08 (units)*	*2008/09 (units)*	*2009/10 (units)*	*2010/11 (units)*	*2011/12 (units)*	*DPu11 (units)*
England & Wales	2	52	18	111	69	150	113	32	68
Scotland	0	0	0	9	18	16	18	4	6
WCRM	46	0	0	0	0	n/a	n/a	n/a	n/a
Network Total	**48**	**52**	**18**	**120**	**87**	**166**	**131**	**36**	**74**

Signalling renewed (M24)

Definition

This measure reports the total number of signalling equivalent units (SEU) which were commissioned each year. An SEU is defined as each single trackside output function controlled by the interlocking, including every signal, each controlled point end, plungers and any other attribute that require a particular control function and each ground frame. Partial renewals are allocated partial values (50 per cent for external equipment and 45 per cent for an interlocking; the residual five per cent is two per cent for a control centre and three per cent for control equipment). The SEUs recorded do not cover minor works and only include individual schemes with an anticipated forecast cost greater than £5 million but with the exception of stand-alone level crossing projects where one SEU is recorded for renewal of the control circuitry interface (where applicable).

Results

Tables 4.14 and 4.15 show the conventional SEUs renewed for 2011/12 compared to the DPu11 and previous years.

Commentary

During 2011/12 a total of 1,055 conventional SEUs were commissioned after adjusting for type of work undertaken. This was an increase from the previous year and compared to DPu11.

A description of the types of schemes delivered is as follows:

- 126 SEUs fully renewed as part of Water Orton;
- 218 SEUs fully renewed as part of Newport;
- 351 SEUs renewed with an interfaced SSI at Mount Pleasant, Southampton and Totton giving a total reportable volume of 158;
- 211 SEUs commissioned as part of Slough IECC relock and recontrol.

The main variance to the forecast is as a result of the deferral of the Ely Norwich commissioning to September 2012. This was offset by the inclusion of Newport which had previously slipped from December 2010 to May 2011 as a result of a delay in the product approval of the new Westlock equipment.

Table 4.14: Total Signalling renewed per year

	2004/05 (SEU)	*2005/06 (SEU)*	*2006/07 (SEU)*	*2007/08 (SEU)*	*2008/09 (SEU)*	*2009/10 (SEU)*	*2010/11 (SEU)*	*2011/12 (SEU)*	*DPu11 (SEU)*
England & Wales	576	277	477	1,437	600	778	800	1,266	1,196
Scotland	100	1	4	4	381	35	2	0	0
Network Total	**1,678**	**278**	**481**	**1,441**	**981**	**813**	**802**	**1,266**	**1,196**

Note: The total includes conventional and ERTMS SEUs.

Table 4.15: Signalling renewed

	2011/12	*DPu11*	*Variance*
Conventional SEU	1,055	1,031	24
ERTMS SEU	0	0	0
Crossrail accelerated (SEU)	211	165	46
Total SEU	1,266	1,196	70

Level crossing renewals

Definition

This measure reports the number of level crossings renewed each year by Route. Each level crossing accounts for one Level Crossing Equivalent Unit (LXEU). If a partial renewal is undertaken then an appropriate part LXEU will be declared. The volumes are captured and monitored within our project planning tool, P3e,

and the volumes declared within the period that the level crossing is commissioned.

Table 4.16: Number of Level crossings renewed 2011/12 (equivalent units)

	2009/10	*2010/11*	*2011/12*
England & Wales	20	9.75	21
Scotland	0	0	1
Network Total	**2**	**9.75**	**22**

Results

Table 4.16 shows the number of level crossings equivalent units renewed in 2011/12.

Commentary

22 Level Crossings were renewed nationally this year compared to 59 that were planned for the year. The key reasons for the change are:

- ten level crossing renewals associated with Ely to Norwich resignalling scheme which slipped to September 2012;
- six level crossings associated with the Bollo Lane and Kew East project which slipped to 2012/13.

The remaining variance is down to the decision to package crossings into larger schemes for delivery efficiency and thus has seen these reprogrammed for delivery in future years.

Telecom renewals

Definition and reporting method

This measure reports on a total of nine categories of telecoms volumes which were commissioned over the course of the year. The nine categories span two main telecoms asset groups: Operational Telecoms and Station Information and Surveillance Systems (SISS).

Operational telecoms consists of the following assets: concentrators (split for large and small), level crossing public emergency telephone systems (PETS), driver only operation (DOO) systems and voice recorders.

The SISS group consists of the following assets (unit of measure given in brackets): PA – public address (per speaker), CIS – customer information screen (per display), CCTV – closed circuit television (per camera), clock (per clock).

Results

Tables 4.17 and 4.18 show the different types of telecoms renewals for 2011/12. Partial renewals to extend the life of assets are not reported in this measure.

Commentary

During 2011/12 the total number of operational telecoms volumes delivered varied from the original forecast in the Delivery Plan Update 2011. There was also further clarification about the classification of some systems previously captured within the baseline and also around SISS asset reporting.

Concentrators

From the DPu11 plan for large concentrators of nine, two were delivered in the year. The variance from was caused by a number of factors; a reduction of one unit due to a duplicate entry in the plan; a reduction of one unit as a result of a Network Operating Strategy (NOS) acceleration by a number of years resulting in the renewal requirement being removed. A further five units slipped into 2012/13 as a result of either alignment of the planned renewal with the Fixed Telecoms Network (FTN) availability or internal resource availability to deliver the works.

From the DPu11 plan for small concentrators of 36, 24 were delivered in the year. The variance was caused by a number of factors, including programme acceleration of three units into 2010/11, minor scope decrease of two units due to changes to keyboard only renewals. A further seven units slipped into 2012/13 as a result of alignment with other programmes of work.

Public emergency telephone systems

There was an initial increase of eight units due to slippage from 2010/11. Furthermore, there was also a correction in volumes being delivered leading to an increase of three, resulting in an overall increase of 11 against the planned total.

Driver only operation systems

Of the planned 119 units, 117 volumes were delivered during the year. There was a reduction of two units due to the misclassification on Guard CCTV systems.

Voice recorders

One unit was delivered in the year, in line with the plan.

Station information and surveillance systems (SISS)

During 2011/12, SISS renewal was a significant portion of the telecoms renewals activity with a large proportion of volumes being delivered by several large projects on the Western Route.

Customer information screens (CIS)

Compared to the plan of 301 units, 449 units were delivered in the year. The variance was caused by a number of factors, including programme slippage of Network Rail and train operator delivered works from 2010/11 of 229 units, minor scope increase of delivered system of 10 units, and an additional 14 units which had been omitted from the baseline also being delivered. A further 105 units slipped into 2012/13 as a result of a delay in obtaining planning consents at stations with listed building status.

Public address & long line public address (PA/LLPA)

Compared to the planned 2,025 units, 2,445 units were delivered in the year. The variance was caused by a number of factors, including programme slippage of Network Rail and train operator delivered works from 2010/11 of 1,342 units and minor scope changes of 201 units. A further 798 units slipped into 2012/13 as a result of a delay in obtaining planning consents at stations with listed building status.

Table 4.17: Telecom renewals – Operational telecoms (number of units)

	2006/7	*2007/8*	*2008/9*	*2009/10*	*2010/11*	*2011/12*	*DPu11*
Large concentrators							
England & Wales	-	-	-	2	3	1	8
Scotland	-	-	-	0	0	1	1
Network total	10	20	4	2	3	2	9
Small concentrators							
England/Wales	-	-	-	28	22	24	36
Scotland	-	-	-	0	6	0	0
Network total	31	69	83	28	28	24	36
Public Emergency Telephone Systems							
England & Wales	-	-	-	5	14	12	1
Scotland	-	-	-	0	0	0	0
Network total	25	45	44	5	14	12	1
Driver Only Operation systems							
England & Wales	-	-	-	247	120	117	119
Scotland	-	-	-	0	0	0	0
Network total	203	187	68	247	120	117	119
Voice recorders							
England & Wales	-	-	-	8	13	0	1
Scotland	-	-	-	0	0	1	0
Network total	43	104	191	8	13	1	1

Note: Planned figures are from the 2011 Delivery Plan update

Table 4.18: Telecom renewals - Station Information and Surveillance Systems (number of units)

	2009/10	*2010/11*	*2011/12*	*DPu11 2011/12*
Customer information screen (monitors)				
England/Wales	530	662	449	
Scotland	110	0	0	
Network total	640	662	449	301
Public address (speakers)				
England/Wales	287	1,574	1,975	
Scotland	521	1,723	470	
Network total	808	3,297	2,445	2,025
Closed circuit television (cameras)				
England/Wales	89	748	229	
Scotland	0	0	0	
Network total	89	748	229	176
Clocks				
England/Wales	0	127	11	
Scotland	3	6	0	
Network total	3	133	11	72

Note: Actuals for CIS and PA in 09/10 restated from those in the 2011 Delivery Plan.

Closed circuit television (CCTV)

Compared to the plan of 176 units, 229 units were delivered in the year. The variance was caused by a number of factors, including programme slippage of NR and TOC delivered works from 2010/11 of 81 units, minor scope changes of 30 units, a reduction in the baseline of 12 units due to the misclassification on Guard CCTV systems. A further 46 units slipped into 2012/13 as a result of a delay in obtaining planning consents at stations with listed building status.

Clocks

Compared to the plan of 72 units, 11 units were delivered. The variance from the baseline was caused by a number of factors; programme slippage of TOC delivered works from 2010/11 of nine units and an additional two units which had been omitted from the baseline was also delivered. A further 72 units slipped into 2012/13 as a result of aligning the renewal delivery with other programmes of works so as to avoid repeated capital expenditure.

Civils activity volumes

The Civils volume measures are used to monitor delivery compared to plan and are reported on a period basis in our management review meetings as well as quarterly to ORR.

Volumes are measured in accordance with company standard NR/CIV/B&C/Vol Issue 1, which ensures a consistent measurement to enable future benchmarking for volumes.

The majority of assets delivered greater volume in 2011/12 than in 2010/11. The only assets which delivered less volume than the previous year were overbridges, underbridges and culverts. However, both underbridges and culverts still delivered more than had been planned for 2011/12.

The volumes delivered in 2011/12 are shown in Table 4.19. There were some significant variances between assets.

The increase in underbridge volume is predominantly as a result of additional works to support the Olympics. This overall increase was partially offset by minor reductions at other locations.

The increase in overbridge bridgeguard 3, tunnels and retaining wall volumes was mainly due to scope increases as schemes developed.

The decrease in overbridge volumes was mainly a result of delayed implementation at a number of sites caused by the need to resolve third party issues prior to commencement of site work. Decreases in coastal and estuarine defence work were due to rephasing of works to a later year due to land access and environmental constraints.

Table 4.19: Civils renewal activity volumes delivered in 2011/12 compared to plan

	2006/07	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*Planned 2011/12*
Overbridges (sq ms)	5,636	7,168	8,207	5,235	11,866	7,420	9,667
Underbridges (sq ms)	67,206	51,179	68,201	75,298	87,914	71,498	64,712
Bridgeguard 3 (sq ms)	10,844	6,773	3,181	2,985	6,276	8,882	6,709
Footbridges (sq ms)	1,694	1,686	1,675	1,271	1,224	1,852	2,036
Tunnels (sq ms)	19,089	15,495	38,102	11,664	19,721	28,998	25,712
Culverts (sq ms)	255	753	1,792	1,416	2,340	2,130	1,963
Retaining walls (sq ms)	2,489	542	898	2,153	2,609	12,451	7,503
Earthworks (sq ms)	448,443	485,331	388,635	405,898	386,748	493,323	528,653
Coastal/estuary defence (ms)	3,212	3,368	2,441	541	1,185	1,243	1,967
Other (including major structures) (sq ms)	-	-	-	-	22,288	26,719	36,221

The decrease in Major Structure's volume was predominantly as a result of delays in implementation due to factors encountered on site and environmental constraints.

Following a request by Government, Network Rail is implementing a programme of enhanced investment over the remainder of CP4 to promote economic growth by accelerating work to be delivered by the construction industry. The programme will bring forward works planned for CP5, delivering improved asset condition and safety. The planned work is geographically spread to deliver economic stimulus to England and Wales and is suitable for delivery by a broad supply base to enable investment to reach the wider economy. The value of this investment is £250 million. The funding for this package is discrete and the work stream will be kept separate from the rest of the CP4 programme. An update on progress will be included in the 2012/13 Annual Return.

The tables for M23, M26, M27, M28 and M29 on Civils activity volumes provide a summary of projects completed during 2011/12.

Bridge renewals and remediation (M23)

Definition

This is the total number and area of bridge decks that have been subject to renewal or remediation, with total cost per work item greater than £50,000. The term "bridge" includes over and underbridges, side of line bridges and footbridges.

Results

Table 4.20 shows the different types of bridge renewals and remediation work for 2011/12 and Table 4.21 shows the bridge renewals and remediation for 2011/12 compared to previous years.

Commentary

Overall the amount of remediation (in terms of the number bridges) through preventative repair, strengthening and waterproofing work has reduced from 2010/11.

By comparison to 2010/11 there has been reduction in number of individual assets remediated in 2011/12 across all work types apart from strengthening work, which has increased by approximately 20 per cent.

In 2010 a more robust definition of volumes and data processing systems were introduced to record structures work activity. This enables a meaningful comparison between 2011/12 and 2010/11 results in Table 4.21, however it is not possible to directly compare the volume of deck replacement for previous years. The volume of deck replacement for 2011/12 is marginally greater than 2010/11 and remains broadly in line with the CP3 exit position when adjusted to the new reporting base.

Table 4.20: Bridge renewals and remediation 2011/12: number by task category

	Preventative	*Repair*	*Strengthen*	*Replace*	*Waterproofing*	*Total*
England & Wales	44	69	42	52	11	208
Scotland	20	12	10	10	1	53
Network Total	64	81	52	62	12	261

Table 4.21: Bridge renewals and remediation: square area of deck replacement (actual sq m)								
	2004/05	***2005/06***	***2006/07***	***2007/08***	***2008/09***	***2009/10***	***2010/11***	***2011/12***
England & Wales	7,251	4,943	12,067	16,732	8,240	12,976	8,672	9,765
Scotland	2,971	489	974	8,926	3,806	1,722	1,263	1,127
Network Total	**10,222**	**5,432**	**13,041**	**25,658**	**12,046**	**14,698**	**9,935**	**10,892**

Table 4.22: Culvert renewals and remediation 2011/12: number by task category				
	Preventative	***Repair***	***Replace***	***Total***
England & Wales	17	6	0	23
Scotland	8	0	0	8
Network Total	25	6	0	31

Culverts renewals and remediation (M26)

Definition

This is the total number of culverts that have been renewed or where major components have been replaced with a total cost per scheme greater than £50,000.

Results

Table 4.22 shows the culvert renewals and remediation work for 2011/12.

Commentary

During 2011/12 the total number of culverts remediated or renewed increased by six compared with 2010/11. These were predominantly new items introduced during the year in response to emerging asset details.

Work continues to better understand our emerging picture of culvert condition, which in turn will lead to a review of our approach to investment. As with previous years additional remediation work took place in 2011/12, which was below the financial threshold for this measure.

Retaining walls remediation (M27)

Definition

This is the total number and area in square metres of retaining walls of scheme value greater than £50,000 where renewal works have been carried out.

Results

Table 4.23 shows the different types of retaining wall renewals and remediation work for 2011/12 and Table 4.24 shows the area of retaining wall renewed for 2011/12 compared with previous years.

Commentary

During 2011/12 the total number of retaining walls remediated or renewed was similar compared with 2010/11, although the volume of renewal and remediation was significantly higher. This was influenced by a major retaining wall remediation scheme on the approach to Leeds station.

Table 4.23: Retaining wall renewals and remediation 2011/12: number by task category				
	Preventative	***Repair***	***Replace***	***Total***
England & Wales	5	4	1	10
Scotland	0	0	0	0
Network Total	**5**	**4**	**1**	**10**

Table 4.24: Retaining wall renewed: area (actual sq m)							
	2004/05	***2005/06***	***2006/07***	***2007/08***	***2009/10***	***2010/11***	***2011/12***
England & Wales	2,635	2,016	17,207	5,787	1,737	1,534	738
Scotland	0	0	243	135	0	0	0
Network Total	**2,635**	**2,016**	**17,450**	**5,922**	**1,737**	**1,534**	**738**

Table 4.25: Earthworks Remediation Projects 2011/12: number by task category			
	Preventative	***Repair***	***Total***
England & Wales	52	13	65
Scotland	48	4	52
Network Total	**100**	**17**	**117**

Table 4.26: Earthworks Remediation Projects 2011/12: total volume (m^2) for works greater than £50,000			
	Preventative	***Repair***	***Total***
England & Wales	267,081	13,119	280,200
Scotland	190,905	3,090	193,995
Network Total	**457,986**	**16,209**	**474,195**

Earthwork remediation (M28)

Definition

This is the total number of earthwork schemes that have been subject to remediation, with total cost per scheme greater than £50,000.

Results

Table 4.25 shows the numbers of different types of earthwork remediation works for 2011/12 and Table 4.26 shows the square metre area for different types of work greater than £50,000.

Commentary

The total volume delivered in the year was seven per cent less than planned, this was due to:

- Programme slippage of four schemes, resulting from changes in blockade planning of the Edinburgh Glasgow Improvement Project, and unforeseen land access problems and environmental constraints on a small number of schemes partially compensated by the acceleration of rock cutting remediation programmes in LNE and East Midlands.
- The slippage in volume delivered in 2011/12 will be recovered through the remainder of the control period and the overall volume in CP4 is forecast to be broadly as originally expected, at 2.5 million square metres.
- Overall volume for 2011/12 was 36 per cent greater than for 2010/11. 43 per cent of the volume delivered was cuttings and 57 per cent embankments, with only three per cent of the total volume delivered being unplanned.
- Scotland delivered in excess of 40 per cent of the total volume. This is because of the Scotland ten-year rock cutting remediation programme.

Tunnel remediation (M29)

Definition

The total number of remediation schemes on tunnels with a total cost per scheme greater than £50,000.

Results

Table 4.27 shows the different types of tunnel renewals work for 2011/12.

Commentary

The number of tunnels with renewal and remediation work in 2010/11 is similar to 2011/12. In 2010/11 the total was 49, this figure decreased to 48 this year.

Major schemes were completed in Ore tunnel in Kent and Totley tunnel in LNW.

Table 4.27: Tunnel renewals 2011/12: number by task category			
	Preventative	***Repair***	***Total***
England & Wales	23	24	47
Scotland	0	1	1
Network Total	**23**	**25**	**48**

Electrification and Plant renewal activity volumes

Definition

The volume measures are defined as the new Network Rail definition NR/ARM/M36/DF in the Network Rail Asset Reporting Manual. The volumes are only declared as delivered and reported each period when commissioned into operational use. They are captured and monitored within our Project Planning tool, P3e.

Results

Tables 4.28 and 4.29 set out the electrification and plant renewal volumes for 2011/12 and compare these against the Delivery Plan update 2011.

Commentary

The main reasons for the variances for the volumes delivered compared to plan are described below. Most of the categories were affected by the introduction of a reporting definition standard during 2011/12 financial year. The introduction of the standard provided consistency but affected the actual volumes reported.

- OLE Campaign changes – introduction of reporting standard, slippage due to resource and access issues, scope clarification and changes and repackaging the delivery to maximise delivery efficiency;
- OLE Rewiring – slippage due to on site issues;
- Conductor Rail – slippage due to delivery problems;
- AC HV Switchgear – introduction of reporting standard and scope changes due to feeder station decommissioning;
- GSP transformers and cables – scope changes due to feeder station decommissioning;
- booster transformers – introduction of reporting standard and delivery issues following diversion of resources to deal with a safety incident;
- DC HV Switchgear – introduction of reporting standard, reassessment of asset condition, reprioritisation to maximise efficiency and site safety issues following cable theft;
- DC LV Switchgear – introduction of reporting standard, scope changes to maximise delivery efficiency;
- DC LV Cables – scope changes and delivery issues;
- Transformer Rectifiers – policy and condition led scope changes; and
- Point Heaters – main delay due to repackaging of works to maximise delivery efficiency.

Table 4.28: Electrification and Plant Activity Volumes – network totals

	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
AC distribution						
HV Switchgear (circuit breakers)	1	60	102	41	57	32
AC GSP transformer (No)			1	0	1	0
AC GSP cable (km)				0	0	0
Booster transformers (No.)	28	9	5	53	27	2
OLE and conductor rail						
OLE re-wiring (wire runs)	203	153	25	64	71	49
OLE campaign changes (wire runs)	1,129	961	455	490	784	1127
Conductor Rail (km)	25	46	56	0	2	17
DC distribution						
HV Switchgear (No.)	38	76	63	64	69	14
HV Cables (km)	19	32	50	65	22	20
LV Switchgear (No.)	19	42	139	69	55	13
Transformers / Rectifiers (No.)	6	10	14	27	39	32
LV cabling (km)				0	0	7
Plant & Machinery						
Points Heaters (No.)	527	1,085	535		641	531

Table 4.29: Electrification and Plant Activity Volumes in 2011/12

	England & Wales 2011/12	Scotland 2011/12	Network 2011/12	DPu11 (Network) 2011/12
AC distribution				
HV Switchgear (circuit breakers)	32	0	32	64
AC GSP transformer (No)	0	0	0	1
AC GSP cable (km)	0	0	0	4
Booster transformers (No.)	0	2	2	26
OLE and conductor rail				
OLE re-wiring (wire runs)	49	0	49	79
OLE campaign changes (wire runs)	750	377	1127	1483
Conductor Rail (km)	17	0	17	25
DC distribution				
HV Switchgear (No.)	14	0	14	47
HV Cables (km)	20	0	20	23
LV Switchgear (No.)	13	0	13	66
Transformers / Rectifiers (No.)	32	0	32	39
LV cabling (km)	7	0	7	63
Plant & Machinery				
Points Heaters (No.)	531	0	531	814

Drainage renewals

Definition

The drainage renewal expenditure covers all types of drainage work. Drainage activities are planned in the same way as other delivery activities. Costs are apportioned to those activities in accordance with the normal commercial administration of the projects in the delivery portfolio.

Results

Table 4.30 proves the drainage renewals expenditure for 2011/12.

Commentary

A significant focus is being placed on increasing the amount of drainage work in CP4. The figures reflect an increase in the volume of drainage renewals undertaken in 2011/12.

Table 4.30: Expenditure on drainage renewals

£ million	*2009/10*	*2010/11*	*2011/12*
England & Wales	5.04	9.20	11.26
Scotland	0.42	1.07	2.26
Network Total	**5.46**	**10.27**	**13.52**

Table 4.31: Volumes of drainage renewals

	Volume of Drainage renewals undertaken (yds)	*Volume of drainage pipes cleaned (yds)*	*Volume of catchpits cleaned out (number)*
England & Wales	34,033	182,747	72,837
Scotland	11,489	36,771	12,247
Network Total	**45,522**	**219,518**	**85,084**

Operational Property volumes

Definition

The expenditure covers the entire maintenance and renewal activity carried out at Network Rail's operational property. The majority of the investment was delivered by Infratructure Projects in larger schemes whilst Maintenance Property Works delivered a much greater number of smaller schemes.

Results

Table 4.32 provides the operational property expenditure as a proxy for renewal volumes and provides a comparison with the DPu11. In the latter part of CP4 we will be able to report physical volumes for some work types and in CP5 this will extend to all significant work types.

Commentary

The variance between planned and actual volumes (expenditure) for 2011/12 is in the large part explained below:

Managed Stations

There were a number of slippages to planned work on Network Rail managed stations in England and Wales largely due to unforeseen access complexities. These included interface challenges with major transport infrastructure programmes, with operators, and with other dependent works. In Scotland £6 million of the contingency for Edinburgh Waverley work has been moved into future years and there has also been unplanned slippage due to temporary works development taking longer than planned.

Franchised Stations

The smaller variance in planned volumes for franchised stations is largely explained by delay relating to complex access arrangements with station stakeholders. Some planned volumes were delayed to align with other works to achieve more efficient delivery. There were some increases to expenditure associated with CP5 development work, and managing possessions and isolations, which had been omitted from the DPu11. In Scotland there were additional minor works associated with closing out frost heave damage from the previous two winters.

Depot Plant

Most slippages were associated with creating delivery efficiencies, rescoping and aligning with other planned works. There were also slippages in agreeing scope and programme with stakeholders.

Maintenance delivery units

There was an increase in expenditure in this portfolio as a result of an unplanned increase in minor works activity.

Table 4.32 Operational Property expenditure (£m) – 2011/12 prices

	DPu11			2011/12			Variance		
	Overall	***Scotland***	***England & Wales***	***Overall***	***Scotland***	***England & Wales***	***Overall***	***Scotland***	***England & Wales***
Managed Stations	82	45	37	58	33	26	23	13	11
Franchised Stations	163	18	145	157	26	130	7	(8)	15
LMDs	15	1	14	18	2	15	(2)	(1)	(1)
Depot Plant	11	0	11	5	0	5	6	0	6
LSBs	16	1	15	16	1	15	0	0	0
MDUs	12	2	11	16	1	14	(3)	0	(4)
NDS	1	0	1	2	0	2	(1)	0	(1)
Total	**301**	**68**	**233**	**272**	**65**	**206**	**29**	**4**	**25**

Section 5 – Safety and Sustainable Development

Introduction

This section reports on our principal safety KPIs and our environmental measures and initiatives. It also sets out the steps we are taking to maximise the opportunities available through the sustainable development agenda.

Safety Improvement

This section reports on aspects of safety which are the responsibility of Network Rail and our contribution to safety within the industry. There are two main safety measures; the Passenger Safety Indicator, which reports passenger safety risk associated with Network Rail activity, and the Workforce Fatalities and Weighted Injuries measure, which reports workforce safety. It is through these two measures that we monitor our contribution to the industry target of achieving a three per cent reduction in the risk of death or injury from accidents on the railway for passengers and rail workers over CP4.

We are also reporting on the key aspects of system safety using the following KPIs:

- infrastructure wrong side failures;
- level crossing misuse;
- category A Signals Passed At Danger (SPADs);
- irregular working; and
- criminal damage.

System safety is an indication of the overall safety of passengers, workforce and the public in respect of the risks associated with all aspects of the design, construction, maintenance and operation of the railway system.

The recommendations from the Independent Reporter Data Assurance Report for 2010/11 have been closed out. The 2011/12 report confirmed that the reporting in the majority of our key areas was at a level of accuracy and reliability which was at or better than the benchmark set by the ORR (the Reporter and ORR confidence grades are explained in the Introduction). We recently introduced a measure of red zone/green zone working and the Independent Reporter has since identified some improvements in process and reporting which we will work on in the coming year.

Safety Culture

Network Rail recognises that achieving excellence in culture and risk control are key enablers in its strategy for sustaining and improving health and safety performance.

During 2011/12 we continued to make progress with the Safety Leadership and Culture Change programme. We have now formulated a clear vision for health and safety based on the premise that “everyone goes home safe, every day”.

Our vision is supported by a suite of commitments which form the basis of our long-term safety strategy. We intend to publish our safety strategy in the summer of 2012.

In setting out our approach to safety culture, we have considered a wide range of approaches from the oil and gas sector, the chemical sector and the ORR’s own Rail Management Maturity Model. In doing so, we have taken the best aspects of each and put them into a framework which we believe will make a lasting difference to the culture of our organisation.

One aspect of our programme is the introduction of a set of lifesaving rules. These eleven rules, commonplace in the oil and gas industry, are non-negotiable and are aimed at removing all fatal incidents from our organisation. We are now developing guidance for line managers on the consistent application of consequences in the event of these rules not being followed.

Passenger safety

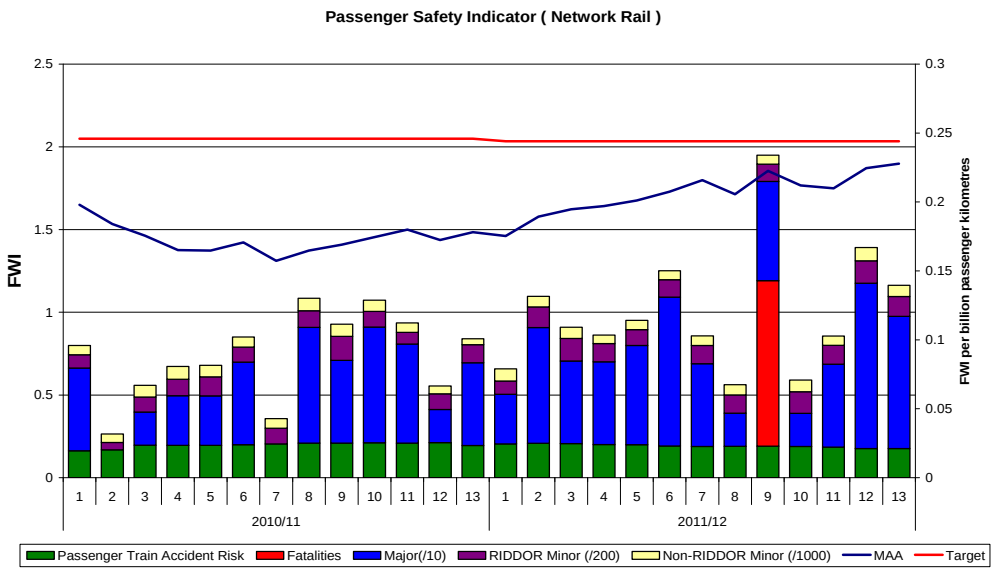
Definition

Passenger safety is primarily measured by the Passenger Safety Indicator. This measure is a combination of two separate data sources, the train accident risk data from the Precursor Indicator Model (PIM) and weighted fatality and injury data from station level crossings and Network Rail managed stations. The PIM is produced by the Rail Safety & Standards Board (RSSB) every quarter, and provides an indication on the trend in train accident risk by looking at the key precursor events (e.g. broken rails). A subset of the PIM is calculated, identifying passenger risks only, and it is that number that is used in calculating the Passenger Safety Indicator (PSI). The main reason the PIM is used for assessing train accident risk is to avoid the effect of low frequency, high consequence events distorting the KPIs.

Table 5.1: Passenger safety

	2007/08	2008/09	2009/10	2010/11	2011/12
Passenger Safety Indicator (MAA)	N/A	0.252	0.215	0.178	0.228

Figure 5.1: Passenger Safety Indicator – Network Rail



The remaining element of PSI is calculated as the weighted number of personal injuries to passengers, at station level crossings and Network Rail Managed Stations only, reported in SMIS (Safety Management Information System). This comprises those defined as reportable under RIDDOR[1] as well as those which are not reportable, normalised per billion passenger kilometres.

Results

Table 5.1 shows the results of the Passenger Safety Indicator for 2011/12 compared to previous years. Our target for the end of CP4 is 0.240, while our target for 2011/12 was 0.244. Figure 5.1 shows the breakdown of the PSI.

Commentary

In 2011/12 the PSI result was 0.228 which is seven per cent ahead of the year end target of 0.244, and 27 per cent worse than the result in 2010/11.

There was one accidental passenger fatality at London Bridge station which occurred on 2 December 2011, when an elderly male fell over while using an escalator. This was the first passenger fatality at a Network Rail managed station in almost three years. There were no passenger fatalities at station level crossings.

During 2011/12 there has been a 46 per cent increase in passenger major injuries at Network Rail managed stations compared with the exceptionally low number recorded in 2010/11. The 2011/12 figure is on a par with the 2009/10 level. The major influence on the figure is the number of passenger major injuries caused by slips, trips and falls on Network Rail managed stations, the majority of which are as a result of passenger behaviour. Safety enhancements and other initiatives have been undertaken at a number of managed stations in order to mitigate the risk of such incidents.

Train accident risk, measured by the train accident Precursor Indicator Model (PIM), represents approximately 15 per cent of the PSI, and has demonstrated a long term trend of improvement over the last ten years. The train accident risk to passengers has improved by a further 17 per cent in the year. The most significant improvements were in signals passed at danger and infrastructure failures.

[1] Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995

Workforce safety

Definition

Workforce safety is primarily measured by the Workforce safety (fatalities and weighted injuries) measure. This measure compares the weighted number of personal injuries that are reported in the Safety Management Information System (SMIS) for all Network Rail staff and contractors working on Network Rail's managed infrastructure, normalised per million hours worked. This measure provides information to help monitor and control accidents and injuries to the workforce.

Results

Table 5.2 shows workforce safety for 2011/12 compared to previous years. The target for the end of CP4 for workforce safety (fatalities and weighted injuries (FWI)) is 0.090, while the target for the end of 2011/12 was 0.094. Figure 5.2 shows the breakdown for FWI by period.

Commentary

The FWI target for this year has not been met and the moving annual average (MAA) FWI rate has remained broadly level since 2009/10. The reduction in major injuries from 100 to 98 has been offset by an increase in the number of fatalities from one to two and lost time injuries from 203 to 314, the highest figure over at least the past five years.

Tragically there was one Network Rail employee fatality in a road traffic accident at Kingussie in Scotland. No blame was attributed to the Network Rail vehicle driver. There was also a fatality to a sub-contractor employee who died when crushed between his lorry and a wall whilst delivering scaffolding to a Network Rail project site at Reading.

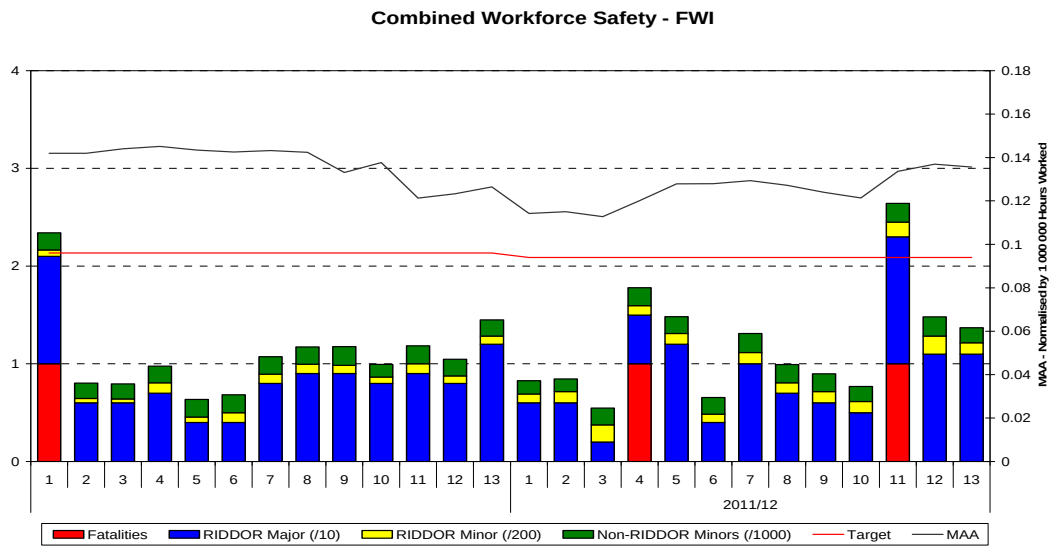
Slips, trips and falls remain consistently the most common cause of accident to Network Rail's combined contractor workforce, accounting for approximately 30 per cent of all workforce injury accidents.

During 2011/12 there has been a significant improvement in the reporting of accidents. The average ratio of RIDDOR lost time to RIDDOR major accidents is now 3.2 to 1, in line with the benchmark ratio referenced in last year's RSSB report. However, reporting levels amongst parts of the contractor workforce are still comparatively low. In particular, we believe reporting levels decrease further down the supply chain, which is an issue for both Network Rail and our principal contractors.

Table 5.2: Workforce safety

	2008/09	*2009/10*	*2010/11*	*2011/12*
Fatalities	3	3	1	2
Major injuries	130	96	100	98
Lost time injuries	198	146	203	314
FWI (MAA)	0.152	0.127	0.126	0.136

Figure 5.2: Combined Workforce Fatalities and Weighted Injuries Rate



During the year, Network Rail trialled its new close call reporting system, a simpler reporting system to encourage reporting of near misses and close calls. Numbers of close calls reported increased significantly throughout the year and, by the year end there were in excess of a thousand close calls reported per four-week period.

System safety

System safety is an indication of the overall safety of passengers, workforce and the public in respect of the risks associated with all aspects of the design, construction, maintenance and operation of the railway system.

Infrastructure wrongside failures

This measure comprises the number of higher risk (hazard index of 50 or above) failures of infrastructure. Table 5.3 shows the number of infrastructure wrong side failures for 2011/12 compared to previous years.

There were 46 infrastructure wrong side failures risk ranked 50 or above in 2011/12, a 46 per cent improvement on 2010/11. This included significant reductions in track, signals, structures and earthworks failures. There were 125 broken rails in 2011/12, a 26 per cent improvement on 2010/11 and the lowest annual figure ever.

Category A SPADs

This measure reports all Category A SPADs (signals passed at danger), which are those instances where signals have been passed when a stop aspect, end of in-cab signalled movement authority, or indication (and any associated preceding cautionary indications), was displayed correctly, in sufficient time for the train to be stopped safely at the signal or end of in-cab movement authority. Table 5.4 shows the number of Category A SPADs for 2011/12 compared with previous years.

There were 278 category A SPADs in 2011/12, a seven per cent improvement on 2010/11 and although 0.7 per cent below the target, it is only five more than the lowest ever recorded number in 2009/10. We have analysed the trends behind signals passed at danger (SPADs). In doing so we have identified signals around the country where further work and investment will make our network safer. We are also working with train operators to understand those SPADs which arise from driver error.

Level crossing misuse

This measure comprises the number of incidents where a motorised vehicle is struck by, or strikes a train, or any incident where a pedestrian or user of a non-motorised vehicle is struck and fatally injured by a train, or any near miss with a motorised vehicle, or non-motorised vehicle or pedestrian. Table 5.5 shows level crossing misuse for 2011/12 compared to previous years.

There has been a five per cent increase in the rate of significant level crossing events since 2010/11. There were five accidental fatalities at level crossings, four pedestrian fatalities (including one child fatality) and one motorcyclist fatality.

We are continuing to enhance our strategy for reducing level crossing risk, and are both closing level crossings where we can or replacing them with bridges or underpasses where feasible. We look to local authorities and other land owners to work with us to help us achieve these goals. In 2012/13, we will be publishing risk assessments for our level crossings to provide more information to the public.

Irregular working

This measure comprises the number of incidents of irregular working that introduce significant risk to the railway (categorised as potentially significant and potentially severe) based on an evaluation of their actual or potential consequence. Table 5.6 shows the moving annual average for irregular working incidents for 2011/12 compared to previous years.

The previously improving trend in irregular working events has reversed, with a 20 per cent increase in events during 2011/12. The categories accounting for the greatest proportion of significant irregular working events are “signaller error”, “protection/isolation” and “red zone working”.

Criminal damage

This comprises the number of malicious acts on, or directly affecting, Network Rail infrastructure, normalised per 100 route miles. Table 5.7 shows the number of malicious acts per 100 route miles for 2011/12 was 4.36, which is six per cent behind the year end target for 2011/12.

There has been a 1.3 per cent improvement in 2011/12 compared with 2010/11. We continue to work with rail industry colleagues, representatives of the local communities, and

Table 5.3: Infrastructure wrong side failures					
	2007/08	***2008/09***	***2009/10***	***2010/11***	***2011/12***
England & Wales			56	76	40
Scotland			11	9	6
Network-wide	**60**	**50**	**67**	**85**	**46**

Table 5.4: Signals Passed at Danger (SPADS)					
	2007/08	***2008/09***	***2009/10***	***2010/11***	***2011/12***
England & Wales			255	272	248
Scotland			19	27	30
Network-wide	**354**	**293**	**274**	**299**	**278**

Table 5.5: Level crossing misuse					
	2007/08	***2008/09***	***2009/10***	***2010/11***	***2011/12***
Level crossing misuse (MAA) England & Wales			26.07	27.77	29.15
Level crossing misuse (MAA) Scotland			2.23	1.61	1.85
Level crossing misuse (MAA) Network-wide	28.46	31.31	28.38	29.38	31
Collisions with road vehicles	8	21	14	5	10
Train striking pedestrian	9	10	8	4	3
Near miss with road vehicle	154	145	138	113	110
Near miss with non-vehicle users	200	231	209	260	279

Table 5.6: Irregular Working					
	2007/08	***2008/09***	***2009/10***	***2010/11***	***2011/12***
Irregular working MAA England & Wales			20.54	16.61	19.84
Irregular working MAA Scotland			1.15	1.08	1.54
Irregular working MAA network-wide	57.38	32.61	21.69	17.69	21.38
Potentially significant	674	347	231	179	224
Potentially severe	72	77	50	51	54

Table 5.7: Criminal damage (malicious acts)					
	2007/08	***2008/09***	***2009/10***	***2010/11***	***2011/12***
Malicious acts per 100 route miles	5.54	5.22	4.42	4.42	4.36

the British Transport Police with the aim of reducing railway crime.

Public safety

Whilst the number of public fatalities (suicides, trespassers and level crossing users) during 2011/12 was on a par with 2009/10 and previous years, the numbers represented a significant increase on the exceptionally low number recorded in 2010/11.

Suicides increased from 204 in 2010/11 to 237. There were 57 trespasser fatalities (including one child trespasser fatality) in 2011/12 compared with 32 in 2010/11 (it should be noted that the final classification of suicides/trespasser fatalities can take many months due to awaiting coroners' verdicts).

Network Rail is currently working with the Samaritans on a range of initiatives to reduce the risk from suicides on the network.

Health surveillance and screening

Exposure to asbestos and lead

During 2011/12 there have been no management referrals to BUPA for employee exposure to asbestos or lead.

Health Issues

We measure the number of health check failures which covers all candidates at pre-employment assessments and employees who are required to have a periodic Competence Specific Medical Fitness Assessment in order to work on or near the track. The pattern of data is consistent over many periods.

Data highlighted that about four per cent of those assessed are deemed unfit at competency-specific fitness assessments, with two per cent being existing employees. The remaining two per cent were not recruited into the business, as they failed pre-employment checks.

Of those deemed unfit at competency-specific fitness assessments, around 50 per cent result from defective vision, hearing or blood pressure, all of which are known to worsen with increasing age.

Around eight to nine per cent of existing employees are found to be fit subject to some form of restriction or recommendation. Many, if not most of these are in relation to health problems that are already known and so the restriction is a continuance of the employee's way of working.

Musculo-Skeletal Referrals

Figure 5.3 details the number of management referrals to BUPA, our occupational health (OH) provider, due to musculoskeletal conditions (based from total number of referrals each period). Of the referrals, 89 per cent (863) are non occupational, five per cent (56) have an occupational element and four per cent (39) are occupational in nature.

In the third quarter of the year musculoskeletal cases assessed to have occupational causation had increased to a level higher than in any previous report.

Stress related absence

Figure 5.4 shows the number of management referrals to BUPA due to stress-related conditions (based from total number of referrals each period that cover work and non work related referrals). Of the referrals 79 per cent (588) are non occupational, ten per cent (76) have an occupational element and ten per cent (74) are occupational in nature.

Noise

Table 5.8 provides information in relation to our Noise at Work Health Surveillance. There are 9,000 employees who have been currently identified as 'at risk', and 32 per cent were screened as part of the programme. 91 per cent of employees were found to have acceptable hearing ability (HSE, Category 1), six per cent to have mild hearing impairment (HSE, Category 2), two per cent to have poor hearing (HSE, Category 3) and 0.03 per cent with rapid hearing loss (HSE, Category 4) as defined by the Health and Safety Executive (HSE).

Figure 5.3: Number of management referrals to OH provider due to musculoskeletal conditions

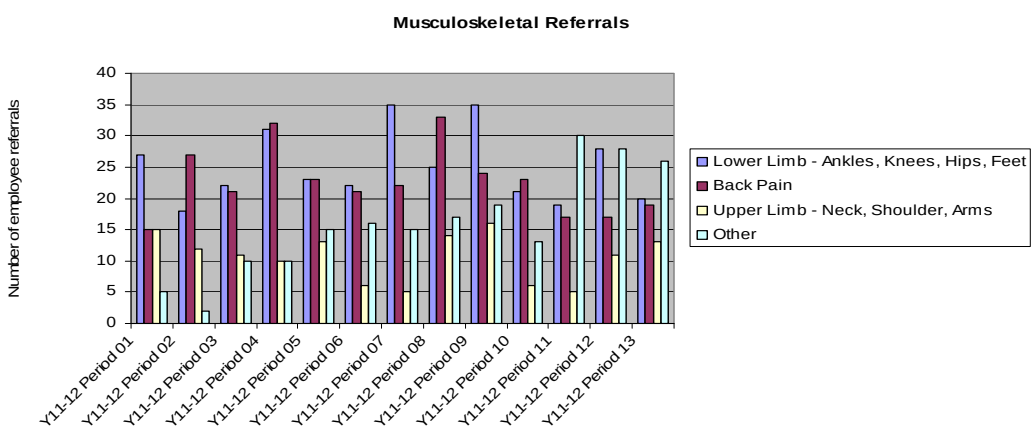
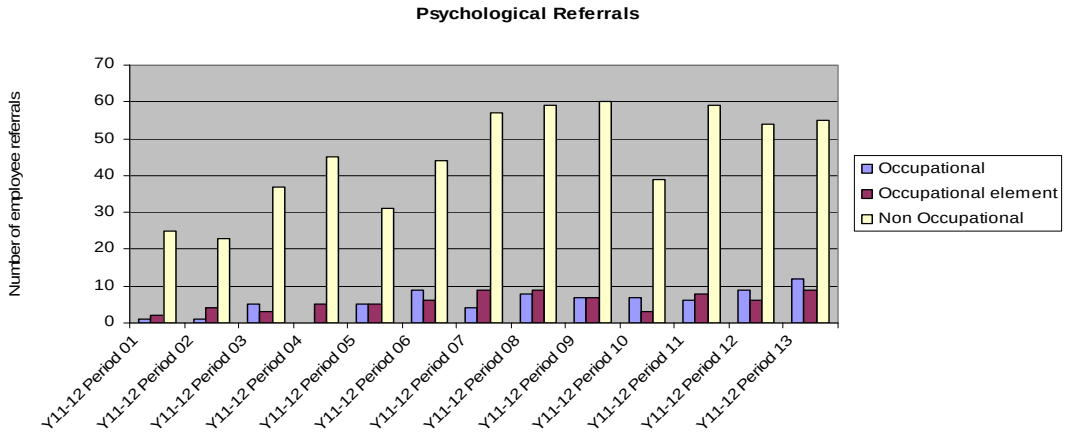


Figure 5.4: Psychological Referrals due to stress related conditions



It is very difficult to benchmark data for hearing conservation because UK HSE does not collect industry data and there is no published data for the prevalence of hearing loss in the railway industry. There are some broad estimates, which informed the HSE categorisation system introduced with the revision of the regulations in 2005. Nevertheless, taking what comparators are available the management information for hearing conservation remains consistent and broadly reassuring. The Category 4 case reported during the year, following further investigation, was found not to have been as a result of a work related issue.

Hand Arm Vibration Syndrome

Table 5.9 provides detail of our annual health surveillance for Hand Arm Vibration Syndrome (HAVS). Of those screened, 88 per cent were fit to work with vibrating tools under our current control measures. Four per cent were diagnosed with early stages of HAVS and could continue to work with restrictions. The 13 cases (representing 0.7 per cent) were diagnosed with late stages of HAVS, and are permanently unfit to work with hand vibration tools.

There is some indication that there has been an initial surge of confirmed cases as often occurs at the outset of a health surveillance programme and that the number of confirmed cases is reducing. This pattern, together with the overall results, appears to be a reasonable basis upon which Network Rail can indicate assurance that workplace exposure is being adequately controlled.

For the most part confirmed cases are related to previous employment, to a large extent in other industries (including the mining industry, docks and armed forces). Those affected are welders, grinders and trackmen who frequently used rail mounted disc cutters, chainsaws, rail saws, Kango guns, impact wrench, and a variety of grinders, wacker plate and nut runners. A close relationship between the diagnosis of HAVS and estimated dose of vibration exposure and cumulative lifetime working is noted.

Employer's liability

Network Rail buys employers liability insurance as required by statute. The insurance provides cover for death, bodily injury, or disease sustained by employees during the course of their employment in circumstances where Network Rail is legally liable. The numbers of claims both open and closed are reported for the first time in this Annual Return.

Table 5.10 provides the status of claims at 31 March 2012. The number of open claims reported is a snapshot of the claims which remain open for consideration at the end of 2011/12. This includes claims open prior to 2011/12 and includes some claims which may have been open for a number of years whether or not any compensation has or will be paid. When Network Rail was created it took over the liability for open and/or potential claims predating the company's existence. It is important to clarify that an open claim does not immediately assume compensation will be paid. A claim will be rejected in circumstances where Network Rail has no liability but may be 'open' prior to that

Table 5.8: Results of Noise at Work health surveillance			
NOISE AT WORK Hearing test result (graded by HSE Category)	***No.***	***%***	***Expected values for UK population as a whole****
1 Acceptable Hearing Ability (HSE Category 1)	2,624	91%	80%
2 Mild Hearing Impairment (HSE Category 2)	184	6%	15%
3 Poor Hearing (HSE Category 3)	61	2%	5%
4 Rapid Hearing Loss (HSE Category 4)	1	0%	N/A
Total Screened	2,871	100%	100%
*Data from HSE Corporate Medical			

Table 5.9: Results of Hand Arm Vibration Syndrome Health Surveillance		
HAVS – Total Screened	***No.***	***%***
Fit for work – no evidence of HAVS	1,673	87.2%
Early HAVS – may require restrictions	74	3.9%
Unfit – Late HAVS (RIDDOR reportable)	13	0.68%
Possible HAVS conditions (further assessment required)	159	8.3%
Total Screened	1,919	100%

Table 5.10 Status of employer liability claims at 31-Mar-12	
Category	***no.***
Open (as at 31 March 2012)	471
Closed (during 2011/12)	244

and remains open for a subsequent period. Similarly 'closed' claims within 2011/12 are those which have reached a stage where no further work is required and so can be closed. 'Closed' is not an indication of whether a claim has been accepted or rejected.

Sustainable development

Introduction

This section covers our environmental performance and our changing approach to managing the wider sustainable development agenda.

Environmental performance

Table 5.11 shows our progress with the five environmental key performance indicators that were set out in our 2009 CP4 Delivery Plan. These cover:

- carbon dioxide emissions;
- recycling of waste;
- significant environmental incidents;
- Sites of Special Scientific Interest.

Definitions, scope and exclusions for each of these metrics are shown in the notes following Table 5.11.

Changing approach

During 2011/12 we established a new Safety & Sustainable Development (S&SD) function and merged the existing Corporate Responsibility and Environment Policy teams. The new S&SD function is leading the development of a company-wide sustainable development vision and strategy which will be implemented in 2012/13.

Key aspects of our strategy will include identifying ways of adapting our infrastructure to the predicted effects of climate change, reducing the carbon footprint of the energy we procure, and improving the diversity and inclusion of our workforce. As well as putting in place company wide strategies in these areas, the team will work to support our business units to integrate sustainable development into our operational priorities. The purpose is to drive efficiency, build trust and create long term value for our stakeholders.

More information

We will be publishing a Sustainability Update in 2012 to provide stakeholders with a snapshot of sustainability performance and achievements from this year. The Sustainability Update will disclose performance on those sustainable development issues that are most material and relevant to Network Rail.

Table 5.11: Environmental performance

Notes/ Indicator	*Measure*	*2009/10 result*	*2010/11 result*	*2011/12 result*	*2011/12 target (from 2009 CP4 Delivery Plan)*
1- Network Rail carbon emissions (CO_2)	CO_2 emissions relating to managed stations, offices and depots (expressed as a change on 2006/07 estimated base year) **Target: 20% reduction by 2014**	-4%	-13%	-14%	-15%
2 - Operational recycling)	Managed station, office and depot waste mass recycled or re-used **Target: 60% diversion from landfill by 2014**	16%	28%	48%	50%
3 - Infrastructure recycling	Infrastructure waste mass managed by National Delivery Service recycled, recovered or reused **Target: 97% diversion from landfill by 2014**	92%	90%	86%	95%
4 - Environmental incidents	Number of environmental incidents (e.g. spillages) categorised as significant **Target: no more than 6 significant incidents per year by 2014**	2	2	2	6
5 - Land management	Network Rail owned Sites of Special Scientific Interest (SSSIs) rated favourable or recovering status (21 specific sites in England) **Target: 95% of the 21 target sites rated as favourable or recovering by 2010**	82%	100% (target achieved)	100% (target achieved)	100% (target achieved)

Notes

The following are accompanying notes to Table 5.11 on environmental performance.

1. Network Rail carbon emissions (CO_2):

1. Data is calculated using Defra Greenhouse Gas (GHG) Conversion Factors (August 2011).

2. This data relates to a specific target to reduce carbon emissions from Network Rail managed stations, offices and depots against a 2006/07 baseline. It includes electricity, gas and gas oil usage.

3. Data for Network Rail managed stations is based on a mixture of actual and estimated meter readings from our energy suppliers. It only includes areas of the stations that are used exclusively by Network Rail, or are shared by Network Rail and third parties. The data does not include spaces used exclusively by third parties (such as retailers and train operating companies), other than those areas that are temporarily vacant or where a bill payer cannot be identified. During 2011/12, management of Gatwick Airport station passed from Network Rail to the train operating company Southern, so data from this station is not included in the calculation from January 2012 onwards.

4. Data for offices is based on a mixture of actual and estimated meter readings from our energy suppliers. This data does not include electricity and gas consumption from a small number of offices where utilities are paid for within a landlord service charge payment. These offices were not included as part of our 2006/07 baseline.

5. Data for depots is based on a mixture of actual and estimated meter readings from our energy suppliers for approximately half of all depot sites. This figure is then doubled to reach an estimated total figure for depots.

6. Due to changes to our supplier arrangements, data for gas oil consumption for quarters two, three and four of the financial year 2011/12 has had to be estimated using 2010/11 data. Gas oil consumption was not included in our 2006/07 baseline.

2. Operational recycling:

1. This data relates to a specific target to reduce waste sent to landfill from Network Rail managed stations, offices and depots. The reported figures are for reuse or recycling of waste.

2. Data is provided by our waste management contractors: SITA UK for our managed stations; MITIE for offices; and UK Waste Solutions for depots.

3. Although our target is for offices, managed stations and depots, as in previous years the data includes a number of signalling centres and signal boxes.

4. This data covers all Network Rail managed stations with the exception of Fenchurch Street station (data was not available at the time of reporting). During 2011/12, management of Gatwick Airport station passed from Network Rail to the train operating company Southern, so data from this station is not included in the calculation from January 2012 onwards.

5. This data does not include figures from a small number of offices where waste management services are paid for within a landlord service charge payment. These offices were not included in our previously reported figures.

6. Some discrepancies were found in our source data for depot waste during a review of a random sample of three datasets as part of our end of year reporting. These discrepancies were not material but will be reviewed with our supplier.

3. Infrastructure recycling:

1. National Delivery Service (NDS) is the internal logistics function for Network Rail. NDS transports and manages our key used materials.

2. This data includes the management, by NDS, of inert ballast, hazardous ballast, rail, concrete and wooden sleepers, and scrap metal.

3. The data represents the percentage of ballast expected to be recovered from all the ballast removed from the infrastructure this year, based on known landfill and ballast recovery rates at our contractor's depots. It should be noted that a certain quantity of ballast will be stockpiled by our contractor awaiting processing at any given time. At the end of the financial year a total of 387,976 tonnes was stockpiled for processing.

4. In 2011/12, we are reporting a decrease in the amount of ballast that we have recycled compared to previous years. This decrease is in part due to more accurate data capture, analysis and reporting. It is also due to improvements in our detection of contaminants, which has caused some ballast to be identified as unsuitable for recycling. We are working to improve our ability to manage this contaminated material to maximise recycling.

5. In July 2011, NDS commissioned a new facility to wash ballast that has been contaminated with hydrocarbons, allowing Network Rail to divert this hazardous waste stream from landfill into a recycled product.

4. Environmental incidents:

1. This data relates to significant environmental incidents, which are classified as being either: a) a major spill (typically in excess of 1000 litres); b) any spill which either has affected, or has significant potential to affect, a sensitive receptor(s) such as surface water or groundwater, or to cause significant ground contamination; c) physical damage to a protected site or species; d) an environmental incident which has resulted in or has significant potential for prosecution.

2. The data does not include contractor and third party incidents on Network Rail sites.

3. There were two significant environmental incidents in 2011/12. One involved a leak from a fuel tank after a train struck an object on the track, where approximately 1,100 litres of fuel were lost. The other incident was in relation to an oil leak from an oil storage tank. The exact quantity of oil lost is unknown, but was likely to be several thousand litres.

5. Land management:

1. In England, Network Rail owns and manages 141 designated Sites of Special Scientific Interest (SSSIs). These areas are protected by law, as they are important to the nation's natural heritage for their habitats, plants, animals or geology.

2. Our target for December 2010 was to bring 21 of these sites into favourable or recovering condition. This was in support of a Natural England Public Service Agreement target set in 2000.

3. We reached our target thanks to an investment of over £6m and work was substantially completed on 100 per cent of the 21 sites by April 2011.

Metrics not reported in 2011/12

6. Water Recovered:

1. In 2009/10, we reported that we would be targeting the water reused from the two biggest rail tunnels on our network which run under the Severn and Mersey Rivers. After further investigation and discussions with both water companies and local customers, we concluded that an 85 per cent reuse target (that was initially suggested) is unachievable and as a result this target has been removed.

Changes to historic 2009/10 and 2010/11 data

7. Previously reported Network Rail carbon emissions (CO_2)

1. The reported figures for 2009/10 and 2010/11 Network Rail carbon emissions (CO_2) have changed since the publication of the last Annual Return. This is due to the inclusion of updated consumption data and the use of latest Defra Greenhouse Gas (GHG) Conversion Factors.

Section 6 – Enhancement Programme

Introduction and Summary of progress in the year

We have progressed delivery of the enhancement schemes that we have committed to during CP4. Some highlights for the year include:

Thameslink: Benefits have now been realised in two locations in Central London where the latest milestones have been completed at:

- **Blackfriars:** The upgraded ticket office booking hall and concourse are now open to the public, along with a new south-bank entrance, giving easier access to nearby offices and tourist attractions like the Tate Modern. Work continues on full integration with the enlarged Underground station. The station is due to be fully completed before the Summer Olympics, but already the new customer and staff facilities are a significant improvement.

- **Farringdon Station**: In February, we reopened this grade II listed station with two new entrances in addition to the original restored entrance, new ticket gates and machines, two new ticket offices, and a new staircase and footbridge. Further improvements are scheduled to be delivered progressively to this key National Rail / Underground interchange.

A feature of the Thameslink programme was the introduction of 12 car services along the existing Thameslink route from Bedford to Brighton in December. Work undertaken through central London, with 12 car capable stations at St Pancras International, Farringdon, City Thameslink, Blackfriars and beyond means that services will be further boosted as new rolling stock is introduced in coming years.

Line Speed Improvements - Wrexham to Marylebone: As an integral part of the Evergreen 3 project which includes linespeed improvements, journey times and travel opportunities between London (Marylebone) and Birmingham (Moor Street) have been improved, with Chiltern Railways now able to offer a 100-minute fastest journey time between these two cities.

Allerton Depot: The modernised depot now provides additional stabling for Northern's fleet, as well as enhanced vehicle maintenance, cleaning and fuelling, together with better facilities for train crews. It was brought into operation for the December 2011 timetable change.

Access for all: This programme is designed to improve access to the railway for everyone through the installation of new lifts, footbridges and tactile platform paving. Continuing our work from last year, we have now upgraded a further 27 stations during the year 2011/12.

Reading: Reading is still one of the busiest parts of this country's rail network, and work continues to improve the complicated track layout around, and passing through, the station. Significant progress this year has seen the construction and commissioning of a new platform, an extension to another, and the widening of Vastern Road (George Street) roadbridge. All existing platforms have been renumbered. Also, following extensive works during the Christmas period to replace the bridges spanning Cow Lane to the west of the station, the road passing underneath was reopened in January after the first phase of widening work. This part of the project will be fully completed in 2015.

North London / East London Line: Improvements to these routes have enabled frequent passenger services to be operated by London Overground round the periphery of Central London, while maintaining the existing loading gauge and capacity for freight traffic too. As an example, a customer may now make a journey from Highbury & Islington to West Croydon in less than an hour on one train. These improvements all form part of the Olympics Transport Plan strategy.

Station Improvements at King's Cross and St Pancras: The King's Cross Station concourse is now complete. It offers a bright, spacious passenger circulation environment with new retail facilities. Additionally, there has been refurbishment of the east and west range offices, and the whole complex has been integrated with the London Underground development, as well as the adjacent, successful St Pancras International Station.

Cardiff Area Improvements: We have finalised plans to improve the track layout, signalling and selected stations in the Cardiff area that offer the potential for trains to run more frequently. This will benefit both business and leisure travellers in the busy areas around the City. Some of the work is subject to funding, but the combined projects are committed for delivery by December 2016.

Edinburgh Waverley: In January, the refurbished Waverley Steps at Edinburgh Waverley Station reopened as part of the first phase of the overhaul to the station's Princes Street entrance. The steps have been rebuilt and three banks of double escalators installed as part of a modernisation programme to improve access at the station. The thoroughfare is protected from the weather by a new canopy. Two lifts, providing step free access from Princes Street to the station, will be installed by summer 2012.

Change control

The CP4 enhancement programme is funded through the ORR's final determination for CP4 as well as through subsequent agreement to fund additional schemes (such as the "on network" works for Crossrail, the electrification programme and the Edinburgh to Glasgow improvement programme). Each of the projects and funds described in this Annual Return has a defined set of outputs and key dates that we have committed to meet. Material changes to these can only be implemented after consultation and via a formal change control process. The changes agreed by the ORR during the year are given below in Table 6.1, and those still under consideration at the time of writing are shown in Table 6.2.

Table 6.1 Changes approved by the ORR

ID no.	*Project*	*Change*
3.01	Felixstowe to Nuneaton Freight Capacity scheme	Revised scope, outputs and milestones due to project development.
8.00	Access for All	Further definition of delivery dates.
9.00	King's Cross	Revised milestones due to project development.
10.02	WCML Traction Power Supply upgrade project	Revised scope, outputs and milestones due to project development.
10.03	Stafford Area Improvement Project	Revised scope, outputs and milestones due to project development.
11.00	Thameslink Programme	Change to key milestones due to project development.
12.00	Intercity Express Programme	Revised scope and milestones due to project development.
13.01	Crossrail	Revised scope and milestones due to project development.
13.02	Reading	Revised milestones due to project development.
15.20-15.32	Train Lengthening – Southern	Revised project definitions to align with the procurement packages for the delivery of works. Additional changes to scope, outputs and milestones due to project development.
15.33	Waterloo	Revised scope, outputs and milestones.
15.34	Train Lengthening - Southern – Wessex ASDO	New project
16.06	Route 6 – Power Supply Enhancements	Revised scope due to project development.
18.01	Capacity Relief to the ECML (GN/GE Joint Line)	Revised scope, outputs and milestones due to project development.
18.02	Peterborough Station Area Capacity Enhancements	Revised scope due to project development.
18.06	Hitchin Grade Separation	Revised scope due to project development.
19.00	East Coast Main Line Overhead Line Electrification	Revised scope, outputs and milestones due to project development.
22.02	Redditch Branch Enhancements	Revised scope and milestones due to project development.
22.05	Route 17 – Train Lengthening	Revised scope and milestones due to project development.
22.06	East Midlands Train Lengthening	Revised outputs due to project development.
23.01	Capacity Improvements (Leeds area)	Revised scope, outputs and milestones due to project development.
23.02	South Yorkshire – Train Lengthening	Revised scope, outputs and milestones due to project development.
23.03	South Yorkshire – Stabling for Northern	Revised scope, outputs and milestones due to project development.
24.01	Route 20 – Platform Lengthening	Revised scope, outputs and milestones due to project development.

table continued …

Table 6.1 Changes approved by the ORR *continued*

ID no.	*Project*	*Change*
24.02	Route 20 – Stabling for Northern	Revised scope, outputs and milestones due to project development.
24.04	Route 20 Capacity Enhancements	Revised scope, outputs and milestones due to project development.
25.00	Liverpool – Leeds Journey Time Improvements	Revised scope and milestones due to project development.
26.01	Barry – Cardiff Queen Street Corridor	Revised scope and milestones due to project development.
26.04	Maidenhead and Twyford (relief lines)	Project no longer required to sustain the operational plan.
100.01	Great Western Main Line Electrification	Revised scope due to project development.
100.02	North West Electrification	Revised scope, outputs and milestones due to project development.
100.03	North Trans-Pennine Electrification	New project
101.00	Northern Hub Phase One	New project
33.01	Ayrshire and Inverclyde infrastructure Enhancements for Class 380 Train Introduction	Revised scope and milestones due to project development.
33.03	EGIP – Edinburgh Gateway (Gogar) Intermodal Transport Interchange	Currently outwith the change control process due to impact of contractual dispute between the City of Edinburgh Council and the consortium awarded the contract for the tram project delivery.
33.05	EGIP – Infrastructure works	Revised scope, outputs and milestones due to project development.
33.06	EGIP – Edinburgh to Glasgow Electrification	Revised scope, outputs and milestones due to project development.
33.07	EGIP – Haymarket Station Capacity – GRIP Stages 5 – 8 Implementation	New project

Table 6.2 Changes requested and still under consideration (as at June 2012)

ID no.	*Project*	*Change*
14.00	Birmingham New Street Gateway	Further definition of scope and delivery milestones.
15.26	Kent & Sydenham Train Lengthening	Revised scope and delivery milestone due to project development.
15.32	Windsor Line	Revised delivery milestones due to project development.
16.01	Route 1 – Power Supply (Kent)	Revised scope and delivery milestones due to project development.
16.08	DC Regenerations	Revised scope and delivery milestone due to project development.
22.01	Bromsgrove Electrification	Revised delivery milestones due to project development.
28.00	FTN/GSM-R inclusion of freight-only branch lines	Further definition of scope and delivery milestones.

Enhancement Expenditure

Actual expenditure incurred on each enhancement programme in 2011/12 and the cumulative total for the first three years of CP4 is shown in Table 6.3. The table groups expenditure separately for those schemes that were funded by the 2008 Periodic Review settlement (PR08) and those that were agreed after the review was determined.

Table 6.3 Enhancement expenditure in 2011/12 (£ million at 2011/12 prices)

	2011/12	CP4 cumulative
PR08 Funded Schemes in England and Wales		
NRDF (Network Rail Discretionary Fund)	25	138
NSIP (National Stations Improvement Programme)	47	94
SFN (Strategic Freight Network)	24	33
Performance Fund	72	137
Seven Day Railway Fund	24	31
CP5 Development Fund	19	35
Safety and Environment Fund	19	76
Access for All	50	158
Adjustment due to change of funding from DfT	0	-117
King's Cross	116	321
WCML Committed Schemes	39	63
Thameslink	697	1,660
Intercity Express Programme	8	15
Reading	100	195
Birmingham New Street Gateway Project	12	13
Platform Lengthening – Southern	88	125
Power Supply Upgrade	20	43
Southern Capacity	7	10
ECML Improvements	48	73
ECML Overhead Line Enhancement	9	21
Midland Mainline St Pancras – Sheffield line speed improvements	4	8
Nottingham Resignalling	0	1
Midlands Improvement Programme	16	20
Northern Urban Centres - Yorkshire	8	9
Northern Urban Centres - Manchester	17	20
Liverpool to Leeds Linespeed Improvements	1	2
Western Improvements Programme	15	44
North London Line Capacity Enhancement	0	75
GSM-R on Freight Routes	0	0
Station Security	6	10
PR08 Funded Schemes in Scotland		
Tier 3 Project Development	5	6
Small Projects Fund	2	7
Airdrie to Bathgate	1	240
Paisley Corridor Improvements	69	146
Borders Railway	0	0
Glasgow to Kilmarnock	0	17
Other - Schemes carried over from CP3 and unallocated	**14**	**115**
Total for PR08 Funded Schemes	**1,582**	**3,844**
Non PR08 Funded Enhancements		
Crossrail	84	175
Electrification	59	64
Edinburgh to Glasgow Improvement Programme	21	45
Ayrshire Inverclyde	1	19
Waverley Steps	7	8
Third Party Promoted	113	389
Other – Promoted by Network Rail or DfT	210	343
Funded directly by third parties (inc change in DfT funding)	190	947
Total for non PR08 Funded Schemes	**685**	**1,990**
Total Enhancement Expenditure	**2,267**	**5,834**

England and Wales

Programme ID 1.00 Network Rail Discretionary Fund (NRDF)

Current Project Stage: Various

The Fund is a mechanism for funding minor schemes which have an appropriate industry business case. The schemes may be either linked to renewals or standalone schemes. The fund was primarily aimed at interventions that result in an increase in the capacity or capability of the network, however it now also seeks opportunities to reduce the short and medium term cost of the railway. Our obligation is to work with our customers and stakeholders to identify the best use of the funds available.

The NRDF spend in 2011/12 was £25 million (20010/11 was £31 million). During the year the CP4 NRDF was increased by £100 million and an additional tranche of schemes funded. At £138 million spend in CP4 so far, the fund remains on target to spend the funding available in the control period.

During the year we conducted an analysis of the NRDF business cases, in part to inform the discussion around the case for the fund's continuation in CP5. Our conclusions were that the overall Benefit cost ratio (BCR) of the fund is 6, well in excess of the DfT's "high" value for money threshold of 2 (that is also now the hurdle rate adopted for the Fund). The work looked at the 142 NRDF schemes completed in both CP3 and CP4. The total cost of these schemes was £253 million.

We have developed a spreadsheet application to simplify the appraisal required to justify the use of the NRDF for the removal of Permanent Speed Restrictions (PSRs) across the network, based solely on the reduction in energy costs through reduced braking and acceleration. Each such NRDF scheme thus provides an enduring reduction in industry cost and carbon consumption. We intend to role out a programme of PSR removals during the remainder of CP4.

A detailed list of NRDF schemes can be found within our "CP4 Delivery Plan 2011 Enhancements Programme" publication.

Programme ID 2.00 National Stations Improvement Programme (NSIP)

Current Project Stage: Various

The National Stations Improvement Programme (NSIP) is a joint rail industry initiative involving Network Rail, train operating companies (TOCs) and the Department for Transport (DfT). The programme is funded primarily by the DfT and aims to deliver £179 million worth of station improvements to a minimum of 150 medium sized stations in England and Wales during Control Period 4 (CP4). In many cases this funding has been supplemented by contributions from train operators, local authorities and other interested parties raising the potential provision by an additional £79 million.

The programme adopts a new approach to the working partnership between Network Rail and the TOCs. Through the formation of 17 Local Delivery Groups (LDGs) the programme encourages and empowers the LDGs to make decisions at a local level. The LDGs are jointly chaired by Network Rail and the TOCs. LDGs integrate their plans with other programmes of work, and deliver the right solution in the most efficient manner complementing all the interfaces for each station.

Our obligation is to work with stakeholders to identify the best use of available funds and to deliver the proposed programme of station works delivered by the cross-industry LDGs. Projects can also be delivered by the TOCs or third parties where agreed by the LDGs.

The core objective is to achieve a noticeable improvement in passenger perception by focussing on stations of high footfall density and low passenger satisfaction. A wider aim of the programme is to develop a more effective, co-ordinated approach for the planning and delivery of activities at stations by all stakeholders, thereby improving efficiency and value for money in station investments.

As the programme develops, the scope of NSIP works has evolved beyond the initial

"high street" type works to more complex projects. For completed projects, the scope has included: new customer information screens, cycle facilities, seating, signage, waiting shelter improvements, new canopies, new station buildings, booking hall refurbishments, subway improvements and improvements to station retail outlets.

64 projects have been completed in the first two years of CP4 benefiting 161 stations. 32 projects have been completed in 2011/12 benefiting the stations listed in the table below. The final tranche of NSIP funding has now been allocated to LDGs and this will benefit at least a further 200 stations by the end of CP4.

Progress in 2011/12
The completed projects are listed by Station Facility Owner (SFO) in Table 6.4.

Table 6.4 Completed projects

SFO	***Stations***
Arriva Trains Wales	Abergavenny, Birchgrove, Caergwrle, Caldicot, Cardiff Central (Phase 1), Cefn y Bedd, Danescourt, Fairwater, Gwersylt, Hawarden, Hereford, Hope, Ninian Park, Penyffordd, Rhiwbina, Whitchurch (Cardiff), Treforest Estate, Ty Glas, Waun Gron Park, Wrexham General, Wrexham Central.
c2c	Southend East
Chiltern Railways	-
East Coast	Wakefield Westgate
East Midlands Trains	Burton on Trent, Skegness
First Capital Connect	-
First Great Western	Cheltenham, Chippenham, Exeter Central, Exeter St Davids, Gloucester, Hayes & Harlington, Hereford, Honeybourne, Langley, Newbury, Plymouth (Phase 1)
Greater Anglia, formerly National Express East Anglia	Brentwood, Colchester, Marks Tey
London Midland	-
Merseyrail	Kirby, Liverpool Lime St (Underground), Maghull, Moorfields
Northern	Blackburn, Bolton, Bradford Interchange (Phase 1), Buxton, Harrogate (Phase 2), Hartlepool (Phase 2), Ilkley, Manchester Oxford Road, Manchester Victoria, Mexborough, Skipton
South West Trains	Honiton, Southampton Central (phase 1), Wandsworth Town
Southeastern	Folkstone Central, Gillingham, London Waterloo East, Sittingbourne
Southern	Balham (Phase 1), Norbury
TransPennine Express	Barrow in Furness, Warrington Central
Virgin Trains	Birmingham International, Carlisle Tranche 1, Preston Tranche 2, Wigan North Western

Examples of completed works are:

Blackburn Station (Northern Rail) - Current Project Stage: Completion
The NSIP project at Blackburn delivered customer improvements and better access to the station.

The project was delivered by Network Rail, and included:

- Canopy provision to provide protection to passengers
- Provision of Customer Information System (CIS), lighting, signage and CCTV coverage to provide enhanced security and benefits to passengers
- Installation of additional passenger seating under the canopies
- Provision of an Access for All (AfA) lift which was delivered alongside the NSIP works and made possible by efficiencies within the contract.

The project started in February 2008 and was completed in December 2011. The project was delivered for £587,000 including third party contributions of £200,000, and £100,000 sourced from AfA funding.

Gloucester Station (First Great Western) - Current Project Stage: Completion
The NSIP project at Gloucester delivered overall customer improvements to the station.

The project was delivered by First Great Western and work included:

- Construction of 2 new heated waiting rooms, catering for over 100 people in total;
- Construction of a new covered walkway between platform and station building;
- Upgrading the customer assistance point; and
- Installation of new seating on the platforms.

The project was delivered in just over eight weeks; starting in May 2011, and completing in July 2011. The works cost £782,000, including £100,000 of third party funding.

Maghull Station (Merseyrail Electrics) –

Current Project Stage: Completion
The NSIP project delivered by Merseyrail Electrics installed:

- An ‘M-to-Go’ new concept booking office and retail facility at the station

The project started in March 2011 and completed in July 2011. The project came in on budget at £312,000 and was delivered on time.

Programme ID 3.00 Strategic Freight Network (SFN)

The Department for Transport (DfT) announced in its HLOS (July 2007) funding to facilitate the implementation of a Strategic Freight Network. This would add capacity and capability to the network in CP4 to allow an increase in the number of freight trains, along with larger loading gauges and longer trains. All this will be delivered by five schemes (detailed below), each of which provides an enhancement for freight customers. These schemes have been developed with the Strategic Freight Network Steering Group (SFN) comprising Network Rail, the freight operating companies and freight users, the Association of Train Operating Companies (representing passenger operators), the DfT, the Welsh Assembly Government and Transport Scotland.

Felixstowe to Nuneaton Freight Capacity Project. Programme ID 3.01

Current Project Stage: Detailed Design / Construction

The provision of two key physical interventions was identified in the option selection study (completed March 2009), as follows:

- The provision of a 1.4km double track chord line between the East Suffolk Line and Great Eastern Main Line known as 'Ipswich Chord' to enable cross-country intermodal trains to bypass Ipswich Yard
- The provision of two 775 metre loops on the east side of Ely station (towards Soham) for regulation of intermodal freight trains heading towards Peterborough over Ely North Junction and towards Ipswich over the single line section to Soham

During 2011/12, the SFN Steering Group also agreed to fund an incremental enhancement to the Kennett Resignalling Project in order to improve the headways for freight traffic.

Progress in 2011/12

- Both Ely Loops and Ipswich Chord obtained GRIP 5-8 authority during the year
- Development Consent Order application made to the Infrastructure Planning Commission and accepted for Examination.
- Public hearings held examining the Application during February 2012
- Main design and build contractor for Ely Loops engaged through the Multi Asset Framework Agreement
- The incremental enhancement to Kennett resignalling commissioned in March 2012.

Milestones:

This next committed delivery milestone is the completion of the Ely Loops by April 2013. The project is on target to meet this date.

Ipswich Chord is due to be delivered by March 2014, subject to the date by which the Secretary of State for Transport reaches a decision on the Development Consent Order application.

Southampton to West Coast Main Line W10 / W12 Diversionary Route via Andover Programme ID 3.02

Current project stage: Construction

This project delivers a W12 Diversionary Route between Southampton and Basingstoke to enable intermodal traffic to run without disruption whilst maintenance and renewal takes place on the core route via Eastleigh. The identified scope of the project includes:

- Reconstruction of 15 overbridges with a standard "Conarch" solution
- Demolition of three overbridges
- Demolition of an arched overbridge and replacement with a footbridge
- Track lowering and slewing at eight overbridges
- Bridge modification (notching) at two sites in association with trackwork
- Modification of four station canopy awnings.

Progress in 2011/12

- Work commenced on site in September 2011 and is on target and within budget
- Anticipated Final Cost (AFC) reduced to £29.85 million, including £1.67 million of Third Party Funding for increases in scope, from an authority of £33.86 million, a saving of £4 million

Milestones for ID 3.02		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 Completion	June 2013	June 2013

- Track lowering and slewing works completed at Four Lanes, Coldharbour Lane, Dean, St John's Road, Church Acre, and Foxdown
- Canopy Alterations completed at Whitchurch and Andover Stations
- Bridge demolitions and reconstructions completed at Lunn, Allington Road, Sarson Down, Apsley, Freefolk, Lee Drove, Weyhill Road Andover, Old Salisbury Road, Newbury Road, Burts, and Taskers
- Scope of work amended at Hat Hill Farm where the National Trust has agreed to relinquish access rights (so that the bridge can be demolished rather than reconstructed) and at Coldharbour Lane, where clearance will be provided solely by track lowering reducing the requirement for a notch.

This project has a committed delivery milestone of clearance of the route to W12 Gauge by June 2013. In advance of this the project aims to achieve W10 Gauge Clearance by January 2013.

Channel Tunnel South of London Route Fund. Programme ID 3.03

Introduction

The Channel Tunnel south of London route fund currently has two component projects: Channel Tunnel Second Route and Redhill to Reading London Orbital Freight Study.

Current Project Stage: GRIP 3
The output of the Channel Tunnel Second Route is to provide an alternative route for freight between the Channel Tunnel and Willesden which is both clear for W9 gauge and Class 92 haulage in addition to the single route currently available via Maidstone East. This will provide an alternative route during times of maintenance and renewals on the current route. The route being considered in this project is Dollands Moor – Ashford – Tonbridge West Junction – Redhill – Selhurst – Streatham Common – Balham – Clapham Junction –
Latchmere Junctions and the West London Line to Willesden.

Progress in 2010/11

Channel Tunnel Second Route

- GRIP 3 completed to programmed date
- GRIP 3 conclusions demonstrated that the project represents poor value for money
- Stakeholder consultation has taken place and the project is preparing to progress towards formal closeout
- As part of the project closeout process, alternative options for electrically hauled freight to or from the Channel Tunnel are being explored and a remit for further study of other route options developed

There is no further update for the Redhill to Reading London Orbital Freight Study aspect of the work as Investment Panel approved the Project Closeout Report in June 2011, and the study has been concluded.

In-Fill Gauge projects fund. Programme ID 3.04

The In-Fill Gauge projects fund currently has six component projects.

Water Orton to Doncaster Rail Gauge Enhancement

Current Project Stage: GRIP 5-8

This project will provide W10 and W12 gauge between Water Orton and Doncaster via Castle Donington, the Erewash Valley and Beighton Junction. It will connect South Yorkshire and the East Midlands to the existing and planned high gauge routes that extend to/from the West Midlands.

Progress in 2011/12

- The cost / scope / outputs of the project confirmed and baselined to clear 49 foul structures to provide both W10 and W12 gauge.
- Work ongoing and has developed solutions for the identified structures to GRIP 4.
- Opportunity identified to clear a foul structure in January 2011 at Castle Donington. The works to reinstate a

- connection to the Castle Donington Freight Terminal were combined with track lowering, which provided a cost saving to the project and avoided the need for additional possessions

No milestones were committed to be delivered during 2011/12.

However, this project is planned to be completed within CP4 and is on target to meet that date.

London to Peterborough via the Hertford Loop on the ECML ('ECML South')

Current Project Stage: GRIP 5-8

This project will provide W10 and W12 gauge on the southern end of the East Coast Main Line, including the links to the North London Line in both an east and westbound direction. The main functionality of this project is to provide a high gauge diversionary route for intermodal traffic to/from Felixstowe when the route via March is unavailable.

Progress in 2011/12

- The scope and outputs of the project have been confirmed and baselined to clear 27 foul structures to provide both W10 and W12 gauge. During the year, work has been ongoing and has developed solutions for these structures to GRIP 4
- An opportunity was identified to clear two foul structures in August 2011 on the Hertford Loop. Plain Line Track Renewals were combined with track lowering, which provided a cost saving to the project and avoided the need for additional possessions

No milestones were committed to be delivered during 2011/12.

This project is due to be completed within CP4 and is on target to meet that date.

Teesport to ECML Gauge Enhancement

Current Project Stage: GRIP 5-8

This project will provide W10 and W12 gauge between Grangetown Junction and Darlington Up Sidings via Darlington South Junction.

Progress in 2011/12

- The SFN Steering Group agreed to make a fixed funding contribution to the project which is primarily met by third parties
- The project was authorised for progression through GRIP 5-8 and the design and build contractor engaged through the Multi Asset Framework Agreement

No milestones were committed to be delivered during 2011/12.
This project is to be completed within CP4 and is on target to meet that date.

ECML North to WCML (Carstairs) Gauge Enhancement

Current Project Stage: GRIP 1-3

The project will provide a W10 and W12 gauge route between Temple Hirst Junction and Carstairs via the ECML. The project will also investigate the potential for high gauge diversionary routes away from the ECML in Yorkshire.

Progress in 2011/12

- A LaserRail survey of the route has identified that 69 foul structures will be cleared to provide both W10 and W12 gauge. *(LaserRail is one of the railway research companies in Derby)*
- Single option development site surveys and investigations are now taking place

No milestones were committed to be delivered during 2011/12.

The project programme and deliverability within CP4 is currently being reviewed.

Swinton to South Kirkby Gauge Enhancement

Current Project Stage: GRIP 1-3

This project will provide W10 and W12 gauge on a nine mile track section in Yorkshire that will provide a more direct route to/from the intermodal terminals at Leeds Stourton and Wakefield Europort and avoid trains having to be routed through the busy ECML junctions at Doncaster.

Progress in 2011/12

- LaserRail survey of the route identified that 12 foul structures will be cleared to provide both W10 and W12 gauge. The majority of these foul structures are platform faces, trackside signs and signals which can be cleared through Rules of the Route possessions. There is only one foul bridge structure (Broad Lane overbridge) which requires disruptive possessions to provide gauge clearance
- Single option development site surveys and investigations currently taking place

No milestones were committed to be delivered in 2011/12.

This project is due to be completed within CP4 and is on target to meet that date.

GB1 gauge from Exchange Sidings near Barking to terminals in the vicinity

Current Project Stage: GRIP 7

The project aims to deliver European gauge capability (GB1 / GB2) from HS1 Exchange Sidings to Dagenham, Ripple Lane West Yard and into Barking and Ripple Lane terminals, via Renwick Road Junction.

Progress in 2011/12

Works to achieve the gauge clearance carried out in May 2011, and the route handed back into use.

The first European Gauge (GB1) train operated into Dagenham Ford freight terminal overnight in July 2011.

Train lengthening projects fund. Programme ID 3.05

The In-Fill Gauge projects fund currently has three component projects:

1. Peak Forest and Hope Valley to London and the South East.

Current Project Stage: GRIP 5-8

The project is to enable the operation of a standard hourly 2,600 tonne freight path from the Peak District quarries to London via the Midland Main Line.

Progress in 2011/12

The scope and outputs of the project have been confirmed and the following infrastructure interventions will be required:

- Dowlow and Hindlow – minor remodelling of the trackwork adjacent to the quarries
- Buxton – extended sidings for the run round movement where freight trains switch between the Dowlow and Great Rocks branch lines
- Chinley South Junction – redoubling of the junction to allow parallel moves for a loaded freight train towards Manchester at the same time as an empty freight train from Dore
- Manton Junction – redoubling of the junction to eliminate the current wrong direction operation through Manton Tunnel for services travelling towards Corby
- Sundon Loop – A new Up Loop between Bedford and Luton on the Midland Main Line, to enable freight trains to be regulated amongst Slow Line passenger services
- Carlton Road Junction – increase the speed of the junction from 10mph to 20mph for freight trains to/from the Midland Main Line and the Gospel Oak – Barking line

No milestones were committed to be delivered during 2011/12.

This project is scheduled to be completed within CP4 and is on target to meet that date.

2. Felixstowe to Nuneaton via London

Current Project Stage: Single Option Selection

The project delivers infrastructure interventions to enable the operation of 662

metre long intermodal trains between Felixstowe Port and Nuneaton via London.

Progress in 2011/12

The scope and outputs of the project have been confirmed as modifications to the layout of Ipswich Yard.

No milestones were committed to be delivered during 2011/12.

This project is due to be completed within CP4 and is on target to meet that date.

3. Southampton to West Coast Main Line Train Lengthening

This project will deliver an increase in freight train lengths up to 775m on the route from Southampton to the WCML via Eastleigh, Winchester, Reading, Didcot, Oxford, Leamington to Nuneaton via Tyesley and Coventry.

Progress in 2011/12

GRIP 3 Feasibility into options of 665m and 775m long trains was completed in August and presented to SFN Steering Group.

The project was endorsed for development to GRIP 4 for the 775m option with an anticipated final cost of £54.93m.
This project is to be completed within CP4 and is on target to meet that date.

Current Project Stage: Single Option Development

The scope of work has been identified as:

- Southampton Maritime / Redbridge - remodelling to accommodate 775m trains
- Southampton Western Docks - extension of Docks Arrivals / Departure lines, plus increased entrance / exit speeds
- Eastleigh - Extension of Up Slow line south of station to provide new 775m Goods Loop with 40mph entrance
- Wallers Ash Up and Down Loop – design for the re-siting of signals and provision for longer trains
- Oxford - extension of Down Passenger Loop to Wolvercot Junction to provide 775m looping facility on the Down Main
- Fenny Compton - Down Goods Loop, renew S&C and Track to provide increased entry / exit speed
- Hatton Down Goods Loop - renew loop for increased entry / exit speed
- Dorridge Down Loop - extend loop with increased entry / exit speed
- Washwood Heath - extend Up Washwood Heath Goods Loop / Up Derby Slow plus increased exit speeds
- Milverton Junction - re-site signals LN 51/52

Programme ID 4.00 Performance Fund

Current Project Stage: Various

The overall objective of the fund is to facilitate improvement activity to deliver performance levels beyond those anticipated to be achieved by our:

- Core asset management policies
- Enhancement projects

Thereby working towards delivery of the performance targets identified in the 2008 Periodic Review.

A 'programme approach' is applied to authorisation of schemes for funding. The detailed control process provides funding by area, based on the measured challenge of delivery, whilst also maintaining a broad-based approach which:

- Enables and focuses attention on performance by all parties, which can influence good train performance
- Is responsive to change in the challenge of overall delivery
- Encourages innovation and the transfer of good practice
- Brings consistency to business-case consideration across all possible improvement activities to enable the sound prioritisation of projects

Business cases are prepared based on the forecast benefits in core outputs of *Public Performance Measure* (PPM) and *Cancellations and Significant Lateness* (CaSL), with recognition of other performance benefits where appropriate.

Progress in 2011/12
Delivery in 2011/12 continued the migration away from traditional performance improvement schemes towards a more holistic approach sought in developing the fund management process and seen in previous years' use of the fund. This included the funding of schemes involving problems with delivery, such as cable theft and seasonal management. Authorisation of schemes towards the overall limit of the fund was almost complete by the end of 2010/11.
New authorisation in 2011/12 focussed on fleet-related schemes aimed at delivery of a material objective for fleet contribution to the overall CP4 objectives ('fleet challenge'). Other new schemes have focussed on more local objectives, funded by the efficiency gains achieved from already completed schemes. Given current challenges in achieving the CP4 performance outputs, a softer focus for the programme team is to seek other funding sources to enable more investment in performance improvement.

Delivery of schemes in 2011/12 has been in accordance with overall forecasts at the start of the year. Significant delivery within a balanced portfolio has included:

- Cable theft mitigation across all key routes
- Response to other externally-caused delays – fatality management, trespass reduction etc
- Winter resilience work – both infrastructure and fleet-based
- Fleet challenge improvements to rolling stock
- General infrastructure reliability improvement work
- Remote monitoring and other data related projects
- Other weather mitigation activity – lightning protection etc
- Projects to improve the "flow" of trains on the network – e.g. work to approach controlled signals; improvements to Control etc.

Programme ID 5.00
Seven Day Railway

Current Project Stage: Various

The funding is to support delivery of the regulated output measures for Network Availability during CP4. These are measured by the Possession Disruption Indices (PDI) for passenger and freight (PDI-P and PDI-F).

The primary benefits of the fund are based on directly improving the PDIs. Secondary benefits include Route Categorisation initiatives (e.g. diversionary route capabilities), shortened possession limits or times, additional market opportunities, improved TOC/FOC resilience to planned disruption and reduced bus mileage.

In working with our customers to produce Joint Network Availability Plans (JNAPs), we have consulted with the Train and Freight Operating Companies to understand their requirements and identify where there may be an opportunity to invest from the seven day railway fund to meet these requirements.

Progress in 2011/12

- Since the start of Control Period 4, over 70 projects have been identified. 45 of these projects have progressed to single option development and beyond
- The projects cover a wide variety of interventions which allow access to the network to remain open for longer periods of time, so improving the journey experience to service users. These projects include improvements to assist maintenance activities such as additional access points, junction lighting, improved isolation points, and introduction of new plant. It also includes infrastructure enhancement such as the provision of additional platforms, additional crossovers, turn back facilities as well as timetable studies to identify opportunities for implementing single line working. In addition, funding has been provided to some major signalling enhancement schemes to allow them to deliver their works in a less disruptive access regime, and it has also funded schemes that support diversionary route capabilities
- During the year, Route categorisation principles have become further embedded within our planning processes. The December 2012 timetable and accompanying Engineering Access Statement have been developed on the basis of Route Categorisation. Our Network Availability Implementation Plan was originally published in September 2009 and a further update to this published at the end of March 2011
- Joint Network Availability Implementation Plan (JNAPS) have been reviewed and updated with our customers
- Levels of disruption to both passenger and freight services from planned engineering work remain better than the regulatory requirements for the end of the Control Period. We anticipate some upward pressure on the PDIs towards the end of the Control Period, so we continue to have in place measures to manage this

Seven Day Railway funded schemes completed since the start of CP4 include:

- Additional platform at Chesterfield – which reduced rail replacement requirements and better optimised possession regimes
- RRV access at Christchurch – minimising the impact and disruptions of weeknight possessions on the Waterloo to Weymouth route
- New stabling facility at Worcester – empty coaching stock moves are reduced and possessions have become less disruptive
- Cembre clipping machines – enabling a reduction in possession time required for clipping / de-clipping of rail
- Cotswold line turnback facility – enabling possession impacts to be reduced on the Cotswold Line
- Ramsgate mobile wheel lathe – enabling a more flexible response to wheel turning thus reducing the number of possessions required to repair rail damage caused by unturned wheels
- Tampers - a new, more efficient procedure to operate tampers and stoneblowers is on trial in Wessex; the information gathered will inform the next steps on this project

Programme ID 6.00 CP5 Development Fund

This funding was allowed in the PR08 settlement specifically to support the early development of enhancement schemes to be included in the Initial Industry Plan for consideration within the High Level Output specification for England and Wales; specifically where such schemes were not funded elsewhere within the settlement. The fund has been used with governance and overview provided by the Rail Industry Planning Group.

Spend to date in CP4 is £35 million.

A detailed list of CP5 Development Fund schemes can be found within our "CP4 Delivery Plan 2011 Enhancements Programme" publication.

Programme ID 7.00 Safety and Environment Rollover Fund

Current Projects: Various

Network Rail's funding in CP3 included a fund for safety and environment enhancements to meet legal requirements. As some of the schemes initiated would not complete until CP4, a roll-over of funds was provided in the 2008 Periodic Review Settlement. Our objective is to deliver the specific schemes designated to this fund (or agreed substitute schemes). The following provides a summary of progress with these schemes, some of which have been completed in 2011/12 and a number of which are continuing.

Current Project: Various

The fund is comprised of the following 11 categories:

1. Energy Efficiency

- *On-train metering*
  By providing this facility to train operators they have the opportunity to use it to measure their trains' actual use of electricity and thereby understand what measures can be adopted to improve and minimise consumption. It is currently fitted to Virgin Trains Pendolino fleet, London Midland electric fleet and 4 trial vehicles in the Southern fleet., First ScotRail has opted-in its class 380 fleet and c2c its class 357 fleet for metering from 1 April 2012. This project continues into 2012/13.

- *Carbon reduction commitment*
  The aim of this commitment is to develop a strategy and then identify options for reducing Network Rail's carbon dioxide emissions. The S&E Funded element of this project covered the initial development stage, and the remainder of the project will be taken forward as a self-funded capital expenditure project.

- *Photovoltaic cells on Blackfriars Station roof*
  The Blackfriars station redevelopment is scheduled to be one of Network Rail's first major projects to incorporate the large scale use of Photovoltaic (PV) cells. The PV cells will form part of the station roof design and supply up to 70 per cent of the station's electrical needs. Excess electricity will be fed back into the national grid. Physical delivery has been re-phased into early 2012/13 due to the re-sequencing of the Blackfriars Bridge west side platform roof works.

2. Environment protection

- *Sites of special scientific interest*
  This project brought a number of Sites of Special Scientific Interest in England to favourable or recovering status during 2011/12.

- *Sustainable Lineside*
  This programme identified biological planting solutions and management options to mitigate/prevent risks to the operational railway. Following pre-planting surveys, the next phase of work is to develop the solutions which will be trialled, monitored and, if considered successful, will be rolled out nationally.

- *Thornaby Depot oil pollution*
  The project addresses the risk of oil seeping into an adjacent water course at the depot. The work, which will continue into early 2012/13, includes cleaning out a drainage run and installing filters and booms.

3. Infrastructure failure

- Improvement to the design of switches and crossings was undertaken in 2011/12

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4. Level crossing closure

- Chorley Rylands level crossing was closed in 2011/12 and replaced with an overbridge
- Normanton Station footpath level crossing was closed in 2011/12 and replaced with an overbridge
- The closures of a further nine crossings are being progressed into 2012/13 and beyond. This is due to the timescales associated with obtaining the necessary closure permissions
- The S&E funded element of the National User Worked Crossing (UWC) level crossings closure programme was completed which, since its inception, has either closed or is in the process of closing over 390 UWCs

5. Passenger safety

- A programme of work on trap points in the Great Northern area completed in 2011/12. Trap points are designed to protect railway lines from unauthorised rail vehicle movements by derailing such vehicles. The work reduced the risk of derailed vehicles obstructing adjacent railway lines.
- The fitment of scrubber blocks to the wheelsets of class 158 diesel multiple units was completed in 2011/12. These clean the wheel sets and keep the wheel/rail interface free from contamination during the leaf fall season
- Slip, trip and fall mitigation measures installed at twelve Managed Stations, completed in 2011/12

6. Route crime

- Installation of forward facing cameras on rolling stock leased to Northern Rail completed in 2011/12
- Installation of forward facing cameras on the Cross Country train fleet continues into 2012/13

7. Security

-
- Improved connectivity to the CCTV Control Hub at British Transport Police's headquarters continues into 2012/13
- A national programme of installation of enhanced security measures at key operational locations, also continues into 2012/13

8. Signals Passed At Danger (SPADs)

- A project on London North Eastern Route which seeks to reduce the risk of a starting train passing a signal at danger and entering the conflict area beyond a signal. Following review, the work will involve lowering the line speed at four of the signals (in the Leeds area). This is planned for completion in 2012/13

9. Vegetation management

- A national lineside tree survey of Network Rail's operational corridors was completed in 2011/12. The survey sought to assess the condition of lineside trees and any potential risk posed to the railway or to third party property by them

10. Workforce safety

- Three enhancement projects were completed in 2011/12. These were improvements to access points nationally; improvements to catchpit covers nationally; and junction lighting improvements on London North Western route

11. Workforce health

- Improvements to reduce the risk of injury to signallers caused by excessive signal lever pulls in mechanical lever signal boxes by assessing and, where necessary, implementing appropriate enhanced risk mitigation measures (e.g. enhanced maintenance, motorisation of signals/points) for the highest risk signal levers was completed in 2011/12

Programme ID 8.00
Access for All

Current Project Stage: Various

The objective of the Access for All Programme is to deliver accessibility at as many stations as possible. The locations have been selected by the Department for Transport for England and Wales (135 stations), and Transport Scotland for Scotland (13 stations).

Our obligation is to deliver projects that are authorised from the Access for All fund. The programme delivered enhancements at 22 stations in CP3, and is in a position to complete another 126 in CP4. Following the Autumn Statement in November 2011, the Secretary of State agreed to bring forward the funding from CP5 to CP4. Programme integration analysis continues along with the industry's Integrated Station Plans, the National Stations Improvement Programme and station renewals. This is done to make sure synergies and opportunities are exploited and has been achieved through active stakeholder management to minimise business disruption. Within this framework we have completed 75 per cent of planned stations.

Station specific outputs

For each station identified we must achieve an unobstructed and obstacle free "accessible route" within Network Rail controlled infrastructure, from at least one station entrance and all drop off points associated with that entrance, to each platform and between platforms served by passenger trains.

Scope of works

This is decided on a station by station basis but typically includes the provision of lifts or ramps to an existing, or new, footbridge or subway with the appropriate signage, information systems, non-slip surfaces and colour contrasting handrails as necessary.

Progress in 2011/12

- Option selections agreed with DfT/TS:19
- Outline designs signed off: 10
- Detailed designs signed off: 14
- Stations completed in 2011/12: 27
- Additional funding provided to enable more schemes to be undertaken

The completed stations were:

Blackburn, Blackheath, Boston, Bridgend, Cheadle Hulme, Clapham Junction, Dorking, Farnborough, Grimsby Town, Huddersfield, Ipswich, Keighley, Leominster, Littleborough, Loughborough, Pitsea, Prestatyn, Rotherham Central, Sittingborne, Sutton Coldfield, Staines, Walthamstow Central, Waterloo (Merseyside), Wellingborough, Wembley Central, Wrexham General, West Hampstead Thameslink

Programme ID 9.00
King's Cross

Current Project Stage: Construction, testing and commission

The King's Cross Station Redevelopment Programme is a major redevelopment project covering the whole station and incorporates both the main line and suburban train shed renewals and enhancement elements. A key objective of the project is to provide an integrated, seamless transport interchange between Kings Cross main and suburban train sheds, linked to London Underground (via the northern ticket hall located below the new station concourse), and with the adjacent St Pancras station. Many elements of the existing station are being updated, modernised and renewed including:

- The east and west range offices
- Station roofs, platforms and footbridge
- Building façades

Enhancements include:

- A completely new western concourse, incorporating a mezzanine level with footbridge access to platforms 0 to 8
- A new platform beneath the eastern range offices
- A new iconic square to the south of the station
- A new access road and service yard for station deliveries in conjunction with the adjacent King's Cross central property development

This project supports an improved network capability through an increased station capacity (to handle future passenger forecasts), and increased train path availability through the construction of a new platform.

Other key outputs include:

- Creation of a high quality passenger environment
- Improved circulation space and additional facilities
- Increased retail opportunity within the new concourse
- Additional commercial opportunity by refurbishment of the east and west range offices
- Maximising the heritage environment within the confines of a Grade 1 listed station

Progress in 2011/12

Platform Works:

- Main trainshed platforms (0 to 8) complete and in use: including installation of new footbridge with escalators and lifts over platform 1 to 8.
- Suburban Trainshed platforms (9 to 11) completed and in use
- Main trainshed concourse extension to platforms completed

Gateline Installation:

- Automatic ticket gates installed, commissioned and in use covering the main trainshed (southern façade, western range and new footbridge), and suburban trainshed

Shared Service Yard:

- Service yard and access road commissioned and operational

Western Range:

- Station facilities completed and commissioned including new booking hall, first class lounge, station control room and gateline facilities
- Office facilities completed and commissioned throughout western range
- Retail facilities completed and in use in western range, including pub/restaurant to old parcels yard

Western Concourse:

- New western station concourse and mezzanine level completed, commissioned and in use: including escalator and lift access plus footbridge link from mezzanine level, through refurbished western concourse, into main trainshed
- New access links (escalators, stairs and lifts) to London Underground northern ticket hall below western concourse completed and in use
- Retail facilities within concourse completed and in use

Southern Façade Refurbishment:

- Southern façade arch windows replaced and brickwork refurbished

- both internally within main trainshed and externally

Roof Refurbishment:

- Main trainshed roof refurbishment and glazing replacement (including photo-voltaic panel installation) continuing. Two thirds of roof and glazing completed within both east and west roof barrels.
- Construction deck moved to north of station in both barrels and roof glazing revealed to complement southern façade windows
- Suburban trainshed roof refurbishment works completed
- King's Cross Square design works complete
- Construction works to be commenced - including booking hall access stair canopies on behalf of London Underground
- Other public realm works, taxi ranks, disabled parking etc, completed, including Station Square works completed on behalf of King's Cross Central

Final Delivery:
This project has a committed final delivery milestone of completion by September 2013 and the project is on target to meet that date.

Milestones for ID 9.00		
Activity/Output	***Date***	***Date Met/Expected***
Main train shed interior modifications to link in with western concourse. Provides new passenger circulation régime for new concourse.	March 2012	March 2012
Western range refurbishment. Provides operational facilities.	March 2012	March 2012
Western concourse in use. Enhanced passenger and retail facilities.	March 2012	March 2012

Public Realm Works:

Programme ID 10.00 West Coast Main Line committed schemes

Programme ID 10.01 Bletchley Re-Modelling Project

Current project stage: Final Design and Construction

The purpose of the project is to renew signalling and track assets in the area of Bletchley station and the nearby carriage sidings. It also supports the provision of capacity enhancements which contribute to the delivery of DfT's HLOS strategy.

Progress in 2011/12

- Completion of Sub Commissioning 1 (Stage 2D)
- Progressed Permanent Way (P/Way), OLE, Civils and Signalling Physical Preparation Works
- Progressed P/Way, OLE, Civils and Signalling Detailed Design – Civils, P/Way and OLE substantially complete

This project has a committed delivery milestone of completion by September 2013 with the project on target to meet that date.

West Coast Power Supply Upgrade. Programme ID 10.02

Current project stage: Final Design (phase 3A) and Single Option Development (phase 3B)

The scope of the overall programme is to deliver an upgraded traction power supply system to support the North West Electrification Programme and the Stafford Indicative Service Specification.

Phase one was completed in time for the December 2008 timetable change. Phase two is substantially complete and is planned to be completed in July 2012.

Phase three is the implementation of an upgraded traction power supply between Wembley and Oxenholme. Phase 3A will be substantially complete by the end of CP4 and phase 3B will be completed in CP5.

The project will renew and upgrade the 25kV power supply equipment on the WCML between North Wembley and Whitmore (Phase 3A) and between Whitmore and Oxenholme (Phase 3B) with an upgraded Autotransformer (AT) traction power supply and distribution system.

Progress in 2011/12

- Single Option Development for Phase 3A has been completed, with final design work ongoing. Contracts have been entered into for the distribution and on-track works for the delivery of 3A. These comprise over 90% of the total contractor work

- Option Selection for phase 3B has been completed and single option development work is ongoing. Delivery phases for 3B have been aligned with the requirements of North West Electrification Project delivery phases and the Stafford Area Improvement Project

- *Approval In Principle* completed for phase 3B

- Full review of outputs and scope undertaken and agreed with DfT and ORR. Phase 3B scope has been reduced, and Phase 3C (Oxenholme-Great Strickland) has been removed from the scope of the project

Milestones in the year 2011/12

Note: Completion of work against this milestone was delayed whilst the DfT and Network Rail undertook a review of phase 3B scope to be taken forward into single option development.

Milestones for ID 10.02: Phase 3A: North Wembley – Whitmore		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 4 complete - Detailed Design option confirmed	May 2011	May 2011
GRIP 5 Started - Detailed Design	May 2011	May 2011

Milestones for ID 10.02: Phase 3B: Whitmore – Oxenholme		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 complete - Single Option selected	May 2011	September 2011

Programme ID 10.03
Stafford Area Improvement Project.

Current Project Stage: Single Option Development

The project supports the implementation of a new service specification on West Coast Main Line through the provision of additional fast line capacity, additional freight capacity on the Trent Valley route at Stafford Station, and additional capacity on the Birmingham – Manchester axis. In addition a package of line speed enhancements between Stafford and Crewe has been developed.

Progress in 2011/12

- Completed GRIP 3 option selection work and commenced GRIP 4 final option development work
- Preferred alignment for Norton Bridge Grade Separation identified and is the subject of technical and public stakeholder consultation – the second round of which was completed in December 2011
- Revised Delivery Plan milestones agreed with DfT and ORR, which accurately reflect the infrastructure interventions to be delivered by this project
- Engagement with BPA and National Grid to incorporate the Norton Bridge area pipeline diversions into the project plan and consultation strategy
- In support of the planned IPC submission, the project worked closely with Staffordshire County and Borough Councils, Environment Agency and other stakeholders

The Delivery Plan milestone in 2011/12 has been met

Milestones for ID 10.03

Activity/Output	*Date*	*Date Met/Expected*
GRIP 4 commencement	May 2011	May 2011

Programme ID 11.00 Thameslink

Current Project Stage: Various

The Thameslink Programme will provide the stations and railway systems to enable modern 12-car trains to travel from Bedford, Peterborough and Cambridge to destinations such as Brighton, Horsham, East Grinstead, Sevenoaks and Maidstone East through a central London core at a peak rate of up to 24 trains per hour. The scope of works to achieve this are grouped into three key outputs.

Key output zero (KO 0) allowed a consistent train service to run throughout the Thameslink Programme KO1 construction periods was completed in March 2009.

Key output one (KO 1) enabled 12-car train length operation between Bedford and Brighton and was completed in December 2011. An improved service capacity of up to 16 train paths per hour between St Pancras International (Low Level) and Blackfriars stations and the re-opening of the Blackfriars bay platforms are planned in time for the May 2012 timetable change. Delivery is currently on target to achieve these outputs.

Key output two (KO 2) provides for the complete Thameslink service giving a further improved train service of up to 24 train paths per hour between St Pancras International (low level) and Blackfriars stations by December 2018. This milestone has been deferred from December 2015, as outlined by the Secretary for State for Transport in November 2011.
The following are some of the key projects in this programme.

N280 Outer Areas

Extended platforms and enhanced stations to accommodate 12-car trains from the introduction of the KO 1 timetable and to manage passenger numbers to KO 2 and beyond.
This encompassed works at Bedford, Radlett, Harlington, Flitwick, Elstree & Borehamwood, Luton, Harpenden, St Albans, West Hampstead, Mill Hill Broadway and Luton Airport Parkway stations. Project sites required multidisciplinary coordination with all railway systems disciplines as well as station, rail bridge and passenger footbridge works.

N222 Farringdon Station

Farringdon Station is being remodelled to accommodate increased passenger numbers and improve existing interchanges with London Underground and a new interface with Crossrail.
The project will deliver a new station entrance and concourse from Turnmill Street, an extension to the pre-existing Underground concourse, and a new station entrance and concourse on Cowcross Street.

N221 Blackfriars Station

The Blackfriars Station and Bridge Project involves the re-development and expansion of the existing station complex. The station will be enlarged with a new north bank concourse and station building, new wider 12-car platforms spanning the River Thames and a brand new south bank station entrance. All four platforms will be covered by a new single east-west span roof above their entire length. A photo-voltaic cell scheme to produce solar energy for the station has been incorporated into the roof design. This is in line with corporate and stakeholder objectives. Blackfriars Underground station will be enlarged and extensively rebuilt with new escalators, lifts and improved customer and staff facilities.

N242 KO1 Signalling

The project will commission a high capacity, conventional colour-light signalling scheme between Kentish Town and Loughborough Junction to accommodate the more intensive service and 12-car trains.

N244 KO1 Electrification & Plant
The project is upgrading the electrification system on the Thameslink routes to provide sufficient power for the additional and longer trains.
On the Midland Main Line this involves the upgrade of the overhead line system with autotransformer feeding equipment between Kentish Town and Borehamwood. On the DC third rail electrified network, new substations and additional lineside cabling is being commissioned to support the train service.

N232 Borough Viaduct Project

The project will provide a new twin-track viaduct on the south side of the existing tracks to facilitate the provision of four tracks through

the existing 'bottlenecks' between London Bridge and Metropolitan Junction. This will allow Thameslink and Charing Cross services to operate over dedicated tracks improving capacity and reliability.

N420 London Bridge Station & Bermondsey Dive-under

London Bridge will be significantly redeveloped, with the main station concourse and a pedestrian thoroughfare created at street level (between Tooley Street and St. Thomas Street). We are building a station big enough for approximately two-thirds more passengers than the number that uses the station today.

The station will also accommodate additional tracks from the new Borough Viaduct, as the configuration of the station will be changed to nine through tracks and six terminating tracks. This realignment enables the increase to 18 Thameslink train paths per hour through the station, and a total of 86 train paths per hour into and through the station as a whole. A dive-under will be constructed in the Bermondsey area, which will allow Thameslink services from the Sussex Route to access London Bridge on dedicated tracks.

N421 London Bridge Railway Systems (including ATO)

The railway systems project will upgrade the track, signalling, electrification and telecoms to accommodate the more intense service and longer trains. This includes the commissioning of Automatic Train Operation (ATO) between Blackfriars and St Pancras International (Low Level), which is required to deliver 24 train paths per hour.

Progress in 2011/12

Farringdon:

- Completed works to achieve 12 car operations functionality
- Integrated ticket hall (ITH) building complete and open for customer use
- Commenced fit-out of new FCC Ticket Office and installation of lifts
- Completion of the erection of the north trainshed roof structural steel
- Turnmill Street entrance and concourse complete
- Powerlink Substation brought into use
- Completed refurbishment works of the London Underground building
- Commenced heritage works to the LU station frontage

Blackfriars:

- Completed works to achieve 12 car operations functionality
- Opened new south station
- Bridge rib installation completed
- Completed roof steelworks structure
- Commenced installation of photo-voltaic cells
- Opened new common entrance building
- Completed phase 1 of external highway works
- Commenced new bay platform works

Borough Viaduct:

- Construction of Park St and Hop Exchange Viaduct
- Construction of Borough Market Viaduct
- Construction of Borough High Street Bridge
- Construction of Railway Approach Viaduct

KO1 Railway Systems

- Midland Road cross-overs installed and commissioned
- Signalling phases 1 & 2 completed between Kentish Town and Blackfriars station
- Autotransformer system (Electrification and plant) commissioned on the Midland Main Line
- DC substation upgrades completed

Outer Areas

- All 12 car platform extensions completed

KO2 (including London Bridge):

- Slab extended at Canal Tunnel Junction
- Cable diversions at London Bridge commenced
- Site work commenced at Tanners Hill
- Optimisation of layout design for London Bridge completed

<u>Three Bridge Depot Connections</u>

- Completed GRIP 4 stage gate review

- Awarded GRIP 5 to 8 contract in January 2012

Three Bridges Enabling Works

- Completed the first phase of HV cable diversions
- Completed vegetation clearance on the down side

London Bridge station

- Southwark Council Planning Committee approved the Resolution to Grant Planning Permission subject to agreement
-

of Legal conditions for London Bridge Station Redevelopment in December 2011

- Construction of a new Maintenance Delivery Unit at Ewer Street
- The construction of new public toilets for completion pre-Olympics is underway and the principal utility diversions have commenced as has the construction of interim ticketing facilities
- The main works detailed design and build contract for the station was awarded in time for the November 2011 milestone necessary for early contractor involvement

Programme ID 12.00 Intercity Express Programme (IEP)

Current Project Stage: Various

In March 2011 Government confirmed its intention to push ahead with the Intercity Express programme and the Great Western Electrification Project. This change in scope and timescale has resulted in a number of changes during 2011/12.

The originally funded CP4 project was to look at capability work on a like-for-like replacement of HSTs. The revised client remit - Infrastructure Output Statement 3 takes into account the switch to electric traction on Great Western Main Line (GWML), and also asks for some specific capacity works to be developed and included.

In June 2011, the CP4 Delivery Plan was updated to reflect the revised timescales for delivery of IEP which were set by the Department of Transport following the value for money review (1st March announcement).

Capability works must be completed to enable the introduction of Intercity Express trains up to 260m long on GWML from 2016 onwards, and on East Coast Main Line (ECML) from 2018 onwards. The development of the specific capacity works on GWML will require to be completed to enable implementation by December 2017.

Network Rail has progressed development of infrastructure capability works (traction power upgrade, platform alterations, gauge clearance and OLE alterations). These will deliver infrastructure ready to accept the operation of the new Intercity Express trains allowing for the replacement of some existing trains on a 'like-for-like service' basis i.e. no increase in service levels.

The June 2011 update of the Delivery Plan split the Intercity Express programme into three elements:

12.01 – Great Western Main Line
12.02 – East Coast Main Line
12.03 – East Coast Main Line Traction Power

Progress in 2011-12

12.01 Great Western Main Line

The revised client remit - Infrastructure Output Statement 3 takes into account the switch to electric traction, and also asks for specific capacity studies to be undertaken at Paddington, Bristol Parkway and on the north and south Cotswolds lines.

Capability Works

- Gauge clearance GRIP 3 work is continuing. A revised train design was issued to Network Rail in July 2011. This has led to the identification of additional scope and has necessitated a review of work already undertaken. GRIP 3 is expected to be completed by 31st December 2012
- Platform Extension GRIP 3 is continuing. A revised timetable specification and fleet mix was issued to Network Rail in September 2011. A verification study has been undertaken to confirm that the proposed platform extension development scope remains valid. GRIP 3 is now expected to be completed by 31st August 2012
- Paddington area capability works completed GRIP 3 in August 2011. These cover additional OLE works in the station and throat along with some signal relocations

With Crossrail now not being completed until 2019, the planned works between Paddington and Maidenhead, funded by Crossrail, but necessary for IEP operations, have been reviewed. The electrification project will deal with any delays in establishing the Kensal Green supply point. A study of clearance and performance issues with the current OLE is currently in GRIP 3. This has been delayed by poor project delivery and will not be available until May 2012 (previously October 2011)

Capacity Works

- At Paddington, a small line speed increase is being developed. This completed GRIP 3 in summer 2011, and is now in GRIP 4
- In the Paddington area an improved track layout is being considered in order to deliver the proposed enhanced timetable. This completed GRIP 3 in summer 2011, and is now in GRIP 4
- At Bristol Parkway, the output of the proposed enhanced timetable is such that a review of the current track layout and platform configuration is necessary. This project has just

- started GRIP 3 and will complete in April 2013

Other Works:

- A number of technical work streams associated with the emerging technical design of the train are continuing. These cover aspects such as: wheel / rail interface, acceleration curve, bridge resonance, and traction power changes on the move. These work streams are expected to conclude GRIP 3 by March 2013
- A further new item of scope expected to be agreed is platform stepping distances. This will need to be agreed by the DfT following discussions with Hitachi and First Great Western (FGW)

-

Milestones for ID 12.01		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 complete – Paddington Capability Works, Single Option Selection	April 2012	August 2011
GRIP 3 complete – Paddington Capacity Works, Single Option Selection	N/A	August 2011
GRIP 3 complete – Paddington to Airport Junction Overhead Line Enhancement Works, Single Option Selection	N/A	May 2012
GRIP 3 complete – Gauge Capability Works, Single Option Selection	April 2012	December 2012
GRIP 3 complete – Stations Capability Works, Single Option Selection	April 2012	August 2012
GRIP 3 complete – Technical Capability Works, Single Option Selection	April 2012	March 2013
GRIP 3 complete – Bristol Parkway Capacity Works, Single Option Selection	April 2012	December 2012
GRIP 4 complete – Paddington Capability Works, Complete Single Option Development	December 2012	December 2012
GRIP 4 complete – Paddington Capacity Works, Complete Single Option Development	December 2012	December 2012
GRIP 4 complete – Gauge Capability Works, Complete Single Option Development	December 2012	December 2013
GRIP 4 complete – Stations Capability Works, Complete Single Option Development	December 2012	April 2013
GRIP 4 complete – Bristol Parkway Capacity Works, Complete Single Option Development	April 2013	April 2013
GRIP 4 complete – Paddington to Airport Junction Overhead Line Enhancement Works, Complete Single Option Development	N/A	March 2013
GRIP 6 start – Capability Works, site works commence	December 2013	December 2013
GRIP 6 complete – Capability Works, Completion of Capability Works	December 2015	December 2015

12.02 Project Definition IEP ECML

- Gauge clearance GRIP 3 work is continuing. A revised train design was issued to Network Rail in July 2011. This has led to the identification of additional scope and has necessitated a review of work already undertaken
- Station Capability GRIP 4 now includes station verification studies and has been split into 2 geographically based phases. Phase 1 completed GRIP 4 in April 2012 as planned
- OLE alterations completed GRIP 3

Activities and milestones

Note:
* Station Capability Phase 1: 7 stations on LNE (Stevenage, Peterborough, Grantham,Newark Northgate, Northallerton, Darlington and Wakefield Westgate)
** Station Capability Phase 2: Includes stations in Scotland, Anglia and additional stations on LNE that were identified in February 2012

Milestones for ID 12.02 – OLE		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 4 complete: OLE Capability Complete Single Option Development	August 2012	August 2012
GRIP 6 start: OLE Capability Site works commence	August 2013	August 2013
GRIP 6 complete: OLE Capability Complete and ready for IEP operation	August 2017	August 2017

Milestones for ID 12.02 – Gauge Capability		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 complete – Gauge Capability Complete Single Option Selection	June 2012	March 2013
GRIP 4 complete (test route only) – Gauge Capability Complete Single Option Development	October 2012	October 2012
GRIP 4 complete – Gauge Capability Complete Single Option Development	October 2013	July 2014
GRIP 6 start (test route only) – Gauge Capability Site works commence	August 2013	August 2013
GRIP 6 start – Gauge Capability Site works commence	August 2014	August 2014
GRIP 6 complete (test route only) – Gauge Capability Complete and ready for IEP operation	September 2014	September 2014
GRIP 6 complete – Gauge Capability Complete and ready for IEP operation	August 2017	August 2017

Milestones for ID 12.02 – Station Capability		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 4 complete: Station Capability Phase 1*, Complete Single Option Development	April 2012	April 2012
GRIP 3 complete: Station Capability Phase 2**, Complete Single Option Selection	June 2013	June 2013
GRIP 4 complete: station capability Phase 2**, Complete Single Option Development	June 2014	June 2014
GRIP 6 start: Station Capability Site works commence (change in procurement strategy, ORR Change Control to be prepared)	April 2013	August 2013
GRIP 6 complete: Station Capability Complete and ready for IEP operation	August 2017	August 2017

12.03 Project Definition IEP – ECML Traction Power Supply Upgrade

- Contract awarded to National Grid for 400kV feeder station at Essendine near Peterborough
- Contract awarded with Yorkshire Electricity Distribution for 132kV feeder station at Ardsley
- Following Network Rail refresh of the Governance of Investment Projects (GRIP) in 2011, there is an obligation on the project to obtain Approval In Principle in GRIP Stage 3. This has led to the timescales for GRIP Stage 3 being extended. GRIP 4 has also been extended to allow for greater supply contractor engagement. The changes to GRIP 3 and 4 dates will not impact on overall programme milestones
- GRIP 3 analysis has confirmed that upgrade to an autotransformer traction power system is not required between Hitchin to Cambridge / Kings Lynn. This has therefore been removed from ECML PSU programme and is now part of an Initial Industry Plan submission (DP009) for upgrade to the "classic" system which obtained GRIP 1-2 authority in February 2012. Completion of GRIP 3 is planned for February 2014

Activities and milestones

Note other GRIP milestones are not appropriate as this programme is delivered by National Grid.

Milestones for ID 12.03 – Classic System Reinforcement - Ardsley Feeder Station & Hitchin Cambridge / Kings Lynn		
Activity/Output	***Date***	***Date Met/Expected***
Ardsley (Leeds – Doncaster) GRIP 3 Complete Single Option Selection	Complete	January 2011
Ardsley (Leeds – Doncaster), Contract with DNO Contract with YEDL for connection agreement	Complete	February 2011
Ardsley (Leeds – Doncaster), GRIP 6 start Commence installation	October 2013	October 2013
Ardsley (Leeds – Doncaster), GRIP 6 complete Commissioning complete	March 2014	March 2014
Hitchin to Cambridge / Kings Lynn GRIP 3 complete	March 2012	February 2014
Hitchin to Cambridge / Kings Lynn GRIP 6 complete Commissioning complete	August 2017	August 2017

Milestones for ID 12.03 – Autotransformer Feeder System Upgrade Wood Green to Bawtry		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 Complete Single Option Selection (Following GRIP refresh activity in 2011, there were additional requirements to deliver in GRIP 3, but they did not impact on overall programme timescales. GRIP 3 will complete in March 2012)	October 2011	March 2012
GRIP 4 Complete Outline Design Due to changes in GRIP refresh, GRIP 4 will start later, but finish in October 2012	October 2012	August 2014
GRIP 6 start Commence installation	November 2013	November 2013
GRIP 6 complete – Corey's Mill to Welwyn (Thameslink requirement) Commissioning complete	May 2015	May 2015
GRIP 6 complete – Wood Green to St Neots Commissioning complete	April 2016	April 2016
GRIP 6 complete – St Neots to Bawtry Commissioning complete	August 2017	August 2017

Milestones for ID 12.03 – National Grid 400kV Feeder Stations		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 Complete Single Option Selection	July 2011	July 2011
Contract with DNO Contract with National Grid for connection application	September 2011	September 2011
GRIP 6 start Commence installation	December 2013	December 2013
GRIP 6 complete Commissioning Complete	October 2015	October 2015

Programme ID 13.00 Crossrail and Reading

Crossrail and Reading are separate projects, with different objectives and clients. Both however have the potential to provide significant capacity improvements on the Great Western Main Line (GWML). With opportunities to share access time and resources during implementation, a single Crossrail and Reading Programme team was established to deliver these two important schemes in the most effective way benefiting from those synergies.

This team also includes the Western Integration team, responsible for coordinating these projects with others on the GWML as there are multiple interfaces between the Crossrail 'On Network Works' (ONW), and other Network Rail projects including Electrification and IEP.

Crossrail. Programme ID 13.01

Current Project Stage: GRIP 4 Single Option Development

Crossrail, which is partly financed by Network Rail, links Maidenhead and Heathrow Airport in the west with Shenfield and Abbey Wood in the east. It includes 23km of sub-surface railway tunnelled beneath the centre of London.

Network Rail is delivering the ONW for Crossrail Limited (CRL), who in turn is delivering the project for the joint sponsors, TfL and DfT. The ONW comprises enhancements to the existing railway network, on either side of the central tunnels, necessary to deliver the timetable and performance levels required by the joint sponsors.

The requirements on Network Rail are set out in the Network Rail Client Requirements which also incorporates the On Network Functional Requirements. Within these documents CRL sets out the infrastructure capability which is needed to operate the Crossrail train service described within their Access Option.

Network Rail is also delivering various directly cash funded works for CRL. These are enabling works necessary to support the commencement of tunnelling (for example the relocation of equipment cases at the portals) and are not included in the outputs given in the Delivery Plan.

Scope of works

The ONW comprise the following infrastructure enhancements along 76km of existing railway:

- Platform extensions at a number of stations from Maidenhead to Abbey Wood and Shenfield to cater for 205m long electric trains
- Improvements at stations to cater for the increased numbers of passengers;
- New station at Abbey Wood
- Doubling the capacity of Stockley Viaduct at Airport Junction to improve access to Heathrow Airport
- Providing a grade separated junction at Acton
- Other operational improvements including freight loops and turn back sidings to support the timetable

Progress in 2010/11

- Network Rail was asked to resubmit the OTP when the GRIP 4 design had reached a greater level of maturity. As agreed, on 1 December 2011 Network Rail submitted its Key Date 1A (KD1A) submission to CRL which contained an updated OTP for delivery of the ONW
- The GRIP 4 programme for the ONW was accelerated and completed for over 60% of the programme by value by 31 December 2011
- Successful delivery of the Christmas 2011 works including:
  - The re-lock re-control of Slough inner PSB
  - Transfer of control to the Thames Valley Signalling Centre at Didcot
  - Early works at Acton Yard relating to the construction of a dive-under
  - Works at Ladbroke Grove

Milestones for ID 13.01

Activity/Output	*Date*	*Date Met/Expected*
KD1A submission to CRL of updated Overall Target Price (OTP) for the ONW	December 2011	December 2011

Milestones in the year

- The OTP is planned to be agreed by April 2012
- All remaining work packages are on track for GRIP 4 completion by August 2012

Programme ID 13.02 Reading Station Area Redevelopment and Southern Platforms

Current Project Stage: GRIP 5 Detailed Design

Reading station area redevelopment (RSAR) is designed to deliver significant capacity and performance improvements throughout the area for GWML, Cross Country passenger trains and freight services. The southern platform project is an integral part of the redevelopment project and is required to support the proposed plan to operate 12-car services on the Waterloo lines. This programme has a number of assumptions including the provision of funding in CP5.

The project outputs require a minimum of four additional train paths per hour in each direction, six additional platforms (five new and one brought back into use), 125 per cent improvement on through line platform capacity, and 37 per cent improvement in train delay minutes.

Scope of works

- A new Thames Valley signalling centre replacing Reading signal box
- New platforms and platform extensions
- A new train maintenance facility replacing existing facilities
- Grade separation to allow trains to cross the GWML
- Extensive track layout reconfiguration and resignalling throughout the area
- Passive provision for a possible future extension of Crossrail and the introduction of Airtrack

Progress in 2011/12

- Start on Site Cow Lane under bridge south in May 2011
- Complete demolition of Northern Building and Royal Mail in July 2011
- Complete GRIP 6 of Implementation 2 (Caversham, Vastern and Southern Tunnel) in July 2011
- OLE Stage Gate 5 Executive Review in October 2011
- Signalling contract award for Western Lines in October 2011
- Contract for depot awarded in November 2011
- Stage C commissioning completed (incl platform renumbering) in January 2012

Programme ID 13.03 Reading station southern platforms

This project encompassed:

- a new south side platform and platform extensions for Waterloo line services
- an additional bridge span over Vastern Road

The Southern platforms work is being delivered as an integral part of the Reading Station Area Redevelopment project, for which the milestones for Platform 4 and the Vastern Road Bridge were completed on target by January 2012.

Milestones for ID 13.02

Activity/Output	*Date*	*Date Met/Expected*
Initial Works: Construction & commissioning of platform 4 Renumbering of all existing platforms Platform 10 face extension Vastern Road (George Street) bridge widening	January 2012	January 2012

Programme ID 14.00 Birmingham New Street

Birmingham New Street

Current Project Stage: Implementation
The Gateway project will redevelop station infrastructure at Birmingham New Street to provide greater capacity for passenger handling to the year 2035 and enhanced station facilities. The project is jointly funded by Network Rail, Advantage West Midlands, Birmingham City Council (BCC), Centro and the Department for Transport, with BCC as client.

Progress in 2011/12

- Work during Easter and May Bank Holidays, successfully completed pilling and foundation work for infilling the east void
- Construction of the atrium commenced with demolition of retail units on the roof and the removal of the southern roof light
- Central core of Pallasades retail units demolished to accommodate the atrium
- Works under possession on platforms 1 and 12 completed and platforms handed back into use. Possession of Platform 10 taken
- Demolition of Stephenson Tower competed
- Station Link bridge demolished during Christmas possession
- Navigation Street Bridge widened and extended during Christmas possession
- Construction of new west concourse well underway with installation of new service spine, control room and vehicle crash protection

The scope of the project has increased significantly with the bringing forward of the South Side Development. This includes the construction of a new John Lewis full line department store and the refurbishment of the Pallasades shopping centre. Significant work has gone into integrating the development with the main Gateway programme, ensuring all stakeholders understand and support the development whilst securing the agreement of the train operators to the Station Change proposals.

Milestones in the year:
There are no strategic milestones in the delivery plan for 2011/12.

Programme ID 15.00 Southern Platform Lengthening

Package 0: Twelve-car capability on the Tilbury Loop and Ockendon Branch Programme ID 15.20

Current project stage: *Scheme Handback*
This project had a delivery plan milestone of project implementation by December 2011 which it successfully met.

The project's scope was to deliver the necessary infrastructure to allow the operation of 12-car trains on the Tilbury Loop and Ockendon branch.

This required platform extensions and associated signalling, track, power supply and level crossing works at the following stations:

- Pitsea
- Stanford le Hope
- East Tilbury
- Tilbury Town
- Grays
- Ockendon
- Purfleet
- Rainham
- Dagenham Dock

Progress in 2011/12

- Completion of Detailed Design
- Completion of construction, testing and commissioning

Package 1: Cambridge Island Platform. Programme ID 15.21

Current project stage: *Scheme Handback*

This project had a delivery plan milestone of project implementation by December 2011 which it has successfully met.

This project's scope was to deliver the necessary infrastructure to allow operation of 12-coach trains on the West Anglia route between Cambridge and Liverpool Street, based on class 317 and new rolling stock.

Progress in 2011/12

- Completion of Detailed Design
- Completion of construction, testing and commissioning

Package 11: West Anglia Outer Twelve-car Trains. Programme ID 15.22

Current project stage: *Scheme Handback*

This project had a delivery plan milestone of project implementation by December 2011 which it successfully met.

This project has allowed 12-coach operations on the West Anglia route between Cambridge / Stansted Airport and Liverpool Street, based on class 317 and new rolling stock.

This required platform extensions and associated signalling, track, and power supply works at the following stations:

- Broxbourne
- Cheshunt
- Sawbridgeworth
- Stansted Mountfitchet

The following stations have platforms that have not been extended, but have been made capable of being served by 12-car trains that have selective door operation (SDO) fitted:

- Roydon
- Harlow Mill
- Elsenham
- Newport
- Great Chesterford
- Shelford

Milestones for ID 15.20

Activity/Output	*Date*	*Date Met/Expected*
GRIP 6 Commence	April 2011	April 2011
GRIP 6 Complete	December 2011	December 2011
Infrastructure ready for use	December 2011	December 2011

Milestones for ID 15.21

Activity/Output	*Date*	*Date Met/Expected*
GRIP 6 Commence	August 2011	April 2011
GRIP 6 Complete	December 2011	December 2011
Infrastructure ready for use	December 2011	December 2011

Milestones for ID 15.22		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 Commence	August 2011	April 2011
GRIP 6 Complete	December 2011	December 2011
Infrastructure ready for use	December 2011	December 2011

Milestones for ID 15.23		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 4 stage gate review complete	December 2011	July 2011

Milestones for ID 15.24		
Activity/Output	***Date***	***Date Met/Expected***
Infrastructure ready for use	December 2011	December 2011

Progress in 2011/12

- Completion of Detailed Design
- Completion of construction, testing and commissioning

Package 4: Gravesend. Programme ID 15.23

Current Project Stage: *Detailed Design*

Highlights of this programme:

- Re-modelling of Gravesend station to accommodate 12-car operation including a new platform, platform extensions and extensive track and signalling alterations
- Provision of AfA bridge

Progress in 2011/12

- Completion of single option development
- Investment authority for detailed design to completion has been achieved
- Detailed design is ongoing

This project has a committed delivery milestone of completion by May 2014 and the project is on target to meet this date.

Package 15: Kent DOO-only stations. Programme ID 15.24

Current Project Stage: *Scheme Handback*

This project had a delivery plan milestone of project implementation by December 2011 which it has successfully met.

This project has allowed platform lengths for 12-car trains to be provided on all suburban routes from Charing Cross and Cannon Street with the exception of Woolwich Dockyard Station and

stations east of Gravesend.

Progress in 2011/12

- This project has completed outline design and construction, testing and commissioning providing 12-car capable infrastructure at the 61 platforms within its scope

Package 18, Charing Cross Station. Programme ID 15.25

Current Project Stage: *Detailed Design*

Highlights of this programme:

- Platform extensions and associated infrastructure alterations to platforms 1, 2 and 3 at Charing Cross Station

Progress in 2011/12

- This project has completed single option development
- Investment authority for Detailed Design to completion has been achieved and Detailed design is underway

No milestones were committed to be delivered last year.

This project has a committed delivery milestone of completion by May 2012 and the project is on target to meet this date.

Milestones for ID 15.26		
Activity/Output:	***Date***	***Date Met/Expected***
Kent - GRIP 6 Commence	June 2011	June 2011
Sydenham – GRIP 6 Commence	July 2011	July 2011
Sydenham - GRIP 6 Complete	December 2011	December 2011
Sydenham - Infrastructure ready for use	December 2011	December 2011

Milestones for ID 15.27		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 Commence	September 2011	September 2011
GRIP 6 Complete	December 2011	December 2011
Commence 12-car operations	December 2011	December 2011

Milestones for ID 15.28		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 Commence	September 2011	September 2011
GRIP 6 Complete	December 2011	December 2011
Commence 12-car operations	December 2011	December 2011

Package 8: Kent & Sydenham Ttrain lengthening. Programme ID 15.26

Current Project Stage: *Detailed Design and Construction, testing and commissioning (Kent) and Scheme Handback (Sydenham)*

Highlights of this programme:

- Platform extensions and/or associated infrastructure alterations to 74 platforms and one siding, providing 10-car capable infrastructure on the Sydenham Corridor and 12-car capable infrastructure on the Kent metro routes

Progress in 2011/12

- Detailed design, construction and entry into service was successfully completed on the Sydenham Corridor to accommodate 10-car trains in time for the December 2011 timetable change
- Detailed design and construction, testing and commissioning is ongoing across the Kent stations

Package 2: East Grinstead station. Programme ID 15.27

Current Project Stage: *Scheme Handback*

This project had a delivery plan milestone of project implementation by December 2011 which it has successfully met.

The project's scope was to deliver the necessary infrastructure to allow operation of 12-car trains at East Grinstead station in time for the December 2011 timetable change.

Progress in 2011/12

- Completion of Detailed Design
- Completion of construction, testing and commissioning

Package 16, East Grinstead Line. Programme ID 15.28

Current Project Stage: *Project Completion*
This project had a delivery plan milestone of project implementation by December 2011 which it has successfully met.

The project's scope was to deliver the necessary infrastructure to allow operation of 12-car trains on the East Grinstead line in time for the December 2011 timetable change.

This required platform extensions and associated signalling, track and power supply works at the following stations:

- Sanderstead
- Oxted
- Upper Warlingham

Progress in 2011/12

- Completion of construction, testing and commissioning

Package 3: 10-car Sussex Suburban Railway. Programme ID 15.29

Current Project Stage: *Detailed Design*

The project's scope is to deliver necessary infrastructure works to accommodate 10-car train operations on suburban routes from London Victoria and London Bridge. This will require platform extensions and associated signalling, track and power supply works at the following stations:

- Wandsworth Common
- Balham
- Streatham Common
- Norbury
- Thornton Heath
- Selhurst
- Waddon
- Wallington

- Sutton
- Epsom Downs
- Streatham Hill
- Gipsy Hill
- Carshalton
- Cheam
- Mitcham Eastfields

Progress in 2011/12

- Completion of single option development
- Investment authority for detailed design to completion has been achieved
- Detailed design is ongoing

This project has a committed delivery plan milestone of project implementation by December 2013 and is currently on schedule to meet this commitment.

Package 17: Battersea Park station. Programme ID 15.30

Current Project Stage: *Single Option Development*

The project's scope is to deliver necessary infrastructure works to accommodate 10-car train operation on Platform 3 at Battersea Park station.

Progress in 2011/12

- Investment authority for single option development has been achieved

No milestones were committed to be delivered in 2011/12.

The project has a committed delivery plan milestone of project implementation by December 2013 and is currently on schedule to meet this commitment.

Package 7: South West Suburban railway. Programme ID 15.31

Current Project Stage: *Detailed Design*

This project has delivery plan milestones of project implementation by December 2012 (Hounslow Loop) and December 2013 (other routes). It is currently on schedule to meet these commitments.

The project's scope is to deliver necessary infrastructure works to accommodate 10-car train operations on the Wessex route into London Waterloo. This will require platform extensions and associated signalling, track and power supply works to 93 platforms at 48 locations.

Progress in 2011/12

- Completion of single option development

Milestones for ID 15.29

Activity/Output	*Date*	*Date Met/Expected*
Norbury Route – GRIP 4 Stagegate Review complete	September 2011	March 2011
Streatham Hill Route – GRIP 4 Stagegate Review complete	March 2012	April 2011
Hackbridge Route – GRIP 4 Stagegate Review complete	March 2012	December 2010

Milestones for ID 15.31

Activity/Output	*Date*	*Date Met/Expected*
Staines to Weybridge – GRIP 4 Stagegate Review Complete	September 2011	February 2011
Raynes Park to Dorking – GRIP 4 Stagegate Review Complete	September 2011	February 2011
Kingston Loop and Shepperton Branch – GRIP 4 Stagegate Review Complete	March 2012	February 2011
Hampton Court Branch – GRIP 4 Stagegate Review Complete	September 2011	February 2011
Guidlford via Woking – GRIP 4 Stagegate Review Complete	September 2011	February 2011
Guildford via Cobham – GRIP 4 Stagegate Review Complete	September 2011	February 2011
Guildford via Leatherhead – GRIP 4 Stagegate Review Complete	September 2011	February 2011
Chessington Branch – GRIP 4 Stagegate Review Complete	September 2011	February 2011

-
- Investment authority for detailed design to completion has been achieved
- Detailed design is ongoing

Package 9: Windsor Line. Programme ID 15.32

Current Project Stage: ***Detailed design, construction, testing and commissioning and Scheme Handback***

This project had a delivery plan milestone of project implementation by December 2011 for five stations on the Windsor line which it successfully met.

The project also has delivery plan milestones of project implementation by May 2012 for Putney, Barnes, Staines, Clapham Junction platforms 3 and 4, North Sheen, Wandsworth Town and Richmond stations, December 2013 for Clapham Junction platforms 14 and 15, and March 2013 for Queenstown Road, Twickenham and St Margarets. It is currently on schedule to meet all of these commitments.

The project's scope is to deliver necessary infrastructure works to accommodate 10-car train operations on the route between London Waterloo to Windsor & Eton Riverside, and also at Clapham Junction for services between London Victoria and Sutton/Epsom Downs via Norbury. This will require platform extensions and associated signalling, track and power supply works at the following stations:

- Windsor & Eton Riverside
- Staines
- Ashford (Middlesex)
- Whitton
- Twickenham
- St Margarets
- Richmond
- North Sheen
- Mortlake
- Barnes
- Putney
- Wandsworth Town
- Clapham Junction (Platforms 3 and 4)
- Queenstown Road
- Vauxhall
- Clapham Junction (Platforms 14 and 15)

Progress in 2011/12

- Detailed design has been completed for stations on the Windsor line
- Construction, testing and commissioning has been completed at Windsor & Eton Riverside, Ashford (Middlesex), Whitton, Mortlake and Vauxhall
- Construction, testing and commissioning in progress on ten remaining stations on the Windsor line
- Detailed design is in progress for Clapham Junction platforms 14 and 15

Waterloo International Integration. Programme ID 15.33

Current Project Stage: ***Single Option Development***

The project is part of an overall programme to deliver increased capacity on both the Windsor and Suburban lines into London Waterloo by the end of CP4. This was to be achieved by lengthening platforms at Waterloo Station and also the conversion of Waterloo International Terminal for domestic use.

Progress in 2011/12

- The single option development of the project had been concluded in line with programme
- During last quarter of 2011, a potential performance impact was identified with the single option. It was concluded that substantial additional capacity could be delivered by revising the operational plan. This change has resulted in a need to revisit the supporting infrastructure scope of works. As a result of revised scope the project has reverted to design development
- Works to open platform 20 in Waterloo International Terminal will be progressed. This will be delivered in CP4. Revised milestones have now been developed and are listed in the table below.

Milestones for ID 15.32		
Activity/Output	***Date***	***Date Met/Expected***
Windsor Line - GRIP 6 Commence	March 2011	March 2011
Windsor & Eton Riverside, Ashford (Middlesex), Whitton, Mortlake and Vauxhall – GRIP 6 Complete	December 2011	December 2011

Milestones for ID 15.33		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 Completion	June 2013	June 2013
GRIP 4 Complete detailed design option confirmed	November 2012	November 2012
GRIP 6 Commence start on site	August 2013	August 2013
GRIP 6 Complete construction complete	December 2013	December 2013

Programme ID 16.00 Power Supply Upgrade

Routes 1, 2 and 3 power supply enhancements: Programme IDs 16.01, 16.03 & 16.04

Current project stage:

- **GRIP 7 for Sussex December 2011 - East Grinstead Branch**
- **GRIP 7 for Wessex December 2011 - Windsor and Eton Riverside Branch**
- **GRIP 5-8 for Wessex December 2012 scope**
- **GRIP 4 for December 2013 scope for the rest of Wessex and Sussex**
- **GRIP 3 for Kent scope / Phase 2 and 3**
- **GRIP 4-8 for Kent Phase 1**

Completion will enable longer trains and different rolling stock to operate on the National Rail network in Wessex, Sussex and Kent drawing increased quantities of traction power from the DC third rail system.

The programme relates to train lengthening proposals agreed with Department for Transport for the period to end of CP4.

Progress in 2011/12

- Delivery of infrastructure to enhance traction power capability in Sussex and Wessex in December 2011 and preparation for 2012.
- Validation modelling has confirmed the December 2013 Wessex scope. Electric Traction Equipment (ETE) scope will be defined further in 2012.
- In Kent, of two options, infrastructure enhancement is the preferred option. The traction power requirements are now being delivered in a phased approach. Phase 1 to accommodate a limited 12 car operation is proposed to be delivered by December 2013. Phase 2 for the flexibility to operate 12 car services during the London Bridge high level construction works from December 2014, and Phase 3 enabling 12 car operations when the Kent and Sussex timetable is recast when Thameslink (circa 2018) is implemented. GRIP 3 phase 1 has been completed in February 2012. GRIP 3 for future phases will be completed in 2012/13.

Progress to final delivery

The enhancements in Sussex and Wessex are being accelerated for delivery by the expected timetable change and train lengthening dates of 2012 and 2013.

Route 1 New Cross Enhancement to power supply. Programme ID 16.02

Current project stage: Development to design (GRIP 4)

This project supports an increase in capacity of the network through an enhanced power availability allowing the HLOS capacity metric to be achieved in South London, North Kent and Surrey.

Milestones for ID 16.01 (Kent)

Activity/Output	*Baseline Date*	*Date Met/Expected*
Completion of GRIP 3 - Phase1	April 2012	February 2012

Milestones for ID 16.03 (Sussex)

Activity/Output	*Baseline Date*	*Date Met/Expected*
East Grinstead Branch GRIP 6 Complete	December 2011	December 2011

Milestones for ID 16.04 (Wessex)

Activity/Output - Other Routes	*Baseline Date*	*Date Met/Expected*
Windsor & Eton Riverside Branch GRIP 6 Complete	December 2011	December 2011

The project is to modify and extend National Grid's 275kV substation at New Cross to provide a replacement to the existing 66kV railway power supply feeds which will be decommissioned.

Progress in 2011/12

- National Grid is tendering the 275/33kV super grid transformers and is on target to provide the supplies as per the delivery plan (September 2015)
- Constructability studies for the cable routes through the public road to the Network Rail substation at South Bermondsey have been completed and detailed costing commenced.
- Proposals to use a proposed cable tunnel have been abandoned due to timescale uncertainties.

This project has a committed delivery milestone of completion by December 2016 and the project is on target to meet that date.

Programme IDs 16.05, 16.06 & 16.07: Routes 5, 6 and 7 Power Supply enhancements

Current project stage: *Scheme handback*

This project had a delivery plan milestone of project implementation by December 2011 which it successfully met.

This project delivered enhancements to existing traction power supply infrastructure required to facilitate the operational plan assumed with train operators for delivery of the agreed CP4 capacity metrics.

In summary, the capacity metrics for CP4 required additional and lengthened rolling stock on each of the routes, as well as the introduction of new Class 379 rolling stock on Route 5.

Milestones for ID 16.05		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 completion and assets into service	December 2011	October 2011

Milestones for ID 16.06		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 completion and assets into service	December 2011	December 2011

Milestones for ID 16.07		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 completion and assets into service	December 2011	December 2011

Progress in 2011/12

- Detailed design and installation completed for all works.

16.08 Current project stage: GRIP 4

This project is to enable rolling stock to operate with regenerative braking on all DC routes in Wessex, Sussex and Kent.

The scope of works encompasses the modification of contact breakers, transformer settings and other equipment to allow regenerative braking.

No further work is required to achieve this in Kent and Sussex.

In Wessex where power is supplied to London Underground Limited (LUL) rolling stock, segregation of Waterloo and City Line power supplies is required to allow older LUL stock to continue to operate reliably. Segregation is not proposed for the District Line since it is not considered viable and since older stock will be removed in 2013. If LUL decides to delay plans to remove older stock from the District & Circle lines any delays will limit the maximum regen capability for South West Trains to 810V.

The scheme is also developing options to raise the inner area DC nominal voltage from 660V to 750V (so that voltage across the whole DC network is at 750V). This is not required to enable regenerative braking but has other benefits including reduced energy losses.

GRIP 4 authority was granted in September 2011 for this project.

Progress in 2011/12

- Civil engineering strategy and surveys completed for a mezzanine level at Waterloo substation.
- Technical Work Scopes have been developed for main electrical design items.

Route 5 – West Anglia Main Line	
Location	***Scope***
Northumberland Park	Increased FSC to 18.5 MVA
Rye House	Increased FSC to 16.5 MVA
Ugley	Increased FSC to 6 MVA
Milton	Increased FSC to 12.5 MVA

Route 6 – Thameside	
Location	***Scope***
West Ham	Increased FSC to 14 MVA
Southend Central	Increased FSC to 14 MVA

Route 7 – GE Main Line	
Location	***Scope***
Hill House	Neutral section and associated 25kV cabling and substation installed.
Hythe	Substation extension and associated neutral section works installed. New 25kV supply circuit from UKPN installed. Increased FSC to 13 MVA
Rayleigh	Upgraded existing 25kV supply circuit from UKPN.
Springfield	Increased FSC to 18 MVA
Stowmarket	Increased FSC to 10 MVA

-
- Discussions with LUL have been held regarding segregation of electrical supply to the Waterloo and City Line.
- Surveys have begun for the 750V voltage increase activities.
-
- The additional complex works at Waterloo have delayed the forecast works completion milestone to June 2015. A detailed opportunities register is in place and actions are being progressed with an aim to bring completion back in line with the CP4 delivery plan commitment.

Programme ID 17.00 Southern Capacity

Gatwick Airport remodelling and passenger capacity scheme. Programme ID 17.01

Current Project Stage: Single Option Development

The project will deliver improved performance, reduced journey times and removal of the existing capacity constraint at Gatwick caused by the Gatwick Express services crossing over four running lines every 15 minutes. Passenger congestion will be reduced and accessibility improved. The signalling interlocking will be renewed as part of this project.

These outputs will be achieved through the construction of a seventh platform, with associated track and signalling, to accommodate the move of the Gatwick Express services from the slow line platforms. Enhancements will be made to the passenger facilities on platforms 5 / 6 to improve passenger circulation and access to and from the station concourse. Full accessibility will be provided onto the new platform via a new walkway linked into the existing concourse.

Progress in 2011/12

Following funding and scope for the track and platform works being agreed with all parties in 2010/11, the outline design stage (GRIP 4) has been progressed in 2011/12. The key design risk areas including signalling and structures have now been completed up to GRIP 4 with all other packages due to be signed off by May 2012. Network Rail has appointed a contractor to take the scheme to delivery. Such early appointment has enabled the contractor to inform the design process as well as provide a more robust programme including track possessions. The contractor has also completed some early enabling works including vegetation clearance and detailed survey work / trial bore holes etc.

Concourse improvements have been developed in coordination with the structural changes required to deliver the pedestrian bridge link to the new platform along with improved vertical circulation from the concourse to the proposed Gatwick Express Platforms 5 and 6. Works have commenced on GRIP 5 detailed designs for customer facing concourse improvements to allow these works to be completed before the Olympics.

Milestones in the year:

Milestones were revised in the December 2010 Delivery Plan. No milestones were due to occur in 2011/12.

This project is on course to meet its committed delivery milestone of completion by January 2014.

East Croydon Passenger Capacity Scheme. Programme ID 17.02

Current project stage: Outline Design Development

The station capacity improvement project delivers a mid-platform dispersal bridge that redirects passengers requiring the town centre and office district away from the existing congested concourse and associated access ramps. It does this by providing a second entrance to the west of the station. The bridge will also provide level access between platforms via lifts. The project also looks to remodel the existing station concourse to improve pedestrian flows into the town centre.

Progress in 2011/12

- The detailed bridge design is largely complete and is due to be finalised by May 2012
- Network Rail has agreed the access rights with a neighbouring landlord to build the bridge
- The contract to build the bridge has been let
- The existing Royal Mail conveyor bridge was demolished under a blockade of the Brighton Main Line in December 2011 to make way for the new passenger bridge
- An amended concourse design has been agreed in principle with the train operators

The December 2011 GRIP 6 milestone for demolition of the Royal Mail conveyor bridge was commenced in October 2011. The Project is on programme for completion by December 2013.

Milestones for ID 17.02

Activity/Output	*Date*	*Date Met/Expected*
GRIP 6 Commencement	December 2011	October 2011

Seven Sisters Station Capacity Improvement works. Programme ID 17.03

Current Project Stage: Single Option Development: The proposals have been developed with stakeholders and will improve passenger flows to and from the overland station platforms. Platform accommodation will be removed to improve circulation space. The flow of passengers going to and from Platform 1 will be improved by the widening of the access staircase.

Scope of works:

- Relocation of staff platform accommodation
- Widening of stairs to Platform 1
- De-cluttering of Platform 2
- Reinstate Birstall Road entrance (to be used on match days and for emergency access)
- Improvements to CIS & CCTV
- Additional waiting shelter on Platform 1

Progress in 2011/12 - Activities and milestones:

Milestones for ID 17.03

Activity/Output	*Date*	*Date Met/Expected*
GRIP 3 Stagegate review Complete Option Selection	August 2011	August 2011
GRIP 4 Completion Outline Design	January 2012	February 2012
GRIP 5-8 Project Completion	December 2013	December 2013

Programme ID 18.00 East Coast Main Line improvements

The following projects and schemes will allow an increase in Long Distance High Speed (LDHS) passenger and freight services as part of a programme of ECML schemes identified in the East Coast Main Line (ECML) Route Utilisation Strategy.

Access to South End of GN/GE – "GN/GE Southern Access". Programme ID 18.01

The project will generate additional passenger train paths on the ECML between Peterborough and Doncaster through the provision of W9 and W10 gauge cleared paths on the GN / GE Joint Line (Peterborough to Doncaster via Spalding and Lincoln), and the upgrade of structures and track to accommodate the predicted increase in annual gross tonnage. Additional infrastructure upgrades will be introduced to provide an alternate route for freight with a comparable journey time to that currently achieved through daytime ECML journey timings. Any required level crossing upgrades will be driven by increased traffic and line speeds.

Progress in 2011/12 (Access to south end of GN / GE)
This element of the works is now part of the ECML line of route capacity: 2018 in the Initial Industry Plan submission for the 2013 Periodic Review.

- Access options have been further refined during December 2011 (GRIP 3)
- the GRIP 3 output has shown that the preferred option is a grade separated solution in the Werrington area
- the Delivery Plan recognises that a grade separated option is unlikely to be deliverable in CP4, and the schedules associated with such options confirm that these options could not be delivered in CP4

The final confirmation for an infrastructure intervention in the Werrington area came from the ECML line of route capacity: 2018 (GRIP 1) modelling, completed in March 2012.

Progress in 2011/12 (Route)

- GRIP 3 completed
- GRIP 4-6 commenced for track renewals, structures and maintenance
- Physical works commenced on site for track renewals and maintenance activities
- Contracts awarded for underbridge and overbridge reconstructions
- Level crossing optioneering near finalisation
- Consultation with stakeholders continuing
- Possession / blockade plans submitted and consultation continuing
- Network Change Notice of Intended Scope issued November 2011
- Anticipated final cost increased from £241 million to £276 million due to the introduction of resignalling and re-control into the scheme
- Bridge strengthening and track renewals work remains on schedule for completion in December 2013
- Level crossing works (and signalling) remain on schedule for completion in March 2014

Peterborough Station Area Capacity Enhancements. Programme ID 18.02

Current Project Stage: Detailed Design

The scheme will generate additional passenger train paths on the ECML at Peterborough by segregating East Anglian traffic from the East Coast Main Line through the development of a new island platforms (6 and 7) to the west of the station. East Anglian freight traffic will be accommodated by means of a 775m goods loop to the west of the station area. Standage for 775m freight trains accessing / egressing the Spital Ladder from / to East Anglia will be possible via platform 5.

Extensions to the existing platforms 2 and 3 will be provided to accommodate 12-car Thameslink trains. Extensions to the existing platforms 4 and 5 will be provided to accommodate Intercity Express Programme trains. Both station bridges will be extended to the new island platform, with step free access being incorporated into the main footbridge to all platforms on behalf of the Access for All programme.

The rear face of the existing platform 3 is to be built out to the Up Fast Line to accommodate southbound Long Distance High Speed (LDHS) services (funded from NRDF).

Progress in 2011/12

- Single Option Development complete November 2011

- Network Change established November 2011
- Station Change consultation completed March 2012
- Site office facility open March 2012
- GRIP 4 Stage Gate Review complete November 2011
- Extensive consultation undertaken with local authority, train and freight operating companies
- 775m freight standage provided for all routes to and from East Anglia (in response to industry comments)
- Continuing liaison with Thameslink and Intercity Express Programmes
- Continuing liaison with GNGE Joint Line Upgrade team
- Initial possessions agreed; negotiations for future possessions ongoing

This project has a committed delivery milestone of completion by June 2014 and the project is on target to meet that date.

Milestones for ID 18.02

Activity/Output	*Date*	*Date Met/Expected*
GRIP 4 Stage Gate Review complete	January 2012	November 2011

Alexandra Palace to Finsbury Park Third Up line. Programme ID 18.03

Current Project Stage: Implementation

This project provides for an additional third passenger line in the Up direction (towards London) from Alexandra Palace (leading from the Up Hertford line to the north of Alexandra Place Station) through to the top of Holloway Bank. It also includes associated platform faces at Alexandra Palace and Finsbury Park stations to allow trains to serve these locations. This allows some Gordon Hill / Hertford to Moorgate inner suburban services to operate independently of outer suburban and LDHS services from Alexandra Palace.

Milestones for ID 18.04

Activity/Output	*Date*	*Date Met/Expected*
GRIP 6 Commences	January 2012	September 2011

Progress in 2011/12

- Contract for GRIP 5-8 awarded in May 2011
- Network Change and Station Change established
- Detailed designs produced and commencement on site achieved in September 2011
- Possession requirements for 2012 have been defined in conjunction with the NDS planning team, First Capital Connect and East Coast Ltd
- Value Management and Value Engineering exercises carried out to reduce unnecessary complexity and costs
- Working group established with First Capital Connect to manage station working and operational interfaces at Finsbury Park and Alexandra Palace.
- Consultation continuing with East Coast Ltd to manage operational interfaces with Bounds Green Depot
- Work continues on behalf of the Thameslink Programme to deliver 12-car extensions to platforms 3 and 5 at Finsbury Park, and depot connections to the new Thameslink depot at Hornsey

This project has a committed delivery milestone of completion by June 2014 and the project is on target to meet that date.

Milestones for ID 18.03

Activity/Output	*Date*	*Date Met/Expected*
GRIP 6 Commences	January 2012	September 2011

Finsbury Park – Alexandra Palace Third Down Line improvements. Programme ID 18.04

Current Project Stage: Implementation

This project supports the improved use of the Down Slow 2 line between Finsbury Park and Alexandra Palace which will allow some Moorgate to Gordon Hill / Hertford inner suburban services to operate independently of other inner and outer suburban and Long Distance High Speed (LDHS) services south of Alexandra Palace through improved linespeeds.

Progress in 2011/12

- Contract for GRIP 5-8 awarded in May

2011
- Network Change and Station Change established
- Detailed designs completed and commencement on site achieved in September 2011
- The first new crossover installed during Christmas 2011
- Possession requirements for 2012 defined in conjunction with the NDS planning team, First Capital Connect and East Coast Ltd
- Value Management and Value Engineering exercises carried out to reduce unnecessary complexity and costs
- A working group established with First Capital Connect to manage station working and operational interfaces at Finsbury Park and Alexandra Palace.
- Consultation continues with East Coast to manage operational interfaces with Bounds Green Depot
- Work continues on behalf of the Thameslink Programme to deliver 12-car extensions to platforms 3 and 5 at Finsbury Park, and depot connections to the new Thameslink depot at Hornsey

This project has a committed delivery milestone of completion by June 2014 and the project is on target to meet that date.

East Coast Mainline (ECML) Level Crossings. Programme ID 18.05

Current Project Stage: GRIP 4

The project supports the increase in passenger and freight services on the ECML between King's Cross and Northallerton and between Newark Northgate and Lincoln by eliminating, or reducing, the safety risks associated with level crossings. Optioneering of all relevant level crossings on these routes has been completed for the anticipated increase in passenger and freight services in CP4 to assess safety risk. Having completed this analysis, this scheme is to deliver the following scope:

Co-Op footpath level crossing located south of Arlesey at 36m19ch on ECML1; the footpath over the railway is to be diverted via a new footbridge; and

Ballast Hole footpath level crossing located south of Boultham at 30m33ch on NOB1; the footpath over the railway is to be diverted via a nearby CCTV-controlled level crossing (Doddington Road).

Progress in 2011/12

- Contract awarded for GRIP 4 - 8, and Approval in Principle designs have been completed
- Planning permission for both schemes has been approved
- Diversion order applications have been submitted to the local authorities for public consultation
- The scheme is on target to meet delivery plan completion milestones

No milestones were committed to be delivered during 2011/12. This project has a committed delivery milestone of completion by March 2014 and the project is on target to meet that date.

Hitchin Grade Separation. Programme ID 18.06

Current Project Stage: Detailed Design / Construction

This project will eliminate conflicting passenger train movements at Hitchin on the ECML where the branch line to Cambridge divides from the main line. The conflicts are between trains towards London from the Peterborough direction and passenger trains from London which leave the main line heading towards Cambridge. This removes a major constraint in developing timetables, thereby allowing an increase in Long Distance High Speed (LDHS) and freight services as part of the overall programme of schemes on the ECML, as well as reducing junction layout risk. This scheme also provides for greater flexibility during maintenance, engineering and operational perturbation.

The project consists of a flyover to the north of Hitchin Cambridge Junction from the Down Slow to the Down Cambridge line and a Down Fast to Down Slow crossover immediately north of Hitchin Cambridge Junction.

Progress in 2011/12

- Design and build tender awarded
- Land acquisitions completed
- Construction boundary fenced
- Access agreed and construction of site entrance from highways completed
- Utility Services diverted
- Detailed design progressed
- Site clearance completed and earthworks construction commenced

- Continuing regular engagement with local communities and bodies
- Construction of intersection viaduct foundations commenced

Milestones in the year:

Only one milestone was identified for the year 2011/12, and this has been improved upon by three months. This project has a committed delivery milestone and is on target to meet that date.

Milestones for ID 18.06		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 Commences	February 2012	December 2011

York Holgate Junction Fourth Line. Programme ID 18.07

Current Project Stage: GRIP 5 detail design

The project provides an additional connection into platform 11 and platform 10 via a crossover from the new line, along with operational improvements on platforms 9 and 10.

The project eliminates conflicting moves from the Leeds line passenger services that are operating to the North East and Scotland and all other passenger services. This reduces a major constraint in developing timetables on the ECML.

Progress in 2011/12
This project had a committed delivery milestone of completion by March 2012. The project not only achieved this date, but accelerated the commissioning of the scheme by bringing it into operational use on 27th December 2011 with the realisation of infrastructure benefits.

Milestones in the year:

Milestones for ID 18.07		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 4 stage gate review complete	September 2010	May 2010
GRIP 5 stage gate review complete	September 2011	June 2011
GRIP 6 stage gate review complete	March 2012	December 2011
GRIP 7 stage gate review complete	June 2012	January 2013

North Doncaster Chord. Programme ID 18.08

Current Project Stage: Single Option Detail design (GRIP 5)

The project will allow an increase in passenger and freight services on the ECML by removing a significant number of existing freight services between Joan Croft Junction and Hambleton South Junction, and re-routeing them via the new chord on a more direct route. This will create greater capacity on this constrained two track section of the ECML whilst at the same time reduce mileage and journey times for the majority of the re-routed freight trains.

Progress in 2011/12

- Design and build contract awarded
- Detailed design progressed
- Introductory meetings held with Infrastructure Planning Committee
- Infrastructure Planning Committee representations and submissions completed
- Infrastructure Planning Committee hearing supported and completed
- Closeout documents and evidence submitted to Infrastructure Planning Committee
- Continuation of consultation and negotiation with local communities and authorities

This project has a committed delivery milestone as recorded in the delivery plan statement and the project is on target to meet that date. There were no recognised milestones attributed to the year 2011/12. Delivery remains subject to ground conditions being consistent with investigations to date and the timely receipt of a Development Consent Order (DCO).

First Capital Connect Train Lengthening. Programme ID 18.10

Current Project Stage: Implementation / Handback

The project provides infrastructure enhancement to support the delivery of

London HLOS capacity metrics in CP4. The specific requirements are for platform extensions for operation of longer vehicle trains and future Thameslink trains at Letchworth Up and Down platforms, and Royston Down platform. This includes, where necessary, the provision of additional Driver Only Operated train dispatch equipment on these platforms, and possible relocation of existing equipment.

Progress in 2011/12

- Letchworth platform extension was completed in time to meet FCC's December 2011 timetable change and delivered under budget
- All outputs and milestones for this Delivery Plan scheme have been met

Milestones in the year:
This project has a committed delivery milestone of completion by November 2011 and the project has met that date.

Milestones for ID 18.10		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 commences Letchworth	June 2011	June 2011
GRIP 6 complete Letchworth	November 2011	November 2011

Programme ID 19.00 - East Coast Main Line Overhead Line Electrification Performance Improvements

Current Project Stage: GRIP Stage 6 Construction, Test & Commission

Scope of works

This project is split into the following distinct elements:

- Defect survey – full survey of approximately 1900 wire runs of the ECML to record all defects, all outstanding campaign changes and any existing non-conformances
- Campaign changes – the implementation of 11 campaign changes. This is the removal of components or designs with known reliability problems with a modern fit-for-purpose equivalent
- Defect removal – in line with the campaign change delivery, all defects identified as a risk to performance will be removed with highest priorities being delivered first. A separate work stream will be used for tunnels where a non-intrusive survey is not practicable
- Neutral sections – the upgrade of 78 neutral sections to a more reliable type

Following completion of the survey, the project identified defect removal / campaign changes to 1,252 wire runs on the ECML from London King's Cross to Marshall Meadows incorporating the Hertford, Cambridge, and Doncaster to Leeds branch lines.

Progress in 2011/12

- Defect removal and campaign changes in tunnels have been completed
- 719 wire runs of defect removal and campaign changes have been undertaken
- 78 neutral section upgrades now completed

Milestones in the year:

The project is on course to achieve the final delivery dates on the remaining activities.

Milestones for ID 19.00		
Activity/Output	***Date***	***Date Met/Expected***
Neutral sections	December 2011	December 2011
Vegetation	September 2012	September 2012
Defect removal and campaign changes	March 2013	March 2013

Programme ID 20.00 St Pancras – Sheffield linespeed improvements

Current Project Stage: GRIP Stage 4 – Single Option Development

This project will improve the capability of the infrastructure to enable a minimum eight minute improvement in journey times between London and Sheffield for Class 222 operated services calling at Leicester, Derby and Chesterfield.

Progress in 2011/12

- Completion of GRIP 4 outline design for track elements of the project
- Completion of GRIP 3 for all other disciplines including signalling
- Completion of detailed topographical and asset surveys undertaken in order to confirm viability of single option
- Heavy maintenance of affected S&C units commenced as early works to implementation
- Timetable modelling undertaken to inform users / stakeholders of potential new pathways available, both from upgrading and improving the use of existing infrastructure
- Draft Network Change issued for consultation to stakeholders
- Implementation of early works at Wellingborough and Loughborough through synergy projects

Milestones in the year:

Milestones for ID 20.00		
Activity/Output	***Date***	***Date Met/Expected***
Performance & Timetable Plan	April 2011	April 2011
GRIP 6 Commences	June 2011	March 2011

Programme ID 21.00
Nottingham Resignalling

Current Project Stage: GRIP Stage 5&6 – Detailed Design and Implementation

The project will enhance capacity through remodelling, re-signalling and re-design of the platform layout at the west end of Nottingham Station. This will enhance the layout leading to improved services operating through Nottingham and improved performance. The project also migrates the control of the area into the East Midlands Control Centre at Derby.

Progress in 2011/12

- GRIP Stage 5-6 contracts awarded to delivery contractors
- Implementation of main civils works commenced
- GRIP 5 detailed design of signalling commenced
- Network Change Notice negotiations continue with key stakeholders
- Train Plan for 37 day commissioning period under development with support from the train operators

Milestones in the year:

Milestones for ID 21.00		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 4 stagegate review complete	June 2011	June 2011
GRIP 6 commences	August 2011	August 2011

Programme ID 22.00
Midlands Improvement Programme

Bromsgrove Electrification. Programme ID 22.01

Current Project Stage: Option Selection

Network Rail has a CP4 output commitment to enable the extension of services on the Birmingham Cross City South Line to Bromsgrove in CP4. Currently London Midland operates six trains an hour to Longbridge with two trains an hour running on further to Redditch (Class 323 rolling stock). The output is that all services would be extended from Longbridge so that three trains an hour operate to Bromsgrove (and three trains an hour to Redditch under Programme ID 22.02).

The scope of the project includes:

- The extension of four and a quarter miles of electrification from Barnt Green to Bromsgrove
- The immunisation of the existing signalling equipment between Barnt Green and Bromsgrove which will result in complete signalling renewal and control transfer
- Permanent way and signalling enhancements at the relocated Bromsgrove Station to facilitate the turning back of trains
- The examination of five overbridges between Barnt Green and Bromsgrove which have been identified for either bridge reconstruction or track lowering due to insufficient clearance for electrification

This project has a dependency on a third party funded project to enhance the functionality of the station at Bromsgrove, funding for which is currently under review.

Progress in 2011/12

- The scheme was placed 'Outwith the Change Control Process', as noted in the ORR quarterly report Q1 of year two (April to July 2010). Bromsgrove Electrification is subject to third party funding being fully agreed for a new station at Bromsgrove. Relocating the existing station to a new station site is a pre-requisite for the outputs from Bromsgrove Electrification to be delivered.

- GRIP 3 development was recommenced to assess options for enhancing the track and signalling to provide the necessary capacity at the new third party funded station. Although condition-led resignalling is not due until 2020, it is proposed to bring the resignalling solution into CP5 to address immunisation and is subject to change control. Timetabling work has assessed the capacity needed to turnback trains, as well as the impact on the section between Bromsgrove, Barnt Green and Longbridge.

- On the station scheme, GRIP 4 design work was re-activated, funded by Worcestershire County Council, under an extension to the existing Development Services Agreement. Centro has also agreed with Worcestershire County Council to take the lead in promoting the new station development. Network Rail will provide asset protection services. Centro is discussing detailed funding plans and schedules for delivery with Network Rail, the DfT and the ORR that will provide a basis for change control on the electrification project milestones.

Milestones in the year:

This project has a committed delivery milestone of completion by December 2013 but, because of the dependency on the functionality of the station, that date will slip into CP5 and a revised date is currently being agreed through the change-control process.

Milestones for ID 22.01

Activity/Output	*Date*	*Date Met/Expected*
Station re-location GRIP 4 final option	June 2010	November 2013
Start development of single option	September 2010	April 2013

Redditch Branch Enhancement. Programme ID 22.02

Current Project Stage: Option Selection

This project enables the extension of services on the Birmingham Cross City South to Redditch. Currently London Midland operates six trains an hour to Longbridge with two trains an hour running on further to Redditch. The output is that all services would be extended

Milestones for ID 22.02		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 stage gate review complete	November 2010	June 2011
GRIP 4 stage gate review complete	June 2011	April 2012

from Longbridge such that three trains an hour operate to Redditch (and three trains an hour to Bromsgrove under Programme ID 22.01).

The scope of the project is to deliver a passing loop centred on Alvechurch Station involving an additional platform face, 3.2km of track, OLE and signalling alterations. In addition, the second platform at Alvechurch will require access such as a footbridge to be provided to cross the railway. Proposals include the removal of the footpath level crossing at Alvechurch to improve line speed and safety.

Progress in 2011/12

- GRIP 3, which identified the preferred option of a 3.2km double track section through Alvechurch Station, was completed. It achieved the required outputs with the most affordable solution, whilst maintaining performance.
- In GRIP 4, an application to the Infrastructure Planning Commission is being prepared for a Development Consent Order (DCO) under the Planning Act 2008. The application is needed for consent to widen the railway for the double track section, and to acquire land outside the rail boundary. Under the IPC process, a first phase consultation has taken place to explain the proposal to those potentially affected by the scheme.
- Technical development is being progressed with contracts let for engineering designs. Early involvement of a works contractor will advise on construction methodology.

Milestones for ID 22.03		
Activity/Output	***Date***	***Date Met/Expected***
Start of construction	July 2011	July 2011
Enhancements in Service	September 2011	September 2011

Milestones in the year:

The initial GRIP 3 work was on the timetable and performance analysis to determine a viable set of options for surveys and preliminary designs required for the option selection process. The preliminary designs showed that all options required the widening of the railway to accommodate the double track section and would require a DCO application. GRIP 3 is now complete although resolving a viable option for the timetable and confirming the need for a DCO meant that the duration of the stage was lengthened causing the stagegate review to slip.

The impact of preparing and submitting a DCO application, plus the examination timescales required by the IPC before the works can commence, will delay completion of the programme as originally planned.
The GRIP 6 completion milestone is now August 2014, and Network Rail is seeking to determine whether the completion date can be brought forward should the DCO be made earlier than currently expected to take account of IPC timescales. A change control was agreed for the October 2011 update.

Line Speed Improvements Wrexham to Marylebone. Programme ID 22.03

Current Project Stage: Close-out

This output has been delivered by Chiltern Railways as an integral part of the Evergreen 3 project, which includes linespeed improvements, infrastructure enhancements, and fleet upgrade to deliver a 100-minute fastest journey time between London (Marylebone) and Birmingham (Moor Street). Programme 22.03 has delivered one minute towards the journey time reductions.

Progress in 2010/11

- Work completed and brought into use in September 2011

Route 16 – South Ruislip Loop (formerly Gerrards Cross bay platform) ID 22.04

Current Project Stage: Close-out

This output has been delivered by Chiltern

Milestones for ID 22.04		
Activity/Output	***Date***	***Date Met/Expected***
Start of construction	July 2011	July 2011
Enhancements in Service	September 2011	September 2011

Railways as an integral part of the Evergreen 3 project, which includes linespeed improvements, infrastructure enhancements and fleet upgrade to deliver a 100-minute fastest journey time between London (Marylebone) and Birmingham (Moor Street). Programme 22.04 has contributed towards the delivery of an improved track layout in the Northolt / South Ruislip area which allows slow trains to be overtaken by faster services and facilitates more flexible timetable arrangements.

Progress in 2010/11

- Work completed and brought into use in September 2011

Route 17 – Train Lengthening ID 22.05

Current Project Stage: Tranche 1 – Detailed Design and Construction, Tranche 2 Single Option Development

The project supports the industry capacity metric from the HLOS for West Midlands Route 17 and requirements for train operating companies' operational plans. This is to facilitate longer trains by extending station platforms or utilising selective door opening where necessary.

Progress in 2011/12

- Construction works complete at Tranche 1 sites Whitlocks End, Widney Manor, Yardley Wood & Wythall
- GRIP 5 Detailed Design progressed for all Tranche 2 sites: Spring Road, Cradley Heath, Langley Green, Kidderminster, Droitwich Spa, Hampton in Arden, Small Heath, Rugeley Trent Valley, Hednesford and Lye
- On-going liaison with London Midland and agreement reached to de-scope Hampton in Arden as the existing platform lengths are adequate for the existing operational plans.
- Further site visits and designs reviews held with London Midland to assess and value management the project to achieve efficiencies on stopping tolerances and signal sighting within Standards
- London Midland introduced new Class 172 rolling stock replacing Class 150s

Milestones in the year:

The project has achieved the milestones required during the year, noting that the GRIP 6 completion for Tranche 1 was added to show the early delivery of platform extensions at these stations and support the introduction of the Class 172s.

Milestones for ID 22.05		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 commences (Tranche 1)	April 2011	April 2011
GRIP 4 stage gate review complete (Tranche 2)	July 2011	July 2011
GRIP 6 commences (Tranche 2)	February 2012	February 2012
GRIP 6 complete (Tranche 1)	February 2012	February 2012

East Midlands Train Lengthening. Programme ID 22.06

Current Project Stage:
Project 1 is at GRIP Stage 7 – Handback
Project 2 is at GRIP Stage 7
Project 3 is at GRIP Stage 8

The overall project was to provide infrastructure to support the delivery of Midlands HLOS capacity metrics in CP4, allowing the increases in capacity (revised from last year via the Change Control process).

This was to be achieved through three separate projects:

1. **Loughborough**. This element required platform lengthening to accommodate 10×23m (class 222) vehicles at Loughborough station (platforms 1 and 2). The existing platforms could only accommodate 4-Car class 222 vehicles, so the new platform lengths were planned to be more than double the existing lengths (235m)

2 **Stansted Airport**. This element required platform lengthening to accommodate 4×23m (class 170) vehicle trains at Stansted Airport Station (97m). This scheme was developed and delivered by Network Development London and South-East as part of other works at the station

3 **Class 170 Selective Door Opening (SDO)**. This element was a funding contribution to Cross Country Trains for the fitment of SDO to the Turbostar (Class 170/1) fleet to enable 4×23m (Class 170) vehicle trains to call at all stations on the Birmingham to Stansted route, including infrequent calls at Whittlesea and Manea

Progress in 2011/12

Loughborough:

- All new signalling has been brought into use
- Barrow crossing removed following the opening of a new DDA compliant footbridge
- Platform extension work completed in February 2012 (ahead of the delivery milestone date of March 2012)

Stansted Airport:

- Platform extensions complete and taken into use by the Delivery Plan milestone in December 2011.
- Associated signalling changes delayed until December 2011 due to factors outside the project's direct control

Class 170 SDO:

- The programme for the fitment of SDO completed in February 2011

Increases in Capacity

Description	*Additional vehicles involved*	*Station served*	*0700 – 0959 capacity impact*	*0800 – 0859 capacity impact*
Release capacity provided by additional EMT 4-car set and 5-car set in the peak	0	Leicester	341	148
Lengthening of some CrossCountry services within existing resource base	2	Leicester	80	209
		Birmingham	80	80

Programme ID 23.00 Northern Urban Centres (a) Yorkshire

The interventions described in this section are based on the quantum and deployment of additional rolling stock described in the operational plan agreed between DfT and its franchised train operators. The operational plan for Northern Rail is divided into three Interventions, which have now been contractualised.

The Delivery Plan was originally based on the assumption that rolling stock provision and the consequent operational plan would be contractualised between the DfT and Northern Rail by July 2009. In reality a much reduced agreement was finalised in May 2011, and (with the exception of the Horsforth turnback and additional signals which are designed into a planned signalling renewal), the programme dates have been revised to reflect this.

Capacity improvements (Leeds area). Programme ID 23.01

Programme ID 23.01 includes the following projects:

Capacity improvements (Leeds area)

Current project stage:
Network Rail has undertaken a study of platform capacity at Leeds which has confirmed that the existing platform layout is capable of accommodating the proposed longer and additional services which start / terminate there.

Other works are to include new turnback facilities at Horsforth, clear of the running lines (4×23m vehicles). To allow for growth beyond CP4, the turnback will have provision to permit formations longer than necessary for current CP4 train lengths.

Two additional signal sections between Harrogate and Horsforth (in either direction) will provide additional capacity between Harrogate and Leeds, facilitating future operational plans by exploiting “once in a lifetime” opportunities afforded by signalling renewals.

The proposed scope of works includes enhanced stabling and servicing facilities at Skipton to accommodate up to 12 (additional) electric vehicles per night. This will be supplemented by additional stabling capacity at Neville Hill (Leeds) and Botanic Gardens (Hull) to accommodate the requirements of Northern Rail’s operational plan.

Progress in 2011/12

- Regular communication continued to take place with Northern Rail in order to make sure that the developing infrastructure interventions meet their Operational Plan requirements
- Timetable modelling work undertaken to confirm that the additional services planned to operate on the Doncaster, Skipton, Ilkley and Horsforth routes can be accommodated within the existing infrastructure of Leeds station
- GRIP 5-8 commenced for Horsforth turnback
- GRIP 3 complete for Micklefield turnback; this scheme now placed on hold
- Platform extensions at Cottingley, Deighton & Mossley (Up) completed in December 2011
- Skipton additional stabling delivered an operational siding by December 2011; non critical works ongoing

* Please refer to the milestone table 23.02 for the slight slippage in programme schedule. The two advance-completion dates are due to revised efficiencies necessitated by the delivery of new rolling stock for Northern Rail.

West and South Yorkshire Platform Lengthening, including South Yorkshire Train Lengthening. Programme ID 23.02

Milestones for ID 23.02		
Activity/Output	***Date***	***Date Met/Expected***
Outline design completion	September 2010	September 2011

Milestones for ID 23.02 – West Yorkshire Stabling (Northern Urban Centres)		
Activity/Output	***Date***	***Date Met/Expected***
Outline design completion	December 2010	September 2011
Complete consents	March 2011	September 2011

Current Project Stage:

This project concerns the provision of longer platforms at stations in West and South Yorkshire to meet the requirements of Northern Rail's CP4 Operational Plan, and to meet HLOS passenger growth metrics.

The original project scope was to provide 143 metre platforms at stations on the routes from Leeds to Skipton and Ilkley to facilitate the operation of six-car trains of 23 metre vehicles., It was also to facilitate the operation of trains of varying lengths and formations on other routes in accordance with the Operational Plan. The scope has evolved as Northern Rail's Operational Plan has undergone further development. As a result the project scope is now to provide longer platforms to accommodate longer peak services at:

Cottingley Up & Down (complete), Deighton Up & Down (complete), Mossley Up (complete), Mossley Down (GRIP 3), Marsden Down (GRIP 3), Mirfield Down (GRIP 3)

Progress in 2011/12

- Discussions continue to take place on a regular basis with Network Planning and Northern Rail to refine the project scope in light of the evolving nature of Northern Rail's Operational Plan
- Following the contractualisation of the Northern Rail Operational Plan, authority obtained to progress platform extensions through to completion
- Following a competitive tendering exercise, a contractor engaged to deliver platform extensions at Cottingley and Mossley stations
- Platform extensions at Deighton delivered by Network Rail's Buildings and Civils team in conjunction with the planned redecking of the timber trestle platforms at this location

The remaining platforms which are currently in GRIP 3 will be completed by Autumn 2012.

West Yorkshire Stabling (Northern Urban Centres)

Current Project Stage:

Our obligation is to provide the necessary infrastructure to facilitate the operational plan agreed with train operators to deliver HLOS capacity metrics.

The scope of work necessary to meet the obligation for stabling was additional stabling and servicing in the Huddersfield and Skipton areas to accommodate up to 34 and 16 (additional) vehicles per night respectively for Northern Rail as part of the DfT Rolling Stock Strategy. These numbers were subsequently reduced and therefore the facilities at Hillhouse (near Huddersfield), were deemed as no longer required, and not be considered further. However, additional stabling facilities Skipton, Hull Botanic Gardens and Neville Hill are being progressed.

The delivery plan milestones have been subject to alteration because of the original DfT / Northern Rail Operational Plan negotiations have taken longer than anticipated.

Progress in 2011/12

- Regular communication with Northern Rail to ensure that the infrastructure interventions meet the requirements of the rolling stock
- Skipton Stabling additional capacity substantially complete by December 2011. (This was a significant achievement, as the implementation duration was considerably shortened to meet the client's December 2011 aspiration, and was the first application of the Multi Asset Framework Agreement in the area)
- Hull Botanic Gardens completed on time in February 2012
- Neville Hill Additional Stabling –scope yet to be defined

South Yorkshire - Stabling for Northern. Programme ID 23.03

Current Project Stage: cancelled

The Delivery Plan was originally based on the assumption that rolling stock provision and the consequent operational plan would be contractualised between the DfT and Northern Rail by July 2009. In reality a much reduced agreement has recently been finalised. This reduced operational plan no longer requires the provision of additional stabling capacity in South Yorkshire.

Programme ID 24.00 Northern Urban Centres (b) Manchester

Route 20 – Platform Lengthening. Programme ID 24.01

Current Project Stage: Construct, test and commission

The project has provided the infrastructure to allow for operating longer trains in accordance with the Northern Rail Operational Plan by platform lengthening.

Progress in 2011/12

- Authority for design and implementation secured in May 2011
- Single option detailed design completed in September 2011
- Platforms brought into operation for the December 2011 timetable; apart from Thatto Heath (Down)
- Temporary extension to the platform installed at Bescar Lane due to problems on site with piling works

The permanent solution at Bescar Lane is planned to be completed by the end of June 2012.

That to Heath Down platform is targeted to be delivered by the North West electrification project in May 2012

Route 20 – Stabling for Northern. Programme ID 24.02

Current Project Stage: Construct, test and commission

The project provides additional stabling and servicing facilities for Northern Rail's fleet to accommodate the additional Northern Rail rolling stock to meet CP4 HLOS growth. Allerton Depot provides the required additional stabling plus an under-carriage vehicle washer, watering, fuelling, wheel lathe, exterior washer and train crew facilities.

Progress in 2011/12

- Authority for design and implementation secured in May 2011
- The depot brought into operation for the December 2011 timetable change

The original scope was completed in December 2011. However, additional work has been identified to the west shunt neck to bring it into operation. It has been planned for completion in June 2012. This is slightly later than planned due to Thatto Heath Down platform and platform stepping work at Swinton and Walkden being delivered by the North West Electrification project. .

Salford Crescent station redevelopment. Programme ID 24.03

Current Project Stage: Single Option Development / Detailed development

This project is to redevelop Salford Crescent station in order to support the operation of six-car units, improve passenger circulation and comply with DDA arrangements. It may be necessary to undertake minor remodelling of the track layout in order to support the operation of six-car units.
The project will also review the potential for an additional platform at the station in order to relieve overcrowding.

Milestones for ID 24.01		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 4 Completion	September 2011	September 2011
GRIP 5-6 Completion *	December 2011	May 2012

Milestones for ID 24.02		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 feasibility completion	July 2011	July 2011
GRIP 4 Single option design completion	August 2011	August 2011
GRIP 5-6 Detailed design and construction completion	December 2011	June 2012 (including additional scope)

Milestones for ID 24.04		
Activity/Output	***Date***	***Date Met/Expected***
Ashburys re-control	November 2011	November 2011
Guide Bridge re-commissioning	December 2011	December 2011
Output definition Hadfield intervention	March 2010	on hold
Hadfield intervention completion GRIP 2	December 2010	on hold

The primary objectives are to:

- Accommodate future projected growth of passenger numbers by lengthening and/or widening station platforms
- Investigate whether an additional platform is feasible which could also relieve overcrowding at the station
- Remodel the station to improve passenger circulation space on the platforms, (possibly by de-cluttering station buildings and furniture)
- Improve access arrangements in and around the station along with improved interchange facilities

Progress in 2011/12

- Single option development authority secured in March 2011 (The option selected is to alleviate crowding and improve circulation on the island platform by removing the existing ticket office, waiting room buildings and stepped ramp to provide more available space. A new ticket office with waiting facility, access via a new footbridge, steps and a lift are to be provided. The platform is to be extended at each end to accommodate six-car trains)
- The planning application submitted in December 2011
- The constructability report completed in February 2012, based on consultation with stakeholders - the intention was to implement the scheme whilst keeping the station operational
- Single Option Development (GRIP Stage 4) completed in April 2012

Milestones in the year:
This project has a committed delivery milestone of completion by October 2014 and the project is on target to complete GRIP 6 in February 2014.

Programme ID 24.04. Route 20 Capacity Enhancements.

Current project stage: Stalybridge– detailed design / implementation Hadfield – on hold.

This scheme combines track and signalling renewals with the installation of an additional bay platform turnback at Stalybridge station. It includes some remodelling and line speed increases through the station. A new control system is to be provided for Stalybridge, Ashburys and Guide Bridge which will be located at Manchester South Signalling Control Centre.

The scheme will provide increased flexibility for network operation and train movements. The proposed additional bay platform adjoining the Ashton branch will result in increased capacity for Manchester Victoria services in support of the DfT HLOS. It will remove conflict from Stalybridge Junction, and enhance performance of the Stalybridge – Manchester Piccadilly services. There will also be a new platform face for through trains.

Progress in 2011/12 (Stalybridge Intervention):

- Detailed design completed and approved for most elements of the scheme
- Network Change consulted with only one returned comment outstanding
- Ashburys re-control completed November 2011
- Guide Bridge commissioning completed December 2011
- Planning approval received for demolition of Ashburys and Guide Bridge signal boxes
- Station change for works to Stalybridge station underway

Milestones in the year:
The Hadfield line interventions are on hold pending finalisation of the Northern Rail Operational Plan.

Milestones for ID 24.03		
Activity/Output	***Date***	***Date Met/Expected***
Planning Application submitted	December 2011	December 2011
GRIP 4 stage gate review complete	January 2012	April 2012

The project intervention at Stalybridge has a committed delivery milestone of June 2013 and the project is on target to meet that date. The interventions at Hadfield will be re-evaluated, once the Northern Rail Operational Plan is contractualised and the current uncertainty is resolved.

Programme ID 25.00 Northern Urban Centres (c) Liverpool – Manchester Journey Time Improvements

Manchester to Leeds Journey Time Improvements

Current Project Stage:
Liverpool to Manchester – Outline design;
Manchester to Leeds – Feasibility

The primary output is a contribution to the Route 10 and Route 20 HLOS passenger kilometre metrics by stimulating further passenger demand through improving journey times between Leeds and Manchester via Diggle, and Manchester and Liverpool via Chat Moss.

Reductions in journey times between these cities are a move towards the Government's target journey time of 30 minutes between Liverpool Lime Street and Manchester via Chat Moss and 43 minutes between Manchester and Leeds. It is recognised that achieving improved journey times will require both the defined infrastructure interventions combined with an industry agreed timetabling intervention.

The line speed improvements will manifest themselves as revised sectional running times over the route between Liverpool Lime Street and Leeds. The scope of infrastructure and timetabling works required to achieve these time savings is continuing to be assessed.

Scope of works

The project will be taken forward as two separate projects: Liverpool to Manchester; and Manchester to Leeds. Liverpool to Manchester will progress into GRIP Stage 4 and Manchester to Leeds will return into early stage development.

Liverpool to Manchester
The project scope is for track, signalling, structures and earthworks alterations to take place at locations between Liverpool Lime Street Station and Manchester via the Chat Moss route.

The scope of the GRIP 4 is to complete the outline design for the following options selected at the end of GRIP 3:

- Line speed improvements between Olive Mount Cutting and Ordsall Lane Junction

Manchester to Leeds
The project scope is to develop and deliver journey time opportunities which involve capacity improvements to move towards a journey time of 43 minutes between Manchester and Leeds via Diggle in CP4.

Early work in GRIPs 1 and 2 has looked at the standard hourly timetable to identify the use of pathing time and options to reduce it.

The following options will be further developed:

- Relaxing the Approach Control through signalling interventions to the down passenger loop at Dewsbury
- Relaxing the Approach Control at Mirfield East Junction
- Create an accessible for all Platform 2 at Marsden which allows stopping services to run via the Up Main Line and thereby have a journey time reduction

Significant interfaces

There are interfaces with stakeholders including the DfT, TOCs, FOCs, Merseytravel, GMPTE and West Yorkshire PTE. The scheme has interdependencies with other projects including the Seven Day Railway

Milestones for ID 25.00: Liverpool to Manchester JTI		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 Completion	June 2010	September 2010
GRIP 4 Commences	September 2010	November 2010

Milestones for ID 25.00: Manchester to Leeds		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 Completion	June 2012	October 2012
GRIP 4/5 Commences	June 2012	October 2012

renewals and resignalling schemes, the Northern Hub and Electrification.

Progress in 2011/12

- Option selection completed during 2011/12 (Whilst it has been possible to identify line speed improvements between Liverpool and Manchester, it has not been possible to do the same between Manchester and Leeds, as the latter has already been subject to modernisation and line speed improvement. Therefore the scheme has been split into two, with Liverpool to Manchester progressing into outline design, and Manchester to Leeds being taken forward as a journey time improvement scheme.)
- Stakeholder agreement reached regarding the infrastructure interventions to be taken forward on the Manchester to Leeds route.
- GRIP 2 for the Manchester to Leeds scheme reached its completion in October 2011.

Milestones in the year:

The project has a committed delivery milestone of completion by March 2014 and the project is on target to meet that date.

Programme ID 26.00 - Western Improvements Programme

Barry – Cardiff Queen Street corridor. Programme ID 26.01

Current Project Stage: Single Option Development

This scheme aims to deliver an increase in network capacity and capability on the lines between Barry through Cardiff Central to Cardiff Queen Street from the current 12 trains per hour (tph) to 16tph. This will be achieved alongside the renewal of the signalling system throughout the Cardiff Signal Box (PSB) control area and including the following enhancements:

- Cardiff Queen Street additional platform 1a
- Cardiff Queen Street additional Bay platform
- Cardiff Central additional platform 8
- Cardiff East crossover platform 4 to Up Barry and bi-directional signalling in platforms
- Station Building improvements at Cardiff Queen Street and Cardiff Central south entrance
- Treforest Curve doubling
- Barry Town Platform 3
- Cogan Junction loop enhancement

These outputs are as agreed with the ORR following the change control approval.

- Subject to further change control it is proposed to reinstate the City Line linespeed enhancement into the scope as being deliverable within the current funding

Additionally the work includes:

- Improved access to Canton Depot, reinstatement of the main-main crossover at Rumney River Bridge (SWM 167m 40ch) and access to Platform 2 from the Down Main and Down Relief lines under the Seven Day Railway programme to improve layout flexibility
- Additional platforms will be provided at Barry Junction and Caerphilly stations, and a new platform and passing loop at Tir Phil funded by the Welsh Assembly Government

Progress in 2011/12

- The completion of single option development in April 2011
- Commencement of the detailed design and construction phase in May 2011
- Contracts for delivery of the works let
- Work commenced on site with cable route and relay room bases being constructed and the first main stage commissioning, that of the Vale of Glamorgan Line section, on track for commissioning January 2013
- Overall programme for commissioning work developed and consulted with Train Operating Companies and key stakeholders(The main Central section being planned for New Year 2015; Platform 8 will follow in the Summer of 2015 after the closure of Cardiff PSB and transfer to the nearby Wales Route Operational Control)
- Track design of Cardiff East Junction modified under the electrification programme to lower the track and re-deck the canal bridge during the remodelling so as to provide for electrification clearance to the railway viaducts above. (This work is currently planned for Christmas 2013)

In order to support the funding of the required new station buildings associated with the additional platforms at Cardiff Central and Queen Street, the planned Cardiff Bay Platform 5 enhancement was removed from the scope following agreement with the ORR. This element was not required to support the core output of sixteen trains per hour in the Barry to Queen Street corridor

Milestones in the year:

No milestones were committed to be delivered in 2011/12.

This project has a committed delivery milestone of completion by December 2016 and the project remains on target to meet that date. The project gained GRIP 5-8 authority in May 2011.

Cotswold Line Re-doubling. Programme ID 26.02

Current Project Stage: GRIP Stage 7 and 8

The objective of this project was to increase

capacity and improve performance by re-doubling two sections of single line between Charlbury and Ascott-under-Wychwood, and Moreton-in-Marsh and Evesham. The extra twenty miles of track significantly increases the capacity for both passenger and freight operators, as well as improving the robustness of the timetable, with subsequently less delays due to the currently restrictive infrastructure.

Other improvements include increased line speeds between Wolvercote Junction and Norton Junction, through removal of several speed restrictions on the approach to the single to the double line junctions and the removal of the token exchanges at Moreton-in-Marsh, Evesham and Norton Junction/Worcester Shrub Hill. The provision of turn-back signals at Charlbury, Moreton-in-Marsh and Evesham also improve the flexibility of the route during periods of maintenance engineering and operational perturbation.

Progress in 2011/12

- 20 miles of plain line installed in two stages: Charlbury to Ascott and Moreton-in-Marsh to Evesham between December 2010 and May 2011
- Three new platforms installed at Charlbury, Ascott-under-Wychwood and Honeybourne(Including signage, lighting, waiting shelters and two new footbridges at Charlbury and Honeybourne)
- Five road level crossings renewed and enhanced to accommodate the second line (This included new barriers, zig-zag road markings, relay rooms, cameras, and lighting and road surfaces.) The crossings were at Ascott-under-Wychwood, Breune, Chipping Campden, Blockley and Littleton and Badsey
- Existing signal boxes at Evesham and Ascott-under-Wychwood converted from a mechanical box to a panel to operate the new sections of double track under their control
- 29 LED signals and numerous location cases installed between Wolvercote Junction and Pershore, along with axle counters and track circuit sections
- Four new power distribution points installed along with 650v cabling between these locations
- Five sets of new S&C installed, including two new high speed turnouts at Charlbury and Evesham West
- Eight sets of S&C were removed as part of the same contract

Milestones in the year:

The ‘Charlbury to Ascott-under-Wychwood’ section was commissioned as planned in June 2011 and the ‘Moreton-in-Marsh to Evesham’ section was brought into service in August 2011, although this was subject to three days of amended train working due to signal testing being held up by outstanding works.

Three new passenger train services commenced in September 2011 between Moreton-in-Marsh and Oxford / London, and in December 2011 between Charlbury and London as a result of the additional capacity created through this scheme.

Westerleigh Junction – Barnt Green Line Speed Enhancement. Programme ID 26.03

Current Project Stage: Single Option Development

The project will enhance the linespeed on approximately 18 miles of track between Westerleigh Junction and Barnt Green. Efficiencies are being achieved through utilising current (High Output) planned possessions on the route during 2011/12 and 2012/13. The project output will be a line speed of 100 mph over the majority of the route.

Milestones for ID 26.03		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 5 (Detailed design for Track) commences	May 2010	May 2010
GRIP 6 (Track only) commences	August 2010	August 2010
GRIP 5-8 Investment Authority	November 2011	November 2011
GRIP 4 (non-Track) Option selection commencement	November 2011	November 2011
GRIP 4 (non-Track) Option selection completion	March 2012	March 2012
GRIP 5 (non-track) commences	April 2012	April 2012
GRIP 6 commences (non-Track)	August 2012	August 2012
GRIP 6 completion (non-Track)	November 2012	November 2012
GRIP 7 commissioning	December 2012	December 2012

Significant interfaces

- High Output Track renewals programme 2011/12 through to 2012/13
- Bromsgrove station relocation project
- Bromsgrove electrification and Redditch branch improvement

Delivery of this project is dependent on the High Output renewals programme.

Progress in 2011/12

- Track design work completed. (The works in Wickwar tunnel are being jointly funded by IEP and Gauge Capability projects as all three projects required enhancements within the tunnel.)
- Contract awarded for all the track works
- Network Rail Signalling Design Group progressing the signalling design for GRIP 4-8 development of the (non-track) single option
- Two Footpath crossing diversion / closures progressed by the relevant local authorities
- High Output possession plans for 2011/12 and 2012/13 finalised allowing all the works to be completed by December 2012 without the need for further disruption to train services
- Minor speed enhancement works at Blackwell agreed to be removed following stakeholder consultation

Objection to Network Change has now been withdrawn subject to the provision of some more information and an agreed way forward with further line speed raising opportunities on the Birmingham to Plymouth route

Milestones in the year:

This project has a committed delivery milestone of completion by December 2012 and the project is on target to meet that date.

Maidenhead and Twyford (relief lines). Programme ID 26.04

Current Project Stage: Suspended

This project was originally required due to the proposed HLOS vehicle procurement for this line of route, including the existing locations being capable of handling seven-car trains.

In the light of developments with the Crossrail and the Great Western Main Line Electrification projects, this scheme has been suspended as its prerequisites will be covered elsewhere.

Programme ID 27.00 - North London Line capacity enhancement

Outputs

The project created the rail infrastructure to facilitate the following service pattern, whilst maintaining loading gauge and capacity for freight traffic (numbers stated are in each direction):

- 4 trains per hour (tph) Stratford to Richmond
- 2 tph Stratford to Camden Road (peak hours only)
- 2 tph Stratford to Clapham Junction
- 2 tph Clapham Junction to Willesden

In addition, the enhancements to the North London Line (NLL) infrastructure have enabled an extension of the East London Line (ELL) services to Highbury & Islington.

The infrastructure modifications enable segregation of NLL and ELL services over the most constrained section of the route and provide passing loops for freight trains.

The work facilitates a package of transport improvements in the area, which form a part of the Olympics Transport Plan.

The project outputs have been met and the new train service commenced in May 2011.

Programme ID 28.00 - GSM-R coverage of freight-only lines

Current Project Stage: Implementation (in South), Option Selection (in North)

This project supports the provision of GSM-R radio on all freight-only branch lines in Great Britain.

The National Radio Network (NRN) operational license for southern England (i.e. south of the 'Severn / Wash line') expires in 2012. Northern England, Wales and Scotland will lose the NRN license in December 2015.

The 40 freight-only branch lines south of the 'Severn-Wash' line are currently being installed with GSM-R base station sub-system equipment, ready to be brought into operation by December 2012.

The system requirement is to provide, as a minimum, a level and quality of driver-signaller communication equivalent to the existing NRN service. The current (baseline) scope includes the installation of trackside GSM-R base transceiver equipment together with connections to the Fixed Telecoms Network (FTN). Assumed scope volumes for freight-only branch lines are derived from the same design rules applied elsewhere on the GB railway for the provision of GSM-R. Any viable relaxation of the design rules will be identified on a site-by-site basis during the project development phase and managed as programme efficiency.

An alternative solution for the freight branches in the north is to meet the requirement through roaming onto an equivalent service provided through public Mobile Network Operators. This would have the advantage of avoiding the need to build GSM-R/FTN infrastructure on these routes whilst still providing a continuous and viable GSM-R service to Freight Operators. The feasibility of such a solution is under review and a decision on whether to adopt such a solution or to continue with GSM-R implementation will be made early in 2012/13.

Where branch lines are part-privately owned, radio coverage will be provided to minimum operational standards only as far as the Network Rail Controlled Infrastructure (NRCI) boundary. However, if a public roaming solution is implemented, Freight Operators would benefit from continuation of such coverage beyond the NRCI boundary.

Progress in 2011/12

- GSM-R in the south designed, contracted and installation works commenced
- Initial design work for GSM-R solutions in the north underway and consents process commenced
- discussions with public mobile operators concluded with a specification being established and tenders for a roaming solution issued, returned and currently under evaluation

No milestones were committed to be delivered in 2011/12.

This project has a committed completion milestone of July 2013; however this is a general high level target and more detailed milestones have been identified that will be formally change-managed into this programme.

Programme ID 29.00 - Station Security

Current Project Stage:
Phase 1 – Pilot Stations: Complete
Phase 2a – Remaining Managed Stations: Complete
Phase 2b - Remaining Managed Stations: Implementation
Phase 3 - Franchised Stations: Implementation

This Programme incorporates enhanced security measures at Network Rail's 17 directly managed stations for the safety and benefit of all our users, i.e. our staff; the train and freight operating companies' employees and customers, as well as any contractors or other third party stakeholders. The following schemes are included:

Station Security - 3 Phases:
Phase 1 - Pilot Stations
Phase 2 - Remaining Managed Stations
Phase 3 - Franchised Stations

Highlights of this programme are:

- The provision of measures to prevent vehicle access to station concourses nationally at both Managed and Franchised Stations
- The alteration of working practices to allow appropriate staff coverage at significant times of the day

The implementation phase of the project has provided significant challenges around Listed Building Consent together with buried services diversions. The programme was rephased to allow the key stations which have Olympic links to be completed ahead of the others.

Progress in 2011/12

- Phase 2a completed and handed back
- Phase 2b underway
- Phase 3 completed for the Olympic Delivery Stations

Programme ID 30.00 - Scotland: Tier 3 Project Development Fund

Fund Purpose:

This fund is primarily aimed at initial development of future projects that will enhance the network in Scotland and will contribute to the Scottish Government's target of promoting sustainable economic growth.

Schemes are developed to a point where a decision about next steps and funding can be made. In a small number of cases and by agreement with Transport Scotland, expenditure from the fund has contributed to the implementation of new schemes.

Current Project stage:

Various, as detailed below.

Funding:

All project proposals are submitted by Network Rail for approval by Transport Scotland prior to any commitments being made.

There are currently 14 schemes being developed under this fund, three of which the development work is complete and progress is shown below

Milestones for ID 30.00		
Activity/Output	***Date***	***Date Met/Expected***
Aberdeen Station north bay platform. Option selection completed. No further work currently being undertaken.	Completed	
Grangemouth east facing freight connection. Pre-feasibility completed in previous year. No further work undertaken.	Completed	
G&SW line speed increases. Pre-feasibility completed in previous year. No further work undertaken.	Completed	
Rail enhancement between Aberdeen and the Central belt - output definition	No milestone date yet agreed	
Carstairs to Haymarket line speed improvements. Further pre-feasibility work being undertaken.	February 2012	May 2012
Carstairs Junction remodelling. Further pre-feasibility work being undertaken.	February 2012	May 2012
Mossend area capacity improvements. Further pre-feasibility work being undertaken.	February 2012	May 2012
Motherwell area stabling. Further pre-feasibility work being undertaken.	February 2012	May 2012
Motherwell North re-signalling enhancements - option selection	March 2012	March 2012
Highland Main Line journey time improvements. Phase 1 - design & construction Phase 2 – output definition	 March 2012 March 2013	 April 2012 March 2013
Aberdeen to Inverness rail improvements - option selection	May 2012	May 2012
Further electrification of the network - option selection	May 2012	May 2012
Aberdeen North Siding Walking Route - output definition	March 2013	March 2013
Dalmarnock Station redevelopment - design & construction underway	September 2013	September 2013

Programme ID 31.00 - Scotland Small Projects Fund

This programme comprises 20 projects at various stages of development / delivery, from output definition to project close out. All projects are programmed to be completed during CP4.

Progress in 2011/2012 of key projects:

Glasgow South Suburban Renewals (GSSR, LLF690)

Current Project Stage: Single Option Selection

Various enhancements in synergy with major signalling renewals, comprising: doubling of existing single lead junction at Busby Junction; signalling capacity enhancement on Glasgow Barrhead and Kilmarnock line; and turnback facilities at Whitecraigs station on Neilston line. The project has now completed Outline Design stage and will be commission in April 2013.

Laurencekirk Loop:

Current Project Stage: Option selection

This consists of a new loop for freight traffic between Aberdeen and Dundee on the Up line. The project is on hold pending further development work due to capacity issues on the Dundee to Aberdeen section of the East Coast Main line. The project has completed the Option Selection stage.

Aberdeen Station – New north Bay Platform

Current Project Stage: Option Selection

New northbound platform at Aberdeen station to increase capacity on the through lines. The business case (developed as part of the Option Selection stage) is insufficient to justify the level of expenditure. Currently reviewing other opportunities to enhance business case benefits

Ladybank to Hilton Junction Line Speed Improvements
Current Project Stage: Project Close out
Linespeed increases proposed over 13 track miles. Scope consists of minor track renewal, tamping, risk assessment, and speed board changes. The scheme was successfully completed in December 2011 and was delivered within budget.

Hurlford Line Speed Increase

Current Project Stage: Detailed Design.

This consists of the planned removal of an existing permanent speed restriction by moving a signal to achieve correct braking distance for the proposed higher linespeed, with associated speed board changes. Detailed Design is underway and commissioning is on target to take place in August 2012.

Midcalder S & C Renewal

Current Project Stage: Single Option Selection

The project redoubles the junction at Midcalder from current single lead on the Shotts line, through alignment with the switch and crossing track renewal scheme. The project has commenced Outline Design and is on programme for a May 2013 commissioning.

Dumfries Station Improved Turnback Facility

Current Project Stage: Single Option Selection

The scheme involves the provision of a new turnback facility at Dumfries Station. The original project is not now proceeding and instead a signal is being converted to main aspect to enable turnback on main line.

Stirling North to Dunblane Minor Renewals and Enhancement (previously titled Bridge of Allan)

Current Project Stage: Option Selection

This consists of the provision of a new signal section in the down direction between Stirling and Dunblane, seeking to improve headways / capacity on the route. This project will commission in early 2013.

Barnhill Line Speed Improvement

Current Project Stage: Output Definition

This involves linespeed improvements between Perth and Barnhill for passenger trains. Structural surveys are underway to ascertain the capability of structures on the section of line affected to take increased

linespeed. Project expected to start in April 2012.

Newbridge West Junction Signalling & Crossing Renewal

Current Project Stage: Project Close out

This involves the removal of redundant signals and crossings with corresponding change in track alignment to increase linespeed. It was successfully completed and the linespeed raised in January 2011.

Wick Platform Permissive Working

Current Project Stage: Project Close out
This project introduced signalling to permit two trains working in the platform at Wick Station to reduce the number of shunts required. The project was completed in January 2011 on time and within budget.

Stirling Middle: Junction Doubling

Current Project Stage: Detailed Design

The doubling of Stirling Middle Junction increases capacity and provides higher linespeed to / from Alloa for both passenger and freight services. The Project has completed Outline Design and will be delivered by Autumn 2013.

Paisley Corridor Improvements Scheme

Current Project Stage: Detailed Design

The project is proposed to provide bi-directional working in the Shields Junction area as part of the larger scheme – see Programme ID 32.02.

Edinburgh and Glasgow Permanent Speed Restriction Easements.

Current Project Stage: Project Close out

This project is to raise linespeed in the Bishopbriggs area of the Edinburgh to Glasgow main line. The project was successfully commissioned in August 2011.

Ladybank Junction Enhancements

Current Project Stage: Option Selection

The project will increase linespeed for trains between Edinburgh and Perth / Inverness. Option Selection is underway and a commissioning date of January 2014 has been proposed.

Camelon Line Speed Improvement

Current Project Stage: Detailed design

This covers linespeed improvement works between Carmuirs East Junction and Falkirk Grahamston. Enabling works, as part of a planned renewal, have been carried out and detailed design is underway in preparation for raising the linespeed.

Programme ID 32.00 - Scotland Projects

Airdrie to Bathgate & Linked Improvements. Programme ID 32.01

Current Project Stage: Handback / Close out.

The project is now substantially complete and has reopened the railway between Airdrie and Bathgate. This now provides an additional four trains per hour between Glasgow and Edinburgh in addition to providing a service to the new intermediate stations.

The project has built and commissioned:

- A re-opened and electrified double track railway between Drumgelloch and Bathgate
- Three new stations at Caldercruix, Armadale and Blackridge
- Two relocated stations at Drumgelloch and Bathgate
- Five new station car parks
- Three upgraded stations at Airdrie, Livingston North and Uphall
- One new Light Maintenance Depot
- A replacement National Cycle Route between Drumgelloch and Bathgate

The work is nearing completion along with a minor works programme to close out Local Authority commitments.

Paisley Corridor Improvements. Programme ID 32.02

Current Project Stage: Scheme handback.

This project aims to enhance capacity on the Glasgow Central to Ayrshire and Inverclyde routes. This has been done by means of:

- Additional platforms at Glasgow Central
- Three-tracking, and some four-tracking, of the Paisley corridor (between Shields Junction and Paisley Gilmour Street)
- An extension of the loop at Elderslie

The project also included a full signalling renewal of the Paisley Corridor. Control of this line plus the routes to Ayr, Ardrossan, Largs, Wemyss Bay and Gourock, were transferring to the West of Scotland Signalling Centre.

Progress in 2011/12

- Commissioning of the new Shields interlocking in July 2011
- Commissioning of the new Paisley interlocking in December 2011
- Completion of the new track layout in January 2012
- Substantial project completion achieved by the end of February 2012

Milestones in the year:

The main signal commissioning milestones were all achieved on time or early against the project milestones, with the signalling re-control milestone being achieved 12 months early. This was done by reprogramming this activity to exploit the opportunity offered by the Christmas 2011 disruptive possession, thus negating the need for additional access. Substantial completion was achieved in February 2012; four weeks later than the target date.

Borders Railway. Programme ID 32.03

Current Project Stage:

The Borders Railway is a project to build a new rail connection between the existing station at Newcraighall (south of Edinburgh) and Tweedbank in the Scottish Borders. This involves approximately 30 miles of new railway and the construction of seven new stations.

Transport Scotland intended procuring the project using a Design, Build, Finance and Maintain (DBFM) Strategy. Two of the three consortia selected by Transport Scotland withdrew from the procurement leading to the termination of the process. In September 2011 Network Rail were invited to take the project forward through final development and implementation. Discussions are ongoing with Transport Scotland on the basis of Network

Milestones for ID 32.02

Activity/Output	*Date*	*Date Met/Expected*
Main Line first commissioning	July 2011	July 2011
Main Line second commissioning	January 2012	December 2011
Main corridor works substantial completion	January 2012	February 2012
Complete signalling re-control	December 2012	December 2011

Rail assuming this role.

Network Rail has agreed with Transport Scotland a package of advance works including de-vegetation and mine remediation works to accelerate critical activities within the project programme.

Progress in 2011/12

Prior to the termination of the DBFM procurement, Network Rail progressed with its obligation to complete the proposed connection of the Borders Railway with the National Rail network. This was delivered in May 2011.

Milestones in the year ahead:

It is anticipated that a submission will be made to the ORR in Summer 2012 for the inclusion of the development and delivery of the project in the Delivery Plan, which will identify future milestones to be met.

Milestones for ID 32.03		
Activity/Output	***Date***	***Date Met/Expected***
Complete GRIP Stage 5 (Track connection)	May 2011	May 2011
Site Mobilisation	June 2011	February 2011
Construction test and commissioning	September 2011	May 2011

Glasgow to Kilmarnock. Programme ID 32.04

Current Project Stage: Completed

This project was commissioned in December 2009 and has taken time to close down due to contracting issues.
The works are now complete.

Programme ID 33.00 - Other Transport Scotland Tier 3 Schemes

Class 380 Introduction. Programme ID 33.01

The following projects within the programme are complete and closed out:

- Ayr Townhead Depot Enhancement
  - The project involved enhancement to stabling facilities at Ayr Townhead Depot to accommodate the new Class 380 trains introduced onto the Ayrshire and Inverclyde routes from late 2010. The project comprised provision of additional electrified sidings with access platforms, a non electrified siding for diesel trains, provision of new Controlled Emission Toilet facilities, and extension to an existing electrified headshunt to accommodate longer train formations

- Yoker Depot
  - The project involved enhancement to the existing Controlled Emission Toilet (CET) facilities at Yoker Train Maintenance Depot in Glasgow, currently leased to First ScotRail

- Corkerhill Depot Headshunt Extension
  - The project involved the extension of the existing headshunt at Corkerhill Depot by 58 metres to allow longer trains to use the facility

- Shields Depot Enhancement
  - The project was required to enhance maintenance and stabling facilities at the existing Shields Depot in Glasgow to accommodate the new fleet of Class 380 trains. It involved:
  - The construction of an additional train maintenance shed with specialist maintenance equipment
  - The construction of a new wheel lathe building and installation of a new wheel lathe
  - The decommissioning and removal of the existing wheel lathe for transfer to another Network Rail site (Plymouth Laira), and demolition of the existing wheel lathe building
  - The installation of additional electrified sidings
  - The installation of new Controlled Emission Toilet (CET) facilities
- Gauge Clearance in Central Scotland at 46 sites

Stepping Improvement Works
The majority of the works here are complete. The works still to be carried out were transferred to Buildings and Civils and programmed for 2012/14.

Platform Extensions
All work is completed. There is one outstanding matter that needs to be closed prior to submission of the Project Completion Report. This relates to the final handover of the platform extensions at Prestwick International Station. Once this has been finalised the project will be closed down.

Cook Street Neutral Section Relocation
The initial work was done to put in new neutral sections. The recovery of redundant equipment was undertaken in conjunction with Paisley Corridor Improvements possessions. In addition, a booster overlap at Prestwick Town was relocated. This work was completed in March 2012.

Waverley Steps. Programme ID 33.02

Current Project Stage: Construction

Network Rail proposes to provide covered, well lit, improved access, including step free and DDA compliant access, between Waverley Station and Princes Street, in Edinburgh, by delivering:

- Three banks of two side by side covered and lit escalators connecting with the existing internal station mezzanine link bridge
- The removal and reconstruction of seven varying flights of stone steps, which will be covered and lit to modern standards
- A new feature pedestrian entrance to Waverley Station on Princes Street which will be capable of being closed and secured during station closure hours
- The provision of two sixteen person lifts, located within the existing station footprint but adjacent to the Princes Mall Shopping Centre, which will connect with the internal station mezzanine link bridge
- Level access to and from the lifts to Princes Street by means of a pedestrian walkway across the roof of

the Princes Mall Shopping Centre. This will provide compliant DDA access from Princes Street to the station platforms

Progress in 2011/12

- Phase 1 of the works which comprised the escalators, re-profiling of the existing steps and the glass canopy roof was completed and opened to the public in January 2012
- Work has started on the Phase 2 works with the removal of the temporary link bridge to Princes Mall, and piling work for the lift shafts

Edinburgh Gateway (formerly Gogar) Intermodal Interchange. Programme ID 33.03

Current Project Stage: Detailed Design

This project forms part of the Edinburgh to Glasgow Improvements Programme (EGIP). It will provide a new intermodal station on the existing Edinburgh to Fife rail line in the Gogar area. The station will be located adjacent to the new Edinburgh Tram network that is being constructed by the City of Edinburgh Council.

The new station will provide a means of connecting Edinburgh Airport into the National Rail network via the Edinburgh Tram network. It will also provide an access to the surrounding Edinburgh Park and Gyle areas as well as the proposed West Edinburgh development area.

The current obligation for this project is to deliver GRIP Stage 5 (Detailed Design) and the implementation of advance works. The advance works consist of:

- Track lowering below the adjacent A8 road bridge to achieve electrification clearances
- Utilities diversion works
- Land acquisition

Progress in 2011/12

Progress with the commission has been significantly affected by the contractual dispute between the City of Edinburgh Council and the consortium awarded the contract for the tram project delivery. As a consequence the Detailed Design cannot be completed and only some of the advance works have been undertaken. The project was placed on the 'Projects Outwith the Change Control Process' list in the March 2011 update of the Published CP4 Delivery Plan.

Only a limited amount of work has therefore been undertaken in 2011/12. This has mainly included advice to the City of Edinburgh Council and Transport Scotland on potential alternative design solutions to address the Edinburgh Tram interface issues.

Although the Edinburgh Tram dispute has now been resolved and physical works have recommenced, indicative timescales for the implementation of this project cannot yet be provided.

Edinburgh Glasgow Improvement Programme (EGIP); Haymarket North Lines Electrification. Programme ID 33.04

Current Project Stage: Handback

This project forms part of the Edinburgh Glasgow Improvement Programme (EGIP). The northern two tracks (the North Lines) of the Edinburgh to Glasgow (E&G) route between Edinburgh Waverley and Haymarket Central Junction have been electrified, providing an alternative route for electric traction passenger trains (e.g. the four trains per hour Airdrie - Bathgate service) and freight (up to W7 gauge).

Progress during 2011/12:

Completion of OLE works and final commissioning was achieved prior to the start of the May subsidiary timetable for 2011, from which date electrified train services ran as scheduled via Haymarket North Lines.

Completion of the work was delayed beyond the originally planned dates due to adverse weather at the end of 2010 and the requirement to develop a revised technical solution due to the discovery of voids behind the existing tunnel lining.

As a result of the revised gauge clearance solution, which involved additional track lowering, assessments have shown that some pinning and grouting works will be required in

Milestones for ID 33.02

Activity/Output	*Date*	*Date Met/Expected*
Escalator Commissioning	December 2011	January 2012
Phase 1 Completion	December 2011	January 2012

the North Haymarket Tunnels to protect against longer-term stability risks. Funds from the current project are likely to be transferred to EGIP Electrification to allow these works to be delivered via the EGIP Alliance.

Edinburgh Glasgow Improvement Programme - EGIP Infrastructure Project. Programme ID 33.05.

Current Project Stage: Single Option development – GRIP Stage 4

These projects form part of the Edinburgh Glasgow Improvement Programme (EGIP). The Programme vision is to increase service levels via all Edinburgh to Glasgow routes to 13 services per hour with a fastest journey time of 37 minutes. The projects described below represent infrastructure enhancements that are required to support that vision. The outputs from this phase are individual GRIP 4 single option development reports for each project and a consolidated report and estimate that covers all the projects.

Projects not requiring TAWS (Transport & Works - Scotland) powers

- Rutherglen to Newton infrastructure capacity
- Springburn re-modelling
- Hyndland turnback
- Glasgow Queen Street High Level Station infrastructure capacity
- Haymarket to Inverkeithing signalling headways
- Edinburgh Waverley Station infrastructure capacity : Mound Tunnel scissors
- Edinburgh Waverley Station infrastructure capacity : Platform 10/11 crossover
- Edinburgh Waverley Station infrastructure capacity : Waverley to Haymarket signalling improvements
- Winchburgh Junction to Dalmeny Junction upgrade
- New EGIP rolling stock depot

Projects requiring TAWS (Transport & Works - Scotland) powers

- Croy Station turnback
- Greenhill Upper Junction grade separation enhancement
- Winchburgh Junction grade separation enhancement
- Almond chord and grade separated junction enhancement
- Stirling area stabling and cleaning facilities
- Edinburgh Waverley Station infrastructure capacity : Abbeyhill Turnback

Progress in 2011/12

GRIP Stage 4 development of all the above projects was progressed.

Phase 1 of public consultation for TAWS infrastructure projects was undertaken between August 2011 and February 2012. This involved over 220 events to engage with the public, local authorities, community councils, MSPs, statutory bodies and special interest groups, a radio campaign designed to reach the bulk of the population of the Central Belt of Scotland, and a dedicated EGIP website.

Completion of GRIP Stage 4 is now planned for July 2012 to allow the conclusion of the above consultation to be incorporated as appropriate.

Development of the EGIP December 2016 Timetable to GRIP Stage 4 is progressing with a draft final report issued for review at the end

Milestones for ID 33.04

Activity/Output	*Date*	*Date Met/Expected*
Electrification between Haymarket Central Junction and Haymarket Station (including Platform 0).	December 2010	March 2011
Electrification through Haymarket North Tunnel into Princes Street Gardens.	March 2011	May 2011

Milestones for ID 33.05

Activity/Output	*Date*	*Date Met/Expected*
GRIP Stage 4 EGIP Timetable development (draft report issued)	January 2012	January 2012
Completion of GRIP Stage 3 (New EGIP Rolling Stock Depot)	April 2012	April 2012
Completion of GRIP Stage 4 for all projects (except New EGIP Rolling Stock Depot)	December 2012	December 2012

of January 2012.

Edinburgh Glasgow Improvement Programme (EGIP) - Electrification Project. Programme ID 33.06

Current Project Stage: GRIP Stage 4 development + GRIP Stages 5-8 for 2012 Advance Works

This project forms part of the Edinburgh Glasgow Improvement Programme (EGIP). It will electrify the core Edinburgh to Glasgow via Falkirk High (E&G) route, linked diversionary routes (via Cumbernauld and the new Almond Junction), northern extensions to Stirling, Dunblane and Alloa, and the Glasgow Northern Suburban Route to Anniesland and Knightswood North Junction. The output from this phase of the Project will be a GRIP Stage 4 Single Option selection report for all the works and completion of a package of advance route clearance works at 28 structures.

The Project covers approximately 350 single track kilometres of new electrification. A 275kV feeder station will be installed in the Greenhill area to supply power to the newly electrified routes. This will require the inclusion of land requirements in the EGIP TAWS (Transport and Works – Scotland) submission.

Progress during 2011/12:

GRIP Stage 4 route clearance and electrification designs were completed by Atkins in early 2011.

The ORR independent Reporter, Halcrow, published a draft final report in January 2012, which concluded positively on the quality, deliverability and efficiency of the EGIP electrification programme.

In December 2011, contracts were awarded for civil engineering and track lowering to initiate advance route clearance works during 2012 and early 2013. This was in preparation for the operation of electrified Cumbernauld services by July 2014.

Local Councils have signed off the majority of Form A designs for route clearance civils works, and at certain locations have offered to part-fund replacement structures that will deliver more appropriate long-term solutions.

Disruptive access has been agreed with Train Operators for delivery of the 2012 route clearance works, and constructive engagement and input has been received from customers during the formulation of access plans for 2013.

Edinburgh Glasgow Improvement Programme – Haymarket Station Capacity. Programme ID 33.07

Current Project Stage: GRIP Stage 5 to 8 Implementation

This Project forms part of the Edinburgh Glasgow Improvement Programme (EGIP). The Project will enhance the facilities at Edinburgh Haymarket Station in order that it can accommodate forecast future demand levels, including that generated by EGIP. A tram interchange will be available on completion of the Edinburgh Tram project by the City of Edinburgh Council.

The proposal involves the redevelopment of Haymarket Station to extend the station concourse over the existing car park to the rear of the station building. Specific works are:

- An expansion of the existing station concourse
- The creation of an additional new entrance facilitating improved accessibility and links to other transport modes
- The retention of the Grade A Listed building with the refurbishment of the ground and lower ground floors
- A glazed roof structure over the new concourse with new station ticket office and retail outlets beneath
- A new footbridge concourse extension with lift, escalator and stair access to platforms below
- The removal of the old footbridge and stairs
- Re-profiled platform surfaces throughout including new copes and new surfacing with tactile strips
- New six-car length platform canopies
- Refurbished platform facilities for staff

Milestones for ID 33.06

Activity/Output	*Date*	*Date Met/Expected*
Completion of GRIP Stage 4	January 2011	January 2011
Completion of GRIP Stage 5 to 8 for advance works	May 2013	May 2013

and passengers
- New emergency escape facilities from the east end of Platforms 2, 3 and 4
- Associated alterations to car park access and egress arrangements
- Enhanced security measures

Progress in 2011/12

- Completion and sign-off of Form A design and associated estimate
- Award of design and build contract in December 2011
- Completion of Station Change process with all Train Operators

Milestones for ID 33.07		
Activity/Output	***Date***	***Date Met/Expected***
Complete GRIP 4 Stage Gate Review	April 2011	April 2011
Award GRIP 5 to 8 Contract	December 2011	December 2011
Completion of Construction Works	December 2013	December 2013
Removal of existing footbridge	April 2014	April 2014

Programme ID 100.00 - Electrification

Great Western Main Line Electrification. Programme ID 100.01

Network Rail's obligation
Our obligation is to develop the extension of electrification of the Great Western Main Line (GWML) from Maidenhead (the furthest western extent of the Crossrail project) and to deliver the scope of works described below.

Scope of works
The Client Remit is being amended for the detailed scope required for this project and includes the extension of electrification on the core route as noted below:

- from Maidenhead (ELR: MLN 24m 19ch) to Wootton Bassett Junction (83m 07ch)
- Wootton Bassett Junction (ELR: SWB 83m 07ch) to Patchway (112m 68ch)
- Patchway (ELR: BSW 5m 61ch) to Severn Tunnel Junction (16m 24ch)
- Severn Tunnel Junction (ELR: SWM2 / SWA 148m 43ch) to Cardiff Central (ELR: SWM2 170m 49ch)
- Reading (ELR: BHL 36m 75ch) to Newbury (53m 06ch)
- Didcot (ELR: DCL 52m 66ch) to Oxford (63m 41ch)
- Filton South Junction to Patchway
- Swindon (ELR: MLN1 83m 07ch) to Bristol Temple Meads (119m 22ch)
- Stoke Gifford Junction to Bristol Temple Meads
- Depot at Reading

The work will also include essential short connecting lines at junctions and depot access lines to facilitate maintenance and stabling of the rolling stock. Private Siding connections will be costed separately and discussed with the funder and holder of the respective Private Siding Agreement. The exact extent of electrification at Newbury, Oxford and Bristol is yet to be determined.

The remit is being executed by Network Rail in two steps

- London to Oxford, Newbury and Bristol; and
- Bristol to Cardiff

This is further detailed in the Activity Table below.

Outputs
This project facilitates the further introduction of electric train service operation on the Great Western Main Line (GWML) between London and Oxford, Newbury, Bristol and Cardiff.

Significant interfaces

- Crossrail - the Crossrail scheme will deliver an electrified passenger train service linking the west of London to the east and southeast via new dedicated infrastructure through central London. Crossrail services will interweave with national train operating company services on Network Rail infrastructure northeast and west of London. Crossrail will provide an intensive service for stations in the western suburban area – Paddington to Heathrow Airport and Maidenhead
- The Intercity Express Programme (IEP) is planned to introduce a fleet of electric and bi-mode Super Express Trains capable of 125mph on key business routes on the GWML from 2016
- Reading Station Area Redevelopment will provide additional capacity and performance benefits for both the GWML and north-south routes with additional platforms, track layout reconfiguration and associated signalling alterations. Installation of the GWML electrification within Reading Station boundaries will be considered for delivery within the Reading project, which will deliver electrification of the Reading Train Depot
- Western Mainline Signalling Renewal. The existing signalling equipment along much of the route requires immunisation works. The proposed timescales for electrification will drive amendments to the existing signalling renewal plan for the route

Key assumptions
It is assumed that:

- Electrification of the main and relief lines between Airport Junction and Maidenhead will be provided by the Crossrail project. Electrification between Paddington Main Line station

Note		
Activity/Output	***Date***	***Date Met/Expected***
DfT target: Electric train services between London and Newbury, Oxford and Bristol	December 2016	December 2016

Milestones for ID 100.01		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 complete Single option selection	**September 2012***	**September 2012***
GRIP 4 complete Single option developed Output to be reviewed based on completion of GRIP 3	January 2013**	January 2013**
GRIP 6 start Construction begins (OCE) Project reviewing earlier opportunities for delivery of work packages in 2012/13 OLE Foundations commence	October 2013	October 2013
GRIP 6 Completion Energised infrastructure available	Summer 2016	Summer 2016

Activities and milestones		
Activity/Output	***Date***	***Date Met/Expected***
Contract award: plant system ordered and **achieved**	November 2011	November 2011
High output base: Construction complete / available for use	April 2013	April 2013
Consist 1: Piling **module** available for use	October 2013	October 2013
Consist 2: Structures **module** available for use	November 2013	November 2013
Consist 3: Wiring **module** available for use	March 2014	March 2014

and Airport Junction already exists for Paddington to Heathrow services

- Changes to the existing electrification between Paddington and Airport Junction that may be required for the Intercity Express Programme will be provided by the IEP Project
- Signalling renewal and immunisation work throughout the route will be undertaken in advance of electrification to provide electrification immune signalling and telecoms
- Delivery of electrification for the majority of open routes between major junctions will be achieved by use of High Output Plant.
- That techniques can be developed to enable electrification work to take place with the adjacent line open to traffic, with a six-hour productive shift
- The Western Programme Integration Team will coordinate the access, possessions and programme integration issues across all the major Western programmes. A key role will be to integrate the various programmes to deliver the key outputs, for example operation of electric services to Cardiff from December 2017
- The electrification project will be able to obtain all relevant planning Consents in a timely manner and without impact to the project programme

Activities and milestones

The DfT target is for electrification to be completed for electric train operation to Newbury, Oxford and Bristol by December 2016, and to Cardiff by December 2017. A full programme, including implementation, will be developed and delivered as part of GRIP 3 outputs, with implementation likely using a phased approach. This will include identification of further milestones for GRIP 4 – 8 for each of the phases of GWML electrification.

Network Rail's specific commitments are as follows:

London to Newbury, Oxford & Bristol

In addition to the main project works, advance works such as bridge reconstructions to provide electrification clearances are being carried out where access is available.

*** Date was January 2012, but has been re-scheduled to permit additional review.**
**** Completion of GRIP 4 is subject to modification. The date will be clarified with ORR and DfT, at completion of GRIP 3.**

Bristol to Cardiff

Great Western Electrification
Procurement of High Output Plant System (HOPS)

The HOPS will be able to:

- Work with adjacent line open (ALO)
- Construct an average of one equivalent tension length per shift (six hours working time)
- Carry all materials to site
- Install two conductors simultaneously, at design tension
- Transit at 60 mph
- Reduce whole-life costs

The HOPS will be formed of three separate consists:

1. Consist 1 Foundations (not just piling)
2. Consist 2A Main Steelwork and SPS (small part steelwork) and Consist 2B Wiring – can be split, each with its own traction units
3. Consist 3 Finishing and Measuring

Key assumptions

- Delivery of electrification of the majority of open routes between major junctions will be achieved by use of High Output Plant. The techniques can be developed to enable electrification work to take place with the adjacent line open to traffic, with a six-hour productive shift

Great Western Electrification
National Grid Connections

In order to deliver the electrification on the Great Western Mainline, new National Grid connections will be required.

Key assumptions

- A key assumption on power provision is that Kensal Green bulk supply point will be available from National Grid to suit the GWML Electrification schedule
- Network Rail has commissioned a feasibility study to examine interim power supply options, should this not be the case

Activities and milestones

The contract with National Grid to procure the necessary connections was signed in May 2011.

North West Electrification. Programme ID 100.02

Current Project Stage: Feasibility

The current stage of this programme is to undertake outline and detailed design of a programme of infill AC electrification at 25 kV OLE of the following routes in North West England:

- Liverpool to Manchester (Liverpool to Earlestown and Manchester to Newton-le-Willows)
- Huyton to Wigan
- Preston to Blackpool
- Deal Street Junction to Euxton Junction (Manchester to Preston)

Activities and milestones

Activity/Output	*Date*	*Date Met/Expected*
Didcot GRIP 6 complete: National Grid connection available for use	December 2015	December 2015
Melksham GRIP 6 complete: National Grid connection available for use	December 2015	December 2015
Imperial Park GRIP 6 complete: National Grid connection available for use	December 2016	December 2016

In addition to the main project works, advance works such as bridge reconstructions to provide electrification clearances are being carried out where access is available.

Activity/Output	*Date*	*Date Met/Expected*
GRIP 3 complete Single option selection	October 2012	October 2012
GRIP 4 complete Single option developed	TBA	TBA
GRIP 6 start Construction begins (civils)	TBA	TBA
GRIP 6 start Construction begins (OLE)	TBA	TBA
GRIP 6 complete Energised infrastructure available	Summer 2017	Summer 2017
DfT aspiration Electric train services between Bristol and Cardiff	December 2017	December 2017

Milestones for ID 100.02		
Activity/Output	***Date***	***Date Met/Expected***
Completion of GRIP 2 report for 'Lancashire Triangle' Routes	March 2011	June 2011
Completion of GRIP 3 report for Phases 1 and 2 of North West Electrification	September 2011	September 2011
Completion of GRIP 3 report for Phases 3 and 4 of North West Electrification	December 2011	December 2011

This relates to the scope that was announced by DfT in July 2009 and December 2009 as having government support, with the new government reconfirming support in October 2010. This project facilitates the introduction of electric train operation on passenger and freight services on these routes.

The current DfT target is for electrification to be completed in 2016. A full programme, has been developed and delivered as part of GRIP 3 outputs.

Implementation is planned in four phases:

Phase 1: Castlefield Junction to Newton-le-Willows / Lowton Junctions
Phase 2: Earlestown to Edge Hill, Huyton to Wigan, Ordsall Lane Junction to Manchester Victoria
Phase 3: Preston Fylde Junction to Blackpool North
Phase 4: Deal Street / Ordsall lane Junctions to Euxton Junction

Each phase will be implemented with two work packages: an advanced civils package (structures clearance, parapet and access point works) and main works (foundations, masts, OLE, signalling, telecoms, distribution). Due to the nature of the different phases and the DfT target dates for commissioning, the implementation works have already begun for Phases 1 and 2.

Progress in 2011/12

- Pre-feasibility (GRIP 2) has been completed for the Lancashire Triangle routes (Huyton – Wigan, Preston – Blackpool and Deal Street to Euxton Junctions)
- Single option selection (GRIP 3) has been achieved for all phases of North West Electrification
- Completion of advanced structures clearance works for Phase 1
- Award of implementation contracts for the main works package (OLE, signalling, distribution) for Phase 1
- Start of advanced civils works on Phase 2

Milestones in the year:

The GRIP 2 report for the Lancashire Triangle routes was completed in June 2011 (due to the complexity of integration with the Liverpool - Manchester project which was already in GRIP 3).

Single option selection (GRIP 3) for phases 1 and 2 was completed in September 2011.

A change to the Delivery Plan was introduced in the June 2011 update, to amend the milestone for completion of GRIP 3 for Phases 3 and 4 to December 2011. This reflected the need to explore the option of resignalling the Blackpool line (compared to immunisation of signalling) and undertake further development work on the solutions for the clearance of the three tunnels in Phase 4. The revised GRIP 3 milestone for Phases 3 and 4 of December 2011 was achieved.

Implementation milestones for the variances in the programme were introduced in the March 2012 Delivery Plan update.

Network Rail
Kings Place
90 York Way
London N1 9AG

Tel: 020 7557 8000

www.networkrail.co.uk

August 2012