A technology-enabled future

A better railway for a better Britain

Advanced on-site welding technology means quick and efficient track repairs, reducing the need for lengthy line closures

Investing in technology transforms the way we work

We are investing in our infrastructure and leveraging cutting edge technology from other industries to improve every aspect of the railway, from the provision of real time information and proactive problem solving to improving the way we carry out safety inspections.

▲ Smartphones and tablets are used by our maintenance teams so information about our infrastructure is at their fingertips, wherever they are, to speed up problem solving.

◀ Our fleet of tilting wagons delivers pre-assembled and tested rail and points direct to site meaning track is replaced quickly and efficiently with minimum disruption.

Cutting edge camera technology in purpose built police vans with number plate recognition technology monitors level crossings for misuse in 'hot spots' to crack down on level crossing law breakers.

We're using overhead line cameras to spot defects and wear, with images instantly streamed to an engineer's laptop. The overhead line's power does not need to be turned off or the tracks closed, meaning fewer delays.

A new automated nationwide traffic management system will consolidate more than 800 signal boxes into 14 rail operating centres over the next 30 years, saving £250m each year and improving services.

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Reporting on the year 2012/13

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Introduction

This Annual Return reports on our achievements, developments and challenges during 2012/13. It is the primary means by which we report progress in delivering the outputs established in the Periodic Review 2008 (PR08).

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

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
- enhancement schemes.

Expenditure and efficiency is 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 disaggregated information for England & Wales and Scotland together with the network total where appropriate, although there are some measures for which we only have network-wide information We have also been developing our reporting to reflect the fact that we have established ten operating routes. We are still continuing to develop consistent reporting to meet the requirements of the routes, but we have included information for the ten routes where possible. We have also tried to backdate historical information to reflect the ten route structure.

This Annual Return follows the agreed form as approved by the Office of Rail Regulation (ORR) in 2012 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 on the high level outputs. The new areas of information are; right time train performance, freight delivery metric, bridge examination and assessments, rail age and rail type.

Highlights from 2012/13

In 2012/13 we delivered our part in achieving a successful Olympic and Paralympic games with sport not transport dominating the headlines. During the Olympic games 92.6 per cent of trains arrived on time and hundreds of Network Rail volunteers helped people find their way and helped reduce potential areas of congestion and overcrowding. Our work for the Olympic games also helped establish new and improved ways of working with our transport partners.

In 2012/13 we also opened our new national centre in Milton Keynes. The new building brings together around 3,000 roles in a single building which in turn provides opportunities for better ways of working and cost savings.

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.

Table 1: Performance against Annual and CP4 regulatory targets			
Measure	***Target 2012/13***	***Performance in 2012/13***	***CP4 target***
Passenger safety indicator (MAA)	0.242	0.226	0.240
Workforce fatalities and weighted injuries (MAA)	0.092	0.149	0.090
	Regulatory target 2012/13	***Performance in 2012/13***	***CP4 target***
PPM (% MAA) England & Wales long distance	91.5	87.0	92.0
PPM (% MAA) England & Wales London & South East	92.7	91.0	93.0
PPM (% MAA) England & Wales Regional	91.9	91.1	92.0
PPM (% MAA) England & Wales Total	92.3	90.7	92.6
PPM (% MAA) Scotland Total (ScotRail)	91.9	93.0	92.0
Cancellations & significant lateness (% MAA) England & Wales long distance	4.0	4.9	3.9
Cancellations & significant lateness (% MAA) London & South East	2.0	2.5	2.0
Cancellations & significant lateness (% MAA) Regional	2.3	2.5	2.3
Delay mins – passenger (000's) England & Wales	5,190	7,030	4,980
Delay mins – passenger (000's) Scotland (ScotRail)	386	378	382
Delay mins per 100 train km – freight	3.05	3.63	2.94
PDI – passenger (MAA)	0.68	0.64	0.63
PDI – freight (MAA)	1.00	0.79	1.00
Station Stewardship Measure (by category)			
A – national hub	2.48	2.21	2.48
B – regional hub	2.60	2.34	2.60
C – important feeder	2.65	2.40	2.65
D – medium, staffed	2.69	2.39	2.69
E – small, staffed	2.74	2.39	2.74
F – small, unstaffed	2.71	2.47	2.71
Scotland (all stations)	2.39	2.33	2.39
Network Capability – No deterioration, see Section 2 for details			
Network Capacity – Generally good progress, see Section 6 for progress with the enhancement programme			
Notes: MAA is the Moving Annual Average.			

Regulatory issues

Train performance

In July 2012 the ORR concluded that Network Rail was not likely to deliver the CP4 target for long distance train service performance. As a result the ORR imposed an enforcement order on Network Rail requiring us to take all necessary steps to deliver the output to the greatest extent reasonably practicable having regard to all relevant circumstances.

During the course of 2012/13 the ORR also concluded that Network Rail had met the requirements of the enforcement order imposed on us in January 2012 in respect of freight performance. Network Rail delay caused to freight services improved markedly during the first half of the year and by September 2012 performance had returned to the levels needed to meet the 2012/13 regulatory target. However during the second half of the year performance deteriorated and we ended the year 19.1 per cent worse than the regulatory target.

Regulatory Asset Base (RAB)

Subject to criteria established by the ORR, each year capital expenditure is added to the RAB and amortisation is deducted. The ORR can make deductions from the RAB in the event that Network Rail does not achieve its outputs, for example not meeting required train performance or breaching a licence condition. As set out in our Annual Report & Accounts the valuation of the railway network includes a reduction of £436 million (2012: £nil) in respect of missed train performance using a calculation that makes no allowance for the impact of extreme weather or other external factors. We continue to have discussions with the ORR about this adjustment.

We have also been advised by the ORR of prospective adjustments in relation to deemed under performance in asset management, specifically on our civils assets (including bridges and earthworks), fencing and drainage. Network Rail does not agree with the principle or the basis of assessment and discussions are at an early stage. The ORR has informed us that it will assess and conclude on the quantum of any adjustments in its annual efficiency and finance assessment later this year.

Passenger information during disruption

In March 2012 a new obligation was incorporated into our network licence requiring Network Rail to cooperate with train operators to enable them to provide passengers with accurate and timely information, including during disruption. During 2012/13 Network Rail developed an industry programme including a number of initiatives to develop good practice and to deliver continuous improvement. Network Rail continues to develop many of these initiatives and key milestones are discussed regularly with our customers and the ORR.

Rail Delivery Group (RDG)

In January 2013 a new condition was incorporated into our network licence which stipulated that Network Rail must remain a member of the RDG and comply with its articles of association. Network Rail has and continues to provide extensive support to the group.

Governance

Members arrangement

In March 2012 Network Rail announced proposed changes to its membership structure designed to help members in holding the Network Rail Board to account. This included a reduction in the size of the membership through the removal of the industry representatives as a class of members. At Network Rail's Annual General Meeting (AGM) in July 2012 a special resolution was unanimously approved to effect the removal of industry membership. The industry representatives stepped down as members immediately following the AGM.

Transparency

During the course of 2012/13 Network Rail developed a programme to become a more transparent organisation. Our voluntary disclosure scheme began in June 2012 and included the publication of information about the budget and costs of our major projects, level crossing risk assessments and minutes of meetings of the Board. The scheme has been developed during the year and now includes nearly 40 categories of information.

We have worked with the industry and external partners to improve and expand information about train performance and how our activities affect the public. In June 2012 we made available a range of real time feeds from our operational systems which developers have used to build websites and smart phone applications providing real-time information about network operation.

Train performance

All the regulatory targets for train performance were missed except for Scotland. The impact of the severe weather was the principal reason for this. Delays caused by severe weather were 142 per cent worse than the previous year.

In Scotland, performance improved largely as a result of joint working with First ScotRail and improvements in the timetable to strengthen capability.

Train performance in the long distance sector in 2012/13 ended 4.5 per cent behind regulatory target with 87 per cent of long distance train services arriving on time. London and South East (LSE) performance in 2012/13 fell 1.7 per cent short of the regulatory target with 91 per cent of train services arriving on time. We have developed recovery plans to improve performance in each of these sectors and have provided quarterly reports to the ORR setting out our progress in recovering performance.

Despite considerable progress in delivering our recovery plans, train performance during the course of 2012/13 was badly affected by poor weather. Large parts of the railway were affected by flooding before Christmas and there was significant snowfall and icy conditions in January. This together with the second coldest March in 100 years made the recovery of train performance challenging for both Network Rail and the train operators and has to some extent hidden the benefits being delivered elsewhere, for example in relation to external causes of delays such as cable theft and suicide where delay reduction has been significant.

Regional sector train performance has also declined during the course of 2012/13 falling 1.7 per cent short of target at 91.1 per cent. In contrast, performance in Scotland finished 1.6 per cent ahead of our 2012/13 target at 93 per cent.

Freight train performance deteriorated during the second half of the year and Network Rail ended the year at 3.63 delay minutes per 100 train kilometres, which was 19.1 per cent worse than target.

For the first time we are publishing right time performance in the Annual Return. This is the percentage of passenger trains arriving at their final destination at or before the time shown in the timetable. For 2012/13 this was 68.1 per cent. Table 2 provides a summary of the historic trends for the train performance KPIs.

Network availability

Network Rail maintains, renews and enhances the network while at the same time providing an operational railway. This requires effective possession planning to reduce 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 2012/13 these measures continue to be ahead of the year end targets. This has been achieved whilst demand for engineering access has increased in line with an increase in work volumes as we approach the end of the control period. This continued improvement in possession planning has been as a result of new, improved and more efficient ways of working, for example, midweek night track renewals on main line routes.

The joint network availability plans (JNAPs) established between routes and customers as well as the freight JNAP has informed network availability requirements with the focus of reducing disruption on key strategic routes.

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

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

	2006/07	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Public Performance Measure (PPM %) (national)	88.10	89.90	90.60	91.50	90.90	91.60	90.90
Total delay minutes (millions)	10.53	9.50	8.84	8.18	8.95	8.38	8.80
Passenger train delay minutes per 100 train km	1.91	1.74	1.59	1.42	1.56	1.42	1.50
Freight train delay minutes per 100 train km	4.61	4.33	4.01	4.02	4.29	3.57	3.63
Cancellations and significant lateness for England & Wales	3.08	2.80	2.76	2.58	2.76	2.39	2.72
Passenger and freight traffic (million train kms)	488	486	498	513	516	536	536

Table 3: Network availability measures

	Actual 2009/10	*Actual 2010/11*	*Actual 2011/12*	*Actual 2012/13*	*2012/13 regulatory target*
PDI-P	0.63	0.52	0.54	0.64	0.68
PDI-F	0.82	0.89	0.85	0.79	1.00

Network capability

Traffic and demand on the network has continued to grow. The capability of the network has improved to help meet this challenge with increased platform lengths and better information to our customers about the actual capability of the network e.g. gauge capability. Please see Section 2 for more details.

Stakeholder relationships

The overall passenger satisfaction score from the latest survey commissioned by Passenger Focus indicates that overall satisfaction is 82 per cent. This is a 1.2 per cent decrease compared with the corresponding survey from spring 2012 and 3.2 per cent decrease from the autumn 2012 survey.

The survey of customer satisfaction showed a 23 per cent increase in overall satisfaction from 43 per cent to 66 per cent with a record number of overall participants, largely as a result of the online survey. The increase appears to be due to customers being satisfied with Network Rail's delivery of train performance and improved working relationships.

Asset management

Although there are no regulatory targets related to our asset stewardship (except the Station Stewardship Measure), we have agreed monitoring measures. During 2012/13 many of these measures performed worse than last year. This is partly related to the extreme weather. For example, heavy rainfall during 2012/13 has increased the number of earthwork failures which have risen from 28 in 2011/12 to 144 in 2012/13. As a direct result of these failures six trains were derailed during the year (compared to no earthwork related derailments in 2011/12). As a result the Adverse Weather Management Plan that was first implemented in Scotland has been rolled out to other routes.

The number of broken rails also increased (to 178 compared with 127 in 2011/12) largely as a result of cold weather. We are looking at how this situation can be addressed given the more volatile weather conditions that have affected Great Britain in recent years.

While the number of signalling failures was higher than the target for the year, it was four per cent better than the number for the previous year. We are continuing to deliver our reliability improvement plans. These plans target signalling related failures including points and train detection failures. We have rolled out intelligent infrastructure systems which predict and prevent service disruption failures and continue to implement remote condition monitoring and improvements in our processes for responding to the alerts.

The number of telecoms failures greater than ten minutes has increased due to the roll out of GSM-R equipment during the year.

Although there was an increase in the number of overhead line equipment related failures in 2012/13 compared to the previous year, this is actually below the average for the last five years and shows an overall trend of improvement. We have been working to address this issue, particularly in London North Western Route which has the highest number of these failures. This includes a campaign to identify and clear a number of defects similar to that undertaken in Anglia Route during 2012/13.

Delivery challenges in the renewal of plain line track, including industrial action in the supply chain, poor performance from the high output plant and the severe weather has resulted in the volume of track renewal delivered in the year being lower than planned. The number of switches & crossings units renewed was broadly in line with plan.

Table 4 shows a summary of our asset condition measures and Table 5 shows the volumes of asset renewals delivered during the year compared to previous years.

Table 4: Comparison of network asset measures with previous years

Measure	2008/09	2009/10	2010/11	2011/12	2012/13
Good track geometry	137.9	137.7	137	136.5	138.1
Poor track geometry	2.18	2.38	2.48	2.58	2.38
Intervention/ Immediate action geometry faults per 100km	38.2	40.3	39.7	41.3	40.3
Broken rails (No.)	165	152	171	127	178
Rail breaks and immediate action defects per 100km	6.8	5.8	4.49	3.8	4.14
Immediate action rail defects per 100 km	6.27	5.31	3.94	3.39	3.48
Condition of asset TSRs (No.)*	4,436*	1,729	1,348	1,864	1,958
Civils – Assets subject to additional inspections (No.)	889	844	810	789	801
Earthworks failures (No.)	61	56	42	28	144
Tunnels condition	n/a	Bore 88	Bore 89	Bore 88	See Section 3
	(new measure for CP4)	Portal 92	Portal 92	Portal 89	See Section 3
Bridge condition score	2.09	2.09	2.09	2.10	2.25
Signalling failures causing delays of more than 10 mins. (No.)	19,607	18,324	16,501	15,638	15,023
Signalling asset condition	2.39	2.37	2.41	2.38	2.37
AC power incidents causing >500 minute train delays (No.)	66	46	61	50	52
DC power incidents causing >500 minute train delays (No.)	14	14	14	16	8
AC traction feeder stations and track sectioning points condition	2.78	2.7	2.56	2.57	2.29
DC traction feeder stations and track sectioning points condition	2.53	2.32	2.36	2.45	2.38
AC contact systems condition	1.6	1.6	1.6	1.6	1.4
DC contact systems condition	1.9	1.9	1.9	2.0	2.0
Telecoms condition	0.89	0.92	0.94	0.95	0.96
Points failures	8,048	7,130	5,815	5,166	5,053
Train Detection failures	6,470	6,061	5,226	4,923	4,608
Track failures	7,748	6,670	5,887	5,501	5,335
Power incidents causing train delays of more than 300 minutes	103	75	100	71	65
Telecom failures causing train delays of more than 10 minutes	817	770	689	698	697
Station stewardship measure					
Category A	2.44	2.38	2.30	2.26	2.21
Category B	2.47	2.46	2.40	2.37	2.34
Category C	2.52	2.52	2.47	2.43	2.40
Category D	2.52	2.54	2.47	2.41	2.39
Category E	2.57	2.58	2.50	2.43	2.39
Category F	2.55	2.56	2.50	2.47	2.47
Scotland (all categories)	2.39	2.39	2.33	2.28	2.33
Light maintenance depot stewardship measure (network)	2.52	2.50	2.48	2.43	2.39
Asset reliability (no. of infrastructure incidents causing delay)	52,270	46,091	42,135	40,415	39,365

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

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Rail (km of track renewed)	1,120	1,028	1,039	1,206	810	587	774	699
Sleeper (km of track renewed)	744	738	763	735	438	445	567	501
Ballast (km of track renewed)	799	850	837	763	509	525	573	522
Switch & crossings (No. of full units replaced)	520	442	436	419	231	269	285	264
Signalling (SEUs)[1]	278	481	1,441	981	813	802	1,266	978
Bridge renewals (No.)[2]	157	154	201	358	248	340	261	214
Culvert renewals (No.)[2]	9	10	25	33	25	25	31	16
Retaining wall renewals (No.)[2]	10	7	8	15	5	11	10	10
Earthwork renewals (No.)[2]	76	68	107	157	113	103	117	148
Tunnel renewals (No.)[2]	39	19	22	44	24	49	48	30

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).

Safety and sustainable development

In 2012/13 we missed our internal passenger safety and workforce safety targets. Regrettably there were two accidental passenger fatalities at managed stations and two workforce fatalities. The passenger fatalities resulted from a fall whilst descending the stairs at Leeds station and a heart attack on the concourse at London Euston station. The workforce fatalities involved a member of staff who was in a fatal road traffic accident on the way to a work site and the other fatality involved a contractor being struck by a train.

There were eight safety improvement notices served on Network Rail and we were prosecuted five times for breaches of health and safety legislation and consequently fined £4.5 million.

The results for our safety KPIs and the supporting measures are shown in Table 6.

During the year 2012/13 we established our safety and wellbeing strategy. This enables the company to deliver business improvement through more mature safety and wellbeing risk assessment.

We are on course to meet the CP4 target of 750 level crossing closures with 662 closed by the end of 2012/13 as part of our focus on reducing the risks at level crossings. Other level crossing improvements include spoken audible warning devices being installed, route based dedicated level crossing managers being appointed, improved training and the continued trial and roll-out of Automatic Open Crossings with flashing lights and barriers.

We have developed and implemented our Lifesaving Rules which are based on the main threats to life in our industry. The rules and associated management arrangements aim to prioritise the safety measures that save lives, provide a clear push-back against unsafe requests, highlight areas where we need to improve and protect people who raise safety issues.

We have started our programme for simplifying safety standards throughout the company. We are identifying key activities and simplifying the processes supporting them which should not only promote a consistent approach but enable clarity on what is expected.

During 2012/13 we developed a replacement for Sentinel (the system that monitors and records the competency of employees and contractors on our infrastructure). The new system that will be launched in 2013/14 will enable us to better verify that everyone who accesses the railway has the correct credentials to do so.

We extended our close call reporting arrangements so that all Network Rail employees and contractors can report any event that has the potential to cause injury or damage. We are developing additional communications to continue to promote the use of the system.

Occupational health has also been an area of focus. We have undertaken organisational and occupational health reviews and the output will be used to address key risks and priorities.

The sustainable development strategy was also finalised during 2012/13. This defines our strategic outcomes, outputs and activities for sustainable development through to CP6.

Table 6: Summary of safety measures

Measure	*2007/08*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Workforce safety – Fatalities and weighted injuries MAA	0.129	0.152	0.127	0.126	0.136	0.149
Infrastructure wrong side failures (No.)	60	50	67	85	59	68
Level crossing misuse – incidents MAA	28.46	31.31	28.38	29.38	31.00	28.31
Category A signals passed at danger (No.)	354	293	274	299	277	252
Irregular working – incidents MAA	57.38	32.61	21.69	17.69	20.46	22.69
Malicious acts per 100 route miles (No.)	5.54	5.22	4.42	4.42	4.36	3.09
Passenger Safety Indicator MAA	-	0.252	0.215	0.178	0.246	0.226

Notes:
- 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.

Enhancement schemes

We have continued delivery of the enhancement schemes that we have committed to deliver during CP4. Section 6 provides more details on all projects and also includes information on projects that have undergone change control during the year. Some highlights for the year are summarised below.

Crossrail which is partly financed by Network Rail links Maidenhead and Heathrow Airport in the west with Shenfield and Abbey Wood in the east. Network Rail is delivering the 'on network works' for Crossrail Limited which includes enhancements to the existing railway network, on either side of the central tunnels, necessary to deliver the required timetable and performance levels.

The **Thameslink** programme will provide the stations and railway systems infrastructure to enable 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.

During 2012/13, significant works have been undertaken at key stations in Central London. At **Farringdon**, a new ticket office has been fitted out and lifts brought into use before the Olympic Games. The north train shed roof and station frontage works have been completed.

At **Blackfriars**, external works have been completed including works to the bridge and the station roof, this includes the installation of photovoltaic cells.

At **London Bridge**, a programme of enabling works has created a new interim ticket office at the front of the station. The train shed over the terminating platforms has been removed, and demolition of accommodation blocks to make way for the future station layout and new viaduct connection was completed.

Following the opening of the new Western concourse at **London King's Cross station** in March 2012, extra passenger circulating capacity and new retailing opportunities have arisen. Other enhancements as part of the project include:

- a new platform beneath the eastern range offices
- a new 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.

Reading station: There has been significant progress in delivering the Reading station area redevelopment during 2012/13. Works to the station include:

- new platforms and platform extensions
- a new train maintenance facility replacing existing facilities
- extensive track layout reconfiguration and resignalling throughout the area
- provision for a possible future extension of Crossrail and the introduction of train services from the west to London Heathrow Airport.

The station main works have been completed including commissioning of the western gateline, a new transfer deck, subway, new relief line Platforms 12-15, and northern entrance building. This is in addition to works to relief line connections, tunnels and removal of an existing footbridge.

Birmingham New Street station redevelopment: This redevelopment provides an upgrade to the station providing greater capacity for passengers to support passenger growth to the year 2035 and

enhanced station facilities. During 2012/13 significant progress was made towards achieving completion of phase 1 of the scheme – opening of the new Western Concourse at the end of April 2013.

North west electrification: This programme delivers AC electrification at 25 kV OLE on various routes in the north west of England. The programme facilitates the introduction of electric train operation on passenger and freight services on the following routes for completion in 2016:

- Liverpool to Manchester
- Huyton to Wigan
- Preston to Blackpool
- Manchester to Preston.

During 2012/13, implementation works have continued on the main works package (OLE, signalling, distribution) for the first phase of the scheme from Manchester to Newton-le-Willows, contracts have been awarded for the main works of the second phase (Liverpool to Newton-le-Willows and Wigan) and advance works have commenced on the third phase (Preston to Blackpool North).

Northern Hub: This programme consists of a series of journey time improvement projects on radial routes from Manchester and capacity schemes at various locations across the north of England. During 2012/13, works commenced on Stage 1 of the Huyton & Roby capacity project and signalling elements of the Chat Moss capacity project, consultation for a Development Consent Order for the Ordsall Chord commenced and single options were identified for the all journey time improvement and capacity projects except for Oxford Road and Piccadilly.

Barry to Cardiff Queen Street corridor: This project provides an increase in capacity and capability on key lines to provide an additional four trains per hour. Works include new platforms at Cardiff Central and Queen Street stations, renewal of signalling and improved track capacity. During 2012/13, the first phase of the signalling works were completed on the Vale of Glamorgan line and construction of the additional platforms commenced following contracts being let.

Paisley Canal electrification: Completed in 2012/13, this was a fast track project which has installed a 25kV overhead electrified system on the Paisley Canal line. The electrification of the route brings timetable performance improvements and maximises the utilisation of electric multiple unit rolling stock. Additionally, the scheme has allowed two Class 156 diesel multiple units to be deployed elsewhere in Scotland. The project was successfully accelerated and implemented through an alliance initiative between Network Rail and First ScotRail.

Strategic Freight Network (SFN): This programme is designed to add capacity and capability in CP4 to allow an increase in the number of freight trains, along with enhanced gauge and longer trains.

Significant progress has been made in delivering the CP4 SFN schemes during 2012/13. These include:

- completion of works at Nuneaton to enable freight trains to travel from Felixstowe to the North West, avoiding London
- Southampton to West Coast Mainline (WCML) W10 / W12 diversionary route bridge demolitions and reconstructions
- redoubling of Chinley South Junction as part of Peak Forest and Hope Valley to London Train Lengthening project.

Introduction

The Annual Return 2013 reports on Network Rail's stewardship of the rail network in 2012/13.

We have included information by the ten operating routes wherever possible. A map of the operating routes is provided at the end of this section.

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 previous year's figures were 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 2014 or forecasts included in the Network Rail Control Period 4 Delivery Plan update 2012.

Most asset condition information is based on assessments from a sample of assets. 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, Network Rail together with the ORR has employed Independent Reporters. The role of the Reporters is to provide independent technical audit services to the 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. 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 have reviewed is provided. This confidence grade provides an indication of the accuracy and reliability of the measure.

It should be noted that from 2011/12 the confidence grading system was slightly modified, an explanation of the previous confidence grading system can be found in the Annual Return 2011. As confidence grades in this Annual Return also include confidence grades awarded by the previous Reporter and those from reviews prior to 2011/12, some confidence grades will be based on the previous system. The new confidence grading system is very similar to the previous one as ORR developed it to enhance the previous system and minimise any confusion.

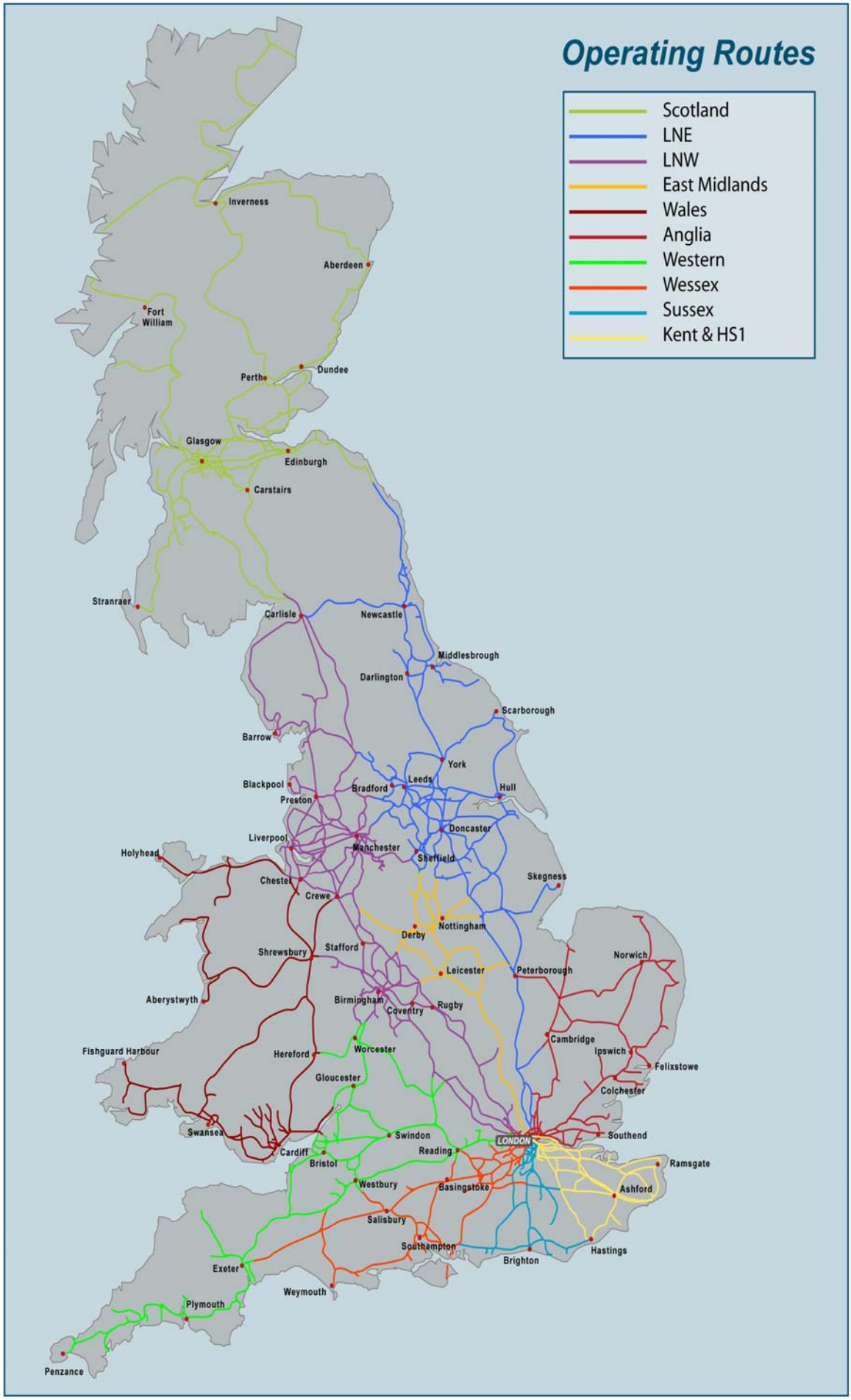
The following tables provide an explanation of the reliability and accuracy grades.

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 per cent
1	Data used to calculate the measure is accurate to within 1 per cent
2	Data used to calculate the measure is accurate to within 5 per cent
3	Data used to calculate the measure is accurate to within 10 per cent
4	Data used to calculate the measure is accurate to within 25 per cent
5	Data used to calculate the measure is accurate to within 50 per cent
6	Data used to calculate the measure is inaccurate by more than 50 per cent
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 per cent confidence level - i.e. the true value of 95 per cent 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
Leeds
Bradford
Hull
Preston
Doncaster
Liverpool
Manchester
Sheffield
Holyhead
Skegness
Chester
Crewe
Nottingham
Derby
Shrewsbury
Stafford
Norwich
Leicester
Peterborough
Aberystwyth
Birmingham
Coventry
Rugby
Cambridge
Fishguard Harbour
Hereford
Worcester
Ipswich
Felixstowe
Gloucester
Colchester
Swansea
Swindon
Southend
LONDON
Cardiff
Reading
Bristol
Ramsgate
Westbury
Basingstoke
Ashford
Salisbury
Southampton
Hastings
Brighton
Exeter
Weymouth
Plymouth
Penzance

Section 1 - Operational performance and stakeholder relationships

Introduction

The primary cross-industry measure of operational performance for all passenger services is the Public Performance Measure (PPM). PPM 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. PPM figures are shown in this section at national, sector and individual operator level.

We also measure passenger train performance using the Cancellations and Significant Lateness (CasL) measure. CaSL is defined as the percentage of passenger trains (both franchised and open access) 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.

Freight delay targets for CP4 are expressed in terms of Network Rail caused delay per 100 train kilometres. This removes the effect of fluctuations in traffic volumes. We also assess freight performance using the freight delivery metric. This measure tracks the punctuality of all freight services at destination as well as taking into account cancellations (not planned) as a result of Network Rail performance. Punctuality failures are defined as those not arriving at destination within 15 minutes of plan and where Network Rail has caused more than 15 minutes of delay during the journey.

In order to ensure appropriate focus on the causes of disruption to both passenger and freight train services, delay minutes are a major operational performance measure which underpins PPM and the Freight Delivery Metric (FDM). Delays experienced by passenger and freight train operators are broken down into two categories, Network Rail attributed delays and those attributed to train operators. Delays attributable to Network Rail typically relate to the performance of the railway infrastructure (such as track or signalling faults), timetabling and operation of the network. This category also includes external events which affect the operation of the railway such as cable theft or poor weather.

Delays which are attributable to train operators typically relate to matters such as train and station operations, fleet reliability or train crew resourcing.

The Annual Return provides data on Network Rail attributed delays only, with specific focus on infrastructure related delays. Figures are presented for 2012/13 in delay minutes and in delay minutes per 100 train kilometres and we include disaggregated results split by cause.

In this section we also report on the management of our stakeholder relationships. We set out the results of both our customer satisfaction survey and the passenger satisfaction survey which is conducted by Passenger Focus bi-annually.

Overview of 2012/13 operational performance

In 2012/13 the number of passenger journeys increased by four per cent and performance continues to be at historically high levels. However, overall operational performance in 2012/13 has been inconsistent and all the regulatory targets for train performance were missed except for Scotland.

During 2012/13 operational performance in England & Wales was badly affected by severe weather conditions. At a network wide level delays caused by severe weather were 142 per cent worse than the previous year.

2012 was the wettest year in England since records began and in December 2012 large parts of the network suffered from flooding as a result of saturated ground conditions. The West Country and Wales were the most heavily-affected areas, with several lines either blocked or open with restricted speeds. The wet weather also led to an increase in earthwork failures (144 in 2012/13 compared with 28 in 2011/12).

In January 2013, snow and ice affected large parts of the network and this, coupled with the second coldest March in 100 years made the recovery of train performance challenging for both Network Rail and the train operators. We have a number of specifically funded workstreams underway to make our network more resilient to adverse and extreme weather.

However, the severe weather conditions have to some extent hidden the benefits being delivered elsewhere, for example in relation to cable theft and suicides where delay reduction has been significant.

The poor weather that affected much of Great Britain in 2012/13 also had an impact on asset reliability (particularly points failures, track faults and track circuit failures). Delay minutes caused by overhead line / third rail faults also increased significantly in 2012/13. In many cases the flooding and other severe weather resulted in resources being deployed to recover services and keep the railway operational. This subsequently led to delays in maintenance and renewals activities that had to be replanned which resulted in a backlog of work. PPM has also been affected by TOC restrictions on resourcing service recovery.

We are undertaking detailed root cause analysis to understand the reasons behind the shortfall in operational performance and we will share this analysis with the ORR later in 2013. This Annual Return seeks to explain the principal reasons for the performance shortfall at both a sector and operating route level.

Public Performance Measure

PPM combines figures for punctuality and reliability into a single performance measure covering all scheduled train services operated by franchised passenger train operators and four open access train operators as defined in the CP4 Delivery Plan. PPM measures the actual performance of individual trains against the planned timetable for the day, and shows the percentage of trains that arrived '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 Long Distance train services a criterion of arrivals within ten minutes (i.e. 9 minutes 59 seconds or less) is used. Where a train 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 franchised passenger and open access operators in 2012/13 was 90.9 per cent, down 0.7 per cent from the 91.6 per cent PPM that was achieved in 2011/12.

In England & Wales PPM for 2012/13 was 90.7 per cent against a target of 92.3 per cent. In Scotland we beat our regulatory target by 1.1 per cent with 93 per cent of trains arriving on time.

In England & Wales regulatory performance targets are also set at a 'sector' level covering Long Distance, London & South East and Regional train performance. In 2012/13 we missed all of our sector level targets.

Table 1.1 compares the PPM for 2012/13 with previous years. Table 1.2 shows PPM by sector (including Scotland) and Table 1.3 shows the PPM by operator for 2012/13.

Table 1.1: Overall PPM for franchised passenger services (%)

	2007/08	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
PPM	89.9	90.6	91.5	90.9	91.6	90.9

Table 1.2: 2012/13 PPM by sector for England & Wales and Scotland (%)

By sector	*PPM Actual*	*PPM Target*
London & South East	91.0	92.7
Long Distance	87.0	91.5
Regional	91.1	91.9
England & Wales (total)	90.7	92.3
Scotland	93.0	91.9

Notes:
Scotland PPM is taken as First ScotRail PPM as this train operator primarily runs services in Scotland.

Table 1.3: 2012/13 PPM by Operator for England & Wales and Scotland (%)	
Operator	***PPM Actual***
Arriva Trains Wales	93.3
c2c	97.5
Chiltern	94.9
CrossCountry	86.8
East Coast	83.9
East Midlands Trains	92.5
First Capital Connect	88.3
First Great Western	89.1
First Hull Trains	81.7
First ScotRail	93.0
First Transpennine Express	91.7
Grand Central	81.4
Greater Anglia	92.3
Heathrow Express	93.3
London Midland	86.0
LOROL	96.6
Merseyrail	95.4
Northern Rail	90.7
Southeastern	91.1
Southern	88.0
Stagecoach South Western Trains Ltd	91.4
Virgin Trains	83.6

Long distance (LD) train performance

PPM in the LD sector in 2012/13 ended 4.5 per cent behind regulatory target with 87 per cent of long distance train services arriving on time. This was 2.1 per cent worse than the result achieved in 2011/12 when 89.1 per cent of LD trains arrived on time.

During the course of the year we have developed, refined and implemented our performance recovery plan for this sector. However, many of the benefits that have been delivered have been offset by the severe weather conditions experienced during the year. Without the recovery plan the LD sector would have been further behind target.

Other reasons for missing the Long Distance PPM target are:

- heavy rainfall and snow resulted in an increase in track faults. These faults led to an increase in the number of Temporary Speed Restrictions (TSRs) and the need to take additional sometimes disruptive possessions to address these issues.
- demand on the network capacity during times of service disruptions when limited TOC resources were reallocated to keep the network operational
- an increase in overhead line dewirements which particularly affected the performance of Virgin, East Coast and CrossCountry train services. We are undertaking more detailed investigations so that we properly understand the root causes behind these increases.

More detailed commentary concerning LD performance is provided at route level below.

London and South East (LSE) train performance

As with the LD sector, we have also developed and are implementing a recovery plan to improve performance in the LSE sector. The LSE recovery plan seeks to address the bigger causes of delay in the sector including timetable conflicts, adopting a right time approach to daily delivery and reviewing how the rules of the railway are applied.

PPM in the LSE sector in 2012/13 ended 1.7 per cent behind regulatory target with 91 per cent of LSE train services arriving on time. This was 0.7 per cent worse than the result achieved in 2011/12 when 91.7 per cent of LSE trains arrived on time.

The regulatory PPM target for LSE train services in 2012/13 was missed primarily as a result of:

- severe weather
- operator changes to train crew and unit workings
- increased usage of the network.

More detailed commentary concerning LSE performance is provided at route level below.

Route level performance

Long Distance sector

The LD sector includes the London North West and London North East routes and part of the Western route (commentary is under Regional). These routes are responsible for delivering the LD recovery plan, with the aim of delivering as close as possible to the regulatory target.

London North West (LNW)

Performance on LNW Route was worse than planed in 2012/13, with delay minutes ending the year 382,000 minutes higher than target. This was the first year within the current control period that the route has not delivered a year on year improvement in delay minutes. The principal reasons for this are: Overhead Line Equipment (OLE) failures, an increase in Temporary Speed restrictions (TSRs), severe weather creating a backlog of maintenance and signalling equipment not being as reliable as planned which has led to longer journey times as well as increased delay minutes and at times cancellations to Virgin and London Midland trains.

Virgin Trains performance was specifically affected by the reliability of non-track assets and OLE on the critical route section between London and Rugby

London Midland performance suffered in 2012/13 due to the same issues that affected Virgin performance. In addition to this there were also issues with train crew availability and fleet reliability. Ongoing redevelopment works at Birmingham New Street Station has had an impact on service recovery.

London North East (LNE)

LNE's performance has been impacted by aging infrastructure. The longer term strategy involves replacing existing in ground signalling equipment with in cab signalling equipment, similar to systems used on Eurostar and across European high speed lines, which should improve signalling asset reliability. Until this is realised the maintenance and reliability of the existing system will be safely maintained. The route also suffers from capacity issues in key sections that restrict customers' requirements.

East Coast train performance was also affected by issues with the OLE and the condition of track whilst at the same time having to operate under a more restrictive public timetable.

London & South East sector

The London & South East (LSE) sector includes Anglia, Kent, Sussex and Wessex routes. These four routes are responsible for delivering the benefits of the LSE recovery plan and to bring the sector in line with the regulatory target.

Anglia

Improvements in Anglia route performance have been largely due to improvements related to the Olympic games (Olympic preparation work and the way the business configured itself both during the Olympic period, and post Olympics). Anglia route has been able to sustain the good performance resulting from these improvements works. The preparation works included OLE resilience activity and increased maintenance prior to the Olympic games and an increased maintenance presence during that time. The route continued to deliver good performance for the remainder of the year and achieved better than target delay minutes across most delay categories.

Kent

Performance was behind target in 2012/13 as a result of traffic growth, large incidents with a greater impact particularly early in the year and prolonged cold temperatures towards the end of 2012/13. TOC-on-TOC delays reduced at the start of CP4 and remain relatively low for Southeastern.

Sussex

During 2012/13 Sussex suffered flooding and incidents involving high winds which caused trees to fall across the track and debris to be blown onto the railway. Autumn performance was better than the previous year and despite the snow in winter Southern still managed to run over 93 per cent of its

trains compared to 70 per cent in 2010, which is a major improvement. However PPM was significantly affected by the winter weather.

This was a tough year for asset reliability with the worsening trend in track faults continuing from 2011/12 (due to the heavy rain and snow in 2012/13 soaking the track bed). Mitigation processes are now in place with track quality teams pro-actively removing track defects. Remote condition monitoring has also resulted in benefits across point and track circuit failures, saving over 65,000 minutes delay, by proactively managing assets before they fail.

Southern performance was affected by an increase in the level of delay caused by infrastructure failures, (including the impact of TSRs resulting from track alignment and reliability issues due to the severe weather), some incidences of cable theft together with more restricted train crew and unit workings which have affected service recovery.

Wessex

The combined alliance result for the South Western Railway Alliance was 13.9 per cent worse than the delay minutes target. Delays resulting from poor asset reliability and severe weather have caused the biggest variances to target. Railway performance has suffered as a result of cable fires, icing on the conductor rails and track faults from broken rails which have increased the number of TSRs on the route. The LSE recovery plan has initiatives that provide greater availability of treatment trains, and improved focus on TSRs to try and address these issues.

Regional

The Regional sector includes Western and Wales routes. PPM performance has been ahead of target for much of CP4. However, during 2012/13 performance has fallen behind target. Network Rail has produced a plan for the Regional sector to reverse the downward trend.

Western

Despite having benefits from the LD and LSE recovery plans in the route, the severe weather in 2012/13 affected assets and in particular embankments (e.g. Devon and Cornish coastal structures) in the route. Revised timetable operations at Reading station during its remodelling has also affected performance. Notwithstanding this, there has been a positive year on year improvement in points and train detection reliability across the route.

Wales

There were 354,000 delay minutes on the Wales route in 2012/13 which is 9.1 per cent worse than target. This was largely as a result of weather and structure related causes such as the collapse of the retaining wall between Cardiff Central and Queen Street which caused 16,000 minutes delay. There have been numerous flooding events throughout the year caused by the impact of high levels of rainfall falling on already saturated ground.

Although there have been improvements in the number of points and train detection incidents through the introduction of remote condition monitoring, there have also been several high impacting incidents caused by weather and structural defects, which have offset the underlying improvements delivered. The impact of external events reduced significantly compared to previous years, primarily as a result of the reduction in cable theft incidents during the year.

The key performance plans that have been identified to address these issues focus on mitigating the risk of future flooding events by improving drainage at known hot-spots, reducing infrastructure failures through continued use of remote condition monitoring, and continuing the focus on improving the route's ability to respond and recover from incidents when they do occur.

East Midlands

East Midlands Route performance affects all three sectors (LD, LSE and Regional).

East Midlands Route has delivered improved performance due to its proactive approach with the TOCs and its use of remote condition monitoring to manage its assets. In the LD sector, East Midlands Trains continues to be the best performing operator. For the LSE sector, despite some large incidents First Capital Connect services have benefitted from improved asset reliability through the rapid response team based at Kentish Town. Finally the Regional sector operation for East Midlands Trains, continues to deliver improved PPM and Right Time performance despite several significant asset incidents and earthwork slippages.

Scotland

Scotland PPM was 1.1 per cent better than the regulatory target of 91.9 per cent. The delay minutes regulatory target was also met with a 22 per cent improvement compared to 2011/12. Key factors of this success include: full delivery of the routes improvement plan and successful delivery of asset incident count targets, effective containment of seasonal risks, and continued progress on improving the resilience of the timetable. This has been achieved through effective joint working with First ScotRail.

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 in previous years and excludes delays to other types of operator (such as London Underground Limited (LUL) services, NEXUS Metro and charter operations), which account for a further 0.7 per cent of the total Network Rail attributed delays.

Results

Table 1.4 shows delays for all train services for 2012/13 compared to previous years.

Commentary

Network Rail attributed delays increased by 0.4 million minutes to 8.8 million minutes in 2012/13. With train miles run increasing by 0.02 per cent this has led to a six per cent increase in delay minutes per 100 train kilometres.

The increase in delay minutes is principally due to severe weather this year. For example, the effects of flooding and snow across the network greatly affected our assets despite improvements made in previous years. Infrastructure delays, in particular traction supply and signalling equipment, were worse than planned and track geometry faults resulting from the weather increased the number of TSRs.

Delays to passenger train services

Total Network Rail attributed delays to passenger trains increased by five per cent. This resulted in a six per cent increase in delay minutes per 100 train kilometres to 1.51 minutes. The trend since 2007/08 is summarised in Table 1.5 below.

England & Wales delays to passenger train services

Total Network Rail attributed delays to passenger trains in England & Wales increased in 2012/13 by eight per cent. Traffic volumes decreased by 0.2 per cent compared to 2011/12. This resulted in a combined impact of eight per cent increase in delay minutes per 100 train kilometres to 1.57 minutes. The delays to passenger services were 35 per cent worse than the regulatory target. The trend since 2007/08 is summarised in Table 1.6.

Table 1.4: Delays to all train services

Network Rail-attributed delays	***2007/08***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Total delay minutes (millions) (incl. minor operators)	9.5	8.8	8.2	8.9	8.4	8.8
Train km (millions)	486.2	497.7	513.4	516.3	536.2	536.3
Delay per 100 train km	1.95	1.78	1.59	1.73	1.56	1.65

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.

Table 1.5: Network-wide Network Rail-attributed delays to passenger train services

	2007/08	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Delay minutes	7,695,360	7,208,574	6,700,700	7,400,705	6,997,245	7,408,507
Train km	442,271,678	454,798,388	470,714,609	475,060,899	492,317,818	492,537,511
Delay per 100 train km	1.74	1.59	1.42	1.56	1.42	1.51

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.

Table 1.6: England & Wales Network Rail-attributed delays to passenger train services

	2007/08	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Delay minutes	*7,223,137*	6,701,324	6,152,260	6,859,224	6,517,432	7,030,198
Train km	*404,921,582*	416,828,459	431,295,163	434,795,367	449,704,866	448,755,501
Delay per 100 train km	*1.78*	1.61	1.43	1.58	1.45	1.57
Regulatory target (minutes)	-	-	6,270,000	5,790,000	5,430,000	5,190,000

Scotland delays to passenger train services

Total Network Rail attributed delays affecting Scotland passenger services (First ScotRail) reduced in 2012/13 by 21 per cent. Traffic volumes increased by 2.7 per cent compared to 2011/12. This resulted in a combined impact of a 23 per cent decrease to 0.87 delay minutes per 100 train kilometres. The delays to passenger services were two per cent better than the regulatory target. The trend since 2007/08 is summarised in Table 1.7.

Despite Scotland being affected by weather including flooding and severe winds, the impact on assets and performance was less when compared to previous years. Our joint work with First ScotRail and improvements to the timetable has strengthened our joint capability to deliver PPM in line with (and ahead of) target.

Table 1.7: Scotland Network Rail-attributed delays to passenger train services

	2007/08	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Delay minutes	472,223	507,250	548,440	493,791	479,814	378,309
Train km	37,350,097	37,969,929	39,419,446	40,265,532	42,612,952	43,782,010
Delay per 100 train km	1.26	1.34	1.39	1.23	1.13	0.87
Regulatory target (minutes)	–	–	436,000	410,000	391,000	386,000

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 increased by 1.7 per cent during the year to 3.63 minutes per 100 train kilometres, which was 19.1 per cent worse than the regulatory target. The trend since 2007/08 is summarised in Table 1.8 and Table 1.9 shows delays to freight operators in 2012/13.

Freight delivery metric

The Freight Delivery Measure has been recorded since 2010/11 and is shown in Table 1.10. The measure tracks the punctuality of all freight services at destination as well as taking into account the cancellations (not planned) as a result of Network Rail performance. Punctuality failures are defined as those not arriving at destination within 15 minutes of plan and where Network Rail has caused more than 15 minutes of delay during the journey.

Results

Table 1.8 shows that delay minutes to freight increased by 1.5 per cent over the year, with the delay per 100 train kilometres measure improving by ten per cent over the last five years. The comparison of freight operators is shown in Table 1.9. Table 1.10 shows that over the past three years the freight delivery metric has improved by 1.2 per cent despite the severe weather over the last year.

Commentary

The increase in delays to freight train services was principally due to the severe weather conditions, delays caused by train planning and delays caused by landslips and earthwork failures including the landslip at Hatfield colliery, which is a key freight route.

During the year, there has been a continued industry focus on reducing delays to freight services. Network Rail continues to work with freight operators through the freight reform programme with the aim of providing a better product for freight customers. As part of reducing freight delays, we have developed more short term planning to optimise rail traffic to market conditions.

Table 1.8: Network-wide Network Rail-attributed delays to freight train services

	2007/08	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Delay minutes	1,762,932	1,568,106	1,421,333	1,504,142	1,329,303	1,349,352
Train km	40,700,435	39,086,440	35,395,805	35,044,683	37,276,094	37,163,438
Delay per 100 train km	4.33	4.01	4.02	4.29	3.57	3.63
Regulatory target (delay per 100 train km)	–	–	3.68	3.41	3.18	3.05

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).
- Delay minutes per 100 train km are based on all PfPI delay minutes, divided by the train kilometres run, multiplied by 100.

Table 1.9: Delays to freight operators in 2012/13

	Delay minutes	*Train km (million)*	*Delay per 100 km*
Major Freight operators			
DBS	599,103	16,281,115	3.68
Freightliner Heavy Haul	244,493	6,330,014	3.87
Freightliner Intermodal	305,369	8,513,164	3.59
GB Rail Freight	151,119	3,678,354	4.11
DRS	49,267	2,360,791	2.09
Other Freight operators	19,935	584,817	3.41
Total	1,369,287	37,748,255	3.63

Table 1.10: Freight delivery metric at a national level (%)

	2010/11	*2011/12*	*2012/13*
FDM	92.8	94.1	94.0

Notes:

- FDM includes all freight operators, not just the five major operators.

Delay minutes by cause

The trends in Network Rail delay minutes by cause are described in this section.

Results

Tables 1.11 and 1.12 show Network Rail delays by category grouping for 2012/13 compared to previous years. Tables 1.13 to 1.15 show Network Rail delays by detailed cause category.

Commentary

Delays caused by Network Rail increased by six per cent, and delays due to operator causes remained broadly the same.

The impact of severe weather caused an increase in the number of delays caused by track defects, TSRs and non-track assets. In many cases freight services had to be diverted onto already intensely used areas of the network (e.g. following the landslip at Hatfield colliery), or cancelled (e.g. following the flooding in Exeter). This increased the impact of any delay causing incidents.

Delays caused by severe weather throughout the year were 142 per cent worse than the previous year. Heavy rain and snow increased track defects and embankment issues in clay soil areas which affected track geometry.

Delays caused by external factors in 2012/13 improved by 24 per cent (from 2011/12) and were at the lowest recorded level in this control period. Despite this improvement there were rises in trespass and vandalism across the operating network. The number of cable theft incidents reduced significantly primarily as a result of our joint work with the British Transport Police (BTP). We have also raised the profile of cable theft to influence legislation changes to the Scrap Metal Dealers Act 1964. Delays caused by suicides have also reduced and we continue our joint work with the BTP and the Samaritans. This includes high profile campaigns and the fencing off of high speed platforms.

Table 1.11: Network delays to passenger and freight trains by summarised category groups (delay minutes)

Category group[1]	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Track defects and TSRs[2]	1,062,288	817,336	826,861	893,526	949,516
Other asset defects[3]	2,883,048	2,669,582	2,593,163	2,562,423	2,648,612
Network management/other[4]	2,331,438	1,967,533	2,529,963	2,366,235	2,386,722
Autumn leaf-fall and adhesion[5]	241,733	153,229	280,427	146,595	198,213
Severe weather/structures[6]	584,241	979,852	962,219	483,785	1,171,384
External factors[7]	1,673,932	1,534,501	1,712,214	1,873,985	1,417,282
Total minutes	**8,776,680**	**8,122,033**	**8,904,847**	**8,326,549**	**8,771,729**
Train kilometres (thousands)	493,885	506,110	510,106	529,594	529,701

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

Category group[1]	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Track defects and TSRs[2]	0.22	0.16	0.16	0.17	0.18
Other asset defects[3]	0.58	0.53	0.51	0.48	0.50
Network management/other[4]	0.47	0.39	0.5	0.45	0.45
Autumn leaf-fall and adhesion[5]	0.05	0.03	0.05	0.03	0.04
Severe weather/structures[6]	0.12	0.19	0.19	0.09	0.22
External factors[7]	0.34	0.3	0.34	0.35	0.27
Total	**1.78**	**1.60**	**1.75**	**1.57**	**1.66**

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 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 1.13: Network wide delays to passenger and freight trains by detailed cause category 2012/13 (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	468,164	0.1	107,705	0.29	575,679	0.11
102	Problems with trackside signs including TSR boards	20,684	0	2,349	0.01	23,010	0
103	Level crossing failures	85,592	0.02	13,427	0.04	99,275	0.02
104A	TSR's Due to Condition of Track	27,383	0.01	39,428	0.11	66,823	0.01
104B	Track faults (including broken rails)	639,031	0.13	130,310	0.35	770,344	0.15
104C	Rolling Contact Fatigue	3,410	0	279	0	3,689	0
104D	Reactionary delay to planned TSRs	92,651	0.02	15,473	0.04	108,660	0.02
105	Civil Engineering structures, earthworks & buildings	138,513	0.03	21,675	0.06	160,261	0.03
106	Other infrastructure	225,363	0.05	40,387	0.11	265,911	0.05
106A	Track Patrols & related possessions	27,097	0.01	6,487	0.02	33,588	0.01
107A	Possession over-run and related faults	141,158	0.03	37,267	0.1	178,395	0.03
107B	Other possession related delay	50,204	0.01	5,850	0.02	59,778	0.01
108	Mishap – infrastructure causes	145,001	0.03	21,623	0.06	166,605	0.03
110A	Severe weather	709,164	0.14	118,990	0.32	828,866	0.16
110B	Other weather	165,691	0.03	16,440	0.04	182,256	0.03
111A	Wheel slip due to leaf fall	61,344	0.01	4,177	0.01	65,407	0.01
111B	Vegetation Management failure	24,844	0.01	4,031	0.01	28,840	0.01
112	Fires starting on Network Rail infrastructure	11,884	0	744	0	12,652	0
150	Low adhesion inc. Autumn (Network Rail)	120,796	0.02	6,469	0.02	127,721	0.02
201	Overhead line/third rail faults	275,752	0.06	44,165	0.12	320,757	0.06
301A	Signal failures	194,873	0.04	26,169	0.07	220,600	0.04
301B	Track Circuit failures	476,537	0.1	51,950	0.14	528,545	0.1
301C	Axle counter failures	75,511	0.02	10,267	0.03	85,777	0.02
302A	Signalling System & Power Supply failures	450,143	0.09	61,550	0.17	515,323	0.1
302B	Other signal equipment failures	55,255	0.01	7,874	0.02	62,808	0.01
303	Telecoms failures	59,579	0.01	7,102	0.02	67,342	0.01
304	Cable faults (signalling & comms)	152,469	0.03	19,915	0.05	172,507	0.03
305	Track circuit failures – leaf-fall	3,221	0	1,864	0.01	5,085	0
401	Bridge strikes	127,394	0.03	16,080	0.04	143,470	0.03
402	External infrastructure damage – Vandalism/Theft	203,378	0.04	59,922	0.16	263,196	0.05
403	External level crossing/road incidents (not bridges)	53,136	0.01	13,158	0.04	66,306	0.01
501A	Network Rail Operations – signalling	352,871	0.07	50,511	0.14	404,582	0.08
501B	Network Rail Operations – control	33,168	0.01	21,506	0.06	55,275	0.01
501C	Network Rail Operations – railhead conditioning trains	33,872	0.01	2,482	0.01	36,341	0.01
501D	Network Rail Operations – other	89,572	0.02	20,578	0.06	111,067	0.02
502A	Timetable Planning	188,008	0.04	131,307	0.35	318,827	0.06
502C	Network Rail commercial takeback/other	176,127	0.04	44,741	0.12	221,051	0.04
503	External fatalities and trespass	597,339	0.12	71,742	0.19	668,905	0.13
504	External police on line/security alerts	9,430	0	1,001	0	10,463	0
505	External fires	15,559	0	2,910	0.01	18,469	0
506	External other	189,488	0.04	45,968	0.12	233,821	0.04
601	Unexplained	414,557	0.08	37,111	0.1	451,987	0.09
602	Un-investigated delay	23,293	0	6,370	0.02	31,466	0.01
Total minutes		**7,408,507**	**1.5**	**1,349,352**	**3.63**	**8,757,859**	**8,771,729**
Train kilometres (millions)		**492.5**	**–**	**37.2**	**–**	**529.7**	**529.7**

Table 1.14: Network total delays to passenger and freight trains by detailed cause category (delay minutes)

No	*Category*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
101	Points failures	744,297	657,883	643,408	593,679	575,870
102	Problems with trackside signs including TSR boards	26,232	17,564	28,193	22,325	23,033
103	Level crossing failures	100,534	95,240	101,294	93,278	99,019
104A	TSR's Due to Condition of Track	204,831	133,996	95,910	72,877	66,812
104B	Track faults (including broken rails)	727,716	614,542	654,269	721,336	769,341
104C	Rolling Contact Fatigue	22,450	11,867	11,196	4,609	3,689
104D	Reactionary delay to planned TSRs	107,291	56,932	65,486	94,703	108,124
105	Civil Engineering structures, earthworks & buildings	77,833	78,289	61,894	58,602	160,188
106	Other infrastructure	232,442	155,880	188,630	232,314	265,750
106A	Track Patrols & related possessions	67,900	33,693	33,164	30,165	33,583
107A	Possession over-run and related faults	155,781	132,324	159,050	172,621	178,425
107B	Other possession related delay	51,267	35,750	41,185	46,906	56,054
108	Mishap – infrastructure causes	194,577	153,580	156,450	159,863	166,623
110A	Severe weather (beyond design capability of infrastructure)	346,845	810,259	817,269	347,428	828,154
110B	Other weather (impact on infrastructure or network operation)	159,563	91,304	83,056	77,754	182,131
111A	Wheel slip due to leaf fall	76,451	45,110	130,110	27,712	65,521
111B	Vegetation Management failure	22,836	25,023	18,894	20,162	28,875
112	Fires starting on Network Rail infrastructure	16,920	32,284	33,903	21,860	12,628
150	Low adhesion inc. Autumn (Network Rail)	142,690	94,223	134,991	111,525	127,265
201	Overhead line/third rail faults	214,291	247,508	241,662	199,197	319,917
301A	Signal failures	308,811	242,661	205,593	230,114	221,043
301B	Track Circuit failures	556,595	514,100	549,483	598,083	528,487
301C	Axle counter failures	142,373	105,824	66,671	72,267	85,778
302A	Signalling System & Power Supply failures	431,539	416,581	514,984	482,557	511,693
302B	Other signal equipment failures	62,157	64,552	68,182	65,152	63,129
303	Telecoms failures	66,387	69,825	53,156	55,077	66,681
304	Cable faults (signalling & comms)	143,717	168,587	148,728	173,019	172,383
305	Track circuit failures – leaf fall	22,592	13,896	15,326	7,357	5,085
401	Bridge strikes	171,195	143,567	163,105	142,728	143,474
402	External infrastructure damage– Vandalism/Theft	503,286	473,394	531,507	531,228	263,300
403	External level crossing/road incidents (not bridges)	76,050	70,320	83,380	86,449	66,294
501A	Network Rail Operations – signalling	407,013	362,990	382,116	386,788	403,382
501B	Network Rail Operations – control	83,925	65,927	72,555	53,535	54,674
501C	Network Rail Operations – railhead conditioning trains	24,003	28,303	31,174	38,369	36,354
501D	Network Rail Operations – other	175,761	119,526	125,421	140,163	110,150
502A	Timetable Planning	241,090	243,465	414,138	320,203	319,314
502C	Network Rail commercial takeback/other	340,003	298,135	347,977	275,470	220,868
503	External fatalities and trespass	653,119	605,067	635,277	768,336	669,081
504	External police on line/security alerts	17,343	23,929	16,359	11,916	10,431
505	External fires	31,940	47,815	55,194	45,302	18,469
506	External other	271,487	190,217	193,489	266,166	235,457
601	Unexplained	353,547	330,101	361,378	409,250	451,668
602	Un-investigated delay (new category)	0	0	169,640	58,093	29,662
Total minutes		**8,776,680**	**8,122,033**	**8,904,847**	**8,326,541**	**8,757,859**
Train kilometres (thousands)		**493,885**	**506,110**	**510,106**	**529,594**	**529,701**

Table 1.15: Network total delays to passenger and freight trains by detailed cause category (delay minutes per 100 train kms)

No	*Category*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
101	Points failures	0.15	0.13	0.13	0.11	0.11
102	Problems with trackside signs including TSR boards	0.01	0.00	0.01	0.00	0.00
103	Level crossing failures	0.02	0.02	0.02	0.02	0.02
104A	TSR's Due to Condition of Track	0.04	0.03	0.02	0.01	0.01
104B	Track faults (including broken rails)	0.15	0.12	0.13	0.14	0.15
104C	Rolling Contact Fatigue	0.00	0.00	0.00	0.00	0.00
104D	Reactionary delay to planned TSRs	0.02	0.01	0.01	0.02	0.02
105	Civil Engineering structures, earthworks & buildings	0.02	0.02	0.01	0.01	0.03
106	Other infrastructure	0.05	0.03	0.04	0.04	0.05
106A	Track Patrols & related possessions	0.01	0.01	0.01	0.01	0.01
107A	Possession over-run and related faults	0.03	0.03	0.03	0.03	0.03
107B	Other possession related delay	0.01	0.01	0.01	0.01	0.01
108	Mishap – infrastructure causes	0.04	0.03	0.03	0.03	0.03
110A	Severe weather	0.07	0.16	0.16	0.07	0.16
110B	Other weather	0.03	0.02	0.02	0.01	0.03
111A	Wheel slip due to leaf fall	0.02	0.01	0.03	0.01	0.01
111B	Vegetation Management failure	0.00	0.00	0.00	0.00	0.01
112	Fires starting on Network Rail infrastructure	0.00	0.01	0.01	0.00	0.00
150	Low adhesion inc. Autumn (Network Rail)	0.03	0.02	0.03	0.02	0.02
201	Overhead line/third rail faults	0.04	0.05	0.05	0.04	0.06
301A	Signal failures	0.06	0.05	0.04	0.04	0.04
301B	Track Circuit failures	0.11	0.10	0.11	0.11	0.10
301C	Axle counter failures	0.03	0.02	0.01	0.01	0.02
302A	Signalling System & Power Supply failures	0.09	0.08	0.10	0.09	0.10
302B	Other signal equipment failures	0.01	0.01	0.01	0.01	0.01
303	Telecoms failures	0.01	0.01	0.01	0.01	0.01
304	Cable faults (signalling & comms)	0.03	0.03	0.03	0.03	0.03
305	Track circuit failures – leaf-fall	0.00	0.00	0.00	0.00	0.00
401	Bridge strikes	0.03	0.03	0.03	0.03	0.03
402	External infrastructure damage– Vandalism/Theft	0.10	0.09	0.10	0.10	0.05
403	External level crossing/road incidents (not bridges)	0.02	0.01	0.02	0.02	0.01
501A	Network Rail Operations – signalling	0.08	0.07	0.07	0.07	0.08
501B	Network Rail Operations – control	0.02	0.01	0.01	0.01	0.01
501C	Network Rail Operations – railhead conditioning trains	0.00	0.01	0.01	0.01	0.01
501D	Network Rail Operations – other	0.04	0.02	0.02	0.03	0.02
502A	Timetable Planning	0.05	0.05	0.08	0.06	0.06
502C	Network Rail commercial takeback / other	0.07	0.06	0.07	0.05	0.04
503	External fatalities and trespass	0.13	0.12	0.12	0.15	0.13
504	External police on line/security alerts	0.00	0.00	0.00	0.00	0.00
505	External fires	0.01	0.01	0.01	0.01	0.00
506	External other	0.05	0.04	0.04	0.05	0.04
601	Unexplained	0.07	0.07	0.07	0.08	0.09
602	Un-investigated delay (new category)	0.00	0.00	0.03	0.01	0.01
Total minutes		**1.78**	**1.60**	**1.75**	**1.57**	**1.66**

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 of delays and cancellations. This information also assists with focusing management decisions on where to maintain or renew assets. These records do not seek to represent a catalogue of every single physical component or system failure occurring on the network. Table 1.16 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 to 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 13 of the 19 categories shown in Table 1.16. This reflects our focus on improved maintenance practices together with the increasingly positive impact of remote condition monitoring. More equipment is now fitted and alert levels are set to capture worsening component delivery in advance of failure. The majority of the categories that have not improved during 2012/13 relate to asset failures which have occurred as a result of the impact of the weather (e.g. earthworks failures and some OLE failures).

Table 1.16: Network infrastructure incidents recorded for delay attribution (number)

No	*Category*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
101	Points failures	8,048	7,130	5,815	5,166	5,053
103	Level crossing failures	2,260	2,162	2,005	1,932	1,859
104A	TSR's due to condition of track	1,429	1,151	866	668	657
104B	Track faults (including broken rails)	6,149	5,392	4,955	4,787	4,649
104C	Rolling contact fatigue	170	127	66	46	29
105	Civil Engineering structures, earthworks & buildings	391	438	385	280	443
106	Other infrastructure	5,496	3,557	3,380	3,709	3,487
106A	Track patrols & related possessions	3,365	2,568	2,269	1,948	2,213
108	Mishap – infrastructure causes	1,849	1,453	1,589	1,917	1,915
112	Fires starting on Network Rail infrastructure	197	221	249	257	115
201	Overhead line/third rail faults	1,370	1,241	1,279	1,259	1,257
301A	Signal failures	6,560	5,999	4,906	4,812	4,157
301B	Track Circuit failures	5,375	5,150	4,580	4,240	3,902
301C	Axle counter failures	1,095	911	646	683	706
302A	Signalling system & power supply failures	3,750	4,018	4,413	4,202	4,496
302B	Other signal equipment failures	1,471	1,559	1,695	1,673	1,521
303	Telecoms failures	1,356	1,351	1,252	1,156	1,292
304	Cable faults (signalling & comms)	574	532	550	570	614
401	Bridge strikes	1,365	1,131	1,235	1,110	1,068
Total		**52,270**	**46,091**	**42,135**	**40,415**	**39,433**

Cancellations & Significant Lateness (CaSL)

Definition

CaSL is defined as the 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

Table 1.17 shows that in 2012/13 2.72 per cent of trains were cancelled or significantly late in England & Wales. This was worse than the 2.39 per cent achieved in 2011/12.

CaSL in the LD sector finished 0.9 per cent worse than the regulatory target. In the London & South East sector CaSL was 0.52 per cent worse than target and in the Regional sector, CaSL was 0.21 per cent worse than target.

These targets were all missed primarily due to the severe weather, the impact of increased network traffic and poor asset reliability.

Whilst not a regulatory output, 1.47 per cent of trains in Scotland were cancelled or significantly late. Table 1.18 shows CaSL from 2008/09 to 2012/13 and Table 1.19 shows CaSL for each train operator in 2012/13.

Table 1.17: Cancellations and significant lateness (% and number)

Full year results 2012/13 (franchised passenger and open access operators)

	CaSL (%)	***Number***
London & South East	2.52	101,204
Long Distance	4.89	26,636
Regional	2.51	48,652
England & Wales	2.72	176,492
Scotland	1.47	10,672
Network Total	**2.59**	**187,164**

Table 1.18: Cancellations and significant lateness (%)

	2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
London & South East	2.50	2.53	2.61	2.38	2.52
Long Distance	5.21	4.64	5.00	3.99	4.89
Regional	2.58	2.10	2.44	1.96	2.51
England & Wales	2.76	2.58	2.76	2.39	2.72
Scotland[1]	2.03	2.42	2.65	2.69	1.47
Network Total	**2.68**	**2.56**	**2.75**	**2.42**	**2.59**

Notes:

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

Table 1.19: Cancellations and significant lateness (%)			
Full year results 2012/13 (franchised passenger and open access operators)			
	CaSL %	***Number of CaSL Trains***	***Number of Trains Planned***
Arriva Trains Wales	2.58	8,286	321,222
c2c	0.93	1,063	113,893
Chiltern	1.42	1,828	129,185
CrossCountry	5.53	5,674	102,571
East Coast	6.73	3,363	49,994
East Midlands Trains	2.38	3,684	155,114
First Capital Connect	3.56	13,398	376,607
First Great Western	3.12	15,933	511,394
First Hull Trains	8.05	367	4,560
First ScotRail	1.47	10,672	725,597
First Transpennine Express	3.52	3,638	103,316
Grand Central	7.72	400	5,183
Greater Anglia	2.11	13,472	638,314
Heathrow Express	1.74	931	53,611
London Midland	4.14	17,506	423,279
LOROL	1.57	5,450	347,938
Merseyrail	2.19	4,557	207,725
Northern Rail	2.00	16,358	819,563
Southeastern	2.41	16,333	676,801
Southern	3.34	25,401	761,452
Stagecoach South Western Trains Ltd	2.27	13,289	584,579
Virgin Trains	5.04	5,561	110,366
Notes: Discrepencies due to rounding of CaSL %			

Right time

Definition

Right Time is defined as the number and percentage of passenger trains (for both franchised and open access operators) which arrive at or before their final destination at or before the time shown in the public timetable.

Commentary

Table 1.20 shows that in 2012/13, 68.1 per cent of trains arrived at their final destination on time compared with 69.8 per cent in 2011/12. This was partly due to our response to the severe weather which was focused on keeping the network operational during these times despite the impact on Right Time performance.

Table 1.21 shows that LD operators recorded the lowest sector right time score of 54.8 per cent, whereas Regional operators recorded a right time score of 70.5 per cent.

Table 1.22 shows the right time scores for individual operators. The best performing operators such as LOROL (London Overground), C2C and Arriva Trains Wales, have embedded right time practices into all aspects of their operations. LOROL is the highest performing Right Time operator at 86.9 per cent, and CrossCountry is the lowest achieving right time operator at 46.2 per cent.

Table 1.20: Passenger train punctuality at a national level (%)					
	2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Right Time	68.0	70.2	69.6	69.8	68.1

Table 1.21: Right time by sector for England & Wales and Scotland for 2012/13 (%)	
By sector	***RT Actual***
London & South East	68.4
Long Distance	54.8
Regional (incl. Scotland)	70.5
England & Wales (total)	69.1

Table 1.22: Right time by Operator for England & Wales and Scotland for 2012/13 (%)	
Operator	***RT Actual***
Arriva Trains Wales	85.5
c2c	84.6
Chiltern	86.3
CrossCountry	46.2
East Coast	61.1
East Midlands Trains	75.0
First Capital Connect	69.1
First Great Western	69.6
First Hull Trains	50.9
First ScotRail	60.0
First Transpennine Express	64.1
Grand Central	47.3
Greater Anglia	71.3
Heathrow Express	73.9
London Midland	62.7
LOROL	86.9
Merseyrail	74.7
Northern Rail	72.4
Southeastern	64.6
Southern	55.6
Stagecoach South Western Trains Ltd	67.8
Virgin Trains	49.4

Customer satisfaction

Network Rail's Customer Satisfaction survey (conducted by GfK) took place between 1 October and 12 November 2012. This is a survey of the top managers from the train and freight operators in Great Britain, both franchised and open access. The key scores are summarised in Figure 1.1.

The survey was revised this year to create a clearer structure for respondents to follow and to be more precise about Network Rail functions and activities. Questions about the impact of devolution were also added. Consistency of trend data was unaffected. The revised questionnaire was piloted with a small sample of TOC and FOC interviewees before final review and being rolled out to a wider audience.

Respondents were again offered the choice of an online option or a telephone interview, with the online option proving ten times more popular than the telephone interview, a significant increase compared with 2011. The convenience of the online option contributed to an improved response rate of 78 per cent compared to 69 per cent in 2011. There were also a high number of participants (276) which provides a strong benchmark for the 2013 survey.

Overall satisfaction increased from 43 per cent (2011) to 66 per cent (2012). This score expresses the number of respondents professing themselves satisfied or very satisfied with Network Rail overall. On a scale of one to five (where one is very dissatisfied and five very satisfied) this equated to a score of 3.55, an increase from 2011 (3.12). The overall satisfaction scores are in Figure 1.2 and Table 1.23.

Within the overall satisfaction figure, the score for TOCs was 3.56 (2011, 3.09) and for FOCs it was 3.47 (2011, 3.43). Analysis of the verbatim comments indicates that the main reasons for the increase appear to be customers being satisfied with Network Rail's delivery of train performance (taking into account the severe weather conditions) and with improved working relationships.

There were improvements in the perception of Network Rail's delivery of train performance but there is still room for improvement in this area. This survey indicates that delivery of reliable infrastructure fit to run punctual trains is at the top of the list of TOCs' and FOCs' requirements which is illustrated in Figure 1.3 and Table 1.24.

Action plans have been developed at route level as part of the natural progression of alliances and other forms of collaborative working.

Figure 1.1: Customer satisfaction key scores

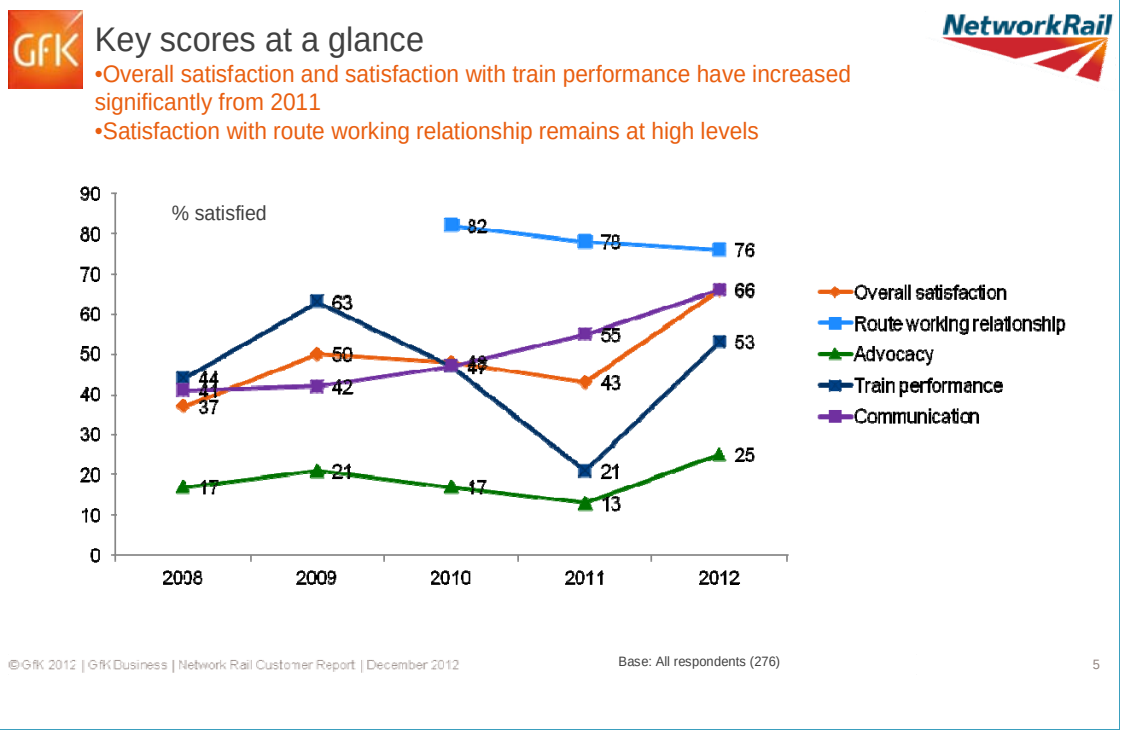


Table 1.23: Comparison of overall satisfaction

Satisfied with Network Rail	*2009*	*2010*	*2011*	*2012*	*Change from 2011*
Satisfied or very satisfied (%)	50	48	43	66	23
Dissatisfied or very dissatisfied (%)	17	29	34	19	(15)
Neither (%)	33	22	23	15	(8)
Mean	3.32	3.15	3.12	3.55	0.43

Figure 1.2: Customer satisfaction overall scores

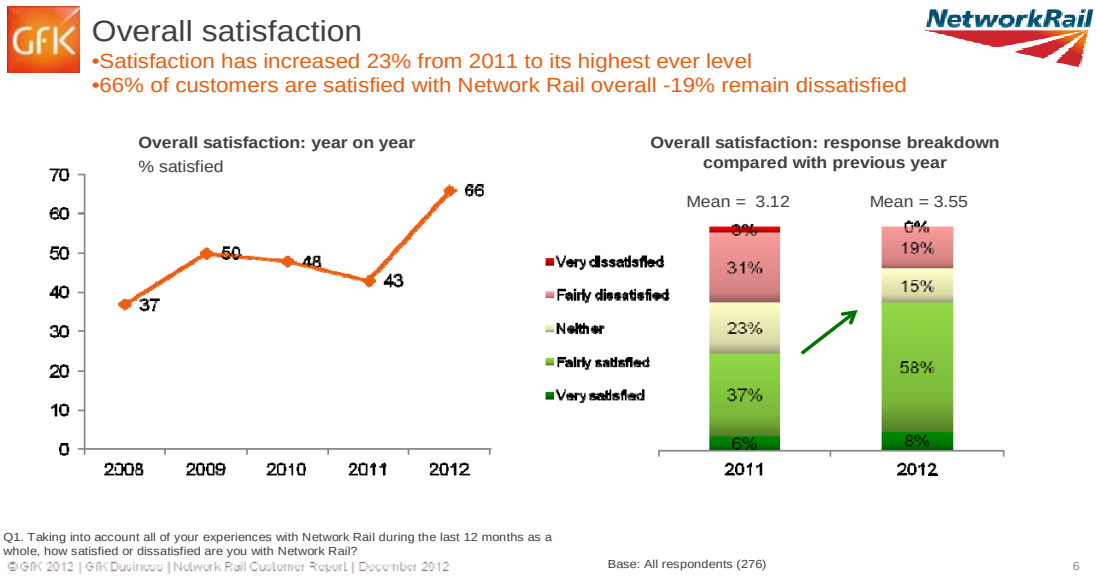
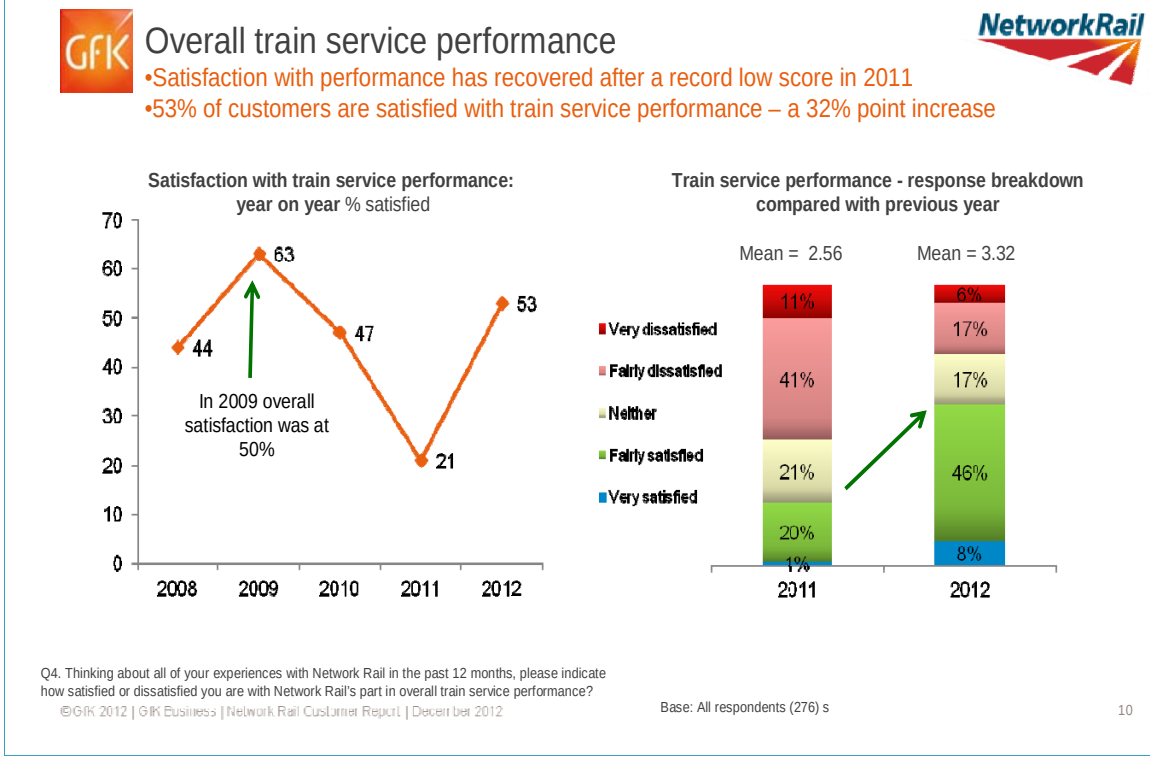


Table 1.24: Comparison of satisfaction with train service performance

Satisfied with Network Rail	*2009*	*2010*	*2011*	*2012*	*Change from 2011*
Satisfied or very satisfied (%)	63	47	21	54	33
Dissatisfied or very dissatisfied (%)	10	30	52	23	(29)
Neither (%)	21	17	21	17	(4)
Mean	3.65	3.18	2.56	3.32	0.76

Figure 1.3: Overall satisfaction with train service performance



Passenger satisfaction

The National Passenger Satisfaction (NPS) survey is commissioned by Passenger Focus. They conduct two surveys each year in spring and autumn. The latest results reflect the spring 2013 survey. Data was gathered from nearly 27,000 respondents at stations all over the network.

The results showed a slight decrease compared with the corresponding survey in spring 2012, with overall satisfaction 1.2 per cent lower at 82 per cent and 3.2 per cent lower than the autumn 2012 survey. Figure 1.4 below shows the NPS survey results over time.

London & South East and Regional sectors showed similar decreases in overall satisfaction while the Long Distance sector showed no change. Of these, Long Distance satisfaction was 87 per cent, the highest of the three, which is positive news given recent performance in this area and the current workstreams which have focused on improvement.

Network Rail is continuing to work closely with train operators to improve Passenger Information During Disruption (PIDD). The survey category most closely reflecting this area (i.e. how well a train company deals with delays) remains a low scoring area with 38 per cent satisfied - no statistically significant change is reported since spring 2012. Work continues in this area to embed and sustain the changes that have been made, so that the provision of better information to passengers becomes part of business as usual activity.

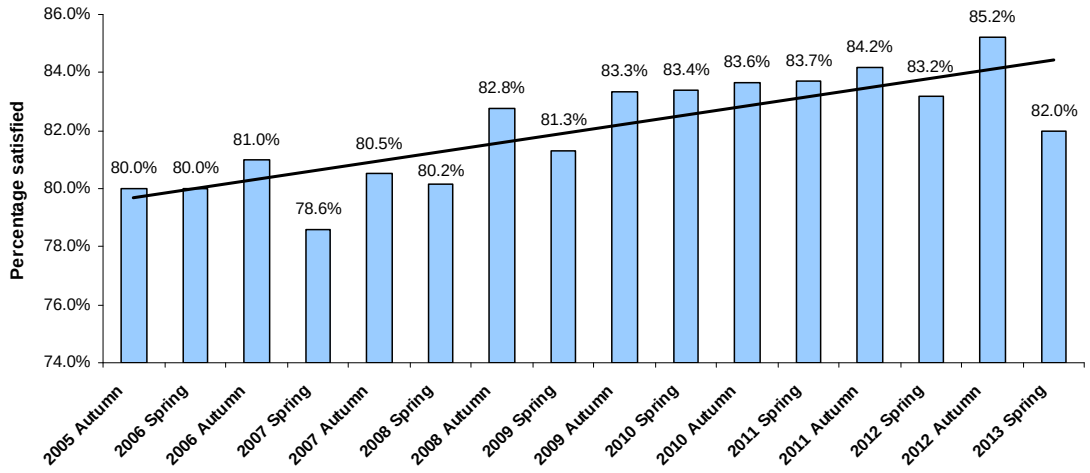
The report suggests that there is still significant room for improvement overall and through its devolved structure Network Rail will be working in partnership with the TOCs to improve delivery to the customer.

The NPS spring 2013 survey of Network Rail's Managed Stations, sampling views from nearly 11,000 passengers, showed positive results with an increase in overall satisfaction from the same period the previous year of 2 per cent, at 82 per cent.

The most positive results were at stations that have benefitted from significant development projects (Kings Cross +23 per cent, Waterloo +10 per cent). Areas for concern are at stations where development projects are beginning or currently underway (Birmingham New Street -12 per cent, London Bridge -3 per cent).

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 1.4: 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 and electrified track measures (C1 – C4). We also include information on network change, platform length and the availability of the network through our possession management.

Network capability

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

- C1 – linespeed
- C2 – gauge
- C3 – route availability value
- 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 (changes which are 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 maximum length of train that may use each of the platforms at passenger stations on the network.

For the four capability measures it should be noted that small discrepancies in the totals are due to rounding.

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
- 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 is reported for that section.

Results

Tables 2.1 to 2.4 show linespeed capability for England & Wales, Scotland and the whole network and also the breakdown by operating route for 2012/13 compared to previous years.

Commentary

In 2012/13 the length of operational lines on the total network increased by twelve track kilometres.

The significant additions include:

- two track kilometres of additional track for the re-opening of the Methil Power Station (goods line)
- one track kilometre of additional track around St Johns station
- one track kilometre of additional track for the opening of the Nuneaton North Chord.

There was two kilometres of track at Folkestone Harbour Branch taken out of use.

During the year there were also small proportions of track kilometres throughout the whole network which were added or removed. As these are small changes, the above explanations only include areas of whole track kilometre changes. In addition data cleansing throughout the year has also accounted for some of these changes.

In Anglia just less than one kilometre of track at Ipswich Dock is no longer in Network Rail ownership, a 5.6 kilometre section in Tilbury had a change of use and is now operational line and there was also a less than one kilometre extension to an existing single track just outside King's Cross.

In London North West there was a reduction of just less than two kilometres of track around Bletchley as part of the WCML upgrade, 1.4 kilometres of single track to Runcorn Dock was moved back to Network Rail ownership, 3.5 kilometres of track from three separate lines were removed from around Stratford-upon-Avon Station (end of line) and there was a removal of 2.2 kilometres of track from various lines around junctions just outside Manchester Victoria Station.

In Scotland an additional 15 kilometres of track is included due to data quality verification work.

Speed band changes in 2012/13 were not extensive, except for 18 track kilometres on the Shrewsbury and Welshpool line which are now predominantly 90 miles per hour formally (40 – 75 miles per hour).

The Reading redevelopment station has also resulted in some speed changes as the track layout was changed.

Table 2.1: Linespeed capability (km of track in each speed band) England & Wales					
Speed Band (mph)	***March 2009***	***March 2010***	***March 2011***	***March 2012***	***March 2013***
Up to 35	3,300	3,223	3,194	3,124	3,125
40 – 75	14,439	14,426	14,422	14,365	14,348
80 – 105	6,378	6,375	6,403	6,496	6,512
110 – 125	2,822	2,860	2,857	2,857	2,854
Total	**26,939**	**26,884**	**26,876**	**26,842**	**26,839**

Table 2.2: Linespeed capability (km of track in each speed band) Scotland					
Speed Band (mph)	***March 2009***	***March 2010***	***March 2011***	***March 2012***	***March 2013***
Up to 35	463	461	459	437	452
40 – 75	2,397	2,403	2,384	2,363	2,363
80 – 105	1,099	1,104	1,168	1,200	1,200
110 – 125	221	221	221	221	221
Total	**4,180**	**4,189**	**4,232**	**4,221**	**4,236**

Table 2.3: Linespeed capability (km of track in each speed band) Network-wide					
Speed Band (mph)	***March 2009***	***March 2010***	***March 2011***	***March 2012***	***March 2013***
Up to 35	3,763	3,684	3,653	3,561	3,577
40 – 75	16,836	16,829	16,806	16,728	16,711
80 – 105	7,479	7,479	7,571	7,696	7,712
110 – 125	3,043	3,081	3,078	3,078	3,075
Total	**31,119**	**31,073**	**31,108**	**31,063**	**31,075**

Table 2.4: Linespeed capability (km of track in each speed band) by operating route						
Operating Route	***Speed Band (mph)***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	0 - 35	265	253	251	240	247
	40 – 75	1,397	1,396	1,394	1,403	1,403
	80 – 105	626	626	626	626	626
	110 – 125	0	0	0	0	0
	over 125	0	0	0	0	0
East Midlands	0 - 35	195	189	186	180	180
	40 – 75	709	711	697	700	701
	80 – 105	528	538	554	554	554
	110 – 125	316	316	313	313	313
	over 125	0	0	0	0	0
Kent	0 - 35	196	192	192	186	187
	40 – 75	1,036	1,030	1,029	1,032	1,033
	80 – 105	534	533	533	525	525
	110 – 125	0	0	0	0	0
	over 125	0	0	0	0	0

Table 2.4 Continued: Linespeed capability (km of track in each speed band) by operating route						
Operating Route	***Speed Band (mph)***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
London North Eastern	0 - 35	726	705	707	699	695
	40 – 75	3,210	3,211	3,224	3,221	3,221
	80 – 105	830	829	829	829	829
	110 – 125	932	933	933	933	933
	over 125	0	0	0	0	0
London North Western	0 - 35	922	883	863	840	829
	40 – 75	3,714	3,697	3,694	3,604	3,607
	80 – 105	1,020	1,008	1,013	1,109	1,109
	110 – 125	1,081	1,119	1,119	1,119	1,119
	over 125	0	0	0	0	0
Scotland	0 - 35	463	461	459	437	452
	40 – 75	2,397	2,403	2,384	2,363	2,363
	80 – 105	1,099	1,102	1,168	1,200	1,200
	110 – 125	221	221	221	221	221
	over 125	0	0	0	0	0
Sussex	0 - 35	114	116	115	114	114
	40 – 75	754	754	754	754	754
	80 – 105	257	257	257	257	256
	110 – 125	0	0	0	0	0
	over 125	0	0	0	0	0
Wales	0 - 35	362	371	369	357	355
	40 – 75	1,532	1,539	1,542	1,542	1,523
	80 – 105	550	550	551	551	569
	110 – 125	0	0	0	0	0
	over 125	0	0	0	0	0
Wessex	0 - 35	171	168	167	171	173
	40 – 75	1,033	1,033	1,033	1,029	1,028
	80 – 105	880	880	885	883	883
	110 – 125	0	0	0	0	0
	over 125	0	0	0	0	0
Western	0 - 35	348	346	343	338	345
	40 – 75	1,053	1,055	1,055	1,080	1,078
	80 – 105	1,155	1,155	1,155	1,161	1,161
	110 – 125	492	492	492	492	489
	over 125	0	0	0	0	0
Network Total		**31,119**	**31,073**	**31,108**	**31,063**	**31,075**

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" (2590mm) high containers, up to 2500mm wide
- W12 is a gauge for up to ISO 9' 6" (2590mm) high containers, up to 2600mm wide.

A definition of these individual freight gauges can be found in the Railway Group Standard referred to above. Reference to W6 in this report is actually to the W6A profile in the Standard.

Results

Tables 2.5 to 2.8 show gauge capability for England & Wales, Scotland and the whole network and also the breakdown by operating route for 2012/13 compared to previous years. Table 2.9 shows the length of track in kilometres capable of accepting loaded vehicle types, by route availability (see section on Route Availability Value C3), gauge value and by route.

Commentary

The changes in the extent of the network reported in the linespeed capability measure are also reflected in gauge capability with a net increase of 15 route kilometres. Gauge capacity is in route kilometres rather than track kilometres so these numbers are not directly correlated to the linespeed capability measure.

With regards to the existing track:

- twelve kilometres of track between Sheet Stores Junction and Stenson Junction is now restored to W8 from W7
- 35 kilometres of the South Yorkshire Joint line between Kirk Sandall Junction and Brancliffe and on to Manton Wood has been upgraded from W7 to W8
- 19 kilometres of track between Lincoln Pyewipe Junction and Gainsborough Trent East Junction has been restored to W8 from W7
- eight kilometres of track at Hull between Springbank North Junction and Hessle Road via Walton Street has been upgraded from W6 to W8
- other works include one kilometre of new Chord at Nuneaton to W12.

Table 2.5: Gauge capability (km of route in each gauge band) England & Wales

Gauge Band	*March 2009*	*March 2010*	*March 2011*	*March 2012*	*March 2013*
W6	4,924	5,284	5,479	5,461	5,451
W7	2,220	2,313	2,258	2,188	2,120
W8	3,721	3,187	2,974	2,997	3,075
W9	1,075	1,057	1,023	947	947
W10 and W6	6	0	0	0	0
W10 and W8	62	74	114	163	162
W10 and W9	1008	1,039	1,105	1,178	1,178
W12	130	130	135	135	136
Total	**13,146**	**13,084**	**13,088**	**13,069**	**13,069**

Table 2.6: Gauge capability (km of route in each gauge band) Scotland					
Gauge Band	***March 2009***	***March 2010***	***March 2011***	***March 2012***	***March 2013***
W6	125	122	118	101	115
W7	944	942	933	896	896
W8	1,130	1,131	1,110	1,147	1,147
W9	308	303	358	359	359
W10 and W6	0	0	0	0	0
W10 and W8	0	0	0	0	0
W10 and W9	162	171	170	170	171
W12	0	0	0	0	0
Total	**2,669**	**2,669**	**2,689**	**2,673**	**2,688**

Table 2.7: Gauge capability (km of route in each gauge band) Network-wide					
Gauge Band	***March 2009***	***March 2010***	***March 2011***	***March 2012***	***March 2013***
W6	5,049	5,406	5,597	5,562	5,566
W7	3,164	3,255	3,191	3,084	3,016
W8	4,851	4,318	4,084	4,144	4,222
W9	1,383	1,360	1,381	1,306	1,306
W10 and W6	6	0	0	0	0
W10 and W8	62	74	114	163	162
W10 and W9	1,170	1,210	1,275	1,348	1,349
W12	130	130	135	135	136
Total	**15,815**	**15,753**	**15,777**	**15,742**	**15,757**

Table 2.8: Gauge capability (km of route in each gauge band) by operating route						
Operating Route	***Gauge Band***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	W6	294	286	279	279	279
	W7	5	5	5	5	5
	W8	521	508	468	467	467
	W9	131	131	109	63	64
	W10 and W6	6	0	0	0	0
	W10 and W8	62	74	114	115	115
	W10 and W9	178	184	206	251	251
	W12	0	0	5	5	5
East Midlands	W6	203	247	246	247	247
	W7	251	225	225	162	150
	W8	247	227	227	247	259
	W9	0	0	0	0	0
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	42	42
	W10 and W9	0	0	0	0	0
	W12	0	0	0	0	0

Table 2.8 Continued: Gauge capability (km of route in each gauge band) by operating route						
Operating Route	***Gauge Band***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Kent	W6	555	552	551	550	550
	W7	129	129	129	129	129
	W8	92	92	92	92	92
	W9	43	43	43	41	41
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	0	0
	W10 and W9	0	0	0	0	0
	W12	0	0	0	0	0
London North Eastern	W6	816	816	812	804	792
	W7	318	323	300	300	246
	W8	888	869	906	904	969
	W9	626	625	626	610	610
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	5	5
	W10 and W9	13	13	13	29	29
	W12	46	46	46	46	46
London North Western	W6	806	803	883	881	882
	W7	701	690	657	651	648
	W8	513	485	396	403	403
	W9	185	166	153	140	140
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	0	0
	W10 and W9	816	842	886	898	898
	W12	84	84	84	84	85
Scotland	W6	126	122	118	100	115
	W7	943	941	933	896	896
	W8	1,130	1,131	1,110	1,147	1,147
	W9	308	303	358	359	359
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	0	0
	W10 and W9	162	171	171	171	171
	W12	0	0	0	0	0
Sussex	W6	342	342	342	340	341
	W7	88	88	88	88	88
	W8	40	40	40	40	40
	W9	41	41	41	41	41
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	0	0
	W10 and W9	0	0	0	0	0
	W12	0	0	0	0	0

Table 2.8 Continued: Gauge capability (km of route in each gauge band) by operating route						
Operating Route	***Gauge Band***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Wales	W6	814	772	893	889	888
	W7	168	259	259	259	259
	W8	469	435	314	313	313
	W9	34	30	30	30	30
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	0	0
	W10 and W9	0	0	0	0	0
	W12	0	0	0	0	0
Wessex	W6	581	573	574	574	574
	W7	286	286	286	285	285
	W8	170	170	170	170	170
	W9	5	11	11	11	11
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	0	0
	W10 and W9	0	0	0	0	0
	W12	0	0	0	0	0
Western	W6	513	897	898	897	898
	W7	274	309	309	309	310
	W8	781	361	361	361	362
	W9	10	10	10	10	10
	W10 and W6	0	0	0	0	0
	W10 and W8	0	0	0	0	0
	W10 and W9	0	0	0	0	0
	W12	0	0	0	0	0
Network Total		**15,815**	**15,754**	**15,777**	**15,742**	**15,757**

Table 2.9: Gauge - Length of track (km) by operating route

	Route Availability	RA0	RA1	RA2	RA3	RA4	RA5	RA6	RA7	RA8	RA9	RA10
	Gauge Band											
Anglia	W6	1	0	0	27	9	0	41	300	56	19	0
	W7	0	0	0	0	0	0	0	0	10	0	0
	W8	0	0	0	0	12	0	48	107	665	31	0
	W9	1	0	0	0	0	0	0	0	126	0	1
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	24	178	0	0
	W10 and W9	0	0	0	0	0	0	0	0	615	0	0
	W12	0	0	0	0	0	0	0	0	5	0	0
East Midlands	W6	3	0	0	0	0	10	0	6	502	0	0
	W7	0	0	0	0	0	0	0	0	374	0	0
	W8	0	0	0	0	0	0	0	0	765	0	0
	W9	0	0	0	0	0	0	0	0	0	0	0
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	85	3	0
	W10 and W9	0	0	0	0	0	0	0	0	0	0	0
	W12	0	0	0	0	0	0	0	0	0	0	0
Kent	W6	5	0	0	0	54	0	25	56	1,034	0	0
	W7	0	0	0	0	0	0	0	0	273	0	0
	W8	0	0	0	0	0	0	0	0	173	0	0
	W9	0	0	0	0	0	0	0	0	125	0	0
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	0	0	0
	W10 and W9	0	0	0	0	0	0	0	0	0	0	0
	W12	0	0	0	0	0	0	0	0	0	0	0
London North Eastern	W6	13	0	0	0	0	11	135	183	899	108	2
	W7	0	0	0	0	0	0	0	0	499	2	0
	W8	7	0	0	0	0	0	0	10	1,549	407	19
	W9	5	0	0	0	0	0	0	0	172	1488	1
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	0	10	0
	W10 and W9	0	0	0	0	0	0	0	0	26	39	0
	W12	1	0	0	0	0	0	0	0	4	44	44
London North Western	W6	15	0	0	0	0	0	9	86	1,506	0	0
	W7	0	0	0	0	0	0	0	238	1,034	0	0
	W8	1	0	0	0	0	0	0	83	726	0	0
	W9	1	0	0	0	0	0	0	87	208	0	0
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	0	0	0
	W10 and W9	6	0	0	0	0	0	0	0	2,487	0	0
	W12	0	0	0	0	0	0	0	0	177	0	0

Table 2.9 Continued: Gauge - Length of track (km) by operating route

	Route Availability	RA0	RA1	RA2	RA3	RA4	RA5	RA6	RA7	RA8	RA9	RA10
	Gauge Band											
Scotland	W6	10	0	0	0	0	32	7	0	30	0	74
	W7	0	0	0	11	0	319	0	31	309	0	656
	W8	0	0	0	26	0	578	0	46	388	0	652
	W9	0	0	0	0	0	5	0	0	120	4	555
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	0	0	0
	W10 and W9	0	0	0	0	0	0	0	0	43	0	340
	W12	0	0	0	0	0	0	0	0	0	0	0
Sussex	W6	0	0	0	0	89	0	28	1	614	0	0
	W7	0	0	0	0	0	0	0	22	160	0	0
	W8	0	0	0	0	0	0	0	0	81	0	0
	W9	0	0	0	0	0	0	0	0	129	0	0
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	0	0	0
	W10 and W9	0	0	0	0	0	0	0	0	0	0	0
	W12	0	0	0	0	0	0	0	0	0	0	0
Wales	W6	0	0	0	0	0	348	230	130	547	0	0
	W7	0	0	0	0	0	0	4	60	407	0	0
	W8	1	0	0	0	0	1	26	2	654	0	0
	W9	1	0	0	0	0	35	0	0	1	0	0
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	0	0	0
	W10 and W9	0	0	0	0	0	0	0	0	0	0	0
	W12	0	0	0	0	0	0	0	0	0	0	0
Western	W6	2	0	0	5	41	64	128	301	1,076	0	0
	W7	0	0	0	0	0	0	19	53	673	0	0
	W8	0	0	0	0	0	0	0	44	655	0	0
	W9	0	0	0	0	0	0	0	0	12	0	0
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	0	0	0
	W10 and W9	0	0	0	0	0	0	0	0	0	0	0
	W12	0	0	0	0	0	0	0	0	0	0	0
Wessex	W6	3	18	0	0	32	6	174	101	726	0	0
	W7	0	0	0	0	0	0	0	12	558	0	0
	W8	0	0	0	0	0	0	0	0	422	0	0
	W9	0	0	0	0	0	0	0	0	32	0	0
	W10 and W6	0	0	0	0	0	0	0	0	0	0	0
	W10 and W8	0	0	0	0	0	0	0	0	0	0	0
	W10 and W9	0	0	0	0	0	0	0	0	0	0	0
	W12	0	0	0	0	0	0	0	0	0	0	0

Table 2.9 Continued: Gauge - Length of track (km) by operating route

	Route Availability	RA0	RA1	RA2	RA3	RA4	RA5	RA6	RA7	RA8	RA9	RA10
	Gauge Band											
Network Total	**W6**	**52**	**18**	**0**	**32**	**225**	**471**	**777**	**1,164**	**6,990**	**127**	**76**
	W7	**0**	**0**	**0**	**11**	**0**	**319**	**23**	**416**	**4,297**	**2**	**656**
	W8	**9**	**0**	**0**	**26**	**12**	**579**	**74**	**292**	**6,078**	**438**	**671**
	W9	**8**	**0**	**0**	**0**	**0**	**40**	**0**	**87**	**925**	**1,492**	**557**
	W10 and W6	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	W10 and W8	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**24**	**263**	**13**	**0**
	W10 and W9	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,171**	**39**	**340**
	W12	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**186**	**44**	**44**

Route availability (RA) value (C3)

Definition

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

The RA measure is a measurement of the length of track in kilometres capable of accepting different loaded vehicle types. Since the Annual Return 2010 we have reported the results by individual RA value.

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 on the strength of individual bridges to check compatibility.

Results

Tables 2.10 to 2.13 show the route availability for England & Wales, Scotland and the whole network and also the breakdown by operating route for 2012/13 compared to previous years.

Commentary

Increases in route availability together with network size alterations and the result of data cleansing as reported for the linespeed capability C1 measure are the principal reason for changes in RA tables.

The principal changes resulting from the increase in the extent of the network result in the following changes:

- two kilometres of RA8 for the re-opening of the Methil Power Station (Goods Line)
- one kilometre of RA8 for the opening of the Nuneaton North Chord
- one kilometre of RA8 for additional track around St Johns station.

The principal change resulting from the reduction in the extent of the network results in the following change:

- two kilometres of RA8 for Folkestone Harbour Branch taken out of use.

The principle changes in route availability for existing lines on the network are:

- 34 kilometres of line between Dundee and Aberdeen restored from RA7 to RA10
- eleven kilometres of line between Willingdon Junction and St Leonards West Marina restored from RA4 to RA8
- one kilometre of line between Newcastle East Junction and Heaton South Junction restored from RA8 to RA9
- one kilometre of line between York and Malton reduced from RA8 to RA6 following establishment of Short Term Network Change.

There have been a number of RA changes during the year and the changes are a consequence of the established safety, engineering and contractual processes (e.g. network changes through the track access conditions). The changes are a combination of the additional/removal of track and those values changing in the relevant RA totals.

The overall changes to the Anglia and LNW Route are due to minor changes in additional / removal of track. In Kent the five kilometres of track has been changed due to data cleansing. LNE also has minor changes in additional / removal of track plus eight kilometres of track just outside Newcastle Station. Sussex has a change in RA on 21 kilometres of track on a section between Eastbourne and Hastings.

Table 2.10: Structures route availability (km of track) for England & Wales

Route availability band	*March 2009*	*March 2010*	*March 2011*	*March 2012*	*March 2013*
(1.)		86	78	60	66
RA1		19	19	19	18
RA2		36	7	0	0
RA3	2,456 [2]	72	32	32	32
RA4		670	273	273	237
RA5		464	469	475	475
RA6		845	871	867	867
RA7		1,759	1,873	1,907	1,906
RA8	24,418 [3]	20,721	21,042	21,000	21,020
RA9		2,146	2,145	2,142	2,151
RA10	65	66	67	67	67
Total	**26,939**	**26,884**	**26,876**	**26,842**	**26,839**

Notes:
1. RA value not reported, line out of use, leased or status being checked
2. RA1-6 not reported
3. RA7-9.

Table 2.11: Structures route availability (km of track) for Scotland

Route availability band	*March 2009*	*March 2010*	*March 2011*	*March 2012*	*March 2013*
(1.)		3	3	3	10
RA1		0	0	0	0
RA2		0	0	0	0
RA3	1,102 [2]	118	38	37	37
RA4		0	0	0	0
RA5		939	934	934	934
RA6		7	7	7	7
RA7		210	223	228	77
RA8	1,173 [3]	873	899	882	890
RA9		4	4	4	4
RA10	1,905	2,035	2,124	2,126	2,277
Total	**4,180**	**4,189**	**4,232**	**4,221**	**4,236**

Notes:
1. RA value not reported, line out of use, leased or status being checked
2. RA1-6 not reported
3. RA7-9.

Table 2.12: Structures route availability (km of track) for Network

Route availability band	*March 2009*	*March 2010*	*March 2011*	*March 2012*	*March 2013*
(1.)		89	81	63	76
RA1		19	19	19	18
RA2		36	7	0	0
RA3	3,558 [2]	190	70	69	69
RA4		670	273	273	237
RA5		1,403	1,403	1,409	1,409
RA6		852	878	874	874
RA7		1,969	2,096	2,135	1,983
RA8	25,591 [3]	21,594	21,941	21,882	21,910
RA9		2,150	2,149	2,146	2,155
RA10	1,970	2,101	2,191	2,193	2,344
Total	**31,119**	**31,073**	**31,108**	**31,063**	**31,075**

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.

Table 2.13: Structures route availability (km of track) by operating route

	Gauge Band	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	(1.)	234 [2]	1	1	1	2
	RA1		1	1	1	0
	RA2		0	0	0	0
	RA3		57	27	27	27
	RA4		43	21	21	21
	RA5		0	0	0	0
	RA6		83	89	89	89
	RA7	2,054 [3]	415	431	431	431
	RA8		1,624	1,650	1,648	1,655
	RA9		50	50	50	50
	RA10	0	0	0	0	1
East Midlands	(1.)	82 [2]	1	7	3	3
	RA1		0	0	0	0
	RA2		0	0	0	0
	RA3		0	0	0	0
	RA4		0	0	0	0
	RA5		9	9	10	10
	RA6		0	0	0	0
	RA7	1,667 [3]	7	7	7	6
	RA8		1,734	1,725	1,726	1,726
	RA9		3	3	3	3
	RA10	0	0	0	0	0

Table 2.13 Continued: Structures route availability (km of track) by operating route

	Gauge Band	2008/09	2009/10	2010/11	2011/12	2012/13
Kent	(1.)	213 [2]	0	0	0	5
	RA1		0	0	0	0
	RA2		0	0	0	0
	RA3		0	0	0	0
	RA4		129	69	69	54
	RA5		0	0	0	0
	RA6		25	25	25	25
	RA7	1,553 [3]	29	56	56	56
	RA8		1,572	1,603	1,593	1,605
	RA9		0	0	0	0
	RA10	0	0	0	0	0
London North Eastern	(1.)	239 [2]	27	33	26	26
	RA1		0	0	0	0
	RA2		36	7	0	0
	RA3		10	0	0	0
	RA4		0	0	0	0
	RA5		5	5	11	11
	RA6		134	134	134	135
	RA7	5,395 [3]	164	194	194	193
	RA8		3,143	3,161	3,160	3,149
	RA9		2,094	2,092	2,090	2,098
	RA10	65	67	67	67	66
London North Western	(1.)	79 [2]	47	25	22	23
	RA1		0	0	0	0
	RA2		0	0	0	0
	RA3		0	0	0	0
	RA4		0	0	0	0
	RA5		0	0	0	0
	RA6		9	9	9	9
	RA7	6,658 [3]	495	492	494	494
	RA8		6,156	6,163	6,146	6,138
	RA9		0	0	0	0
	RA10	0	0	0	0	0
Scotland	(1.)	1,102 [2]	3	3	3	10
	RA1		0	0	0	0
	RA2		0	0	0	0
	RA3		118	38	37	37
	RA4		0	0	0	0
	RA5		939	934	934	934
	RA6		7	7	7	7
	RA7	1,173 [3]	210	223	228	77
	RA8		873	899	882	890
	RA9		4	4	4	4
	RA10	1,905	2,035	2,124	2,126	2,277

Table 2.13 Continued: Structures route availability (km of track) by operating route

	Gauge Band	2008/09	2009/10	2010/11	2011/12	2012/13
Sussex	(1.)	312 [2]	0	0	0	0
	RA1		0	0	0	0
	RA2		0	0	0	0
	RA3		0	0	0	0
	RA4		261	110	110	89
	RA5		0	0	0	0
	RA6		45	28	28	28
	RA7	814 [3]	23	23	23	23
	RA8		797	965	963	984
	RA9		0	0	0	0
	RA10	0	0	0	0	0
Wales	(1.)	678 [2]	5	5	2	2
	RA1		0	0	0	0
	RA2		0	0	0	0
	RA3		0	0	0	0
	RA4		0	0	0	0
	RA5		380	384	385	384
	RA6		264	263	260	260
	RA7	1,767 [3]	192	192	192	192
	RA8		1,618	1,618	1,611	1,609
	RA9		0	0	0	0
	RA10	0	0	0	0	0
Wessex	(1.)	361 [2]	3	3	3	3
	RA1		18	18	18	18
	RA2		0	0	0	0
	RA3		0	0	0	0
	RA4		196	32	32	32
	RA5		6	6	6	6
	RA6		135	175	175	174
	RA7	1,724 [3]	69	113	113	113
	RA8		1,655	1,738	1,738	1,738
	RA9		0	0	0	0
	RA10	0	0	0	0	0
Western	(1.)	261 [2]	3	3	3	3
	RA1		18	18	18	18
	RA2		0	0	0	0
	RA3		0	0	0	0
	RA4		196	32	32	32
	RA5		6	6	6	6
	RA6		135	175	175	174
	RA7	2,788 [3]	69	113	113	113
	RA8		1,655	1,738	1,738	1,738
	RA9		0	0	0	0
	RA10	0	0	0	0	0
Network Total		**31,119***	**31,073***	**31,108***	**31,063***	**31,075**

Notes:
1. RA value not reported, line out of use, leased or status being checked
2. RA1-6 not reported
3. 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.
- third 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 2.14 to 2.17 show electrification capability for England & Wales, Scotland and the whole network and also the breakdown by operating route for 2012/13 compared to previous years.

Commentary

Network size alterations as reported for the linespeed capability measure are the principal reason for changes in electrification data.

An error was made with the AC OHL electrified track kilometres reported for Scotland in 2011/12. The number reported should have been 1,495 kilometres. This has now been corrected (as in Table 2.15). In 2012/13 works were completed at Paisley Canal (9km) and Paisley Corridor (10km) which accounts for the additional 19km of electrified track reported.

In Kent the total kilometres of DC electrified track has increased due to double tracking at Tanners Hill Flydown.

In addition data cleansing throughout the year by our Route Asset Managers has also accounted for some of these changes.

Table 2.14: Electrification capability (km of electrified track) England & Wales

	March 2009	*March 2010*	*March 2011*	*March 2012*	*March 2013*
25 kV AC overhead	6,747	6,761	6,757	6,739	6,750
Third rail 650/ 750V DC	4,481	4,475	4,470	4,469	4,473
Dual AC, overhead/third rail DC	40	37	37	35	34
1500V DC overhead	39	39	39	39	39
Total electrified	11,307	11,312	11,303	11,282	11,296
Non-electrified	15,632	15,572	15,573	15,560	15,543
Total	**26,939**	**26,884**	**26,876**	**26,842**	**26,839**

Table 2.15: Electrification capability (km of electrified track) Scotland

	March 2009	*March 2010*	*March 2011*	*March 2012*	*March 2013*
25 kV AC overhead	1,253	1,255	1,302	1,495	1,514
Third rail 650/ 750V DC	0	0	0	0	0
Dual AC, overhead/third rail DC	0	0	0	0	0
1500V DC overhead	0	0	0	0	0
Total electrified	1,253	1,255	1,302	1,495	1,514
Non-electrified	2,927	2,934	2,930	2,726	2,722
Total	**4,180**	**4,189**	**4,232**	**4,221**	**4,236**

Table 2.16: Electrification capability (km of electrified track) Network-wide

	March 2009	*March 2010*	*March 2011*	*March 2012*	*March 2013*
25 kV AC overhead	8,000	8,016	8,059	8,234	8,264,
Third rail 650/ 750V DC	4,481	4,475	4,470	4,469	4,473
Dual AC, overhead/third rail DC	40	37	37	35	34
1500V DC overhead	39	39	39	39	39
Total electrified	12,560	12,567	12,605	12,777	12,810
Non-electrified	18,559	18,506	18,503	18,286	18,265
Total	**31,119**	**31,073**	**31,108**	**31,063**	**31,075**

Table 2.17: Electrification track capability (km of electrified track) by operating route

	Gauge Band	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	AC OHL	1,452	1,451	1,449	1,453	1,457
	AC / DC	15	15	15	13	13
	DC	23	21	21	20	20
	DC OHL	0	0	0	0	0
	None	798	788	787	783	786
East Midlands	AC OHL	353	347	346	343	343
	AC / DC	0	0	0	0	0
	DC	0	0	0	0	0
	DC OHL	0	0	0	0	0
	None	1,395	1,406	1,405	1,405	1,405
Kent	AC OHL	11	9	9	2	9
	AC / DC	14	11	12	11	11
	DC	1,652	1,647	1,644	1,644	1,645
	DC OHL	0	0	0	0	0
	None	89	89	89	87	80
London North Eastern	AC OHL	2,023	2,024	2,021	2,019	2,019
	AC / DC	0	0	0	0	0
	DC	9	9	9	9	9
	DC OHL	39	39	39	39	39
	None	3,629	3,608	3,624	3,614	3,611
London North Western	AC OHL	2,805	2,827	2,828	2,817	2,817
	AC / DC	9	9	8	8	8
	DC	292	292	292	290	292
	DC OHL	0	0	0	0	0
	None	3,632	3,580	3,562	3,555	3,547
Scotland	AC OHL	1,253	1,255	1,302	1,495	1,514
	AC / DC	0	0	0	0	0
	DC	0	0	0	0	0
	DC OHL	0	0	0	0	0
	None	2,925	2,933	2,931	2,726	2,722
Sussex	AC OHL	1	1	1	1	1
	AC / DC	2	2	2	2	2
	DC	1,031	1,032	1,032	1,032	1,032
	DC OHL	0	0	0	0	0
	None	91	91	91	89	89
Wales	AC OHL	0	0	0	0	0
	AC / DC	0	0	0	0	0
	DC	0	0	0	0	0
	DC OHL	0	0	0	0	0
	None	2,445	2,459	2,462	2,450	2,447

Table 2.17 Continued: Electrification track capability (km of electrified track) by operating route						
	Gauge Band	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Wessex	AC OHL	0	0	0	0	0
	AC / DC	0	0	0	0	0
	DC	1,475	1,475	1,473	1,474	1,475
	DC OHL	0	0	0	0	0
	None	609	606	610	609	609
Western	AC OHL	102	103	104	104	104
	AC / DC	0	0	0	0	0
	DC	0	0	0	0	0
	DC OHL	0	0	0	0	0
	None	2,946	2,945	2,941	2,968	2,969
Network Total		**31,119**	**31,073**	**31,108**	**31,063**	**31,075**

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 2012 to 31 March 2013.

Results

Table 2.18 provides the number of Network changes consulted, established and withdrawn in the past year. 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 during 2012/13 are detailed for each route. Whereas in previous years we have only reported Network changes at a national level. By way of comparison in 2011/12 the number of permanent changes was 146. There were 133 established changes, twelve withdrawn changes and 43 no material effect changes.

Where the previous Infrastructure Capability Programme (ICP) Short Term Network changes have resulted in a permanent change of capability, the corresponding Network change consultation is reflected in the numbers reported here.

In Anglia, Kent, Scotland, Sussex and Wessex the number of Network changes has fallen from the previous year. This is a result of the CP4 workbank having completed the majority of required Network changes earlier in the control period.

The total number of Western route Network changes for 2012/13 was slightly higher compared to last year even after taking into account the separation of Wales route. 2012/13 was the first year that the new Wales route was responsible for issuing its own Network changes since devolution.

For London North East (LNE) and East Midlands the Network changes given in Table 2.18 are combined and are similar to the changes in 2011/12. The number of permanent Network changes issued on the London North Western (LNW) route has increased since 2011/12 by 46 per cent. The reduction in the number of establishments to 2011/12 is due to a significant number of Network changes being issued in the period leading up to the Annual Return 2013 which would not be established by the Annual Return publication date.

Table 2.18 Network changes (2012/13)

	Permanent Network changes	*Established*	*Withdrawn*	*No Material Effect changes*
Anglia	5	4	1	9
LNE / EM	34	39	4	20
Kent	9	9	0	1
LNW	41	21	2	6
Scotland	21	14	1	1
Sussex	7	8	0	0
Wales	8	5	1	7
Western	23	22	1	5
Wessex	7	5	1	0
Network Total	**155**	**127**	**11**	**49**

Notes:
Major projects can also generate network changes, where this is the case, details of these can be found on our website using this link.

Table 2.19: Discrepancies between actual and published capability identified by the Infrastructure Capability Programme

Route	*Line of route*	*Section*	*Capability measure*	*Published status*	*Current status*
LNE	LN804	Tapton Junction to Sheffield North	G	W6a W7(S) W8(S)	STNC extension will be consulted when scope, timescales and funding arrangements finalised with electrification team
LNE	LN860	Thornhill Junction to Leeds, Holbeck East Junction	G	W6a* W7(S) W8(S)	A new STNC will be consulted to combine funding and scope with electrification works
LNE	LN800	Clipstone Triangle	T	Out of use	Was subject to temporary Network change which has expired and will be sought to be extended

Key:
G = Gauge capability
T = Track and route mileage
W6a* refers to the existing wagon types listed in the header notes to Table D5 – Route Clearance of Freight Vehicles
W7(S) refers to specific wagon/container combinations which are permitted to run, but the section does not offer full W7 gauge.
W8(S) refers to specific wagon/container combinations which are permitted to run, but the section does not offer full W8 gauge.

Table 2.20: Number of short-term Network changes

		Expiring by the end of March in each year					
	Total	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***
Anglia	3	1	1	0	0	1	0
EM / LNE	10	1	1	2	4	2	0
Kent	9	0	7	1	1	0	0
LNW	5	1	3	0	0	1	0
Scotland	52	24	11	16	1	0	0
Sussex	7	1	4	0	0	2	0
Wales	1	0	0	0	1	0	0
Wessex	5	3	1	0	0	1	0
Western	3	0	3	0	0	0	0
Network Total	**95**	**31**	**31**	**19**	**7**	**7**	**0**

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. Two Short Term Network Changes have expired without the former gauge capability status being reinstated. We will consult on extensions to the STNCs when timescales for completion of the works have been confirmed.

Commentary

This is the fourth year in which this data has been published in the Annual Return. For the reasons set out in Table 2.19 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.

- Thornhill Junction to Leeds, Holbeck East Junction - W8 gauge clearance work has started at sites on the section but has not been completed due to resource limitations. In the time since development started, the TransPennine electrification project has been confirmed. The optimal solution to provide W8 clearance over this section is to combine the funding and possession arrangements to reduce overall costs and create the minimum possession disruption. Separately, three sites west of Diggle on the Trans-Pennine route are known to have very tight clearances to W8 gauge and these will be addressed by co-funding and clearance in 2016 by the electrification team. It is intended that a STNC covering the core Stalybridge to Leeds route, limiting gauge traffic to the currently operating W8(S) combinations, will be consulted with a commitment to provide full W8 clearances by December 2016
- Tapton Junction to Sheffield North. Similarly, in the time since development started, the Midland Main Line electrification project has been confirmed and is being developed. Access and resources have frustrated full W8 clearance over this section, and the solution will fall into line with electrification scope and timescales. A STNC will be consulted, limiting gauge traffic to the currently operating W8(S) combinations, when track lowering timescales are confirmed with the electrification project
- A short-term network change was established for Clipstone Triangle which is on until 21/5/2013.

Discrepancies between published and actual capability arise from time to time and these are published on the Discrepancy Register pending resolution.

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

Table 2.20 provides the number of STNCs for each operating route, and the dates by which they are due to expire.

Commentary

For Anglia, Kent, Sussex and Wessex all but three of the STNCs were part of the ICP. Extensions have

Table 2.21 Platform lengths (metres) Network-wide		
	2011/12	**2012/13**
England & Wales	823,628	811,456
Scotland	110,770	110,217
Network total	**934,398**	**921,673**

already been progressed for expiring STNCs and the agreed variation changes are reflected in Table 2.20.

For LNW the number of STNCs has decreased slightly from 2011/12. This is due to previous STNCs being extended past their original end date and also becoming permanent Network changes.

In Scotland the number of STNCs has increased from previous years due to an increase in projects utilising STNCs to facilitate their works.

Platform lengths

Definition

The operational platform lengths 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 England & Wales, Scotland 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 2.21 shows the combined lengths of all platforms at stations for England & Wales, Scotland, and for the whole network. Platforms at stations not on the Network Rail owned, operated and maintained network are not included. This includes the international platforms at Ashford, Ebbsfleet and London St Pancras. International stations which are on the High Speed 1 network, Heathrow International Airport and the platforms on the Heathrow Express network, are also excluded. In reviewing the Annual Return 2012 the Independent Reporter found that the platform length numbers recorded by Network Rail were correct. However, a number of 'double counts' were subsequently identified where platforms were found to be included in more than one route calculation. As a result there is a significant correction in reported platform lengths this year.

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 twelve cars) to operate.

Table 2.22 provides a sample of stations at which one or more platforms have been lengthened in 2012/13 as part of train and platform lengthening programmes. Although the platforms have been lengthened at these stations the new operational length may not be in operation until the next working timetable (December 2013) and as such the new length has not been included in the total operational length calculated. There have been no changes on the East Midlands or Kent Route.

Table 2.22: Stations with platforms lengthened in 2012/13				
Station	**Route**	**New Operational Length (metres)**	**Old Operational Length (metres)**	**Change in Operational Length (metres)**
Beccles	Anglia	125 - New Platform		125
Arlesey	LNE	245 - Down Platform	164	81
		245 - Up Platform	164	81
Biggleswade	LNE	247 - Down Fast	169	78
		247 - Down Slow	170	77
		246 - Up Fast	168	78
		246 - Up Slow	168	78
Sandy	LNE	246 - Up Platform	169	77
		246 - Down Platform	169	77

Table 2.22 Continued: Stations with platforms lengthened in 2012/13

Station	Route	New Operational Length (metres)	Old Operational Length (metres)	Change in Operational Length (metres)
Stalybridge	LNW	225 – New Platform 1		225
		115 – Platform 2	112	3
		225 – Platform 3	260	(35)
		250 – Platform 4	158	92
		140 – New Platform 5		140
Salford Crescent	LNW	156.8 – Platform 1	130	26.8
		153.5 – Platform 2	130	23.5
Conan Bridge	Scotland	15 - New Platform		15
Norwood Junction	Sussex	204 - Platform 3	184	20
Fishguard and Goodwick	Wales	92 - Platform 1	80	12
Reading	Western	285 - Platform 7	301	(16)
		331 - Platform 8	323	8
		331 - Platform 9	372	(41)
		330 - Platform 10	283	47
		330 - Platform 11	91	239
		272 - New Platform 12	-	272
		272 - New Platform 13	-	272
		272 - New Platform 14	-	272
		272 - New Platform 15	-	272
Berrylands	Wessex	205 - Platform 1	159	46
		205 - Platform 2	159	46
Bookham	Wessex	205 - Platform 1	157	48
		205 - Platform 2	159	46
Chessington North	Wessex	205 - Platform 1	165	40
		205 - Platform 2	165	40
Chessington South	Wessex	205	161	44
Clandon	Wessex	205 - Platform 1	159	46
		205 - Platform 2	158	47
Clapham Junction	Wessex	205 - Platform 11	204	1
Claygate	Wessex	205 - Platform 1	153	52
		205 - Platform 2	153	52
Cobham & Stoke D'Abernon	Wessex	205 - Platform 1	153	52
		205 - Platform 2	153	52
Earlsfield	Wessex	205 - Platform 1	173	32
		205 - Platform 2	173	32
		205 - Platform 3	203	2
Effingham Junction	Wessex	205 - Platform 1	157	48
		205 - Platform 2	155	50
Ewell West	Wessex	205 - Platform 1	173	32
		205 - Platform 2	173	32
Fulwell	Wessex	205 - Platform 1	172	33
		205 - Platform 2	172	33
Guildford	Wessex	210 - Platform 1	163	47
		208 - Platform 2	200	8
Hampton	Wessex	205 - Platform 1	179	26
		205 - Platform 2	179	26
Hampton Court	Wessex	207 - Platform 1	171	36
		207 - Platform 2	171	36

Table 2.22 Continued: Stations with platforms lengthened in 2012/13

Station	Route	New Operational Length (metres)	Old Operational Length (metres)	Change in Operational Length (metres)
Hampton Wick	Wessex	205 - Platform 1	156	49
		205 - Platform 2	156	49
Hinchley Wood	Wessex	205 - Platform 1	160	45
		205 - Platform 2	160	45
Horsley	Wessex	205 - Platform 1	161	44
		205 - Platform 2	161	44
Kempton Park	Wessex	205 - Platform 1	227	(22)
		205 - Platform 2	321	(116)
Kingston	Wessex	205 - Platform 3	133	72
London Road (Guildford)	Wessex	205 - Platform 1	162	43
		205 - Platform 2	162	43
Malden Manor	Wessex	205 - Platform 1	165	40
		205 - Platform 2	165	40
Motspur Park	Wessex	205 - Platform 1	160	45
		205 - Platform 2	160	45
New Malden	Wessex	205 - Platform 1	169	36
		205 - Platform 4	169	36
Norbiton	Wessex	205 - Platform 1	157	48
		205 - Platform 2	157	48
Oxshott	Wessex	205 - Platform 1	155	50
		205 - Platform 2	155	50

Network availability

Possession Disruption Index – Passenger (PDI-P)

Definition

The PDI-P 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 PDI-F 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 Strategic Route Section divided by average freight tonne km for network) x (track km available divided by total Track km).

Results

Table 2.23 shows the PDI-P and PDI-F for 2012/13 compared to plan and previous years.

Commentary

We ended the year ahead of the Network Availability passenger (PDI-P) and freight (PDI-F) targets set for 2012/13. The PDI-P ended 2012/13 at 0.64, ahead of the 2012/13 target of 0.68. PDI-F ended the year at 0.79, ahead of the 2012/13 target of 1.00

Demand for access requirements rose this year driven by increased work volumes as we deliver the CP4 outputs. The effect of the increase in work volumes were offset by a reduction in access brought about by new ways of working and improved management processes. Efficient methods for delivering track renewals in CP4 such as midweek night track renewals on main line routes contributed to reduced weekend access requirements, thereby freeing up the network for more services to run at weekends.

Network availability data assurance

A review of the reliability and accuracy of the network availability data reporting processes was once again carried out by the Independent Reporter in 2012/13. The PDI-F achieved the top confidence grade of A1 in recognition of improvements made over the course of the year. The PDI-P was rated as B1 in 2012/13, an improvement from the B2 rating achieved in 2011/12.

Table 2.23: Disruptions to passengers and freight as a result of planned engineering possessions					
	2009/10 Actual	2010/11 Actual	2011/12 Actual	2012/13 Actual	2012/13 Planned
Possession disruption index (Passenger) – (PDI- P)	0.63	0.52	0.54	0.64	0.68
Possession disruption index (freight) – (PDI-F)	0.82	0.89	0.85	0.79	1.00

Supporting initiatives

The route categorisation process introduced at the start of CP4 is now embedded in the network access strategy. The Joint Network Availability Plans (JNAPs) established between the routes and some of our customers as well as the single national freight JNAP continues to inform network availability requirements with the focus of reducing disruption from planned works on key strategic flows.

Seven Day Railway Fund

The plan developed by routes with our customers continues to provide a stimulus to how we allocate the Seven Day Railway Fund. A number of investments have been completed and are already delivering benefits, enabling our customers to run trains that would otherwise be disrupted. One such scheme is the work to improve the layout of the Hartford junction on the West Coast Main Line (WCML) which has enabled planned disruptive maintenance possession requirements to be reduced from 29 to eight hours. Schemes such as this enable us to use access more productively.

We have also identified opportunities to invest in specific areas that will support our access strategies in the next control period and are progressing a number of these schemes. For example, the enhanced layout of key junctions on the WCML will enable us to adopt less intrusive maintenance regimes in the long term.

At the end of 2012/13 a total of 126 schemes have been identified for full or part funding through the Seven Day Railway Fund. The schemes were assessed with the Network Availability Investment Guidelines to ensure appropriateness of benefits and have a total anticipated final cost of £187 million with a cumulative authority of £159 million. The schemes

are anticipated to improve the PDI-P by 0.175 and the PDI-F by 0.050.

Of the 126 schemes:

- 32 schemes were completed by the end of 2012/13 including Hemel Hempstead Staircase, reinstatement of Bushey platform, RRV access Christchurch and Barnwood S&C reinstatement
- 54 schemes were authorised for £86 million for single option development and beyond (GRIP 4-8)
- 29 schemes were authorised for £41 million for development (GRIP 1-3)
- eleven schemes were closed following feasibility with a decision not to proceed further as sufficient benefits could not be identified.

Supporting metrics

Working timetable weekend compliance

The Weekend working timetable compliance (WTT) moving annual average (MAA) ended the year at 86.3 per cent, which was one per cent better than 2011/12. The highest WTT MAA of 2012/13 was First ScotRail with 95 per cent and the lowest was East Coast with 75 per cent. Most operators' experienced an increase in WTT performance this year with Chiltern recording the highest increase of eleven per cent.

The highest periodic WTT compliance figure in CP4 was recorded during the Olympic games with 96 per cent of services running to schedule. Period ten was the first winter period that has ever delivered 90 per cent WTT during the peak engineering activity season.

Rail replacement bus hours

In overall terms a year on year reduction of around five per cent has occurred following on from reductions in rail bus replacement hours in each year of the control period. A 5.4 per cent improvement was delivered in 2012/13, with the year on year performance trend being distorted by the Olympic and Paralympic games in periods five and six, where the lowest levels of bus replacement hours in CP4 were experienced following the re-planning of engineering works.

Possession notification discount factor

The metric shows a slight drop in the number of possessions notified prior to the first working timetable and the publication of the informed traveller. This is due to the combined effect of the bad weather, derailments and landslip which necessitated an increase in the use of emergency timetables in 2012/13 compared to last year.

Late and very late notice disruptive possessions

Reporting of very late possession changes commenced in 2012/13 as improvements were made

to the process for reporting late notice disruptive possession. The metric shows a worsening trend as late notice possessions were required to deliver CP4 programmes such as Thameslink and National Electrification Projects.

Possessions involving single line working

The metric shows a reduction in the number of planned single line working interventions as a combination of other methods of working were deployed to minimise disruption in 2012/13.

Delay minutes due to possession overruns

Overall, the metric delivered a two per cent improvement on the 2011/12 result. The metric also delivered a 41 per cent improvement in delay minutes due to possession overruns in the summer months of 2012/13 compared to the same period in 2011/12.

Cancellation minutes due to possession overruns

This metric reported a 40 per cent reduction in cancellation minutes due to possession overruns in the first half of 2012/13 compared to the same period the previous year. At the end of 2012/13 cancellations from a small number of incidents in the last quarter reduced the earlier gains causing the metric to be slightly lower than the previous year.

National unplanned TSRs actual vs. target

The number of unplanned Temporary Speed Restrictions (TSR) increased by six per cent compared to 2011/12. The increase is primarily due to the wet weather. Other contributory factors to the increase were improved data capture accuracy of the current TSR data collation process and an increase in condition of track and level crossing sighting speeds when compared to previous years. Unplanned TSR targets were not set at the beginning of 2012/13 to enable target setting at the route level following devolution.

Section 3 - Asset management

Introduction

Asset management is about aligning the way we manage our assets with our corporate objectives and for Network Rail, this is ultimately to keep the railway operational and to deliver the outputs required by our customers, funders and other key stakeholders in a sustainable way for the lowest whole life, whole system cost.

This section reports on the condition and quality of our assets. It provides information regarding the stewardship of our assets and trends over time, as well as our performance against the Control Period 4 Delivery Plan update 2012 (DPu12) targets for 2012/13.

The following measures are reported in this section:

- rail age / rail type
- broken rails
- rail defects
- track buckles
- track geometry
- track geometry faults
- track failures
- condition of asset temporary speed restrictions
- earthwork failures
- 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
- light maintenance depot stewardship measure.

In this section a confidence grade has been included for measures that have been assigned a confidence grade either by the current or previous Independent Reporter. For measures where no confidence grade has been assigned by the Independent Reporter we have excluded a confidence grade. This is the case for most of the new measures. It should also be noted that for six of our electrification measures, M11 – M16 (AC traction power incidents causing train delays, DC traction power incidents causing train delays, AC traction feeder stations and track sectioning points, DC traction substations, AC traction contact systems and DC traction contact systems) the confidence grades are from the last Reporter review of electrification measures which was conducted in 2009/10. These confidence grades do not therefore take into account the improvements that have been made in subsequent years and we do not believe that they are reflective of the current position. However, these confidence grades are reported for completeness.

Table 3.1 provides a summary comparison of our overall network asset measures for the last five years, where available. Table 3.2 provides a comparison of 2012/13 asset measure results against the condition and reliability forecasts as set out in Appendix 10 of the DPu12.

Table 3.1: Comparison of network asset measures with previous years					
Measure	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Good track geometry	137.9	137.7	137.0	136.5	138.1
Poor track geometry	2.18	2.38	2.48	2.58	2.38
Intervention / immediate action geometry	38.2	40.3	39.7	41.3	40.3
Broken rails (no.)	165	152	171	127	178
Rail breaks and immediate action defects per 100km	6.80	5.80	4.49	3.82	4.14
Immediate action rail defects per 100 km	6.27	5.31	3.94	3.39	3.48
Condition of asset TSRs (no.)	4,436*	1,729	1,348	1,864	1,958
Civils – Assets subject to additional inspections (no.)	889	844	810	789	801
Earthworks failures (no.)	61	56	42	28	144
Tunnel condition	n/a (new measure for 2009/10)	Bore 88 Portal 92	Bore 89 Portal 92	Bore 88 Portal 89	See page 107
Bridge condition score	2.09	2.09	2.09	2.10	2.25
Signalling failures causing delays of more than ten minutes (no.)	19,607	18,324	16,501	15,638	15,023
Signalling asset condition	2.39	2.37	2.41	2.38	2.37
AC power incidents causing >500 minute train delays (no.)	66	46	61	50	52
DC power incidents causing >500 minute train delays (no.)	14	14	14	16	8
AC traction feeder stations and track sectioning points condition	2.78	2.70	2.56	2.57	2.29
DC traction feeder stations and track sectioning points condition	2.53	2.32	2.36	2.45	2.38
AC contact systems condition	1.6	1.6	1.6	1.6	1.4
DC contact systems condition	1.9	1.9	1.9	2.0	2.0
Telecoms condition	0.89	0.92	0.94	0.95	0.97
Points failures	8,048	7,130	5,815	5,166	5,053
Detection failures	6,470	6,061	5,226	4,923	4,608
Track failures	7,748	6,670	5,887	5,501	5,335
Power incidents causing train delays of more than 300 minutes	103	75	100	71	65
Telecom failures causing train delays of more than ten minutes	817	770	689	698	697
Station stewardship measure					
Category A	2.44	2.38	2.30	2.26	2.21
Category B	2.47	2.46	2.40	2.37	2.34
Category C	2.52	2.52	2.47	2.43	2.40
Category D	2.52	2.54	2.47	2.41	2.39
Category E	2.57	2.58	2.50	2.43	2.39
Category F	2.55	2.56	2.50	2.47	2.47
Scotland (all categories)	2.39	2.39	2.33	2.28	2.33
Light maintenance depot stewardship measure (network)	2.52	2.50	2.48	2.43	2.39
Asset reliability (no. of infrastructure incidents causing delay)	52,270	46,091	42,135	40,415	39,365

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 vary significantly from 2008/09 to 2009/10.

Table 3.2: Comparison of 2012/13 asset condition and reliability results with DPu12 forecasts			
Measure	***2011/12***	***2012/13***	***DPu12***
Track			
Good track geometry (%)	136.50	138.10	139.90
Poor track geometry (%)	2.58	2.38	2.14
Intervention / immediate action geometry faults per 100km	41.3	40.3	24.3
Rail breaks and immediate action defects per 100km	3.82	4.14	5.20
Civils			
Civils – Assets subject to additional inspections (no.)	789	801	801
Operational Property			
Station stewardship measure	2.44	2.43	2.33
Light maintenance depot stewardship measure	2.43	2.39	2.42
Signalling			
Signalling asset condition	2.38	2.37	2.41
Electrification			
AC traction feeder stations and track sectioning points condition	2.57	2.29	2.56
DC traction feeder stations and track sectioning points condition	2.45	2.38	2.37
AC contact systems condition	1.6	1.4	1.6
DC contact systems condition	2.0	2.0	1.9
Telecoms			
Telecoms condition	0.95	0.97	0.94
Reliability forecasts			
Signalling failures causing delays of more than ten minutes (no.)	15,638	15,023	14,608
Points failures	5,166	5,053	4,126
Detection failures	4,923	4,608	4,540
Track failures	5,501	5,335	5,260
Power incidents causing train delays of more than 300 minutes	71	65	78
Telecom failures causing train delays of more than ten minutes	633	697	656
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 overall SSM is provided for consistency and specifically calculated to compare with DPu12 and 2011/12. However the regulatory target is for categories A-F and Scotland which is the way that we manage and use this measure as a business. The above overall score is not the average of categories A-F and Scotland i.e. what is in Table 3.2, this overall score has been calculated as part of our internal asset stewardship Indictor which is an average of the segmented categories of stations A-F and does not include Scotland. This calculation is consistent with previous years			

Excellence in asset management

We are working to achieve a highly developed approach to asset management. This includes alignment of planning processes, making decisions based upon lowest whole life costs, functional and technical specifications, approvals processes, installation and commissioning processes and the design of complementary and efficient inspection and maintenance regimes.

Evaluating our capability

The starting point for developing improvement is a good understanding of our current capability and an appreciation of what good and best practice looks like in other organisations. Since 2006 AMCL, the Independent Reporter for asset management, has assessed our asset management capability in a number of areas and made recommendations for improvements.

These assessments involve a review of 23 areas of capability using an Asset Management Excellence Model (AMEM). AMEM is a questionnaire based

model with a six point maturity scale that ranks the responses in a range from 'Innocent' to 'Excellent'. The assessment was first undertaken in 2006 and then repeated in 2009. We used the results and recommendations from the 2009 assessment to develop a forward plan of improvement, against which indicative levels of capability were forecast for the Initial Industry Plan (IIP), the SBP and the end of CP 4.

Capability level sought

Forecast maturity levels have been established for each of the 23 activities in the AMEM model shown in Table 3.3. The forecast maturity level for the SBP is shown in Table 3.3 (for each activity) and in Table 3.4 (for each group).

We accept the need for a long running programme of improvement and have set out our intended further rate of improvement in CP5 in the asset management capability section of our Strategic Business Plan, published in January 2013.

Result from Jan 2013 Assessment

The findings of the assessment undertaken by AMCL at the time of submitting the SBP in January 2013 are summarised in Figure 3.1.

The 2013 AMEM assessment shows improvement in all priority areas relative to past studies and shows that the gap between highest and lowest scores is reducing.

AMCL commented that 'Overall the conclusion is that Network Rail has made significant progress in a number of key areas, with other areas just about keeping pace with expectations. There is now an opportunity to focus on those other areas before the end of CP4 ensuring also that the risks identified by Network Rail related to the deliverability of the CP5 plans are fully understood and mitigated. It is essential that Network Rail is able to build on the momentum achieved to ensure that its Asset Management approach is embedded as business as usual with continual improvement throughout CP5.'

Table 3.3: Evaluated asset management capability level at January 2013 by each of the 23 activities

Group	*Activity*	*2009*	*2011 IIP*	*2013 SBP*	*2013 Forecast*
Strategy & planning	Policy & strategy	54	59	61	61
	Demand analysis	64	69	73	70
	Strategic planning	55	60	63	62
	Asset management plans	52	57	66	66
Whole life cost justification	Capex planning	53	57	65	60
	Opex planning	38	42	51	56
	Unit costing & accounting	51	57	60	63
Lifecycle delivery	Asset creation	85	85	86	88
	Systems engineering	59	59	67	67
	Maintenance delivery	74	72	75	77
	Possession & resource management	51	58	58	61
	Incident response	74	74	75	77
	Asset rationalisation & disposal	46	50	54	54
Asset knowledge	Asset information strategy & standard	61	69	74	74
	Asset information systems	51	51	56	60
	Asset data & knowledge	43	45	52	56
Organisational & people	Contract & supply management	68	71	72	72
	Organisational structure & culture	60	60	63	68
	Individual competence & behaviour	61	61	67	73
Risk & review	Risk assessment & management	73	75	75	76
	Sustainable development	35	50	52	45
	Weather & climate change	28	51	52	43
	Review & audit	62	62	64	68
	Average	**56.4**	**60.6**	**64.4**	**65.1**

Table 3.4: Evaluated asset management capability level at January 2013 by each of the 6 Groups

Group	*2009*	*2011 IIP*	*2013 SBP*	*2013 Forecast*
Strategy & planning	56.25	61.25	65.75	64.75
Whole life cost justification	47.33	52.00	58.67	59.67
Lifecycle delivery	64.83	66.33	69.17	70.67
Asset knowledge	51.67	55.00	60.67	63.33
Organisation & people	63.00	64.00	67.33	71.00
Risk & review	49.50	59.50	60.75	58.00

Figure 3.1: Asset management capability levels for each of the 23 activities at IIP, SBP and forecast levels for SBP and exit CP4

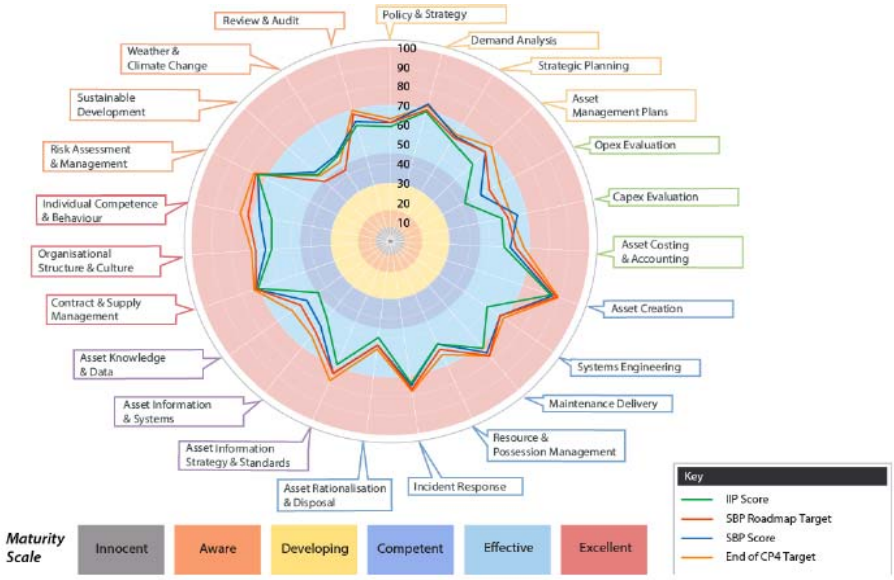
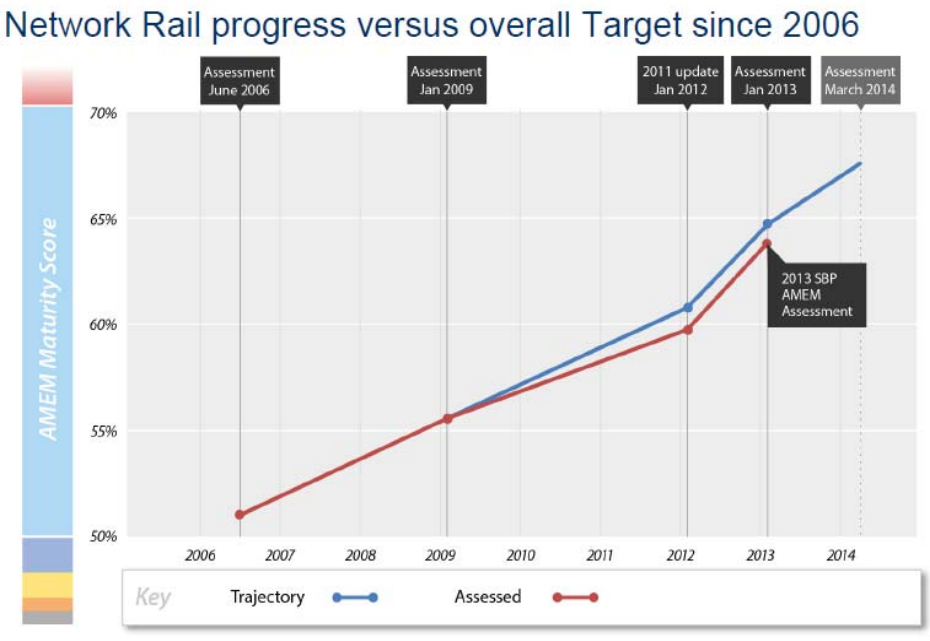


Figure 3.2: Overall average rate of asset management capability improvement from 2006, compared with forecast trajectory



Rail age / rail type

Definition

The sustainability of the track condition is defined in terms of the distribution of the percentage of the average service life used up by each of the track assets: plain line rails, sleepers and ballast and switches and crossings (S&C).

Reporting method

The calculation of the average service life for rails, sleepers and S&C is based on the annual tonnage seen through the asset's lifetime and the asset's characteristics (e.g. whether concrete or timber sleepers, jointed or continuously welded rail), as these affect the rate of wear and fatigue on the asset. Thus, the used service life for each asset has been accumulated year on year from its installation on the track, dependent on the traffic running over it in the year and the asset characteristics. Ballast life is defined in terms of the percentage of the ballast that has been filled with fines (e.g. from erosion due to traffic), as this gives an indication of the quality of the ballast.

This calculation is based on the typical service life for the track assets, given the aforementioned characteristics. In reality, there are other influences on track service life, (such as the local environmental and geological conditions, track access for maintenance, train designs and wheel set conditions) that mean that the actual track service life can vary considerably, with some track surviving perfectly well for many years beyond its typical service life. In this case, renewing track while it is still in acceptable condition would not be the best whole lifecycle cost option. Therefore, there will be some assets on the track that are beyond their nominal service life.

Results

Tables 3.5 to 3.8 shows the rail type installed over the last five years and Tables 3.9 to 3.16 show the used asset lives distribution for the different track assets at the end of 2012/13.

Commentary

The track has been divided into five bands: four 25 per cent bands up to 100 per cent, and an additional band (older) for assets that have survived longer than the typical service life.

The distribution across the bands is based on the percentage of total kilometres across the network of that asset that falls within that band. As a rule, track with more used life is harder to maintain in good condition, although we would still expect assets that have survived longer than the typical service life to be maintainable. The distribution has been fairly stable over the last few years, and is expected to remain so next year, with good asset management of track renewals and refurbishments.

We do however expect to see a small drop in the percentage of new assets (<25 per cent), as well as a shift from the percentage within the older band towards the middle bands (25-50 per cent, 50-75 per cent, 75-100 per cent) over the next control period, as more track is treated and the track asset policy moves towards more refurbishment and fewer complete renewals.

Table 3.5: Plain line rail types (%)

	Route Classification	*Rail Type*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Primary, and key London & South East	60 kg rail (CEN60)	12	13	14	16	18
		56kg rail (113lb flat bottom)	72	73	72	72	71
		Other flat bottom rail	12	11	10	10	9
		Bullhead	2	2	2	2	2
		Other (including unknown)	2	1	1	1	1
	Secondary, other London & South East, and freight trunk	60 kg rail (CEN60)	2	2	2	2	3
		56kg rail (113lb flat bottom)	71	73	74	75	76
		Other flat bottom rail	20	19	19	18	18
		Bullhead	4	4	4	4	4
		Other (including unknown)	2	2	1	1	0
	Rural, and freight only	60 kg rail (CEN60)	1	1	1	1	2
		56kg rail (113lb flat bottom)	47	50	52	54	57
		Other flat bottom rail	20	19	18	18	17
		Bullhead	26	26	25	25	24
		Other (including unknown)	7	5	4	2	0

Table 3.5 continued: Plain line rail types (%)

	Route Classification	*Rail Type*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Total	60 kg rail (CEN60)	6	7	7	8	9
		56kg rail (113lb flat bottom)	68	70	70	71	71
		Other flat bottom rail	17	16	15	14	14
		Bullhead	6	6	6	6	6
		Other (including unknown)	3	2	2	1	0
Scotland	Primary, and key London & South East	60 kg rail (CEN60)	11	13	14	15	16
		56kg rail (113lb flat bottom)	69	68	68	68	68
		Other flat bottom rail	19	17	17	16	15
		Bullhead	0	0	0	0	0
		Other (including unknown)	0	1	1	1	1
	Secondary, other London & South East, and freight trunk	60 kg rail (CEN60)	2	2	2	3	3
		56kg rail (113lb flat bottom)	68	69	69	70	71
		Other flat bottom rail	26	25	24	24	23
		Bullhead	4	4	4	3	3
		Other (including unknown)	0	0	0	0	0
	Rural, and freight only	60 kg rail (CEN60)	0	0	0	0	0
		56kg rail (113lb flat bottom)	15	15	16	17	18
		Other flat bottom rail	17	17	16	16	16
		Bullhead	68	68	67	67	66
		Other (including unknown)	0	0	0	0	0
	Total	60 kg rail (CEN60)	3	4	4	5	5
		56kg rail (113lb flat bottom)	57	57	58	58	59
		Other flat bottom rail	23	22	21	21	20
		Bullhead	17	17	16	16	16
		Other (including unknown)	0	0	0	0	0
Network Total	Primary, and key London & South East	60 kg rail (CEN60)	12	13	14	16	18
		56kg rail (113lb flat bottom)	72	72	72	71	71
		Other flat bottom rail	12	11	11	10	9
		Bullhead	2	2	2	2	1
		Other (including unknown)	2	1	1	1	1
	Secondary, other London & South East, and freight trunk	60 kg rail (CEN60)	2	2	2	3	3
		56kg rail (113lb flat bottom)	71	72	73	74	75
		Other flat bottom rail	21	20	20	19	18
		Bullhead	4	4	4	4	4
		Other (including unknown)	2	1	1	1	0
	Rural, and freight only	60 kg rail (CEN60)	1	1	1	1	2
		56kg rail (113lb flat bottom)	41	43	45	46	49
		Other flat bottom rail	19	18	18	17	17
		Bullhead	34	34	33	33	32
		Other (including unknown)	5	4	3	2	0
	Total	**60 kg rail (CEN60)**	6	6	7	8	9
		56kg rail (113lb flat bottom)	67	68	69	69	70
		Other flat bottom rail	17	16	16	15	15
		Bullhead	8	7	7	7	7
		Other (including unknown)	2	2	1	1	0

Table 3.6: Plain line rail types by operating route (%)						
	Rail Type	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	60 kg rail (CEN60)	5	6	6	6	7
	56kg rail (113lb flat bottom)	66	68	70	72	73
	Other flat bottom rail	18	17	16	15	14
	Bullhead	6	6	6	6	6
	Other (including unknown)	4	3	2	1	0
East Midlands	60 kg rail (CEN60)	4	4	5	5	7
	56kg rail (113lb flat bottom)	70	70	71	70	70
	Other flat bottom rail	20	20	19	18	18
	Bullhead	5	5	5	5	5
	Other (including unknown)	1	1	1	1	1
Kent	60 kg rail (CEN60)	1	1	1	1	1
	56kg rail (113lb flat bottom)	86	86	87	88	88
	Other flat bottom rail	11	11	10	9	9
	Bullhead	2	2	2	2	1
	Other (including unknown)	1	1	1	0	0
London North Eastern	60 kg rail (CEN60)	3	3	4	4	5
	56kg rail (113lb flat bottom)	73	75	75	76	78
	Other flat bottom rail	14	13	13	13	13
	Bullhead	5	5	5	4	4
	Other (including unknown)	5	4	3	2	0
London North Western	60 kg rail (CEN60)	11	11	11	12	13
	56kg rail (113lb flat bottom)	66	68	69	70	70
	Other flat bottom rail	14	13	13	12	11
	Bullhead	6	6	5	5	5
	Other (including unknown)	4	3	2	1	1
Scotland	60 kg rail (CEN60)	3	4	4	5	5
	56kg rail (113lb flat bottom)	57	57	58	58	59
	Other flat bottom rail	23	22	21	21	20
	Bullhead	17	17	16	16	16
	Other (including unknown)	0	0	0	0	0
Sussex	60 kg rail (CEN60)	1	1	1	1	1
	56kg rail (113lb flat bottom)	79	80	80	81	81
	Other flat bottom rail	19	18	18	17	17
	Bullhead	1	1	1	1	1
	Other (including unknown)	0	0	0	0	0
Wales	60 kg rail (CEN60)	5	5	5	6	6
	56kg rail (113lb flat bottom)	52	53	53	54	55
	Other flat bottom rail	25	24	24	23	23
	Bullhead	16	16	16	16	16
	Other (including unknown)	2	1	1	1	0
Wessex	60 kg rail (CEN60)	2	2	2	2	2
	56kg rail (113lb flat bottom)	76	77	79	80	81
	Other flat bottom rail	19	17	16	15	14
	Bullhead	4	4	4	3	3
	Other (including unknown)	0	0	0	0	0

Table 3.6 continued: Plain line rail types by operating route (%)						
	Rail Type	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Western	60 kg rail (CEN60)	14	17	19	24	25
	56kg rail (113lb flat bottom)	60	60	58	55	55
	Other flat bottom rail	18	16	15	13	12
	Bullhead	8	7	7	7	7
	Other (including unknown)	0	0	0	0	0
Network Total	**60 kg rail (CEN60)**	**6**	**6**	**7**	**8**	**9**
	56kg rail (113lb flat bottom)	**67**	**68**	**69**	**69**	**70**
	Other flat bottom rail	**17**	**16**	**16**	**15**	**15**
	Bullhead	**8**	**7**	**7**	**7**	**7**
	Other (including unknown)	**2**	**2**	**1**	**1**	**0**

Table 3.7: S&C rail types (%)							
	Route Classification	***Rail Type***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	Primary, and key London & South East	60 kg rail (CEN60)	11	12	13	13	13
		56kg rail (113lb flat bottom)	78	77	78	78	78
		Other flat bottom rail	6	6	6	6	5
		Bullhead	3	3	3	3	3
		Other (including unknown)	1	1	1	0	0
	Secondary, other London & South East, and freight trunk	60 kg rail (CEN60)	3	3	3	3	3
		56kg rail (113lb flat bottom)	74	75	76	77	77
		Other flat bottom rail	11	11	11	10	10
		Bullhead	10	9	9	9	9
		Other (including unknown)	2	1	1	0	0
	Rural, and freight only	60 kg rail (CEN60)	1	1	1	1	1
		56kg rail (113lb flat bottom)	57	58	60	61	62
		Other flat bottom rail	12	12	11	11	11
		Bullhead	27	27	26	26	26
		Other (including unknown)	3	3	2	1	0
	Total	60 kg rail (CEN60)	7	8	8	9	9
		56kg rail (113lb flat bottom)	75	75	75	76	77
		Other flat bottom rail	9	8	8	8	8
		Bullhead	7	7	7	7	7
		Other (including unknown)	2	1	1	0	0
Scotland	Primary, and key London & South East	60 kg rail (CEN60)	14	16	16	16	16
		56kg rail (113lb flat bottom)	78	76	76	77	79
		Other flat bottom rail	6	6	5	4	4
		Bullhead	0	0	0	0	0
		Other (including unknown)	2	2	2	2	0
	Secondary, other London & South East, and freight trunk	60 kg rail (CEN60)	3	4	4	7	7
		56kg rail (113lb flat bottom)	85	85	85	84	85
		Other flat bottom rail	9	8	8	7	6
		Bullhead	2	2	2	2	2
		Other (including unknown)	1	1	1	1	0

Table 3.7 continued: S&C rail types (%)

	Route Classification	Rail Type	2008/09	2009/10	2010/11	2011/12	2012/13
Scotland	Rural, and freight only	60 kg rail (CEN60)	2	2	3	3	3
		56kg rail (113lb flat bottom)	61	61	61	61	61
		Other flat bottom rail	6	6	6	6	6
		Bullhead	30	30	30	30	30
		Other (including unknown)	0	0	0	0	0
	Total	60 kg rail (CEN60)	6	7	7	9	9
		56kg rail (113lb flat bottom)	80	79	79	79	80
		Other flat bottom rail	7	7	7	6	6
		Bullhead	5	5	5	5	5
		Other (including unknown)	1	1	1	1	0
Network Total	Primary, and key London & South East	60 kg rail (CEN60)	11	12	13	13	13
		56kg rail (113lb flat bottom)	79	77	77	78	78
		Other flat bottom rail	6	6	6	6	5
		Bullhead	3	3	3	3	3
		Other (including unknown)	2	1	1	0	0
	Secondary, other London & South East, and freight trunk	60 kg rail (CEN60)	3	3	3	4	4
		56kg rail (113lb flat bottom)	76	77	77	78	79
		Other flat bottom rail	11	11	10	10	10
		Bullhead	8	8	8	8	8
		Other (including unknown)	2	1	1	1	0
	Rural, and freight only	60 kg rail (CEN60)	1	1	1	1	2
		56kg rail (113lb flat bottom)	58	58	60	61	62
		Other flat bottom rail	11	11	11	10	10
		Bullhead	27	27	27	27	26
		Other (including unknown)	3	2	2	1	0
	Total	**60 kg rail (CEN60)**	7	8	8	9	9
		56kg rail (113lb flat bottom)	75	75	76	76	77
		Other flat bottom rail	8	8	8	8	7
		Bullhead	7	7	7	7	7
		Other (including unknown)	2	1	1	0	0

Table 3.8: S&C rail types by operating route (%)

	Rail Type	2008/09	2009/10	2010/11	2011/12	2012/13
Anglia	60 kg rail (CEN60)	1	1	1	1	1
	56kg rail (113lb flat bottom)	81	82	82	82	82
	Other flat bottom rail	8	7	7	7	7
	Bullhead	9	9	9	9	9
	Other (including unknown)	1	1	1	0	0
East Midlands	60 kg rail (CEN60)	9	11	11	11	11
	56kg rail (113lb flat bottom)	72	72	73	74	75
	Other flat bottom rail	11	10	10	9	9
	Bullhead	6	6	6	5	5
	Other (including unknown)	2	1	0	0	0

Table 3.8 continued: S&C rail types by operating route (%)						
	Rail Type	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Kent	60 kg rail (CEN60)	3	3	3	3	3
	56kg rail (113lb flat bottom)	90	90	90	90	91
	Other flat bottom rail	5	5	5	5	5
	Bullhead	2	2	2	2	2
	Other (including unknown)	0	0	0	0	0
London North Eastern	60 kg rail (CEN60)	4	5	5	5	5
	56kg rail (113lb flat bottom)	83	83	84	85	86
	Other flat bottom rail	4	4	4	3	3
	Bullhead	6	6	6	6	6
	Other (including unknown)	3	2	1	1	0
London North Western	60 kg rail (CEN60)	13	14	14	15	15
	56kg rail (113lb flat bottom)	63	63	64	65	65
	Other flat bottom rail	9	9	9	9	9
	Bullhead	11	11	11	11	11
	Other (including unknown)	3	2	1	1	0
Scotland	60 kg rail (CEN60)	6	7	7	9	9
	56kg rail (113lb flat bottom)	80	79	79	79	80
	Other flat bottom rail	7	7	7	6	6
	Bullhead	5	5	5	5	5
	Other (including unknown)	1	1	1	1	0
Sussex	60 kg rail (CEN60)	1	1	1	1	1
	56kg rail (113lb flat bottom)	91	92	92	92	92
	Other flat bottom rail	6	5	5	5	5
	Bullhead	2	2	2	2	2
	Other (including unknown)	0	0	0	0	0
Wales	60 kg rail (CEN60)	3	5	6	6	6
	56kg rail (113lb flat bottom)	74	74	74	75	75
	Other flat bottom rail	13	12	12	11	11
	Bullhead	8	8	8	8	8
	Other (including unknown)	1	1	1	0	0
Wessex	60 kg rail (CEN60)	11	11	11	11	11
	56kg rail (113lb flat bottom)	73	73	73	74	74
	Other flat bottom rail	11	11	11	10	10
	Bullhead	5	5	4	4	4
	Other (including unknown)	0	0	0	0	0
Western	60 kg rail (CEN60)	11	12	12	13	14
	56kg rail (113lb flat bottom)	66	66	66	66	66
	Other flat bottom rail	15	15	15	14	13
	Bullhead	8	8	8	7	7
	Other (including unknown)	0	0	0	0	0
Network Total	**60 kg rail (CEN60)**	**7**	**8**	**8**	**9**	**9**
	56kg rail (113lb flat bottom)	**75**	**75**	**76**	**76**	**77**
	Other flat bottom rail	**8**	**8**	**8**	**8**	**7**
	Bullhead	**7**	**7**	**7**	**7**	**7**
	Other (including unknown)	**2**	**1**	**1**	**0**	**0**

Table 3.9: Used asset lives (%) for plain line sleepers

	Route Classification	*Used Life*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Primary, and key London & South East	0 - 25 %	27	28	28	28	28
		25 - 50 %	18	18	19	20	20
		50 - 75 %	26	24	23	21	20
		75 - 100 %	18	18	19	19	19
		Older	11	11	12	12	13
	Secondary, other London & South East, and freight trunk	0 - 25 %	23	23	24	24	23
		25 - 50 %	21	19	19	19	19
		50 - 75 %	30	30	30	30	29
		75 - 100 %	14	15	16	17	17
		Older	12	12	12	12	12
	Rural, and freight only	0 - 25 %	24	26	27	28	30
		25 - 50 %	16	16	15	14	13
		50 - 75 %	16	17	18	19	19
		75 - 100 %	9	9	8	8	9
		Older	35	33	33	31	29
	Total	0 - 25 %	25	26	26	26	26
		25 - 50 %	19	18	18	18	19
		50 - 75 %	26	26	25	24	24
		75 - 100 %	15	15	16	17	17
		Older	15	15	15	15	15
Scotland	Primary, and key London & South East	0 - 25 %	27	28	27	27	25
		25 - 50 %	16	17	19	18	20
		50 - 75 %	31	28	27	27	25
		75 - 100 %	19	19	19	18	19
		Older	7	8	9	9	11
	Secondary, other London & South East, and freight trunk	0 - 25 %	17	18	20	21	21
		25 - 50 %	18	16	15	14	14
		50 - 75 %	35	34	33	33	32
		75 - 100 %	15	17	19	20	21
		Older	15	15	12	13	13
	Rural, and freight only	0 - 25 %	9	9	9	11	11
		25 - 50 %	12	12	12	11	11
		50 - 75 %	11	11	11	11	10
		75 - 100 %	15	15	14	14	15
		Older	53	54	54	53	53
	Total	0 - 25 %	17	18	19	20	19
		25 - 50 %	17	16	15	14	14
		50 - 75 %	29	28	27	27	26
		75 - 100 %	16	17	18	18	19
		Older	21	22	20	21	21
Network Total	Primary, and key London & South East	0 - 25 %	27	28	28	28	28
		25 - 50 %	18	18	19	20	20
		50 - 75 %	26	25	23	21	20
		75 - 100 %	18	18	19	19	19
		Older	10	11	12	12	13

Table 3.9 continued: Used asset lives (%) for plain line sleepers							
	Route Classification	***Used Life***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Network Total	Secondary, other London & South East, and freight trunk	0 - 25 %	22	22	23	23	22
		25 - 50 %	20	19	18	18	18
		50 - 75 %	31	31	31	30	29
		75 - 100 %	14	15	16	17	18
		Older	13	13	12	12	12
	Rural, and freight only	0 - 25 %	21	22	23	24	26
		25 - 50 %	16	15	14	13	13
		50 - 75 %	15	16	17	18	18
		75 - 100 %	10	10	9	9	10
		Older	38	37	37	35	34
	Total	**0 - 25 %**	24	25	25	25	25
		25 - 50 %	19	18	18	18	18
		50 - 75 %	27	26	26	25	24
		75 - 100 %	15	16	16	17	17
		Older	16	16	15	15	15

Table 3.10: Used asset lives (%) for plain line sleepers by operating route						
	Used Life	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	0 - 25 %	30	30	31	30	29
	25 - 50 %	14	14	14	15	16
	50 - 75 %	23	22	21	20	19
	75 - 100 %	14	15	16	16	17
	Older	18	18	18	19	18
East Midlands	0 - 25 %	21	22	22	21	23
	25 - 50 %	21	21	19	19	19
	50 - 75 %	27	27	27	27	25
	75 - 100 %	16	15	15	16	17
	Older	15	16	16	17	17
Kent	0 - 25 %	16	15	14	14	12
	25 - 50 %	26	26	26	25	22
	50 - 75 %	31	30	30	30	32
	75 - 100 %	19	20	20	21	22
	Older	8	9	10	10	11
London North Eastern	0 - 25 %	17	18	17	18	19
	25 - 50 %	21	20	20	20	20
	50 - 75 %	32	31	30	29	28
	75 - 100 %	16	18	18	20	20
	Older	13	13	14	13	13
London North Western	0 - 25 %	35	36	36	35	34
	25 - 50 %	19	18	19	20	22
	50 - 75 %	22	22	22	21	21
	75 - 100 %	10	10	10	11	11
	Older	14	13	13	12	12

Table 3.10 continued : Used asset lives (%) for plain line sleepers by operating route						
	Used Life	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Scotland	0 - 25 %	17	18	19	20	19
	25 - 50 %	17	16	15	14	14
	50 - 75 %	29	28	27	27	26
	75 - 100 %	16	17	18	18	19
	Older	21	22	20	21	21
Sussex	0 - 25 %	16	15	15	15	14
	25 - 50 %	19	18	16	16	15
	50 - 75 %	27	28	29	28	27
	75 - 100 %	26	25	26	26	26
	Older	12	14	14	15	17
Wales	0 - 25 %	18	19	19	19	19
	25 - 50 %	19	17	14	13	13
	50 - 75 %	28	29	29	30	28
	75 - 100 %	15	15	16	17	19
	Older	20	21	21	21	21
Wessex	0 - 25 %	21	22	22	22	23
	25 - 50 %	14	14	15	15	15
	50 - 75 %	33	32	28	27	26
	75 - 100 %	19	20	23	24	24
	Older	12	12	12	13	13
Western	0 - 25 %	32	34	37	42	43
	25 - 50 %	16	16	16	16	17
	50 - 75 %	19	18	16	15	14
	75 - 100 %	17	15	15	12	12
	Older	16	16	16	15	15
Network Total	**0 - 25 %**	**24**	**25**	**25**	**25**	**25**
	25 - 50 %	**19**	**18**	**18**	**18**	**18**
	50 - 75 %	**27**	**26**	**26**	**25**	**24**
	75 - 100 %	**15**	**16**	**16**	**17**	**17**
	Older	**16**	**16**	**15**	**15**	**15**

Table 3.11: Used asset lives (%) for plain line rail

	Route Classification	*Used Life*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Primary, and key London & South East	0 - 25 %	34	36	36	36	37
		25 - 50 %	21	20	19	20	20
		50 - 75 %	23	22	22	21	21
		75 - 100 %	15	15	14	14	13
		Older	8	8	9	9	9
	Secondary, other London & South East, and freight trunk	0 - 25 %	31	32	33	34	35
		25 - 50 %	30	29	28	27	26
		50 - 75 %	20	19	19	18	18
		75 - 100 %	14	14	14	14	14
		Older	6	6	6	7	7
	Rural, and freight only	0 - 25 %	27	29	31	32	36
		25 - 50 %	17	17	16	16	15
		50 - 75 %	14	13	13	13	12
		75 - 100 %	30	29	28	25	23
		Older	12	12	13	14	14
	Total	0 - 25 %	32	33	34	35	36
		25 - 50 %	24	23	23	22	22
		50 - 75 %	20	19	19	19	18
		75 - 100 %	16	16	16	15	15
		Older	8	8	8	9	9
Scotland	Primary, and key London & South East	0 - 25 %	33	35	35	34	33
		25 - 50 %	26	23	21	20	20
		50 - 75 %	19	19	22	24	24
		75 - 100 %	14	14	14	14	14
		Older	8	8	9	9	9
	Secondary, other London & South East, and freight trunk	0 - 25 %	21	22	25	26	28
		25 - 50 %	33	32	30	28	27
		50 - 75 %	20	20	21	21	20
		75 - 100 %	16	15	14	14	14
		Older	10	10	11	11	11
	Rural, and freight only	0 - 25 %	11	12	14	16	18
		25 - 50 %	7	7	7	7	7
		50 - 75 %	8	8	7	6	7
		75 - 100 %	34	32	31	29	27
		Older	40	41	41	42	42
	Total	0 - 25 %	21	22	24	26	27
		25 - 50 %	27	25	24	22	21
		50 - 75 %	18	17	18	18	18
		75 - 100 %	19	19	17	17	17
		Older	16	16	17	17	17
Network Total	Primary, and key London & South East	0 - 25 %	34	36	36	36	36
		25 - 50 %	21	20	20	20	20
		50 - 75 %	22	22	22	21	21
		75 - 100 %	15	14	14	14	13
		Older	8	8	9	9	9

Table 3.11 continued: Used asset lives (%) for plain line rail							
	Route Classification	***Used Life***	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Network Total	Secondary, other London & South East, and freight trunk	0 - 25 %	29	30	31	33	34
		25 - 50 %	30	30	28	27	26
		50 - 75 %	20	19	19	19	18
		75 - 100 %	14	14	14	14	14
		Older	7	7	7	7	8
	Rural, and freight only	0 - 25 %	24	26	27	29	33
		25 - 50 %	15	15	14	14	13
		50 - 75 %	13	12	11	12	11
		75 - 100 %	31	30	28	26	24
		Older	17	18	19	19	19
	Total	**0 - 25 %**	30	32	32	34	35
		25 - 50 %	24	24	23	22	22
		50 - 75 %	20	19	19	19	18
		75 - 100 %	17	17	16	16	15
		Older	9	9	9	10	10

Table 3.12: Used asset lives (%) for plain line rail by operating route						
	Used Life	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	0 - 25 %	39	40	42	42	42
	25 - 50 %	19	18	18	18	18
	50 - 75 %	16	15	14	14	13
	75 - 100 %	15	15	15	14	14
	Older	11	11	12	12	12
East Midlands	0 - 25 %	25	26	27	27	30
	25 - 50 %	24	23	22	20	19
	50 - 75 %	22	21	21	20	20
	75 - 100 %	21	22	22	22	21
	Older	8	8	9	10	11
Kent	0 - 25 %	31	31	31	31	31
	25 - 50 %	29	29	28	29	28
	50 - 75 %	20	19	19	19	19
	75 - 100 %	15	15	15	15	15
	Older	6	6	6	7	7
London North Eastern	0 - 25 %	25	26	26	26	28
	25 - 50 %	25	23	23	23	22
	50 - 75 %	24	24	24	24	23
	75 - 100 %	17	18	17	18	17
	Older	9	9	9	10	10
London North Western	0 - 25 %	38	40	40	41	42
	25 - 50 %	25	24	24	24	24
	50 - 75 %	17	16	17	16	16
	75 - 100 %	16	15	15	14	13
	Older	4	4	5	5	5

Table 3.12 continued: Used asset lives (%) for plain line rail by operating route

	Used Life	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Scotland	0 - 25 %	21	22	24	26	27
	25 - 50 %	27	25	24	22	21
	50 - 75 %	18	17	18	18	18
	75 - 100 %	19	19	17	17	17
	Older	16	16	17	17	17
Sussex	0 - 25 %	25	25	26	26	26
	25 - 50 %	26	26	25	24	23
	50 - 75 %	25	24	24	23	22
	75 - 100 %	15	15	15	16	17
	Older	9	10	10	10	11
Wales	0 - 25 %	24	25	25	26	27
	25 - 50 %	32	31	29	27	26
	50 - 75 %	18	18	19	20	21
	75 - 100 %	17	17	16	16	15
	Older	9	9	10	11	11
Wessex	0 - 25 %	30	32	34	35	37
	25 - 50 %	23	23	22	21	21
	50 - 75 %	25	23	22	22	20
	75 - 100 %	15	15	15	14	14
	Older	7	7	7	8	7
Western	0 - 25 %	38	41	43	48	50
	25 - 50 %	16	15	15	15	15
	50 - 75 %	18	17	16	14	13
	75 - 100 %	17	16	15	12	11
	Older	11	11	11	11	11
Network Total	**0 - 25 %**	**30**	**32**	**32**	**34**	**35**
	25 - 50 %	**24**	**24**	**23**	**22**	**22**
	50 - 75 %	**20**	**19**	**19**	**19**	**18**
	75 - 100 %	**17**	**17**	**16**	**16**	**15**
	Older	**9**	**9**	**9**	**10**	**10**

Table 3.13: Used asset lives (%) for plain line ballast

	Route Classification	*Used Life*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Primary, and key London & South East	0 - 25 %	34	36	35	36	36
		25 - 50 %	20	19	19	20	21
		50 - 75 %	22	21	21	20	19
		75 - 100 %	14	14	15	15	15
		Older	9	9	10	10	10
	Secondary, other London & South East, and freight trunk	0 - 25 %	31	31	32	33	33
		25 - 50 %	25	25	24	23	22
		50 - 75 %	27	27	26	26	26
		75 - 100 %	12	12	13	13	13
		Older	4	5	5	5	5
	Rural, and freight only	0 - 25 %	28	30	32	34	37
		25 - 50 %	20	20	19	18	17
		50 - 75 %	29	27	25	23	21

Table 3.13 continued: Used asset lives (%) for plain line ballast

	Route Classification	*Used Life*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Rural, and freight only	75 - 100 %	19	19	20	20	21
		Older	4	4	4	4	4
	Total	0 - 25 %	32	33	33	34	35
		25 - 50 %	22	22	21	21	21
		50 - 75 %	25	25	24	23	22
		75 - 100 %	14	14	15	15	15
		Older	6	7	7	7	7
Scotland	Primary, and key London & South East	0 - 25 %	38	40	38	37	37
		25 - 50 %	13	13	15	17	19
		50 - 75 %	25	23	22	21	19
		75 - 100 %	16	16	17	16	15
		Older	9	8	8	8	9
	Secondary, other London & South East, and freight trunk	0 - 25 %	22	22	25	27	27
		25 - 50 %	25	24	22	20	20
		50 - 75 %	31	30	30	30	29
		75 - 100 %	14	14	15	15	15
		Older	9	9	8	8	8
	Rural, and freight only	0 - 25 %	18	18	18	19	20
		25 - 50 %	9	10	11	12	12
		50 - 75 %	29	28	25	22	20
		75 - 100 %	28	27	28	29	30
		Older	15	17	17	18	19
	Total	0 - 25 %	24	25	26	27	27
		25 - 50 %	19	19	19	18	18
		50 - 75 %	29	28	28	27	26
		75 - 100 %	17	17	18	18	18
		Older	10	11	10	10	11
Network Total	Primary, and key London & South East	0 - 25 %	35	36	35	36	36
		25 - 50 %	20	19	19	20	21
		50 - 75 %	22	22	21	20	19
		75 - 100 %	14	15	15	15	15
		Older	9	9	10	10	10
	Secondary, other London & South East, and freight trunk	0 - 25 %	30	30	31	31	32
		25 - 50 %	25	24	24	23	22
		50 - 75 %	28	28	27	27	27
		75 - 100 %	12	13	13	13	14
		Older	5	6	5	6	6
	Rural, and freight only	0 - 25 %	26	28	29	31	34
		25 - 50 %	18	18	17	17	16
		50 - 75 %	29	27	25	23	20
		75 - 100 %	21	21	22	22	23
		Older	6	6	7	7	7
	Total	**0 - 25 %**	31	32	32	33	34
		25 - 50 %	22	21	21	21	21
		50 - 75 %	26	25	24	23	23
		75 - 100 %	14	15	15	15	15
		Older	7	7	7	7	8

Table 3.14: Used asset lives (%) for plain line ballast by operating route

	Used Life	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	0 - 25 %	34	34	34	34	34
	25 - 50 %	21	20	20	21	21
	50 - 75 %	22	22	21	20	19
	75 - 100 %	14	14	14	14	15
	Older	9	10	10	11	10
East Midlands	0 - 25 %	32	35	34	34	34
	25 - 50 %	25	22	22	21	21
	50 - 75 %	24	24	25	25	24
	75 - 100 %	13	13	13	13	13
	Older	6	6	7	7	8
Kent	0 - 25 %	28	26	25	24	21
	25 - 50 %	29	29	29	29	30
	50 - 75 %	27	27	27	26	27
	75 - 100 %	12	13	15	16	16
	Older	4	4	5	5	6
London North Eastern	0 - 25 %	28	29	30	32	33
	25 - 50 %	23	22	21	21	20
	50 - 75 %	22	22	21	20	19
	75 - 100 %	16	16	17	17	16
	Older	10	11	11	11	11
London North Western	0 - 25 %	43	43	43	43	42
	25 - 50 %	23	23	23	24	25
	50 - 75 %	23	23	22	21	20
	75 - 100 %	8	9	9	9	10
	Older	3	3	3	3	3
Scotland	0 - 25 %	24	25	26	27	27
	25 - 50 %	19	19	19	18	18
	50 - 75 %	29	28	28	27	26
	75 - 100 %	17	17	18	18	18
	Older	10	11	10	10	11
Sussex	0 - 25 %	21	21	20	20	20
	25 - 50 %	21	20	20	20	18
	50 - 75 %	30	28	27	27	27
	75 - 100 %	20	21	23	23	24
	Older	8	9	9	10	10
Wales	0 - 25 %	23	23	23	23	24
	25 - 50 %	23	23	23	22	20
	50 - 75 %	33	32	30	30	29
	75 - 100 %	15	16	18	19	19
	Older	5	6	6	7	7
Wessex	0 - 25 %	26	27	28	28	30
	25 - 50 %	20	19	18	18	17
	50 - 75 %	35	34	33	32	28
	75 - 100 %	15	16	17	18	20
	Older	4	4	4	5	5

Table 3.14 continued: Used asset lives (%) for plain line ballast by operating route

	Used Life	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Western	0 - 25 %	34	37	38	45	47
	25 - 50 %	17	16	15	14	13
	50 - 75 %	23	21	20	19	19
	75 - 100 %	20	18	17	15	14
	Older	7	8	8	7	7
Network Total	**0 - 25 %**	**31**	**32**	**32**	**33**	**34**
	25 - 50 %	**22**	**21**	**21**	**21**	**21**
	50 - 75 %	**26**	**25**	**24**	**23**	**23**
	75 - 100 %	**14**	**15**	**15**	**15**	**15**
	Older	**7**	**7**	**7**	**7**	**8**

Table 3.15: Used asset lives (%) for S&C

	Route Classification	*Used Life*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Primary, and key London & South East	0 - 25 %	29	29	30	31	31
		25 - 50 %	21	20	20	19	18
		50 - 75 %	26	25	25	24	24
		75 - 100 %	17	17	16	16	17
		Older	7	8	9	10	11
	Secondary, other London & South East, and freight trunk	0 - 25 %	18	19	21	22	23
		25 - 50 %	29	27	24	23	21
		50 - 75 %	33	33	32	31	30
		75 - 100 %	13	14	15	16	18
		Older	7	7	7	7	7
	Rural, and freight only	0 - 25 %	14	15	18	19	20
		25 - 50 %	34	31	29	27	25
		50 - 75 %	31	32	32	33	33
		75 - 100 %	15	15	15	15	15
		Older	5	6	6	6	7
	Total	0 - 25 %	24	25	26	27	27
		25 - 50 %	25	24	22	21	20
		50 - 75 %	29	29	28	27	27
		75 - 100 %	15	16	16	16	17
		Older	7	7	8	9	9
Scotland	Primary, and key London & South East	0 - 25 %	31	31	32	33	35
		25 - 50 %	21	22	23	21	20
		50 - 75 %	25	23	20	20	20
		75 - 100 %	16	17	17	17	14
		Older	6	7	8	9	11
	Secondary, other London & South East, and freight trunk	0 - 25 %	14	16	18	23	26
		25 - 50 %	34	31	27	24	21
		50 - 75 %	37	37	37	38	37
		75 - 100 %	11	12	13	12	13
		Older	4	4	5	4	3

Table 3.15 continued: Used asset lives (%) for S&C

	Route Classification	Used Life	2008/09	2009/10	2010/11	2011/12	2012/13
Scotland	Rural, and freight only	0 - 25 %	13	11	10	11	13
		25 - 50 %	54	55	58	56	53
		50 - 75 %	24	24	24	25	28
		75 - 100 %	6	7	6	5	4
		Older	3	3	3	3	3
	Total	0 - 25 %	19	20	21	24	27
		25 - 50 %	33	32	30	28	25
		50 - 75 %	32	31	30	31	31
		75 - 100 %	12	13	13	12	12
		Older	4	5	5	5	5
Network Total	Primary, and key London & South East	0 - 25 %	29	30	30	31	31
		25 - 50 %	21	21	20	19	18
		50 - 75 %	26	25	25	24	23
		75 - 100 %	17	17	16	16	16
		Older	7	8	9	10	11
	Secondary, other London & South East, and freight trunk	0 - 25 %	18	19	21	23	24
		25 - 50 %	30	28	25	23	21
		50 - 75 %	34	33	33	32	31
		75 - 100 %	13	14	15	16	17
		Older	6	6	7	7	7
	Rural, and freight only	0 - 25 %	14	14	17	18	19
		25 - 50 %	37	35	34	32	30
		50 - 75 %	30	31	31	31	32
		75 - 100 %	14	14	14	14	13
		Older	5	6	5	6	6
	Total	**0 - 25 %**	**23**	**24**	**25**	**27**	**27**
		25 - 50 %	**26**	**25**	**23**	**22**	**21**
		50 - 75 %	**29**	**29**	**28**	**28**	**27**
		75 - 100 %	**15**	**15**	**16**	**16**	**16**
		Older	**7**	**7**	**8**	**8**	**9**

Table 3.16: Used asset lives (%) for S&C by operating route

		2008/09	2009/10	2010/11	2011/12	2012/13
Anglia	0 - 25 %	20	19	20	20	20
	25 - 50 %	29	27	25	23	22
	50 - 75 %	32	32	33	33	32
	75 - 100 %	12	13	14	16	17
	Older	7	8	8	8	9
East Midlands	0 - 25 %	27	33	34	34	35
	25 - 50 %	22	20	20	20	20
	50 - 75 %	31	26	24	23	22
	75 - 100 %	14	14	15	16	17
	Older	6	6	7	6	7

Table 3.16 continued: Used asset lives (%) for S&C by operating route

		2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Kent	0 - 25 %	15	17	17	19	19
	25 - 50 %	32	29	27	25	23
	50 - 75 %	27	27	27	27	30
	75 - 100 %	20	20	20	19	19
	Older	5	6	8	10	10
London North Eastern	0 - 25 %	18	17	18	19	21
	25 - 50 %	28	27	25	24	22
	50 - 75 %	33	33	32	31	30
	75 - 100 %	17	17	18	18	19
	Older	5	6	7	8	8
London North Western	0 - 25 %	34	35	36	37	36
	25 - 50 %	24	23	23	21	21
	50 - 75 %	23	23	22	22	22
	75 - 100 %	12	12	11	12	13
	Older	7	7	8	8	8
Scotland	0 - 25 %	19	20	21	24	27
	25 - 50 %	33	32	30	28	25
	50 - 75 %	32	31	30	31	31
	75 - 100 %	12	13	13	12	12
	Older	4	5	5	5	5
Sussex	0 - 25 %	4	5	8	10	10
	25 - 50 %	17	14	11	9	8
	50 - 75 %	42	41	38	36	33
	75 - 100 %	29	30	31	31	32
	Older	9	10	13	14	17
Wales	0 - 25 %	19	20	23	24	24
	25 - 50 %	26	25	23	23	20
	50 - 75 %	31	30	30	29	30
	75 - 100 %	16	16	14	15	15
	Older	8	8	10	10	11
Wessex	0 - 25 %	28	29	29	33	33
	25 - 50 %	16	15	14	13	13
	50 - 75 %	28	27	27	25	23
	75 - 100 %	18	19	19	18	18
	Older	10	11	11	12	13
Western	0 - 25 %	29	28	29	31	33
	25 - 50 %	25	23	22	21	20
	50 - 75 %	28	29	28	26	26
	75 - 100 %	12	13	13	13	14
	Older	6	6	8	8	6
Network Total	**0 - 25 %**	**23**	**24**	**25**	**27**	**27**
	25 - 50 %	**26**	**25**	**23**	**22**	**21**
	50 - 75 %	**29**	**29**	**28**	**28**	**27**
	75 - 100 %	**15**	**15**	**16**	**16**	**16**
	Older	**7**	**7**	**8**	**8**	**9**

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.

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 CP4.

Results

Table 3.17 provides the annual number of broken rails for England & Wales, Scotland, and the network total by route classification type. Table 3.18 shows the same data broken down by operating route.

Reporting confidence

The measure was assigned a confidence grade of A1 by the previous Independent Reporter. This measure has not been reassessed in this Control Period.

Commentary

There were 178 broken rails in 2012/13 compared to 127 in 2011/12. The prolonged cold temperatures at the end of the year, particularly during February and March resulted in a higher number of breaks. Several routes show trends of an increasing moving annual average for broken rails per 100 kilometres from September 2012 to February 2013, with a general levelling out in the last two periods. Wales, Western, Kent and London North Western have stable trends and low rates of broken rails, whereas Sussex has a notable adverse trend over the year. The number of broken rails this year shows less of a change when compared to the numbers of breaks in 2010/11 when winter temperatures were similarly low.

Common factors affecting Sussex and Wessex (which both saw an increase in broken rails) and London North Eastern (which has a sustained high level of broken rails) is the very high tonnage carried on those routes. Although this should be contrasted with the performance in London North Western, which also carries high tonnage levels but has seen a decrease in broken rails in the last two years. A key difference is that London North Western has benefitted from an extensive renewal programme, and has sustained good track geometry, whilst London North Eastern which has similar traffic volumes, has a much older track asset profile and a higher proportion of higher axle load freight traffic.

A number of initiatives are being considered and introduced to target the risks from broken rails. A new ultrasonic test train (UTU) has been built and is now being rolled out to provide a higher frequency of ultrasonic inspection of the rail in lower track category routes. The UTU is planned to test at twice

Table 3.17: Number of broken rails by route classification

	Route Classification	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Primary, and key London & South East	77	71	87	65	97
	Secondary, other London & South East, and freight trunk	58	50	49	42	49
	Rural, and freight only	13	11	13	3	7
	Total	148	132	149	110	153
Scotland	Primary	4	7	7	7	5
	Secondary and freight trunk	13	13	15	8	17
	Rural, and freight only	0	0	0	2	3
	Total	17	20	22	17	25
Network Total	Primary, and key London & South East	81	78	94	72	102
	Secondary, other London & South East, and freight trunk	71	63	64	50	66
	Rural, and freight only	13	11	13	5	10
	Grand Total	**165**	**152**	**171**	**127**	**178**

Table 3.18: Number of broken rails by operating route					
Operating Route	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	18	9	12	6	16
Kent	16	9	9	4	4
London North Eastern	38	43	38	47	54
London North Western	24	27	43	24	23
East Midlands	8	8	11	8	13
Scotland	17	20	22	17	25
Sussex	8	8	8	5	14
Wales	11	5	7	4	4
Western	8	10	12	3	6
Wessex	17	13	9	9	19
Network Total	**165**	**152**	**171**	**127**	**178**

the previous pedestrian test frequency giving potential to identify defects earlier and reduce the number of breaks. Research is also currently being undertaken to look at ultrasonic testing techniques which may enable very small defects in the foot of the rail to be identified to allow better prioritising of rail replacement and to reduce the number of breaks from the rail foot.

The number of broken rails at fishplated rail joints has been reduced by introducing actions in our standards to repair or replace joints if they become dipped beyond specified limits. However a number of broken rails have occurred at fishplated joints either before the limits were exceeded or within the timescales specified for repair. These limits are therefore being reviewed for high speed higher tonnage routes to assess the impact of a change to the national standard. Tighter limits are currently in place on London North Western and are being trialled on high speed, high tonnage sections of London North Eastern to reduce the number of higher risk broken rails at rail ends.

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 3.19 to 3.29 provides the various results for measuring rail defects beginning with the overall number of defects identified, those removed, repaired and those remaining at the end of the year. The tables display the data for isolated rail defects immediate action isolated defects, continuous rail defects (excluding rolling contact fatigue) and heavy and severe rolling contact fatigue in both plain line and switching and crossings. Data for the operating routes is also provided where possible. Further explanation of each of the measures is provided below in the commentary.

Reporting confidence and method

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

Table 3.19 shows that isolated rail defects identified have continued to increase across the network, with a 23 per cent increase from 2011/12 to 2012/13. The number of defects remaining has also continued to increase, with a 39 per cent increase from 2011/12

to 2012/13, due to changes to the standard relating to the minimum actions to be taken for defects indentified. Table 3.20 shows that the overall increase in the number of defects is spread across most of the routes with the exception of Wales and Wessex, which show only a minor increase, and Scotland which shows a significant reduction in defects identified.

Previously very small surface defects were scheduled for removal within 13 weeks, regardless of the size or growth rate. The standard now allows smaller defects to be reclassified as 'defects below actionable limits' which are subject to a programme of retesting with no fixed timescale for removal. This allows for more flexible and efficient planning of their removal, and allows a greater focus on the management of larger defects. Work is currently underway to review the data collection process for isolated rail defects so that a clear distinction can be made between actionable and non actionable defects to provide a more accurate report to be produced which better reflects the true condition of the network.

Tables 3.21 and 3.22 show the number of immediate action isolated rail defects identified per 100 kilometres of track by route classification and by specific route category. Immediate action defects are those defects which require the immediate imposition

Table 3.19: Isolated rail defects

	Defects identified	*Defects removed/ repaired*	*Defects remaining*	*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*	*2012/13*	*2012/13*	*at 31/3/2013*
England & Wales	15,827	14,460	6,127	15,936	14,001	8,057	21,795	17,586	12,085
Scotland	3,603	2,635	2,307	4,710	3,304	3,706	3,579	2,944	4,310
Network Total	**19,430**	**17,095**	**8,434**	**20,646**	**17,305**	**11,763**	**25,374**	**20,530**	**16,395**

Table 3.20: Isolated rail defects by operating route

	Defects identified	*Defects removed/ repaired*	*Defects remaining*	*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*	*2012/13*	*2012/13*	*at 31/3/2013*
Anglia	1,533	1,254	607	1,447	1,202	852	1,873	1,425	1,294
Kent	856	828	298	1,009	773	534	1,310	982	806
London North Eastern	2,517	2,403	847	2,605	2,491	957	3,743	3,087	1,590
London North Western	4,681	4,532	2,188	4,429	3,843	2,774	6,241	4,951	4,045
East Midlands	865	552	541	983	670	854	1,029	1063	815
Scotland	3,603	2,635	2,307	4,710	3,304	3,706	3,579	2,944	4,310
Sussex	674	592	234	546	450	330	950	758	502
Wales	1,195	1,032	316	1,604	1,475	445	1,713	1,597	550
Western	2,309	2,226	751	1,808	1,894	664	3,325	2,420	1,532
Wessex	1,197	1,041	345	1,505	1,203	647	1,611	1,303	951
Network Total	**19,430**	**17,095**	**8,434**	**20,646**	**17,305**	**11,763**	**25,374**	**20,530**	**16,395**

of an emergency speed restriction due to their severity. The underlying network total remains largely unchanged, although it has seen an increase from last year it remains below the average over the last five years. Table 3.21 shows significant increases occurred in rural and freight only routes in Scotland, due predominately to an increase in the identification of rail end defects in jointed track in Scotland. Recent revisions to standards this year have introduced new action levels for defects in rolling contact fatigue which are intended to enable the earlier identification and action of defects before they reach a size when immediate actions are required. This allows for planned replacement of the rail before defects reach a critical size and immediate actions are required. Significant reductions in immediate action defects have been achieved in Wessex primary and key London & South East track through an extensive programme of re-railing of existing rolling contact fatigue sites with premium rail steels to reduce the severity of the rolling contact fatigue and the risk of immediate action defects

Tables 3.23 to 3.25 show the length of continuous defects remaining in track (excluding Rolling Contact Fatigue (RCF)). These are rail defects greater than one yard long made up primarily of lipping, wheelburns and hydrogen shatter cracking. Significant increases were seen in the length of continuous defects in London North Western, Anglia and Kent where greater volumes of defects have been identified. However, the data for these routes does not appear to reflect the true number of continuous defects and further work is underway to understand and correct these reporting errors. A number of routes such as Scotland have also added additional lengths of rail into RDMS which are subject to enhanced inspections due to conditions such as sidewear or rail depth to allow the system to plan and monitor the enhanced inspections. This has resulted in significant increases in the reported lengths of continuous defects in these routes which are not defective but are subject to enhanced inspections. Work is currently being undertaken to enable the RDMS data downloads to be filtered to exclude these lengths of rail from the overall length of defective rail being reported and enable comparable data to be produced.

Tables 3.26 and 3.27 show the volume of heavy and severe RCF in plain line track, measured in yards. The introduction and national use of RDMS has enabled the lengths of rolling contact fatigue reported to be split by severity.

Light and moderate rolling contact fatigue, 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 heavy and severe RCF across the network has shown an increase on 2011/12 figures with heavy RCF increasing by twelve per cent and severe RCF increasing by 31 per cent from 2011/12 to 2012/13.

A number of factors have contributed to the overall increase in heavy and severe RCF in plain line track. Changes to standards have been introduced to allow longer timescales for planning the replacement of heavy and severe RCF which have resulted in heavy and severe RCF remaining in track for longer, increasing the overall length that is recorded in RDMS. In addition to these changes, the delivery of plain line grinding has resulted in lower volumes of grinding being delivered on certain routes which has led to increases in the volumes of RCF in the heavy and severe category. Improved planning and delivery

Table 3.21: Immediate action isolated defects per 100km identified during the year by route classification

	Route Classification	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	Primary and key London & South East	8.14	6.37	5.05	4.32	4.41
	Secondary, other London & South East and freight trunk	5.67	4.50	3.48	2.92	2.91
	Rural and freight only	4.65	4.18	2.83	2.31	1.76
	Total	6.62	5.29	4.08	3.46	3.41
Scotland	Primary	10.91	5.33	3.80	4.20	2.03
	Secondary and freight trunk	2.23	4.20	1.87	2.33	1.79
	Rural and freight only	2.97	9.27	5.84	3.59	11.80
	Total	4.02	5.47	3.05	2.94	3.89
Network Total	Primary and key London & South East	8.31	6.30	4.97	4.31	4.26
	Secondary, other London & South East and freight trunk	5.04	4.45	3.18	2.82	2.70
	Rural and freight only	4.33	5.17	3.41	2.56	3.71
	Grand Total	**6.27**	**5.31**	**3.94**	**3.39**	**3.48**

Table 3.22: Immediate action isolated defects per 100km identified during the year by route classification and operating route

Operating Route	*Route Classification*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	Primary and key London & South East	5.57	4.83	4.64	3.16	3.62
	Secondary, other London & South East and freight trunk	3.35	1.56	3.00	1.80	3.12
	Rural and freight only	3.21	2.77	3.33	1.11	2.23
Kent	Primary and key London & South East	12.01	7.87	3.60	4.97	5.16
	Secondary, other London & South East and freight trunk	1.70	2.64	1.72	2.66	3.29
	Rural and freight only	3.28	0.00	1.71	1.71	3.42
London North Eastern	Primary and key London & South East	6.29	3.72	4.41	3.08	2.53
	Secondary, other London & South East and freight trunk	8.04	5.04	4.26	4.72	2.89
	Rural and freight only	5.97	5.09	2.46	2.66	1.62
London North Western	Primary and key London & South East	11.33	8.83	5.80	4.32	4.87
	Secondary, other London & South East and freight trunk	5.49	6.19	4.64	3.39	3.83
	Rural and freight only	8.36	4.23	1.57	1.58	1.33
East Midlands	Primary and key London & South East	3.11	2.78	4.44	3.31	3.31
	Secondary, other London & South East and freight trunk	5.16	5.01	3.62	3.06	2.50
	Rural and freight only	1.52	4.80	1.59	3.17	0.00
Scotland	Primary and key London & South East	10.91	5.33	3.80	4.20	2.03
	Secondary, other London & South East and freight trunk	2.23	4.20	1.87	2.33	1.79
	Rural and freight only	2.97	9.27	5.84	3.59	11.80
Sussex	Primary and key London & South East	9.39	7.15	10.01	8.57	8.37
	Secondary, other London & South East and freight trunk	3.21	0.75	1.32	0.57	1.51
	Rural and freight only	0.00	0.00	1.88	0.00	0.00
Wales	Primary and key London & South East	1.15	4.31	2.30	0.87	3.78
	Secondary, other London & South East and freight trunk	1.68	2.26	1.61	1.76	1.46
	Rural and freight only	1.78	4.59	3.89	2.71	1.90
Western	Primary and key London & South East	6.99	6.63	4.05	3.80	5.72
	Secondary, other London & South East and freight trunk	10.18	6.79	3.40	2.69	2.92
	Rural and freight only	2.05	4.44	5.44	4.78	3.76
Wessex	Primary and key London & South East	10.84	8.57	7.10	8.15	4.12
	Secondary, other London & South East and freight trunk	8.88	4.26	3.02	0.72	2.54
	Rural and freight only	0.00	2.04	2.04	1.03	0.00

Table 3.23: Lengths of continuous rail defects (excluding RCF data)

	Defects identified	*Defects removed/ repaired*	*Defects remaining*	*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	2012/13	2012/13	at 31/3/2013
England & Wales	71,937	68,529	58,009	76,585	68,699	65,858	127,022	123,976	76,996
Scotland	8,683	9,273	34,274	15,415	14,451	35,292	17,995	7,280	45,335
Network Total	**80,620**	**77,802**	**92,283**	**92,000**	**83,150**	**101,150**	**145,017**	**131,256**	**122,331**

Table 3.24: Lengths of continuous rail defects (excluding RCF data) by operating route

		2008/09	*2009/100*	*2010/11*	*2011/12*	*2012/13*
Anglia	Discovered	17,795	13,111	6,401	4,633	8,307
	Remaining	5,530	2,121	1,742	1,603	3,717
	Removed	15,628	16,520	6,780	4,772	6,141
Kent	Discovered	13,585	9,338	4,716	2,665	22,810
	Remaining	901	875	2,046	1,445	20,168
	Removed	12,908	9,364	3,545	3,266	9,376
London North Eastern	Discovered	52,536	17,758	17,200	19,005	22,578
	Remaining	12,464	7,735	8,704	11,127	12,558
	Removed	46,287	22,487	16,231	16,557	20,159
London North Western	Discovered	56,960	22,830	14,448	16,879	27,222
	Remaining	37,611	31,130	30,307	33,476	13,108
	Removed	55,373	29,311	15,271	13,710	47,536
East Midland	Discovered	5,047	1,528	1,640	2,571	3,967
	Remaining	1,051	684	1,004	2,006	1,240
	Removed	14,580	1,895	1,320	1,557	4,718
Scotland	Discovered	14,590	12,352	8,683	15,415	17,995
	Remaining	46,056	34,864	34,274	35,292	45,335
	Removed	11,269	23,544	9,273	14,451	7,280
Sussex	Discovered	25,740	4,514	6,977	4,552	6,449
	Remaining	1,410	1,304	4,371	2,215	3,304
	Removed	24,396	4,620	3,910	6,708	5,404
Wales	Discovered	37,042	14,061	6,768	13,319	14,629
	Remaining	13,640	4,576	2,265	6,326	9,370
	Removed	23,632	23,125	9,079	9,258	11,737
Western	Discovered	7,656	8,412	8,750	8,450	15,734
	Remaining	2,617	4,238	5,135	4,963	9,522
	Removed	5,573	6,791	7,853	8,622	14,892
Wessex	Discovered	5,950	3,599	5,037	4,511	5,326
	Remaining	2,181	1,938	2,435	2,697	4,009
	Removed	5,345	3,842	4,540	4,249	4,013
Network Total	**Discovered**	**236,901**	**107,503**	**80,620**	**92,000**	**145,017**
	Remaining	**123,461**	**89,465**	**92,283**	**101,150**	**122,331**
	Removed	**214,991**	**141,499**	**77,802**	**83,150**	**131,256**

processes are being introduced to help deliver the planned volumes of preventative grinding more effectively and efficiently. Further work is planned to explain some data changes, particularly as London North West shows a 62 per cent reduction in continuous defects but a 64 per cent increase in severe RCF.

In addition, analysis tools are being considered to identify input errors at their source, where incorrect start and finish mileages are entered, giving rise to significant changes in the number of defects discovered and defects removed. New premium rail steels have also been developed and approved with improved wear and RCF resistance. These new steels are now being installed routinely into plain line sites where RCF or wear has resulted in the premature replacement of the rail. Initial trials have also started on new surface crack detecting equipment fitted to one of our ultrasonic test trains. This is planned to be fitted to our complete fleet of ultrasonic test trains to provide regular, quantitative and more consistent measurement and recording of RCF data across the network.

Table 3.25: Lengths of continuous rail defects remaining (defects excluding RCF)

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Network total length (yards)	123,461	89,465	92,283	101,150	122,331
Network total length (km)	113	82	84	92	112

Table 3.26: Rolling contact fatigue in plain line classified as heavy or severe (yards)

	Classification	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	heavy	293,514	303,627	300,331	338,697	375,767
	severe	143,298	132,719	137,499	161,482	214,371
Scotland	heavy	33,246	28,947	32,242	40,687	47,767
	severe	8,300	14,506	16,518	19,543	23,637
Network Total	**heavy**	**326,760**	**332,574**	**332,573**	**379,384**	**423,534**
	severe	**151,598**	**147,225**	**154,017**	**181,025**	**238,008**

Table 3.27: Rolling contact fatigue in plain line classified as heavy or severe (yards) by operating route

	Classification	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	heavy	17,585	21,457	22,604	21,535	24,088
	severe	4,235	5,417	5,397	8,127	12,413
Kent	heavy	27,882	22,145	16,201	10,833	9,261
	severe	42,634	35,507	20,173	12,929	15,344
London North Eastern	heavy	96,724	98,320	92,874	99,760	109,472
	severe	35,526	35,480	41,111	48,918	65,862
London North Western	heavy	59,971	81,482	91,525	116,742	127,393
	severe	12,701	14,457	15,860	25,558	41,913
East Midlands	heavy	8,405	5,242	5,422	5,682	6,639
	severe	8,244	6,662	4,751	4,950	5,325
Scotland	heavy	33,246	28,947	32,242	40,687	47,767
	severe	8,300	14,506	16,518	19,543	23,637
Sussex	heavy	8,756	6,776	11,429	15,499	15,693
	severe	1,386	1,012	2,816	5,434	7,414
Wales	heavy	1,340	1,738	1,662	2,056	2,632
	severe	3,312	5,094	3,691	7,139	9,845
Western	heavy	39,778	35,743	30,652	31,605	38,902
	severe	12,526	11,295	12,344	12,595	12,881
Wessex	heavy	33,073	30,724	27,962	34,985	41,687
	severe	22,734	17,795	31,356	35,832	43,374
Network Total	**heavy**	**326,760**	**332,574**	**332,573**	**379,384**	**423,534**
	severe	**151,598**	**147,225**	**154,017**	**181,025**	**238,008**

Table 3.28: Rolling contact fatigue in S&C classified as heavy or severe (number of components)						
	Classification	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	heavy	1,307	1,560	1,566	1,884	2,296
	severe	1,179	1,112	1,481	2,231	3,159
Scotland	heavy	195	247	271	280	323
	severe	109	151	187	220	252
Network Total	**heavy**	**1,502**	**1,807**	**1,837**	**2,164**	**2,619**
	severe	**1,288**	**1,263**	**1,668**	**2,451**	**3,411**

Table 3.29: Rolling contact fatigue in S&C classified as heavy or severe (number of components) by operating route						
	Classification	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	heavy	38	56	55	57	71
	severe	15	19	34	47	48
Kent	heavy	150	126	117	87	81
	severe	191	156	141	75	76
London North Eastern	heavy	327	515	458	552	734
	severe	160	218	341	580	797
London North Western	heavy	436	491	580	763	969
	severe	228	199	330	606	1,035
East Midlands	heavy	18	23	34	28	32
	severe	57	51	84	141	175
Scotland	heavy	195	247	271	280	323
	severe	109	151	187	220	252
Sussex	heavy	52	51	44	54	42
	severe	14	7	17	57	83
Wales	heavy	17	15	17	14	13
	severe	36	49	45	76	101
Western	heavy	75	74	57	58	80
	severe	70	74	66	73	117
Wessex	heavy	194	209	204	271	274
	severe	408	339	423	576	727
Network Total	**heavy**	**1,502**	**1,807**	**1,837**	**2,164**	**2,619**
	severe	**1,288**	**1,263**	**1,668**	**2,451**	**3,411**

Tables 3.28 and 3.29 show the volume of heavy and severe RCF in S&C. This is reported as the number of components within the S&C, 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 an increase of 21 per cent in the number of components affected by heavy RCF and an increase of 39 per cent in the number of components affected by severe RCF. The most significant increases in severe RCF in S&C components were reported in London North Western (71 per cent), Western (60 per cent) and Sussex (46 per cent).

As in plain line track the increase in severe RCF in S&C reflects the changes in the standards over the last three years which have relaxed the minimum actions for severe RCF allowing S&C severe components to remain in track longer under a retesting programme before they are required to be removed. Reductions in the volumes of both hand and train based grinding, to help manage RCF, in S&C has also resulted in an increase in the number of components affected by heavy or severe RCF. A number of routes are now introducing dedicated grinding managers and operatives to improve the planning of both hand and train based grinding with a particular focus on S&C. The development and approval of the use of premium rail steels for S&C has been completed and the performance of the first trial sites are now being monitored in track. If the trials are successful and improved performance is realised it is intended that premium steels will be more widely used to help reduce wear and RCF in S&C.

Track geometry quality – Good track geometry (M3)

Definition

The measure for Good Track Geometry (GTG) is based on the proportion of track where the lateral alignment is categorised as 'good' or 'satisfactory'. The alignment is measured by track geometry measurement and recording vehicles and the measurement used is standard deviation (in millimetres). The values of standard deviation that need to be achieved for alignment to be categorised as good or satisfactory varies 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 3.30 shows GTG for England & Wales, Scotland, and the network total for each of the main route classifications. Table 3.31 shows GTG for the ten operating routes over the last five years. Increasing values indicate improvement.

Figure 3.3 is a graphical representation of GTG for England & Wales, Scotland and the whole network over the last five years.

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 2008/09 were recalculated to be consistent with the current methodology.

Reporting confidence

The GTG measure has been assigned a B2 confidence grade by Arup, 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

Network wide track geometry has shown a marked improvement in 2012/13 following three successive years that had a deterioration in GTG due to elongated periods of drought combined with severe winters. This trend has now been reversed and GTG has recovered to a level better than at the start of the control period; although falling just short of the 2012 Delivery Plan update target for primary and key London & South East track.

Figure 3.3 shows the trends in GTG for the network as a whole and for England & Wales and Scotland. It can be seen that overall track geometry scoring is closely linked to that of England & Wales, due simply to the greater volume of track. The seasonal trends in GTG for Scotland are different than for the rest of the network, as the track in Scotland is less susceptible to the effects of ground shrinkage in hot weather, but more susceptible to extreme cold and high rainfall.

The graph for Scotland does not show the same recovery in GTG as England & Wales in 2012/13. Reasons for this include exceptionally severe winters whilst 2012/13 was comparatively mild and a reduction in the use of track geometry maintenance machines when compared to the rest of the network.

Although the drought conditions that have caused ground shrinkage in previous years were not seen in 2012/13 the overall improvement has been tempered by high levels of rainfall which in places has caused

Table 3.30: Good track geometry (%) by route classification

	Route Classification	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	Primary and key London & South East	138.5	137.7	137.0	137.0	138.9
	Secondary, other London & South East and freight trunk	140.0	139.8	139.4	138.6	139.9
	Rural and freight only	125.7	130.7	130.0	127.8	133.4
	Total	137.9	137.8	137.2	136.7	138.8
Scotland	Primary	142.0	141.5	139.9	139.5	139.4
	Secondary and freight trunk	143.3	143.4	141.7	142.0	140.8
	Rural and freight only	111.1	107.2	101.5	95.6	97.5
	Total	138.2	137.4	135.3	134.5	134.1
Network Total	Primary and key London & South East	138.8	138.0	137.2	137.2	138.9
	Secondary, other London & South East and freight trunk	140.6	140.5	139.8	139.3	140.1
	Rural and freight only	123.1	126.3	124.6	121.7	126.4
	Grand Total	**137.9**	**137.7**	**137.0**	**136.5**	**138.1**

Table 3.31: Good track geometry (%) by operating route					
	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	131.10	132.50	134.30	130.90	137.47
East Midlands	133.20	132.80	132.40	132.80	135.78
Kent	130.00	126.20	126.50	124.70	128.20
London North Eastern	142.40	142.30	140.40	137.80	138.51
London North Western	139.00	139.20	139.40	140.40	142.14
Scotland	138.20	137.40	135.30	134.50	134.13
Sussex	130.00	127.60	125.70	123.30	127.41
Wales	142.60	145.50	142.70	142.60	143.14
Wessex	132.90	133.90	133.90	134.70	137.29
Western	142.30	141.00	140.10	141.40	141.91
Network Total	**137.90**	**137.70**	**137.00**	**136.50**	**138.13**

ground softness which also has a negative impact on track geometry. The different issues that have been raised by extremely dry and extremely wet weather conditions highlight the fact that further consideration is required to deal with the issues caused by increasing climate variability. These issues are shared by other infrastructure managers around the world

As part of this further consideration we have increased drainage renewal volumes and improved maintenance focus on drainage. These enhanced volumes have been included in the SBP for CP5, and will have a long term effect on how the track asset copes with extreme weather conditions.

Some operational factors have also adversely affected the situation since the start of the control period.

Traffic volumes have increased, 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. With 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, 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 to track with faster line speeds. An assessment has shown that roughly 20 per cent of the deterioration in GTG over the first four years 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; where as 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.

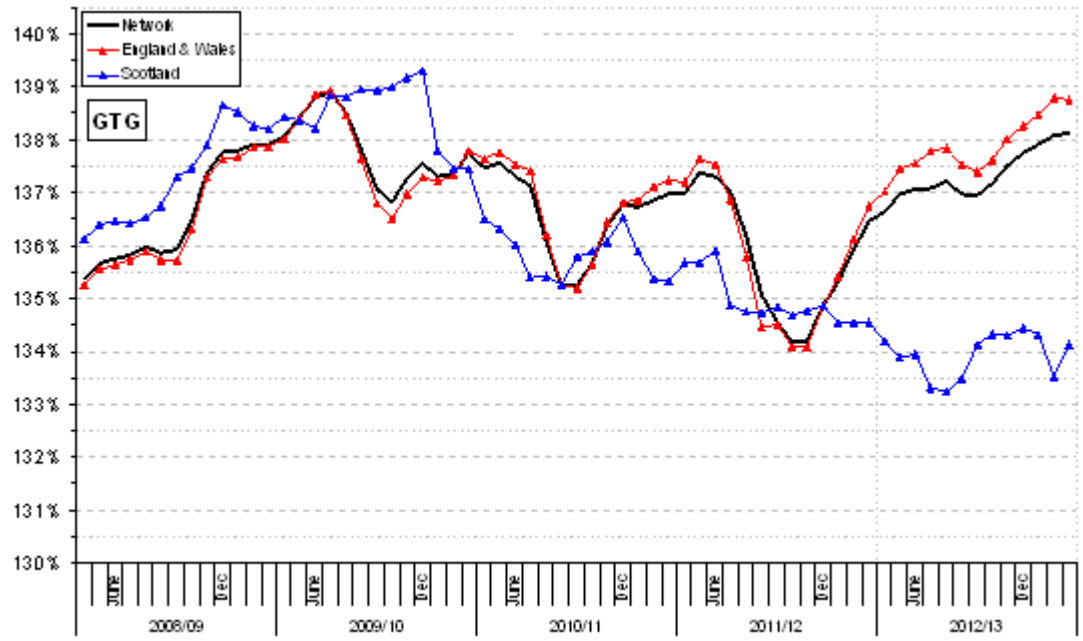
Increased machine allocation has been made, and this and other actions have resulted in the rates of track geometry recovery in autumn 2010, and spring, autumn and winter of 2011/12 being comparable with those achieved in 2005/06 and 2006/07. These actions combined with the absence of significant drought conditions in 2012/13 have had a notable effect in overcoming the cumulative effect of the exceptional weather experienced over the previous three years.

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 and the network wide rate of recovery shown through 2012/13 shows that this target is achievable. 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 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. Track geometry measures always lag behind the actual situation on the ground. They are calculated from the national dataset at the end of each period which holds the last measurement result for each section of track.

Figure 3.3: Network good track geometry



As the dataset can only be updated when a recording run takes place, the dataset will lag both going into any problem phase (when there has been deterioration on the ground that has not yet been detected and measured) and during the recovery phase (when geometry that has been restored to a good or satisfactory condition but has yet to be remeasured).

With the highest frequency of recording any indications of change will be first seen in the statistics for primary track. The effects usually take longer to become apparent in secondary track because of less frequent measurement. With higher proportions of secondary and rural track, Scotland is particularly affected by this lagging effect

Track geometry quality – Poor track geometry (M3)

Definition

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

PTG reflects a combination 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 the underlying ground and other environmental conditions, or wholesale renewal. Affected track is often in the vicinity of major junctions and switches and crossings which compounds the complexity and cost of remediation work, which may then be disproportionate to the benefits of such work, especially on rural and freight routes.

Results

Table 3.32 shows PTG for England & Wales, Scotland, and the network total for each of the main route classifications. Table 3.33 shows PTG for the ten operating routes over the last five years Decreasing values indicate improvement. Figure 3.4 is a graphical representation of PTG for England & Wales, Scotland and the whole network over the last five years.

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 2008/09 have therefore been recalculated to be consistent with current methodologies.

Table 3.32: Poor Track Geometry (%) by route classification						
	Route classification	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	Primary and key London & South East	2.24	2.43	2.49	2.48	2.27
	Secondary, other London & South East and freight trunk	2.08	2.40	2.53	2.59	2.49
	Rural and freight only	2.68	2.77	2.83	3.51	2.69
	Total	2.23	2.45	2.54	2.62	2.39
Scotland	Primary	1.64	1.55	1.63	1.74	1.64
	Secondary and freight trunk	1.68	1.88	2.01	2.16	2.20
	Rural and freight only	2.91	2.50	3.39	3.75	4.02
	Total	1.85	1.88	2.12	2.29	2.32
Network Total	Primary and key London & South East	2.19	2.37	2.43	2.43	2.22
	Secondary, other London & South East and freight trunk	2.01	2.31	2.44	2.51	2.43
	Rural and freight only	2.72	2.71	2.95	3.56	2.95
	Grand Total	**2.18**	**2.38**	**2.48**	**2.58**	**2.38**

Table 3.33: Poor Track Geometry (%) by operating route					
2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	3.02	3.55	3.23	3.61	2.65
East Midlands	2.46	2.47	2.66	2.41	2.20
Kent	2.59	3.57	3.46	4.00	3.59
London North Eastern	1.86	2.10	2.31	2.62	2.60
London North Western	1.89	1.90	1.99	1.87	1.78
Scotland	1.85	1.88	2.12	2.29	2.32
Sussex	3.74	4.22	4.47	5.35	4.91
Wales	1.13	1.28	1.68	1.58	1.40
Wessex	3.05	3.15	3.25	3.47	2.97
Western	2.22	2.48	2.49	2.16	2.08
Network Total	**2.18**	**2.38**	**2.48**	**2.58**	**2.38**

Reporting confidence

The track geometry measures have been assigned an A1 confidence grade by the independent reporter for output monitoring. The track geometry measurement systems that provide the base data and the storage and processing systems that are used to calculate PTG are well established and maintained.

Commentary

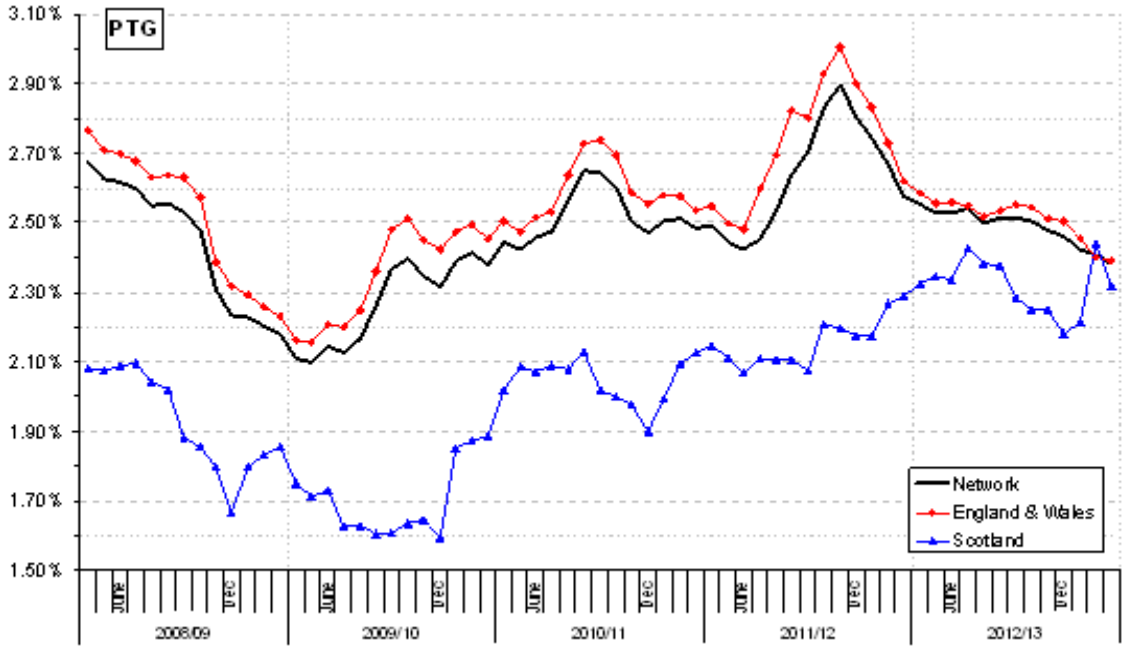
PTG has been affected by the exceptional weather conditions experienced over the first four years of CP4 in a similar manner to GTG.

Figure 3.4 shows the long-term trend for PTG, with substantial improvement over CP3 (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, and the strong level of improvement achieved over the last few months of 2011/12. This recovery has been sustained throughout 2012/13.

The provision of on-track machines for track geometry maintenance is planned by the routes and is continuously reviewed so that resources are optimally deployed to improve track geometry and to allow the plans to adapt to changing weather conditions.

As with GTG, PTG has been adversely affected by the restrictions and wear incurred by increased traffic volume. 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 have been subject to measurement, utilising advancements in the measurement equipment. These lesser used sections have a high

Figure 3.4: Poor Track Geometry



proportion of poor track and so 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 3.4 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 and Wales, but the level of year-on-year deterioration is worse. The reasons for this are similar to those described for GTG, including exceptionally severe winters and the reduction in the use of track geometry maintenance machines. Scotland has also been adversely affected by the increases to linespeeds and increased measurement of cross-overs, loops and other slow speed track. This has disproportionally affected PTG in Scotland's primary track, where the total increase in PTG over the course of the first three years of the current control period was matched by the increase arising from higher linespeed and additional measurement.

Our target 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. The network wide rate of recovery shown through 2012/13 shows that this target is achievable.

Track geometry faults (M5)

Definition

This measure is based on discrete track 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 actions 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 3.34 shows track geometry faults for England & Wales, Scotland, and the network as a whole for each of the main route classifications. Table 3.35 shows track geometry faults for the ten operating routes over the last five years. Decreasing values

Table 3.34: Track geometry faults per 100 km by route classification						
	Route Classification	***2008/09***	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	Primary and key London & South East	27.6	29.6	29.4	30.9	28.9
	Secondary, other London & South East and freight trunk	40.0	43.3	40.9	42.0	42.8
	Rural and freight only	73.6	69.5	66.2	65.7	67.1
	Total	38.8	40.5	39.0	40.2	39.7
Scotland	Primary	24.6	22.9	25.6	20.5	17.5
	Secondary and freight trunk	30.7	35.1	38.0	41.2	39.7
	Rural and freight only	55.0	62.0	78.3	96.3	82.6
	Total	34.6	38.4	44.0	48.5	44.2
Network Total	Primary and key London & South East	27.4	29.1	29.2	30.3	28.2
	Secondary, other London & South East and freight trunk	38.3	41.9	40.4	41.9	42.2
	Rural and freight only	69.9	68.0	68.7	71.8	70.2
	Grand Total	**38.2**	**40.3**	**39.7**	**41.3**	**40.3**

Table 3.35: Track geometry faults per 100 km by operating route					
2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	39.0	53.6	40.2	46.3	43.3
East Midlands	32.1	33.3	24.5	26.8	24.2
Kent	28.3	39.4	49.1	44.8	49.7
London North Eastern	39.2	38.9	36.5	38.2	39.2
London North Western	39.6	36.1	32.6	35.5	34.8
Scotland	34.6	38.4	44.0	48.5	44.2
Sussex	41.7	57.6	64.1	67.1	61.9
Wales	28.4	31.8	40.0	39.3	39.4
Wessex	46.6	47.4	51.0	50.7	47.6
Western	44.8	39.7	40.4	37.9	38.4
Network Total	**38.2**	**40.3**	**39.7**	**41.3**	**40.3**

indicate improvement. Figure 3.5 is a graphical representation of track geometry faults for England & Wales, Scotland and the whole network over the last five years.

Reporting confidence

The measure for track geometry faults per 100 kilometres was assigned an A1 confidence grade by the previous independent reporter for output monitoring. It has not been re-assessed 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

2012/13 has seen a slight overall improvement in the number of track geometry faults on the network. A number of factors caused an initial increase in the number of track geometry faults in the first half of 2012/13 but this deterioration was arrested in the second half of the year.

Root cause analysis has shown that the cause of 30 per cent of this increase was the fitment of new instrumentation equipment on the TRU (Track Recording Unit) measuring train. The new equipment is more reliable, capturing gauge faults which were previously missed. As forecast, the numbers of gauge faults declined in the second half of the year as track maintenance employees fixed the faults recorded earlier in the year and the track was remeasured.

The same analysis also showed that 70 per cent of the overall increase was associated with twist. This was triggered by ground softening caused by the abnormally high rainfall in spring and summer. The percentage of these twist faults that repeated also increased throughout the year as a result of a lack of

effective repair work. Particular problems leading to this were identified as:

- difficulty in accurately locating the positions of recorded faults
- the high volume and concentration of faults leading to less time available to rectify each one (treating immediate symptoms but risking reoccurrence)
- higher skilled personnel needed to deliver more technically demanding tasks, so less skilled personnel assigned to apply simple treatments to fix top and twist faults.

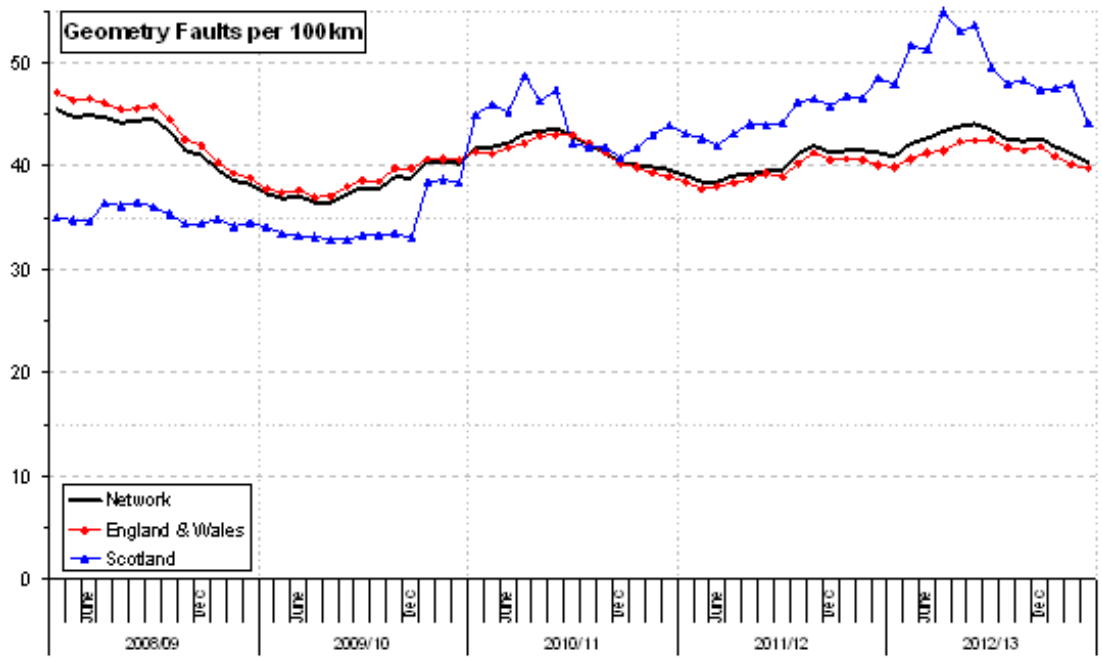
Action plans were implemented, covering technology, training and resourcing, which reversed the increasing number of twist faults across the network.

The long-term trend in geometry faults is shown in Figure 3.5, as with the other geometry measures there is a correlation of geometry faults with weather conditions, but it is less pronounced than for GTG or PTG. One 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 crossovers 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 poor track geometry 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.

It can also be seen from Figure 3.5 that there was a deteriorating trend in track geometry faults in Scotland which started in mid 2010/11 and continued until early mid 2012/13 when performance started to improve, recovering to end 2010/11 levels by the end of 2012/13. This deterioration (amongst other measures) was the subject of an asset management review in early 2012/13 which recommended a number of actions to address resource imbalances and target interventions where immediate and sustainable benefits would be delivered. This resulted in increased, targeted funding for track in Scotland, to which the turnaround in the rate of track geometry faults in Scotland can be ascribed. For the network as a whole, the policy and commitment for CP4 is for a reduction in track geometry faults to

Figure 3.5: Network geometry faults per 100km



35.9 per 100 kilometres by the end of the Control Period in March 2014. The additional actions and resources to achieve this are currently 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, but in order to do this in a consistent manner we need to enhance our current I.T. systems. Work is underway and once complete, Immediate Action geometry faults will be reported 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 3.36 provides the number of track buckles per 100 kilometres of track for England & Wales, Scotland and the whole network.

Reporting confidence

Track buckles are reported to A2 confidence grade. For every occurrence a track buckle report and a hazard report are produced.

Commentary

A total of nine track buckles occurred in 2012/13. This is slightly better than the twelve buckles recorded in 2011/12. There were two significant factors behind this continuous improvement; planned, preventative action and another temperate summer.

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 and have been consolidated on in 2012/13.

Unlike 2010/11 and 2011/12, the majority of buckles (six) occurred in welded track. Three buckles occurred in track with continuously welded rail (CWR), one of which occurred in higher speed and tonnage track (track categories 1A and 1). Only one of the buckles occurred in or close to sections of track containing switches and crossings. The one buckle that did occur in a switch and crossing unit occurred in a renewal site following handback.

The cause of all track buckles is investigated. Of the buckles that occurred during 2012/13, three occurred following disturbance to the track system by maintenance or renewal work and three were due to incorrectly stressed CWR. Of the remaining three buckles one was ballast bolts, another had a pre-existing alignment fault and the last was found to have disturbed/inadequate ballast.

Track failures

Definition

This measure reports the total number of train delay incidents that were attributed to track failures on Network Rail owned infrastructure, using data from TRUST (a train running system which records details of train running as compared with schedule). 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 3.37 provides the number of track failures for England & Wales, Scotland and the whole 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 the years.

Table 3.36: Track buckles per 100 km

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	0.06	0.09	0.10	0.05	0.04
Scotland	0.05	0.05	0.02	0.00	0.00
Network Total	**0.05**	**0.09**	**0.09**	**0.04**	**0.03**

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 (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). 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
- 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 the rail. Rail grinding removes shallow cracks and, more importantly, reprofiles the rail 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 restriction. 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, leading 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 restrictions. Part of the reduction has been brought about by requiring earlier intervention on certain types of defects to prevent them 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.

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.

The adverse effects of extreme weather led to a general deterioration of track geometry in the early years of CP4 (see good track geometry, poor track geometry (M3) and track geometry faults (M5)). This will have resulted in some additional dynamic load. However, with the recovery in track geometry measures seen in 2012/13 and the other initiatives already mentioned, 2012/13 has seen another year on year overall reduction in track failures in England & Wales.

There has also been a reduction in track failures in Scotland following two years of increases. This has brought the overall number of failures in Scotland back to below the level seen in the last three years of CP3. Some of this is associated with the improvement in track geometry faults in Scotland,

Table 3.37: Number of track failures

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	7,318	6,312	5,500	5,053	4,963
Scotland	430	358	387	448	372
Network Total	**7,748**	**6,670**	**5,887**	**5,501**	**5,335**

with reductions 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 pressures of additional traffic volumes, and the adverse effects that extreme weather has had on track geometry, steady reductions in the number of track failures has been achieved throughout CP4. These have been achieved through the application of the current asset management policies and the introduction of 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 of that section of track, 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 also be planned for safety and consolidation of works. Sites where an ESR or TSR has been imposed for less than seven days due to being part of the normal maintenance cycle are excluded.

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 period-end reporting to the ORR, as well as for the M4 condition of asset measure.

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 planned window, or speed restrictions with no removal plans. A 'planned' TSR refers to any speed restrictions that the train operators are formally aware of through Rules of the Route (ROTR) the Confirmed Period Possession Plan (CPPP) or 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.

Results

Tables 3.38 to 3.43 summarise the unplanned and planned speed restrictions across the network by type, cause and operating route. Figure 3.6 shows the actual number of unplanned temporary speed restrictions per period for 2011/12 and 2012/13.

Reporting confidence

The data collection process is unchanged and was previously awarded a confidence grade of B2 in 2008/09 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.

Commentary

The total number of TSRs (planned and unplanned) for the year 2012/13 was 1,958. This represents a five per cent increase compared with last year. Planned speed restrictions increased by almost five per cent, and unplanned speed restrictions increased by almost six per cent compared with last year.

In 2012/13 over 60 per cent of all speed restrictions were planned TSRs arising primarily through scheduled maintenance and renewals work. These necessary speed restrictions are a reflection of good asset stewardship. The very wet weather during 2012/13 also had a significant adverse impact on the number of TSRs on the network. The number of unplanned speed restrictions attributed to earthworks increased from 38 to 67. The number of condition of track TSRs was also adversely affected by the wet weather, which is described in more detail below.

Compared with last year the number of TSRs attributed to structures and signalling power and communications has increased, while TSRs attributed to earthworks saw an increase in the number which were unplanned but a reduction in planned. By contrast those attributed to safety saw a reduction in unplanned TSRs but an increase in planned TSRs.

Track

The total number of track speed restrictions was virtually unchanged between 2011/12 and 2012/13. However the number increased in the second half of the year compared to the first half, reflecting a combination of the timing of renewals work, including the impact of the Olympic games, and the very wet autumn and winter.

Planned track TSRs are often applied to assist with track renewals. These speed restrictions are required to allow the track to consolidate after work has taken place or for track worker safety. Typically the duration of these is short in nature with defined end dates.

Unplanned track TSRs reflect issues with the condition of track. The main causes of these during the winter were cyclic top (a series of dips in the rail at regular intervals which can negatively affect vehicle suspension), wetbeds (a deterioration of the sleepers and ballast caused by saturation) and poor drainage. The high levels of rainfall this year have also resulted in the need to divert resources from planned work to attend to service disrupting incidents, reducing the amount of track geometry

Table 3.38: National TSR summary – Unplanned and planned

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Unplanned	761	724	450	738	781
Planned	3,675	1,005	898	1,126	1,177
Network Total	**4,436**	**1,729**	**1,348**	**1,864**	**1,958**

Table 3.39: National TSR – Unplanned and planned by operating routes

		2011/12		*2012/13*	
		Primary	*Secondary*	*Primary*	*Secondary*
Anglia	Unplanned	59	20	52	4
	Planned	71	49	94	20
East Midlands	Unplanned	9	7	27	21
	Planned	48	15	58	17
Kent	Unplanned	58	15	73	4
	Planned	5	6	6	1
London North Eastern	Unplanned	73	4	45	0
	Planned	218	7	399	1
London North Western	Unplanned	154	7	155	12
	Planned	252	10	250	22
Scotland	Unplanned	13	67	8	63
	Planned	68	122	43	99
Sussex	Unplanned	50	4	60	0
	Planned	12	0	8	0
Wales	Unplanned	13	24	31	15
	Planned	50	11	32	6
Wessex	Unplanned	123	0	138	0
	Planned	32	0	27	0
Western	Unplanned	27	11	61	12
	Planned	144	6	89	5
Network Total	Unplanned	579	159	650	131
	Planned	900	226	1,006	171
	Grand Total	**1,479**	**385**	**1,656**	**302**

Table 3.40: National Unplanned TSRs summary – total 2012/13

	Classification	*Track*	*Structures*	*SP&C*	*Earthworks*	*Safety*	*Total*
England & Wales	Primary	499	43	4	53	43	642
	Secondary	47	3	0	7	11	68
Scotland	Primary	7	0	0	0	1	8
	Secondary	47	2	0	7	7	63
Network Total	Primary	506	43	4	53	44	650
	Secondary	94	5	0	14	18	131
	Grand Total	**600**	**48**	**4**	**67**	**62**	**781**

Table 3.41: National Unplanned TSRs summary by operating route

		2011/12		2012/13	
		Primary	*Secondary*	*Primary*	*Secondary*
Anglia	Track	41	10	37	4
	Structures	0	0	1	0
	Earthworks	6	0	5	0
	Safety	12	10	9	0
	SPC	0	0	0	0
East Midlands	Track	5	7	26	17
	Structures	0	0	0	0
	Earthworks	0	0	0	0
	Safety	4	0	1	4
	SPC	0	0	0	0
Kent	Track	46	12	56	4
	Structures	0	3	10	0
	Earthworks	11	0	7	0
	Safety	1	0	0	0
	SPC	0	0	0	0
London North Eastern	Track	66	4	35	0
	Structures	3	0	1	0
	Earthworks	1	0	2	0
	Safety	3	0	7	0
	SPC	0	0	0	0
London North Western	Track	133	7	131	12
	Structures	2	0	11	0
	Earthworks	4	0	11	0
	Safety	15	0	2	0
	SPC	0	0	0	0
Scotland	Track	12	54	7	47
	Structures	0	4	0	2
	Earthworks	0	5	0	7
	Safety	1	4	1	7
	SPC	0	0	0	0
Sussex	Track	45	2	38	0
	Structures	3	2	10	0
	Earthworks	0	0	6	0
	Safety	2	0	6	0
	SPC	0	0	0	0
Wales	Track	7	14	12	2
	Structures	0	0	5	2
	Earthworks	0	2	0	7
	Safety	6	7	11	4
	SPC	0	1	3	0
Wessex	Track	106	0	133	0
	Structures	3	0	1	0
	Earthworks	4	0	2	0
	Safety	10	0	2	0
	SPC	0	0	0	0

Table 3.41 continued: National Unplanned TSRs summary by operating route

		2011/12		2012/13	
		Primary	Secondary	Primary	Secondary
Western	Track	24	6	31	8
	Structures	0	0	4	1
	Earthworks	2	3	20	0
	Safety	1	2	5	3
	SPC	0	0	1	0
Network Total	Track	485	116	506	94
	Structures	11	9	43	5
	Earthworks	28	10	53	14
	Safety	55	23	44	18
	SPC	0	1	4	0
	Grand Total	**579**	**159**	**650**	**131**

Table 3.42: National Planned TSRs summary – total speeds 2012/13

	Classification	Track	Structures	SP&C	Earthworks	Safety	Total
England & Wales	Primary	823	41	6	17	76	963
	Secondary	48	3	0	3	18	72
Scotland	Primary	39	4	0	0	0	43
	Secondary	55	38	2	2	2	99
Network Total	Primary	862	45	6	17	76	1,006
	Secondary	103	41	2	5	20	171
	Grand Total	**965**	**86**	**8**	**22**	**96**	**1,177**

recovery work and contributing to increases in overall speed restrictions due to an inability to remove wet beds or repair poor drainage.

Cyclic top predominantly affects freight traffic and speed restrictions are imposed to mitigate the risk to these services. The number of cyclic top related speed restrictions rose in the latter half of 2012/13 associated with increased rainfall levels and greater vigilance following a derailment on the East Midlands route caused by cyclic top.

Structures

Total TSRs related to structures has increased, from 67 in 2011/12 to 134 in 2012/13. This reverses the improvement seen last year, and follows an increase in bridge inspections during the course of the year, together with some impact from damage caused by the unusually wet weather conditions. The total number of speed restrictions peaked during the winter (Period 11), and by the end of Period 1 2013/14 had fallen back sharply from this peak.

Earthworks

The average rainfall over the last year on five routes (Western, Wessex, London North Western, London North Eastern and East Midlands) has been significantly higher than normal. This has affected embankment stability, which in turn has resulted in an increase in unplanned speed restrictions being imposed and a programme of earthworks inspections to identify at risk locations due to flooding or water saturation.

Safety

Total safety speed restrictions have increased slightly, from 151 in 2011/12 to 158 in 2012/13. Within this total, planned speed restrictions have increased by 23, reflecting the length of time some of these TSRs have been in place. Network Rail has continued to review safety at level crossings with a programme of work being developed to identify and rectify sites where the time available for pedestrians was below the recommended level. At sites where immediate remedial work could not be undertaken, speed restrictions have been imposed to increase the crossing time available. The main programme to identify level crossings with insufficient sighting is now complete along with an ongoing risk review. The remaining speed restrictions are in place to protect those crossings with insufficient sighting and will be progressively removed when corrective actions have taken place.

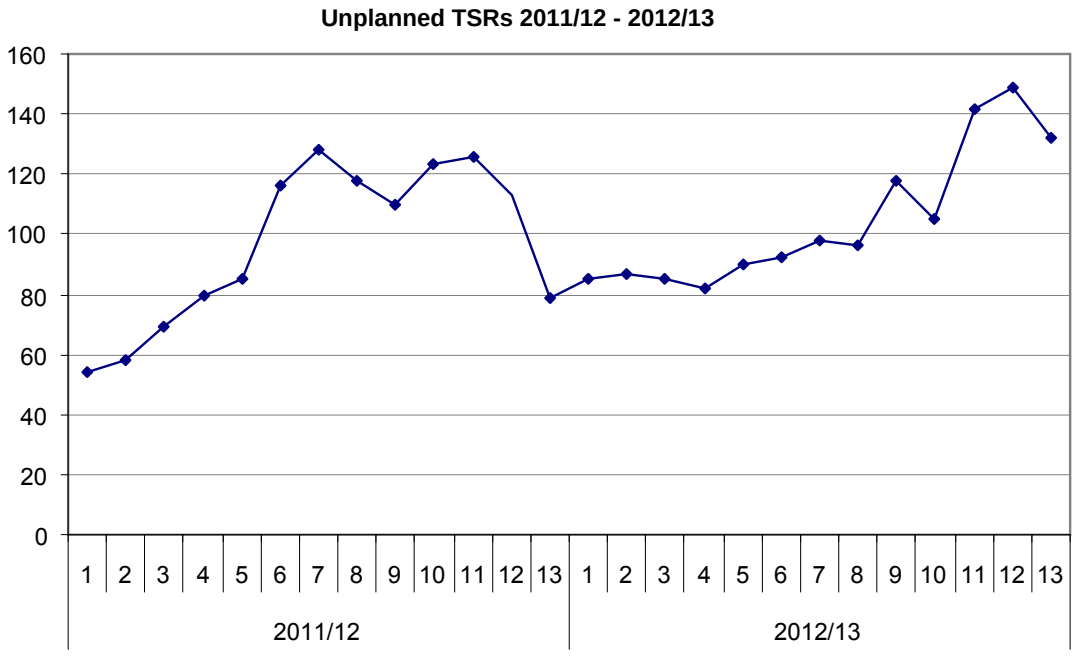
Table 3.43: National Planned TSRs summary – by operating route

		2011/12		2012/13	
		Primary	***Secondary***	***Primary***	***Secondary***
Anglia	Track	48	24	65	8
	Structures	0	4	1	0
	Earthworks	2	0	5	0
	Safety	21	21	23	12
	SPC	0	0	0	0
East Midlands	Track	46	13	54	11
	Structures	2	0	0	0
	Earthworks	0	1	0	1
	Safety	0	1	4	5
	SPC	0	0	0	0
Kent	Track	2	0	3	0
	Structures	0	4	0	1
	Earthworks	0	0	0	0
	Safety	3	2	3	0
	SPC	0	0	0	0
London North Eastern	Track	198	7	381	1
	Structures	12	0	9	0
	Earthworks	6	0	5	0
	Safety	1	0	0	0
	SPC	1	0	4	0
London North Western	Track	212	9	179	19
	Structures	9	0	26	0
	Earthworks	9	0	3	2
	Safety	20	1	42	1
	SPC	2	0	0	0
Scotland	Track	60	114	39	55
	Structures	6	6	4	38
	Earthworks	0	1	0	2
	Safety	0	1	0	2
	SPC	2	0	0	2
Sussex	Track	10	0	8	0
	Structures	2	0	0	0
	Earthworks	0	0	0	0
	Safety	0	0	0	0
	SPC	0	0	0	0
Wales	Track	48	10	24	4
	Structures	2	0	5	2
	Earthworks	0	0	0	0
	Safety	0	1	1	0
	SPC	0	0	2	0
Wessex	Track	29	0	22	0
	Structures	0	0	0	0
	Earthworks	2	0	2	0
	Safety	1	0	3	0
	SPC	0	0	0	0

Table 3.43 continued: National Planned TSRs summary – by operating route

		2011/12		2012/13	
		Primary	*Secondary*	*Primary*	*Secondary*
Western	Track	133	6	87	5
	Structures	0	0	0	0
	Earthworks	11	0	2	0
	Safety	0	0	0	0
	SPC	0	0	0	0
Network Total	Track	786	183	862	103
	Structures	33	14	45	41
	Earthworks	30	2	17	5
	Safety	46	27	76	20
	SPC	5	0	6	2
	Grand Total	**900**	**226**	**1,006**	**171**

Figure 3.6: National Unplanned TSRs (number per period)



Notes: based on count of TSRs at the end of each period. TSRs on for a duration of more than one period, will feature in multiple period results

Signalling Power & Communications (SP&C)

Speed restrictions attributed to SP&C are rare (e.g. speed restrictions imposed due to poor signalling design or equipment awaiting renewal) only twelve occurred throughout the year. This was an increase compared to the previous year, largely reflecting speed restrictions introduced as part of the ongoing implementation of European Rail Traffic Management System (ERTMS), a programme to replace traditional line side railway signals with a computer display within the train cab. These accounted for five of the twelve TSRs.

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 are reported by the route geotechnical teams to the principal civil engineer (geotechnical), in the central team, following occurrence and throughout the year. The principal civil engineer's (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 2012/13 was 144. This is a considerable increase in last year's outturn of 28 and is reflective of the impact of weather and low resilience of the earthworks asset. The recorded rainfall in England & Wales in 2012 was the second greatest since records began in 1910. The North East and South West of England suffered the greatest with rainfall levels exceeding the 30 year average by more than 35 per cent. Table 3.44 shows the number of sites of earthworks failures for England & Wales, Scotland, and for the whole network for the past five years. Table 3.45 then breaks this data down by operating route. Table 3.46 shows earthwork failures for 2011/12 and 2012/13.

Reporting confidence

The confidence rating for earthworks failure measure is A2 which is unchanged from last year

Commentary

There were six train derailments due to earthworks failures in 2012/13. This is the highest recorded number of derailments due to earthwork failures since the measure began in 2003. Of the six derailments, four were due to cutting failures, one was as a result of an embankment failure, and the other derailment occurred as a result of a natural slope failure, some distance above Network Rail infrastructure, resulting in boulders and debris on the tracks. A full in depth causal analysis of all failures in 2012/13 has been undertaken to derive learning on asset resilience, trigger conditions and provide improvements in asset management, dynamic risk assessment and control measures. The large increase in failures contrasts with an improving trend in recent years. The initial analysis indicates that 95 per cent of failures in 2012/13 occurred when the ground was saturated and 75 per cent were weather related. The severe test provided by the weather provided an insight into the resilience of the earthworks asset. The output from the causal analysis will inform the earthworks examination and management standards and improve the targeting of intervention works and improve asset resilience.

Table 3.44: Earthwork failures

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	47	45	29	12	125
Scotland	14	12	13	16	19
Network Total	**61**	**57**	**42**	**28**	**144**

Table 3.45: Earthwork failures by operating route

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	0	2	0	1	2
East Midlands	1	0	0	1	1
Kent	6	4	2	1	5
London North Eastern	7	4	1	1	20
London North Western	9	10	8	1	42
Scotland	14	12	13	16	19
Sussex	2	5	2	0	4
Wales	4	9	2	5	6
Wessex	7	2	2	1	8
Western	11	9	12	1	37
Network Total	**61**	**57**	**42**	**28**	**144**

Table 3.46: Earthwork failures for 2011/12 and 2012/13

		Poor	*Marginal*	*Serviceable*	*No Condition Grade*	*Total*
Anglia	2011/12	0	0	0	1	1
	2012/13	1	1	0	0	2
East Midlands	2011/12	0	1	0	0	1
	2012/13	0	1	0	0	1
Kent	2011/12	0	0	1	0	1
	2012/13	1	1	3	0	5
London North Eastern	2011/12	0	0	1	0	1
	2012/13	1	9	6	4	20
London North Western	2011/12	0	0	1	0	1
	2012/13	11	16	9	6	42
Scotland	2011/12	2	8	6	0	16
	2012/13	3	7	7	2	19
Sussex	2011/12	0	0	0	0	0
	2012/13	1	3	0	0	4
Wales	2011/12	2	3	0	0	5
	2012/13	0	5	1	0	6
Wessex	2011/12	1	0	0	0	1
	2012/13	2	1	3	2	8
Western	2011/12	1	0	0	0	1
	2012/13	17	13	5	2	37
England & Wales	2011/12	4	4	3	1	12
	2012/13	34	50	27	14	125
Network Total	**2011/12**	**6**	**12**	**9**	**1**	**28**
	2012/13	**37**	**57**	**34**	**16**	**144**

The increase in failures was greatest in the Western, London North Western and London North Eastern routes. This correlates with the locations that have been subject to the highest number of short intense rainfall events and/or continuous rainfall considerably exceeding 30 year averages.

Network Rail has responded to the challenge, presented by record rainfall totals, by improving its adverse weather management arrangements, improving its earthworks asset policy to undertake more drainage and maintenance work and greater deployment of remote condition monitoring/alert systems.

The new CP5 Asset Policy and plans together with Network Rail's technical strategy provide the basis for improved management of the asset, improved data quality and systems, improved detection of failures on the infrastructure which in turn will deliver more effective management of the asset. The benefits will be realised incrementally over several control periods.

Earthwork condition (M33)

Definition

This measure covers the number of five chain lengths of earthworks (embankments and cuttings) in poor, marginal and serviceable condition.

Reporting method

Earthwork condition is reported by five chain lengths for poor, marginal and serviceable condition rating split geographically. Earthwork condition is the state defined by a soil slope hazard index (SSHI), or a rock slope hazard index (RSHI) defined in Table 3.47. Examinations are carried out in accordance with the requirements of the Network Rail company standard for the examination of earthworks and an algorithm is used to produce the SSHI or RSHI scores from the field data gathered as part of the examination.

Results

Table 3.48 provides the number of embankments, soil cuttings, and rock cuttings by the condition category per five chains for England & Wales, Scotland, and the overall network by national boundaries. Table 3.49 provides the number of embankments, soil cuttings, and rock cuttings by condition category per five chains for the ten operating routes.

Reporting confidence

The confidence rating for earthworks condition measure is B2.

Commentary

This report is a snapshot measure of earthwork condition at the end of Period 1 (April) of 2013/14 so as to report 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 earthwork, 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.

The number of assets and condition profile are sensitive to improvements in data management and collection processes. This year, the third year of M33 earthwork condition reporting, there has been considerable data cleansing/correction to improve the robustness of the asset inventory. This has covered removal of asset records on lines no longer managed by Network Rail and the addition of new asset following assets inventory verification by use of Light Detection and Ranging (LiDAR) remote sensing surveys gathered by aircraft.

The number of earthwork five chain lengths listed in the examination database has increased from 164,199 in 2011/12 to 167,809 in 2012/13. This net increase in the earthwork asset number is due to the inclusion of assets/examinations in the central database from the asset inventory verification exercise, which were previously excluded.

There has been a slight increase (worsening) in the percentage of poor condition earthworks from 4.9 per cent in 2011/12 to 5.2 per cent in 2012/13. This follows a decrease (improvement) in the percentage of poor condition earthworks from 5.4 per cent to 4.9 per cent between 2011 and 2012.

Reasons for this slight deterioration in condition include:

- the very heavy rainfall in 2012/13 causing a larger proportion of marginal condition grade earthworks to deteriorate to poor than poor earthworks remediated in the year
- a number of first time examination of earthworks added to the asset inventory following verification which have been assessed to be in poor grade condition.

There has also been also been an increase in the percentage of marginal condition earthworks from 40.4 per cent to 44.7 per cent.

Reasons for this include:

- the first time scoring of marginal asset in accordance with the current examination standard
- a number of first time examination of earthworks added to the asset inventory following verification of the asset inventory which have been assessed to be in marginal grade condition
- the deterioration of serviceable condition asset since its first examination 10 years ago.

In 2013/14 the Buildings and Civils Asset Management (BCAM) transformation programme will commence delivery of a new asset management system, Civil Strategic Asset Management Solution (CSAMS) and processes which will enhance Network Rail's management and control of data and drive improvements in data quality and reporting. Phase 1 of CSAMS is due to be deployed in Geotech by April 2014. This will provide the routes with an enhanced tool to manage large earthwork asset portfolios ranging in size to over 30,000 assets, monitor trends and direct investment to achieve planned outcomes.

Table 3.47: 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 3.48: Earthwork condition results per five chains for 2012/13 (By National Boundaries)						
			Poor	***Marginal***	***Serviceable***	***Total***
England & Wales	Embankment	2011/12	4,416	33,473	36,612	74,501
		2012/13	4,565	35,765	35,342	75,672
	Soil Cutting	2011/12	2,064	22,796	26,347	51,207
		2012/13	2,208	25,113	25,366	52,687
	Rock Cutting	2011/12	538	2,673	2,556	5,767
		2012/13	548	3,246	2,683	6,477
	Total	2011/12	7,018	58,942	65,515	131,475
		2012/13	7,321	64,124	63,391	134,836
Scotland	Embankment	2011/12	643	3,204	13,436	17,283
		2012/13	733	4,988	11,287	17,008
	Soil Cutting	2011/12	296	3,029	10,152	13,477
		2012/13	427	4,459	8,719	13,605
	Rock Cutting	2011/12	160	1,221	583	1,964
		2012/13	195	1,513	652	2,360
	Total	2011/12	1,099	7,454	24,171	32,724
		2012/13	1,355	10,960	20,658	32,973
Network Total	Embankment	2011/12	5,059	36,677	50,048	91,784
		2012/13	5,298	40,753	46,629	92,680
	Soil Cutting	2011/12	2,360	25,825	36,499	64,684
		2012/13	2,635	29,572	34,085	66,292
	Rock Cutting	2011/12	698	3,894	3,139	7,731
		2012/13	743	4,759	3,335	8,837
	Total	**2011/12**	**8,117**	**66,396**	**89,686**	**164,199**
		2012/13	**8,676**	**75,084**	**84,049**	**167,809**

Table 3.49: Earthwork condition results per five chains for 2012/13 by operating route					
		Poor	***Marginal***	***Serviceable***	***Total***
Anglia	Embankment	319	2,511	3,519	6,349
	Soil Cutting	105	1,860	2,155	4,120
	Rock Cutting	4	5	14	23
	Total	428	4,376	5,688	10,492
East Midlands	Embankment	295	2,269	2,970	5,534
	Soil Cutting	106	1,435	1,593	3,134
	Rock Cutting	21	93	83	197
	Total	422	3,797	4,646	8,865
Kent	Embankment	231	1,345	2,428	4,004
	Soil Cutting	160	1,312	1,450	2,922
	Rock Cutting	89	340	351	780
	Total	480	2,997	4,229	7,706
London North Eastern	Embankment	806	9,823	8,847	19,476
	Soil Cutting	228	5,381	5,868	11,477
	Rock Cutting	77	809	669	1,555
	Total	1,111	16,013	15,384	32,508
London North Western	Embankment	986	7,326	6,835	15,147
	Soil Cutting	825	6,572	6,435	13,832
	Rock Cutting	96	638	652	1,386
	Total	1,907	14,536	13,922	30,365

Table 3.49 continued: Earthwork condition results per five chains for 2012/13 by operating route

		Poor	*Marginal*	*Serviceable*	*Total*
Scotland	Embankment	728	4,965	11,265	16,958
	Soil Cutting	427	4,435	8,685	13,547
	Rock Cutting	195	1,513	652	2,360
	Total	1,350	10,913	20,602	32,865
Sussex	Embankment	205	1,167	1,712	3,084
	Soil Cutting	83	787	891	1,761
	Rock Cutting	34	177	169	380
	Total	322	2,131	2,772	5,225
Wales	Embankment	660	4,324	2,131	7,115
	Soil Cutting	179	2,885	2,012	5,076
	Rock Cutting	77	527	398	1,002
	Total	916	7,736	4,541	13,193
Wessex	Embankment	346	2,629	3,620	6,595
	Soil Cutting	128	2,029	2,525	4,682
	Rock Cutting	10	83	81	174
	Total	484	4,741	6,226	11,451
Western	Embankment	722	4,394	3,302	8,418
	Soil Cutting	394	2,876	2,471	5,741
	Rock Cutting	140	574	266	980
	Total	1,256	7,844	6,039	15,139
Network Total	Embankment	5,298	40,753	46,629	92,680
	Soil Cutting	2,635	29,572	34,085	66,292
	Rock Cutting	743	4,759	3,335	8,837
	Total	**8,676**	**75,084**	**84,049**	**167,809**

Tunnel condition

Definition

The tunnel condition score is a measure of the average condition of tunnel bores and tunnel portals marked on a 100 point scale; with 100 representing the best possible condition and zero representing the worst possible 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 with brickwork or masonry linings. Scores are derived separately for the tunnel bores (including shaft eyes situated within the bore) and tunnel portals. The unlined sections in 32 tunnels do not attract a TCMI score.

Reporting method

Each time a detailed examination of a tunnel is carried out, the standard defect coding within the report representing severity and the extent of all structurally significant defects generates a condition score for the tunnel. The scores range from 100 for the best condition descending to zero for the worst condition.

Each tunnel asset is sub-divided into components such as bores and portals. Tunnel bores are broken down in to 20 metre lengths termed tunnel sections (termed major elements within the TCMI scoring system). These split horizontally to form smaller discrete areas known as minor elements for condition reporting at a higher resolution, as shown in Figure 3.7. Tunnel portals are also split into major and minor elements as shown in Figure 3.8.

Each time a detailed examination of a tunnel is undertaken all salient defects are coded for severity and extent. This in turn calculates a condition score for each minor element.

In last year's Annual Return it was stated that further improvements to the reporting measure was planned during the course of 2012/13 to provide a greater level of condition granularity and improve monitoring of the resulting condition profile. More minor element data sets are now available and so a more accurate depiction of condition, rates of change due to degradation and intervention can now be provided by reporting on the entire number of tunnel minor element scores rather than the average score of the tunnel sections within a bore as has historically been the case. Network Rail intends to report using this measure in future years so as to allow a direct comparison year on year. The data for both 2011/12 and 2012/13 has been provided as it represents the first two years with sufficient and comparable data since the introduction of TCMI.

It was intended to roll out TCMI for shafts in 2011/12, but due to technical issues during development it is likely that shaft TCMI will be rolled out in 2013/14. The development of TCMI scoring for ancillary tunnel components such as cross passages and adits, and other bore lining types such as segmental linings and jack arches is complete, and now awaits user acceptance testing prior to roll out – expected to coincide with the shaft TCMI in 2013/14.

Results

Figures 3.9 and 3.10 show the minor element condition scores for tunnel bore and portal minor elements for England & Wales in 2012/13.

Tables 3.50 to 3.53 show the tunnel bore and portal minor element condition scores for England & Wales in 2011/12 and 2012/13.

Figures 3.11 and 3.12 show the tunnel bore and portal minor element condition scores for Scotland in 2012/13.

Tables 3.54 to 3.57 shows the tunnel bore and portal minor element condition scores for Scotland in 2011/12 and 2012/13.

Reporting confidence

Network Rail has developed the TCMI scoring system to incorporate all tunnel lining defect types that contribute to overall condition. Engineering principles and judgment have been used to generate an algorithm with appropriate defect weightings to produce a score that reflects the condition of the tunnel.

As TCMI was rolled out for the first time late in 2009/10, it was considered prudent to carry out a calibration exercise once sufficient data had been accumulated to check whether scores reflected the perceived condition of the tunnel sections. This exercise was carried out in December 2010 by six engineers (three independent parties) to score a sample of tunnel sections using TCMI principles to represent their opinion of the tunnel section condition within that sample set. Those scores were then compared with those obtained through the examination process in the field.

Network Rail decided that, although not absolutely necessary, a small recalibration of the algorithm would be prudent in the interest of completeness of the system development and would be implemented in a future version of the TCMI software. This is likely to take place in 2013/14. The impact on the overall scores of a tunnel section will be relatively minor and the more critical factor of monitoring change in condition will be unaffected.

As this is a new measure that has not been reviewed by the independent Reporter, it does not have a confidence grade.

Commentary

The detailed tunnel examination reports that generate the TCMI were first implemented in September 2009 with delivery to Network Rail commencing in 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 understanding the relative condition of the tunnel stock across the country from one year to the next. TCMI has started to bring about improvements in this area.

Tables 3.50 to 3.57 illustrate the percentage of tunnel minor elements in each TCMI ten point score band (i.e. 0-10, 10-20 etc.) in 2011/12 and 2012/13. The condition bands for bore elements in England & Wales and Scotland show largely static minor element condition. There is a very small migration of minor element from the better condition bands (i.e. between 100 and 80) to the mid range bands (i.e. between 80 and 40), equivalent to the movement of 198 minor elements (within the population of 110,000+) from good to fair. These figures are by percentage minor elements scored in that year in each band. This small migration can only be seen when displaying the percentage of minor elements in each score band to three decimal places. This apparent static minor element condition trend i.e. no discernable trends to date can be attributed in part to the high frequencies of tunnel examinations where we have collected data on condition annually.

The apparent larger migration in portal minor elements in Scotland between 2011/12 and 2012/13 is the result of a change in examination technique for portals mid-term in these periods. More accurate data is now being gathered on portals in Scotland by using rope access as opposed to using mobile access platforms which cannot always place the

examiner within touching distance of the high level parts of the portal.

It should also be noted that approximately 6,000 more minor elements were scored during 2012/13 than 2011/12 due to expanding coverage of the scoring system. For this reason it is more appropriate to review the percentage of elements in each band in order to understand year on year fluctuations in the condition of the assets. Figures 3.9 to 3.12 illustrate the percentage of all minor elements in each ten point increment scored to date since the introduction of TCMI.

The national tunnel stock, in the short period in which TCMI has been in use, is showing a steady state condition throughout the network for both tunnel bores and portals. At this stage of TCMI implementation, any small fluctuations in condition will need to be viewed with caution as it may be attributable to system embedment issues as described above.

Figure 3.7: Tunnel bore major and minor elements

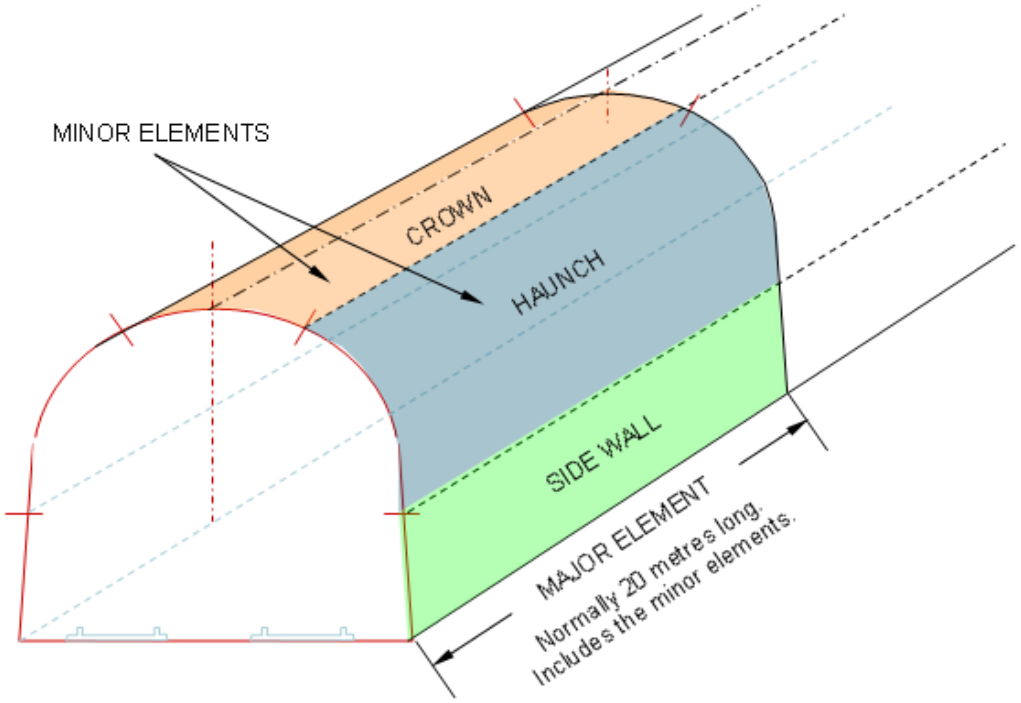


Figure 3.8: Tunnel portal major element indicating minor elements

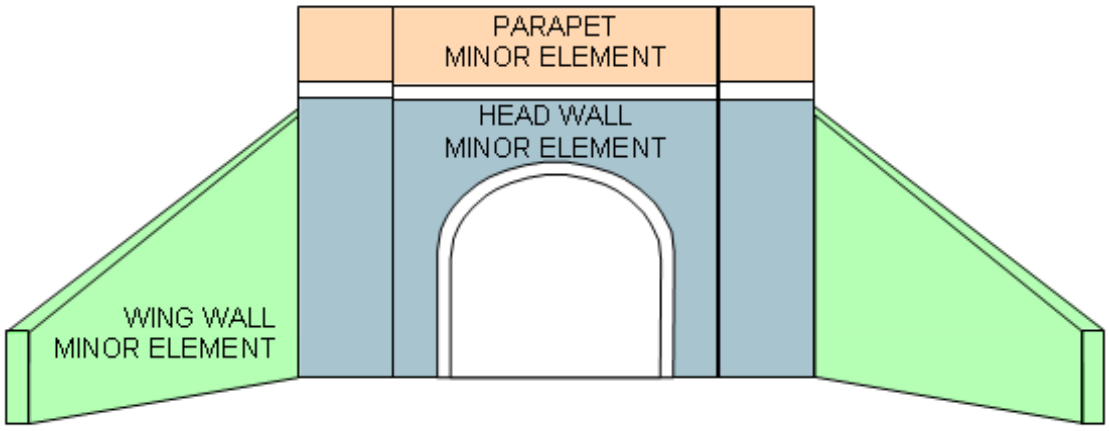


Table 3.50: England & Wales – tunnel bore minor element scores – 2011/12*

Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	13	0.013
10 - 20	68	0.068
20 - 30	191	0.191
30 - 40	519	0.518
40 - 50	1,161	1.159
50 - 60	2,715	2.710
60 - 70	5,884	5.874
70 - 80	10,414	10.396
80 - 90	19,815	19.781
90 - 100	59,393	59.290

Table 3.51: England & Wales – tunnel portal minor element scores – 2011/12**

Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	7	0.313
10 - 20	8	0.358
20 - 30	12	0.537
30 - 40	29	1.299
40 - 50	37	1.657
50 - 60	53	2.373
60 - 70	67	3.000
70 - 80	112	5.016
80 - 90	236	10.569
90 - 100	1,672	74.877

Notes:
*Bore minor elements assumed to be all eye rings, crowns, upside/downside haunch, upside/downside sidewalls, upside/downside walls, and caps.
**Portal minor elements assumed to be all parapets, head walls, face ring/voussoirs, wing walls.

Figure 3.9: England & Wales – tunnel bore minor element scores – 2012/13

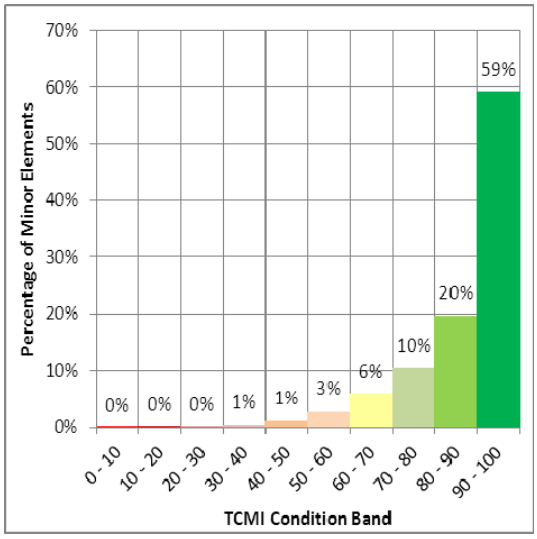


Figure 3.10: England & Wales – tunnel portal minor element scores – 2012/13**

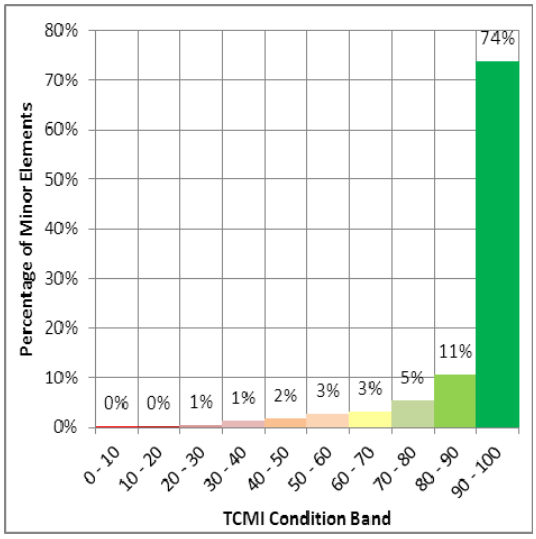


Table 3.52: England & Wales – tunnel bore minor element scores – 2012/13

Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	17	0.016
10 - 20	73	0.069
20 - 30	202	0.190
30 - 40	555	0.521
40 - 50	1,286	1.207
50 - 60	2,977	2.794
60 - 70	6,269	5.884
70 - 80	11,089	10.408
80 - 90	20,950	19.664
90 - 100	63,120	59.246

Table 3.53: England & Wales – tunnel portal minor element scores – 2012/13

Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	7	0.277
10 - 20	9	0.356
20 - 30	14	0.554
30 - 40	34	1.346
40 - 50	45	1.781
50 - 60	68	2.692
60 - 70	82	3.246
70 - 80	135	5.344
80 - 90	269	10.649
90 - 100	1,863	73.753

Table 3.54: Scotland – tunnel bore minor element scores – 2011/12

Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	0	0.000
10 - 20	3	0.036
20 - 30	1	0.012
30 - 40	9	0.108
40 - 50	29	0.348
50 - 60	88	1.057
60 - 70	388	4.660
70 - 80	693	8.323
80 - 90	1,549	18.604
90 – 100	5,566	66.851

Table 3.55: Scotland – tunnel portal minor element scores – 2011/12

Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	0	0.000
10 - 20	2	0.730
20 - 30	1	0.365
30 - 40	0	0.000
40 - 50	2	0.730
50 - 60	3	1.095
60 - 70	2	0.730
70 - 80	7	2.555
80 - 90	52	18.978
90 - 100	205	74.818

Figure 3.11: Scotland – tunnel bore minor element scores – 2012/13

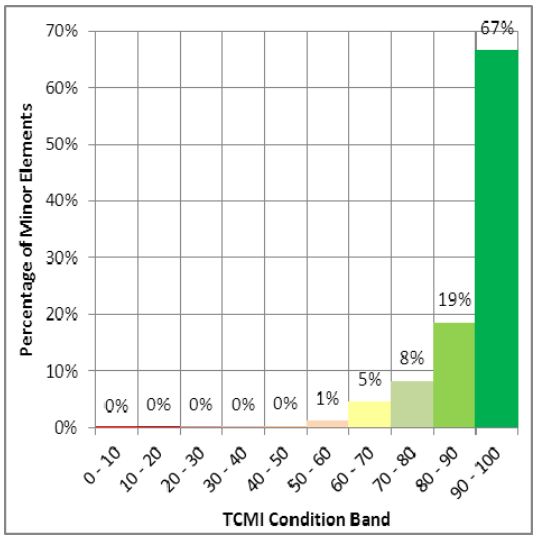


Figure 3.12: Scotland – tunnel portal minor element scores – 2012/13**

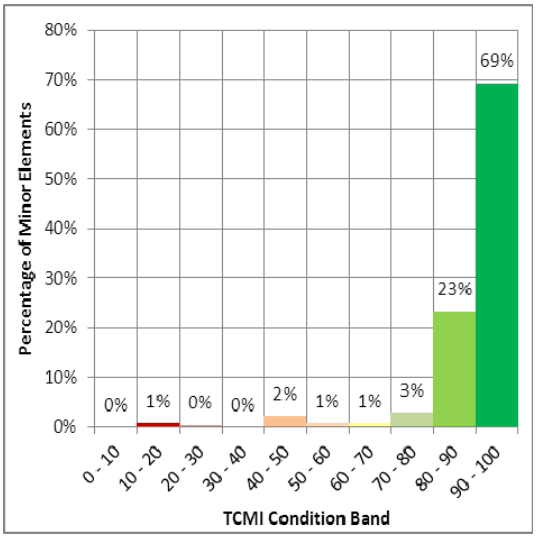


Table 3.56: Scotland – tunnel bore minor element scores – 2012/13

Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	1	0.012
10 - 20	2	0.024
20 - 30	2	0.024
30 - 40	13	0.156
40 - 50	27	0.323
50 - 60	106	1.269
60 - 70	384	4.599
70 - 80	698	8.359
80 - 90	1,556	18.635
90 - 100	5,561	66.599

Table 3.57: Scotland – tunnel portal minor element scores – 2012/13

Condition Band	No. Of Minor Elements	Percentage of Population
0 - 10	0	0.000
10 - 20	2	0.725
20 - 30	1	0.362
30 - 40	0	0.000
40 - 50	6	2.174
50 - 60	2	0.725
60 - 70	2	0.725
70 - 80	8	2.899
80 - 90	64	23.188
90 - 100	191	69.203

Bridge condition (M8)

Definition

The bridge condition grade is a measure from one to five with one representing good condition and five representing poor condition. Each bridge is graded from a Bridge Condition Marking Index (BCMI) value determined using the scoring tool set out in the BCMI handbook. BCMI, formerly known as SCMI (Structures Condition Marking Index), was renamed during the current control period to allow the introduction of condition marking indexes for other types of structures. The BCMI process, unchanged from the SCMI process, is a marking methodology that grades the condition of each bridge on a 1–100 scale and involves defining the elements of the bridge and determining the extent and severity of defects in each of the elements. These are combined to form an overall structure condition score. The condition scores are collated into the five bands as shown in Table 3.58.

Reporting method

The reported measure is presented as:

- a table (Table 3.58) showing the total number of BCMI results entered into the database within the reporting year, split into condition bands for the last five years
- distribution graphs (Figures 3.13 and 3.14) showing the cumulative number of bridges assessed since 2000 on a 1–100 scale for the reporting year and the previous year, split by bridge material type
- a graph (Figure 3.15) showing how many bridges have an initial BCMI score and how many have had a subsequent update to that score
- a graph (Figure 3.16) showing the percentage split by BCMI band of the latest scores for each bridge for each year.

BCMI is not normally carried out on major structures, footbridges and some asset types not deemed suitable for BCMI, typically concrete portals, large diameter Armco pipes and clad tenanted arches.

Use of BCMI outputs

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

BCMI is now being used for several asset 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 and BCMI data has been extensively used to identify structures with a particular generic feature. This assists with improved risk management on a network wide basis.

Reporting confidence

The confidence grade assigned by the previous Independent Reporter for output measures was C3. There has been no assessment of this measure in the current control period.

Since the Independent Reporter assigned the confidence grade of C3 a considerable amount of work has been carried out to improve the BCMI data quality. This work has included the matching of all BCMI scores to bridges as listed in the Civils Asset Register and Electronic Reporting System (CARRS).

Results

Table 3.58 shows the bridge condition index results for the last five year.

Table 3.58: Bridge condition index results

Bridge Condition Grade	*Equivalent*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
1	80 - 100	453	383	293	294	480
2	60 -79	2,243	1,794	1,649	1,635	3,411
3	40 - 59	832	667	722	713	1,524
4	20 - 39	90	84	89	104	172
5	1 - 19	4	4	3	7	6
Total No Examined		**3,622**	**2,932**	**2,756**	**2,753**	**5,593**
Average Condition Grade		**-**	**2.09**	**2.09**	**2.10**	**2.25**

Figure 3.13: All BCMI score distribution 2013

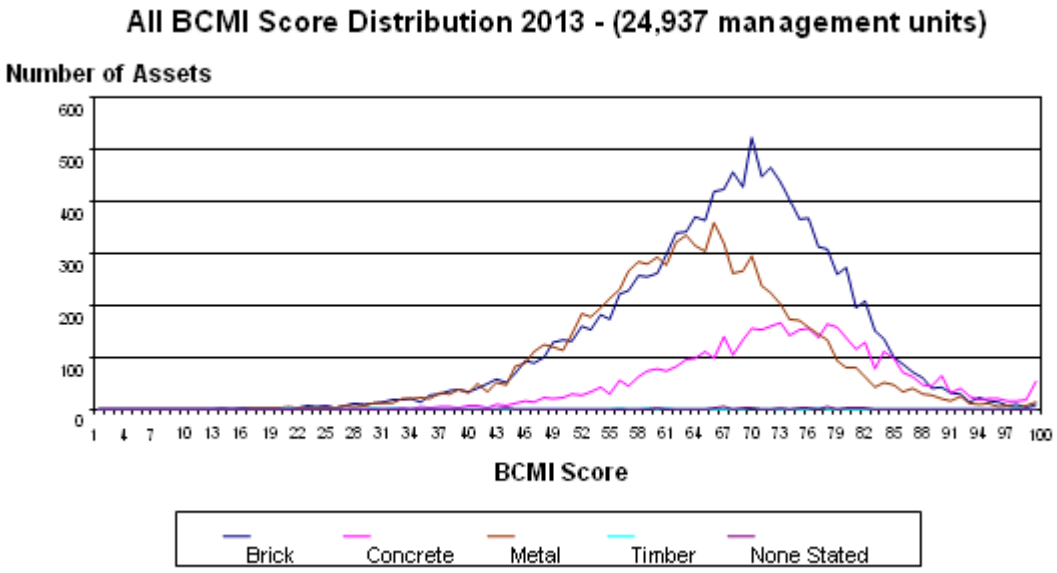


Figure 3.14: All BCMI score distribution 2012

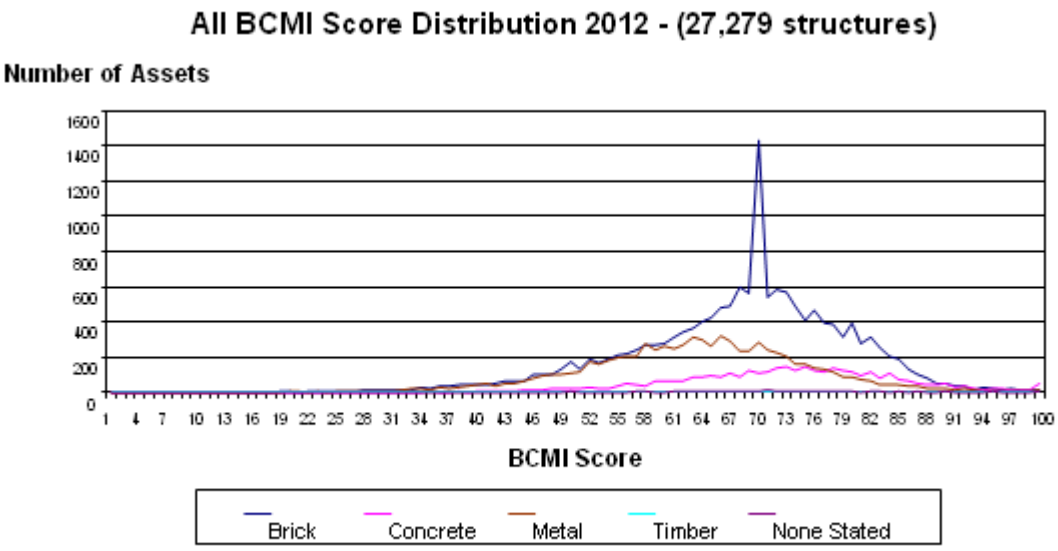


Figure 3.15: BCMI score distribution – Multiple cycle versus total

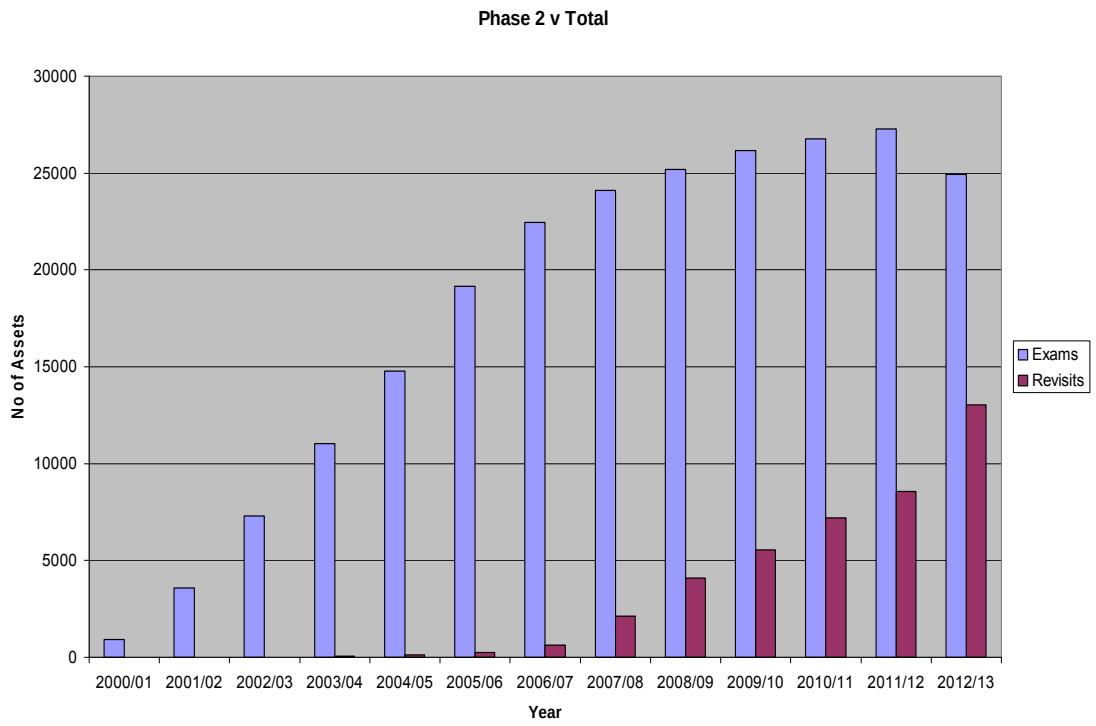
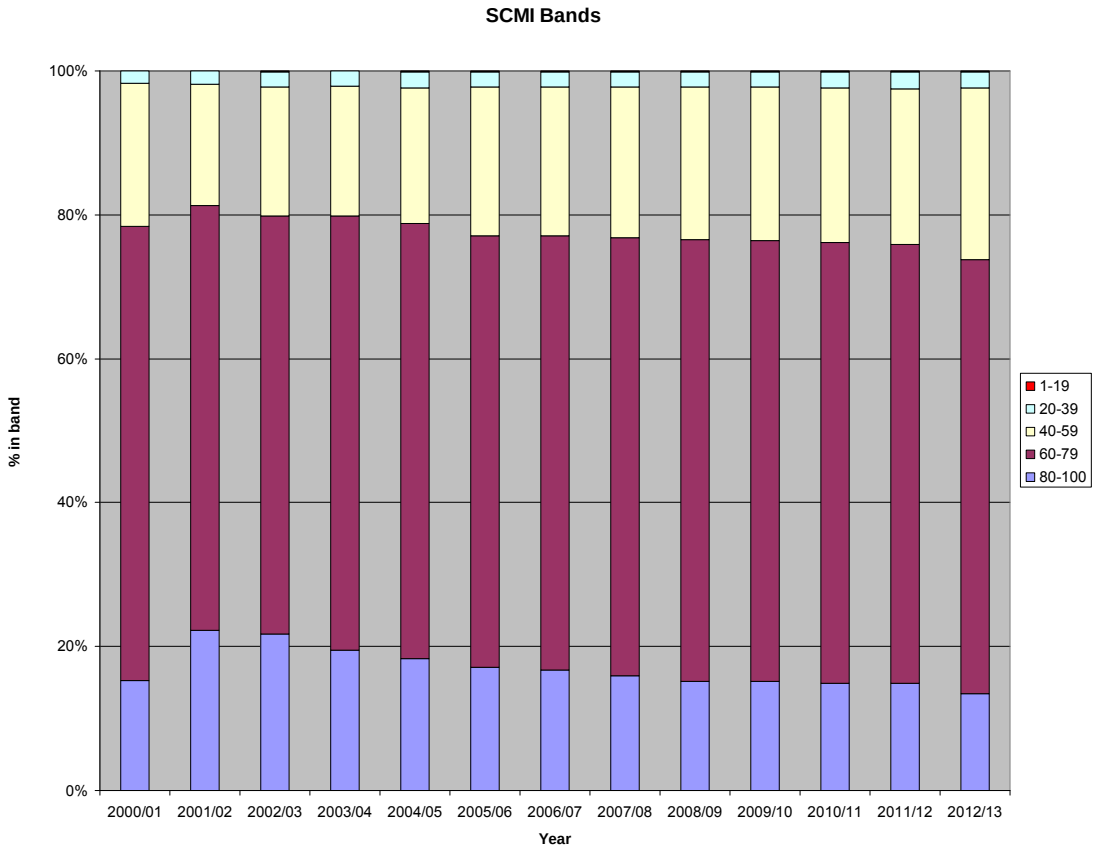


Figure 3.16: BCMI score distribution – Trends



Notes: Bridge condition grade 5 (1-19) is shown in red at the top of the distribution graph but due to its small amount respective to the other bands it can be difficult to see. It should not be confused with bridge condition grade 2 (60-79) which is large with respect to the other bands. Table 3.58 provides a numerical breakdown by condition grade from 2008/09.

Summary of asset counts

Overline and underline bridges

Table 3.59: Summary count of bridges by type and operating route (as at 29 April 2013)

Route	Bridges (exc FB)							Total Bridges	Bridge Spans
	Overline Bridges			Underline Bridges					
	Overline Bridge	Pipe Bridge	Side of Line Bridge	Intersection Bridge	Underline Bridge	Viaduct	Viaduct / Intersection		
Anglia	504	2	77	31	1,178	201	5	1,998	5,615
Kent	414	5	97	28	1,140	388	-	2,072	6,165
London North Eastern	959	2	138	50	2,325	193	5	3,672	7,729
London North Western	2,298	12	258	101	3,681	349	-	6,699	14,008
East Midlands	341	-	45	17	718	68	1	1,190	2,987
Scotland	1,319	34	33	17	2,709	250	1	4,363	6,873
Sussex	234	3	16	34	531	65	-	883	1,979
Wales	672	7	135	13	1,715	69	-	2,611	4,088
Wessex	522	7	130	25	1,183	95	-	1,962	3,793
Western	897	12	123	15	1,850	154	-	3,051	5,603
Network Total	**8,160**	**84**	**1,052**	**331**	**17,030**	**1,832**	**12**	**28,501**	**58,840**

Other assets

Table 3.60: Summary count of other assets by operating route (as at 29 April 2013)

Route	Footbridges	Culverts	Tunnels		Retaining Walls	Coastal/Estuarine Defences
			Parent Tunnels	Bores		
Anglia	177	1,261	12	14	577	7
Kent	118	768	54	55	2,336	8
London North Eastern	184	2,935	76	95	2,209	2
London North Western	309	4,403	204	223	4,351	52
East Midlands	91	916	37	49	452	0
Scotland	129	4,185	68	80	3,405	138
Sussex	56	510	31	31	457	0
Wales	71	3,313	53	55	2,262	173
Wessex	107	1,015	26	30	1,611	31
Western	87	2,651	61	61	3,216	103
Network Total	**1,329**	**21,957**	**622**	**693**	**20,876**	**514**

Commentary

The relationship between the number of bridges and the number of bridge BCMI scores is a complex subject area. This Annual Return details the work undertaken by us to explain these complexities and the actions being taken to remedy known data shortfalls.

Data improvement

Network Rail owns 28,501 bridges, excluding footbridges, as at 29 April 2013. For some of the larger bridges, principally viaducts, the bridge assets are sub divided into smaller management units to aid examination. A management unit typically comprises a grouping of a number of bridge spans. Examination and BCMI scoring is performed at management unit level therefore the number of expected BCMI scores exceeds the number of bridges. The number of management units that BCMI should be performed on is 28,847. Of these, 815 are known to be exempt of BCMI due to their construction type making the number of units subject to BCMI equal to 28,032.

Questions raised regarding the correlation between the number of bridges that we own and the information presented in the Annual Return 2012 raised concern that some of the data contained within the BCMI database was inaccurate. A study of the data confirmed these concerns. We are rectifying matters by carrying out a BCMI data improvement project. This was commenced in November 2012 and is due to complete in November 2013. This has removed some duplicate records and amalgamation of previously reported bridge scores at span level to bridge asset level. This work has resulted in some anomalies when comparing this year's data to previous years. These are explained where necessary below.

We currently hold BCMI scores in the BCMI database for 24,937 of the 28,032 bridge management units, which suggest a potential shortfall of 3,095 first cycle BCMI scores. Of these, 542 historic scores have been located and will be uploaded to the BCMI database during the next reporting year. For the residual shortfall, actions are in place to recover the data either from paper records or through site examination. During the course of 2012/13 additional resources were recruited to assist with addressing an examination backlog. In addressing the backlog of examinations there has been a positive impact on the corresponding BCMI backlog. The review of paper records will be completed by the end of CP4, with any residual site activity completed by the end of year two of CP5.

The three main reasons why some bridges have not been BCMI scored are:

- they were previously classed as major structures but are now not
- they were previously classed as culverts but are now classed as underbridges
- misunderstanding and inconsistency within examination suppliers of when bridges are exempt due to form of construction – particularly barrel type arches.

All the figures quoted and used in the graphs for 2012/13 are related to BCMI scores of bridge management units. There is potential for the make up of management units to vary from one year to the next to facilitate examination. This tends to be associated with long urban viaducts where the bridge arches are occupied by business tenants. Previous years' figures cannot at this time be back aligned with today's current management units and are as presented in previous year's returns. On completion of the BCMI Data Improvement Project realignment will be possible.

2012/13 Results commentary

In 2012/13 it was planned that 3,667 examinations of bridge units subject to BCMI would be carried out. Of these, 1,570 have been received and imported into the BCMI database within the reporting period. A further 1,634 have been completed on site and the BCMI submission is due imminently. The remaining 463 remain to be completed on site.

Table 3.58 provides the number of BCMI results entered into the database within the reporting year (5,593). In addition to the 1,570 results from 2012/13, a large proportion (3,275) are 2011/12 results, which were reported last year as being backlog awaiting uploading. The remainder are historic BCMIs from 2010/11 and earlier found to be absent from the database which have been sourced as part of the BCMI Improvement Project currently in progress.

Within the accuracies of the condition scoring system, the average condition grade of the bridge asset stock entered into the database in the year has fallen slightly to 2.25. This is as a result of targeting examination of poorer condition bridges through the Risk Based Examination (RBE) process.

Figures 3.13 and 3.14 show the distribution of current BCMI scores by material type for 2012/13 and 2011/12. The number of scores used in the analysis this year has reduced from 27,279 to 24,937 due to a change in management units (partial bridges are now inputted under their parent bridges). This work has also removed the anomaly giving

concern in previous years of the disproportionate number of masonry bridges scoring 70, as shown in Figure 3.14.

Figure 3.15 shows the number of bridges which have an initial BCMI score and those with a repeat score. The number of first time scores has reduced to 24,937 due to the amalgamation of spans in to larger management units as described above. It is expected that missing scores sourced by the BCMI Improvement programme will improve the multiple cycle to first cycle relationship shown in Figure 3.16.

Structures examination

Network Rail's primary means of maintaining and refreshing knowledge of its structures assets is through an examination regime. All structures receive a detailed examination at a risk based frequency which is based on the condition and strength capability of the asset. The frequency can vary between one and 18 years. The detailed examination provides a baseline condition of the asset and involves the examiner gaining access to within touching distance of the structure. In the

Figure 3.17: Visual examinations of structures 2012/13

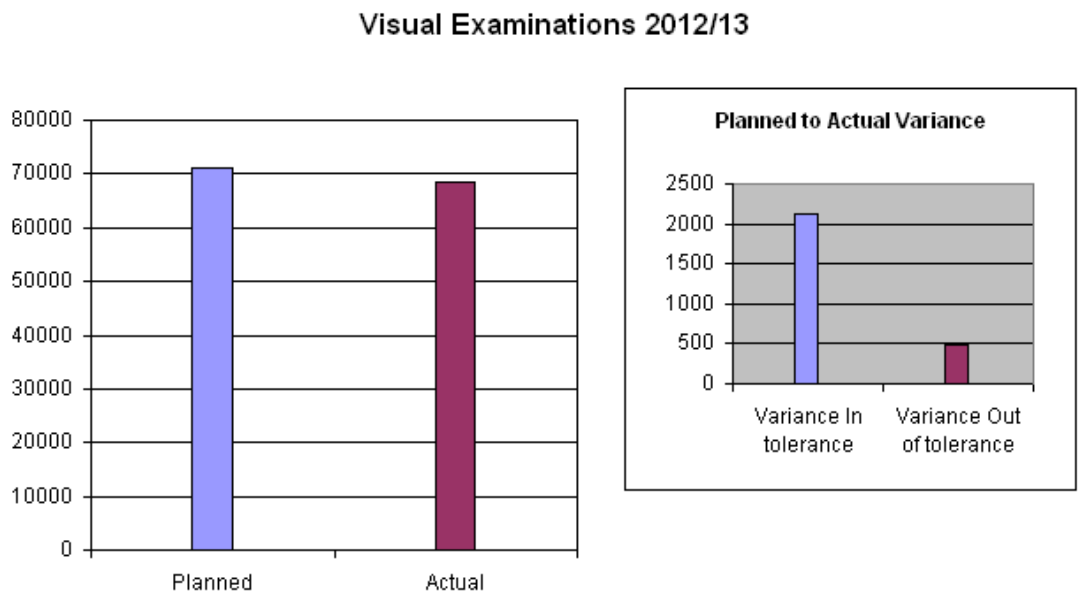
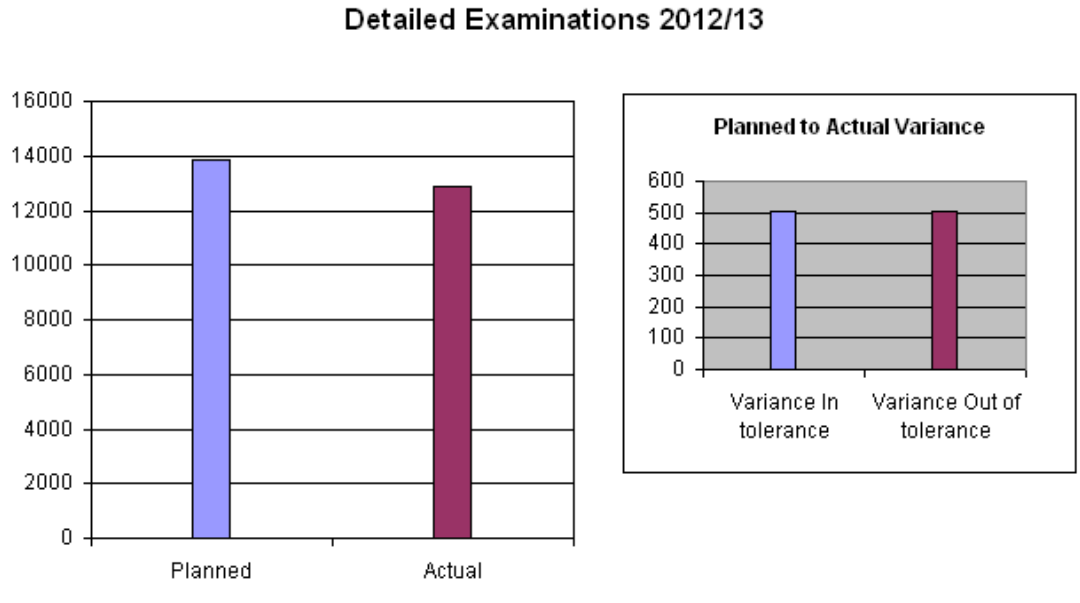


Figure 3.18: Detailed examinations of structures 2012/13



intervening years between detailed examinations an annual examination is undertaken to monitor the asset. The examination regime, coupled with other asset data is used to identify and specify maintenance and renewal activity.

Network Rail has had a backlog of examinations, which it has been addressing during the last two years as part of a backlog recovery programme.

In 2012/13 we planned to undertake 71,212 visual examinations and 13,880 detailed examinations, which includes the recovery backlog exams from previous years.

During the year 68,594 visual examinations and 12,874 detailed exams were completed. Despite a shortfall of 3,624 examinations against our planned target the total number of examinations completed this year represents a record for the current examinations supplier. In addition, many of the more difficult and time consuming examinations were undertaken in the year as the backlog recovery programme tackled the most out of date examinations.

The reason for the variance between planned and actual examinations undertaken include:

- some difficult third party access issues to gain access to sites
- incomplete and onerous enabling works such as de-silting of culverts
- poor weather, in particular high water levels and significant snow fall affecting possessions or other time critical works.

Of the variance between planned and actual examinations, there were 2,121 visual and 504 detailed examinations that were within permissible tolerance for examination compliance. The remainder (502 detailed and 497 visual) all have valid risk assessments undertaken by Network Rail engineers. The remaining examinations will be undertaken in 2013/14.

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.

Reporting method

The data was compiled from TRUST 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

Table 3.61 shows the total number of signalling failures leading to train delays of greater than ten minutes over the last five years for England & Wales, Scotland and the network. Table 3.62 breaks this down by operating route. Table 3.63 shows the number of signalling failures leading to train delays of greater than ten minutes per million train kilometres.

Commentary

We continue to target improvements to our infrastructure performance as part of our 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, which accounts for around 70 per cent of all signalling failures causing delays to train services.

The improving trend of recent years has continued, with a four per cent overall improvement in the number of these signalling failures (causing more than ten minutes delay) in 2012/13 compared with 2011/12. The rate of improvement slowed towards the end of the year, reflecting the difficult winter conditions. From April 2012 to November 2012 the year-on-year improvement was five per cent. These winter conditions adversely affected the reliability of points in particular (further details of which is found within the points failures commentary later in this chapter).

Table 3.61: Number of signalling failures (> 10 mins)

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	17,500	16,325	14,880	14,050	13,566
Scotland	2,107	1,999	1,627	1,588	1,457
Network Total	**19,607**	**18,324**	**16,507**	**15,638**	**15,023**

Notes: The 2010/11 figure has been revised marginally in the above table (from 16,501 to 16,507)

Table 3.62: Number of signalling failures (> 10 mins) by operating route					
	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	1,355	1,614	1,463	1,352	1,250
East Midlands	693	702	660	666	667
Kent	1,118	1,169	1,206	1,107	1,106
London North Eastern	3,026	2,876	3,004	2,764	2,864
London North Western	6,039	5,123	3,917	3,829	3,544
Scotland	2,107	1,999	1,627	1,588	1,457
Sussex	947	812	791	708	719
Wales	1,095	978	891	895	777
Wessex	1,271	1,154	1,105	1,106	1,099
Western	1,956	1,897	1,843	1,623	1,540
Network Total	**19,607**	**18,324**	**16,507**	**15,638**	**15,023**

Table 3.63: Number of signalling failures (> 10 mins) per million train km					
	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	39	35	32	30	29
Scotland	43	40	32	30	27
Network Total	**39**	**36**	**32**	**30**	**28**
Notes: The figures for 2009/10 – 2011/12 have been restated to reflect a revision to the train mileage data used.					

Route based asset management and maintenance teams, supported by the National Infrastructure Reliability Team and Asset Management Services, have been instrumental in targeting a number of failure modes, and implementing initiatives designed to drive sustainable improvements to the reliability of signalling and other assets.

During 2012/13, Network Rail has benefitted from specific reliability improvement plans, including those targeting points and train detection failures (described later in this chapter). These include the continued rollout of intelligent infrastructure systems, which strengthens our capability to predict and prevent service affecting failures. In addition to initiatives to reduce points and train detection failures, there are a range of ongoing initiatives directed at other signalling assets, such as those to improve signal failures (such as fitment of long-life LED lamps), signalling power supply (include remote condition monitoring) and level crossing reliability enhancements.

Signalling asset condition (M10)

Definition

This measure assesses the condition of signalling assets in terms of a 1 to 5 grading system, where a condition grade of 1 is good and 5 is poor. Condition grading is based on the 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 line side signalling equipment is also taken into account.

Reporting method

This Annual Return has been collated from the Signalling Infrastructure Condition Assessment (SICA) assessment records stored in the Signalling Schemes Asset Data System (SSADS) which is Network Rail's repository for all SICA assessments. This tool stores information from all SICA records in a central repository allowing improved visibility of the

Table 3.64: Total number of interlocking areas with a SICA assessment at end of each financial year						
Condition	*Observed nominal*	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*
1	>20	9	89	68	83	102
2	10 to 20	1,030	935	876	863	842
3	3 to 10	546	590	673	664	653
4	<3	24	24	21	15	15
5	At end of life	13	22	8	5	4
Average condition grade		**2.39**	**2.37**	**2.41**	**2.38**	**2.37**
Total number graded		**1,622**	**1,660**	**1,646**	**1,630**	**1,616**

Table 3.65: Total number of interlocking areas with a SICA assessment at end of each financial year by operating route				
Route	***Condition grade***	***Observed nominal residual life (in years)***	***2011/12***	***2012/13***
Anglia	1	>20	2	1
	2	10 to 20	106	80
	3	3 to 10	20	35
	4	<3	1	0
	5	At end of life	0	0
		Average Condition Grade	2.10	2.11
		Total Signal Site Population	135	135
		Total Signal Site Surveyed	129	116
		Total Sites With No SICAs	6	19
East Midlands	1	>20	1	1
	2	10 to 20	69	68
	3	3 to 10	15	15
	4	<3	0	1
	5	At end of life	0	0
		Average Condition Grade	2.16	2.19
		Total Signal Site Population	85	85
		Total Signal Site Surveyed	85	85
		Total Sites With No SICAs	0	0
Kent	1	>20	1	0
	2	10 to 20	56	63
	3	3 to 10	29	21
	4	<3	0	0
	5	At end of life	0	0
		Average Condition Grade	2.23	2.14
		Total Signal Site Population	93	92
		Total Signal Site Surveyed	86	84
		Total Sites With No SICAs	7	8
London North Eastern	1	>20	3	7
	2	10 to 20	194	185
	3	3 to 10	134	141
	4	<3	2	2
	5	At end of life	4	1
		Average Condition Grade	2.37	2.36
		Total Signal Site Population	353	351
		Total Signal Site Surveyed	337	336
		Total Sites With No SICAs	16	15
London North Western North	1	>20	0	1
	2	10 to 20	81	85
	3	3 to 10	104	96
	4	<3	3	3
	5	At end of life	0	0
		Average Condition Grade	2.58	2.54
		Total Signal Site Population	189	186
		Total Signal Site Surveyed	188	185
		Total Sites With No SICAs	1	1

Table 3.65 Continued: Total number of interlocking areas with a SICA assessment at end of each financial year by operating route

Route	*Condition grade*	*Observed nominal residual life (in years)*	*2011/12*	*2012/13*
London North Western South	1	>20	0	0
	2	10 to 20	99	101
	3	3 to 10	36	28
	4	<3	5	4
	5	At end of life	1	2
		Average Condition Grade	2.14	2.07
		Total Signal Site Population	166	165
		Total Signal Site Surveyed	141	135
		Total Sites With No SICAs	25	30
Scotland	1	>20	0	0
	2	10 to 20	101	87
	3	3 to 10	70	86
	4	<3	3	4
	5	At end of life	0	0
		Average Condition Grade	2.40	2.53
		Total Signal Site Population	178	177
		Total Signal Site Surveyed	174	177
		Total Sites With No SICAs	4	0
Sussex	1	>20	0	0
	2	10 to 20	30	43
	3	3 to 10	24	11
	4	<3	0	0
	5	At end of life	0	0
		Average Condition Grade	2.44	2.20
		Total Signal Site Population	54	54
		Total Signal Site Surveyed	54	54
		Total Sites With No SICAs	0	0
Wales	1	>20	0	5
	2	10 to 20	40	32
	3	3 to 10	77	78
	4	<3	1	1
	5	At end of life	0	1
		Average Condition Grade	2.60	2.64
		Total Signal Site Population	123	119
		Total Signal Site Surveyed	118	117
		Total Sites With No SICAs	5	2
Wessex	1	>20	0	0
	2	10 to 20	59	53
	3	3 to 10	22	24
	4	<3	0	0
	5	At end of life	0	0
		Average Condition Grade	2.20	2.17
		Total Signal Site Population	86	86
		Total Signal Site Surveyed	81	77
		Total Sites With No SICAs	5	9

Table 3.65 Continued: Total number of interlocking areas with a SICA assessment at end of each financial year by operating route

Route	*Condition grade*	*Observed nominal residual life (in years)*	*2011/12*	*2012/13*
Western	1	>20	0	0
	2	10 to 20	28	45
	3	3 to 10	133	118
	4	<3	0	0
	5	At end of life	0	0
		Average Condition Grade	2.75	2.69
		Total Signal Site Population	168	166
		Total Signal Site Surveyed	161	163
		Total Sites With No SICAs	7	3
Network Total	1	>20	7	15
	2	10 to 20	863	842
	3	3 to 10	664	653
	4	<3	15	15
	5	At end of life	5	4
		Average Condition Grade	**2.38**	**2.37**
		Total Signal Site Population	**1,630**	**1,616**
		Total Signal Site Surveyed	**1,554**	**1,529**
		Total Sites With No SICAs	**76**	**87**

results from SICA surveys, production of up to date SICA assessment schedules for the routes use and multiple reporting functions of which the Annual Return is just one.

Reporting confidence

Reporting confidence is stated as B2 in line with recent audit findings. The nature of the SICA tool means that an accuracy band better than two cannot be realistically achieved. A reliability band of B is given as although there is no extrapolation of the data, there are still a number of older SICA assessments carried out to an earlier version and a small number of interlockings do not have assessments as they have been newly installed.

Results

Table 3.64 provides the number of interlocking areas with a SICA assessment condition grade from 2008/09 to 2012/13 for the whole network. Table 3.65 then breaks this data down by operating route. Table 3.66 shows a breakdown of the signalling condition profile grades for 2010/11 to 2012/13 for England & Wales, Scotland and the whole network. Table 3.67 shows the total number of level crossings, the number surveyed and the assigned condition grades for England & Wales, Scotland and the whole network. Table 3.68 then breaks this data down by operating route.

Commentary

The total population of interlockings on Network Rail infrastructure is 1,616 as of April 2013/14. Of these, 87 do not have a current SICA assessment as they have been renewed within the last five years. This leaves a balance of 1,529 interlockings requiring a valid SICA assessment which is reflected in the tables below and as such shows that Network Rail has 100 per cent SICA coverage in compliance with the standard.

The total population of signalled level crossings requiring a SICA assessment on Network Rail infrastructure is 1,584 as of April 2013/14. Of these, 44 do not have a current SICA assessment as they have been renewed within the last five years. This leaves a balance of 1,540 level crossings requiring a valid SICA assessment which is reflected in the tables below and as such shows that Network Rail has 100 per cent SICA coverage in compliance with the standard.

Variances in the Interlocking Condition Index at route level are caused by variations in the average age of an operating route's infrastructure and the timing of a route's last significant level of investment. The typical renewal frequency of an interlocking is around 40 years. Routes such as Anglia, which was largely remodelled in 2000, currently has a relatively low condition index compared with Western, which has a high level of investment planned over the next two

years. Following this investment, we would expect Western's Condition Index to improve.

The Interlocking Condition Index has seen a slight improvement in the current year to 2.37, which is slightly better than the 2.39 CP4 Delivery Plan target. This is in line with our current expectations based on the fact that to date most planned renewal interventions have been completed within the expected timescale. Please see Section 4, Signalling Renewed (M24) for further detail with regards to delivered volumes.

Table 3.66: Signalling condition profile

Condition grade	*1*	*2*	*3*	*4*	*5*	*Total 2010/11*	*1*	*2*	*3*	*4*	*5*	*Total 2011/12*	*1*	*2*	*3*	*4*	*5*	*Total 2012/13*
England & Wales	61	774	606	19	8	1,468	79	762	594	12	5	1,452	102	755	567	11	4	1,439
Scotland	7	102	67	2	0	178	4	101	70	3	0	178	0	87	86	4	0	177
Network Total	**68**	**876**	**673**	**21**	**8**	**1,646**	**83**	**863**	**664**	**15**	**5**	**1,630**	**102**	**842**	**653**	**15**	**4**	**1,616**

Table 3.67: Level Crossing condition profile 2012/13 year total

	Total LX Population	*Total LX Surveyed*	*Condition grade*				
			1	*2*	*3*	*4*	*5*
England & Wales	1,479	1,435	54	981	394	5	1
Scotland	105	105	0	45	58	2	0
Network Total	**1,584**	**1,540**	**54**	**1,026**	**452**	**7**	**1**

Table 3.68: Level Crossing condition profile by operating route

		2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	Grade 1	1	8	12	13	9
	Grade 2	186	198	98	172	192
	Grade 3	50	40	136	60	38
	Grade 4	2	1	0	0	0
	Grade 5	2	0	0	0	0
	Not Surveyed	2	9	10	10	16
	Total Population	243	256	256	255	255
East Midlands	Grade 1	-	-	-	10	9
	Grade 2	-	-	-	57	59
	Grade 3	-	-	-	21	20
	Grade 4	-	-	-	0	1
	Grade 5	-	-	-	0	0
	Not Surveyed	-	-	-	2	1
	Total Population	-	-	-	90	90
Kent	Grade 1	0	0	0	0	0
	Grade 2	55	47	37	36	35
	Grade 3	11	13	22	22	21
	Grade 4	1	1	1	0	0
	Grade 5	0	0	0	0	0
	Not Surveyed	0	0	0	1	4
	Total Population	67	61	60	59	60

Table 3.68 Continued: Level Crossing condition profile by operating route

		2008/09	2009/10	2010/11	2011/12	2012/13
London North Eastern	Grade 1	48	49	22	31	33
	Grade 2	518	543	283	395	394
	Grade 3	70	43	324	114	110
	Grade 4	1	1	2	0	1
	Grade 5	0	0	1	0	0
	Not Surveyed	0	2	4	2	2
	Total Population	637	638	636	542	540
London North Western	Grade 1	6	6	1	1	2
	Grade 2	93	101	98	95	95
	Grade 3	54	46	53	42	42
	Grade 4	0	3	2	5	3
	Grade 5	6	0	0	1	1
	Not Surveyed	0	2	2	2	2
	Total Population	159	158	156	146	145
Scotland	Grade 1	0	0	2	0	0
	Grade 2	60	61	50	57	45
	Grade 3	40	39	52	44	58
	Grade 4	0	0	1	2	2
	Grade 5	0	0	0	0	0
	Not Surveyed	0	5	0	2	0
	Total Population	100	105	105	105	105
Sussex	Grade 1	0	0	0	0	0
	Grade 2	59	58	48	42	43
	Grade 3	10	8	18	24	22
	Grade 4	0	0	0	0	0
	Grade 5	0	0	0	0	0
	Not Surveyed	0	0	0	0	1
	Total Population	69	66	66	66	66
Wales	Grade 1	-	-	-	0	0
	Grade 2	-	-	-	63	57
	Grade 3	-	-	-	41	51
	Grade 4	-	-	-	0	0
	Grade 5	-	-	-	0	0
	Not Surveyed	-	-	-	12	8
	Total Population	-	-	-	116	116
Wessex	Grade 1	0	0	0	0	0
	Grade 2	84	79	21	32	50
	Grade 3	21	18	73	61	38
	Grade 4	2	2	1	0	0
	Grade 5	0	0	0	0	0
	Not Surveyed	0	0	5	7	10
	Total Population	107	99	100	100	98
Western	Grade 1	0	0	0	0	1
	Grade 2	114	123	91	54	56
	Grade 3	98	87	109	51	52
	Grade 4	0	5	3	0	0
	Grade 5	0	0	0	0	0
	Not Surveyed	0	1	11	4	0
	Total Population	212	216	214	109	109

Points failures

Definition

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

Reporting method

The data is compiled from TRUST and shows the number of points failures recorded.

Results

Table 3.69 shows the total number of points failures in 2012/13 for England & Wales, Scotland and the whole network, along with a comparison to our target.

Commentary

The total number of points failures impacting on train services fell by two per cent compared with 2011/12.

This was a much smaller improvement than envisaged due primarily to the impact of the severe and prolonged winter. Extended periods of cold weather, snow and ice tend to lead to increases in points failures, due to a combination of factors including snow and ice obstructing the free movement of components, the risk of snow ingress into electrical components, the reduction in the effectiveness of lubrication at low temperatures and points components freezing up. While this is mitigated to an extent by the installation of points heaters, the more severe the winter, the greater the likelihood that heaters themselves will either prove inadequate to cope with the conditions or will fail. A wide range of improvement initiatives across the network, including the continued implementation of remote condition monitoring (totalling 6,198 point ends by the end of 2012/13) and improvements in the process of responding to the alerts and alarms generated by the system, together with the early stages of a campaign to improve the set-up and gauging of points, have led to an overall improvement in failures. These improvement actions are part of an ongoing process, which will also see more effective use of remote condition monitoring for points heating equipment next winter.

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 counter) 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 3.70 shows the total number of train detection failures in 2012/13 for England & Wales, Scotland and the whole network, along with a comparison to the DPu12 target.

Commentary

Track circuits and axle counters showed a combined improvement of a further six per cent in 2012/13, which was about one per cent less than the improvement envisaged for the year. Track circuit reliability benefited from the fitment of remote condition monitoring equipment, which by the end of 2012/13 had been fitted to 7,896 track circuits. The improvement was also supported by other initiatives, including a campaign to address failures of insulated block joints. Track circuit failures were adversely affected by the few days of very hot weather in July 2012 with high temperatures increasing the risk of failures occurring due to thermal expansion and components suffering heat related failures. This period highlighted specific reliability issues at very high ambient temperatures with one equipment type in particular (used mainly on southern routes); which is being addressed. The extra failures during this single week account for the shortfall compared to plan noted above.

Table 3.69: Points failures 2012/13

	2011/12	*2012/13*	*DPu12*	*Variance*
England & Wales	4,607	4,560	n/a	n/a
Scotland	559	493	n/a	n/a
Network Total	**5,166**	**5,053**	**4,126**	**927**

Table 3.70: Train detection failures - 2012/13

	2011/12	*2012/13*	*DPu12*	*Variance*
England & Wales	4,421	4,156	n/a	n/a
Scotland	502	452	n/a	n/a
Network Total	**4,923**	**4,608**	**4,540**	**68**

Telecoms condition

Definition

This measure assesses 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 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 inputted into the DST which determines the prioritisation factor and, when combined with the number of assets, derives the asset condition value.

Results

Table 3.71 shows the 2012/13 telecoms condition rating compared with the DPu12 target.

Commentary

The Telecoms Asset Condition measure was developed in 2008/09 to include Telecoms within the overall Network Rail Key Performance Indicator (KPI) for Asset Stewardship and contributes 2.5 per cent to the overall measure. 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 Station Information & Security Systems (SISS) or network assets such as the fixed telecoms network (FTN) or Global System for Mobile Communications – Railway (GSM-R).

The Telecoms Asset Condition results for 2012/13 are ahead of target at 0.966 reflecting the stable level of investment in the operational concentrator assets across CP3 and during CP4 to date. Based upon the April 2012 value of 0.95 there has been a steady improvement during the year reflected by the March 2013 actual of 0.966.

The number of signal post telephones (SPT) concentrator assets recorded in the Telecoms Decision Support Tool (DST) at the beginning of 2012/13 was 810, (made up of 693 Processor's controlled concentrators, 108 Private Automated Branch Exchange (PABX) concentrators and nine Electro-Mechanical concentrators). The corresponding number of SPT concentrator assets at the end of March 2013 was 776, (666 Processor's controlled concentrators, 104 PABX concentrators and six Mechanical concentrators) giving a net reduction of SPT concentrator assets during the year of 34. The overall net reduction is directly attributed to work delivered as part of the Network Operating Strategy (NOS) programme or signalling renewal projects re-controlling signalled areas into larger signalling centres or Rail Operating Centres (ROCs) that enable smaller signal boxes to be closed; thereby delivering operating efficiencies and updated working practices for Network Rail Operations.

The closing of smaller signal boxes reduces the number of telecoms assets in the network such as SPT concentrators, voice recorders and power supplies, and transfers the telecoms services, such as Single Post Telephones (SPTs) on to either existing or new SPT concentrator assets at signalling centres or ROCs

This leads to an increase in the overall average condition of operational concentrator assets as the lower scoring smaller signalling boxes are removed from the DST, as well as operational service, and the current asset condition score for existing signalling centres, to which the telecoms services have been transferred, is higher in the DST for the SPT concentrators. Additionally new ROCs introduce a new good condition into the DST, and the overall number of assets is reduced as the smaller signalling boxes are removed from operational service. This increase in condition score outweighs the steady deterioration in the asset condition in the DST of minor life extension works on assets remaining until the transfer of their telecoms service is complete.

Table 3.71: Summary telecoms asset condition 2012/13

Telecoms	*2011/12*	*2012/13*	*DPu12*
Telecoms condition	0.950	0.966	0.940

Based upon the total number of SPT concentrator assets at the beginning of the year, we have condition assessed 166 or 20 per cent of the assets during the year. The route split is as follows:

- London North Eastern / East Midlands - 28 inspections were completed
- London North Western – 14 inspections were completed
- Scotland – 86 inspections were completed
- Kent and Sussex- 31 inspections were completed
- Wessex and Anglia - no inspections were carried out
- Wales – two inspections were completed
- Western – five inspections were completed.

Impact on the Asset Condition Index (ACI) as a result of work that has been deferred or scrapped.

For London North Eastern nine SPT concentrator assets renewals have been deferred from CP4 into CP5 to better align with the planned re-control of the signalling system into the York Route Operational Control (ROC) and the proposed CP5 asset policy of targeted renewal to extend asset life from 15 to 20 year life cycles and the proposed CP5 operating strategy. For London North Western, Scotland and the London South East routes there has been no impact on the ACI due to deferrals. For Wales and Western there has been no impact as they have neither deferred nor cancelled any planned activity.

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 and is attributed to assets via the Fault Management System (FMS). TRUST provides data for each recording point on the network and all information on current delay is ultimately sourced from the TRUST database.

Results

Table 3.72 below shows the number of telecoms failures causing train delays of more than ten minutes from 2008/09 to present. Table 3.73 shows the number of Telecoms Failures causing delay incidents greater than ten minutes by operating route.

Commentary

The total number of telecoms failures causing more than ten minutes of train delay for 2012/13 was 697 against a Delivery Plan target of 656. This represents a six per cent decline in telecoms asset performance against target. This decline can be attributed mostly to the rise in incidents caused by Global System for Mobile Communications Railways System (GSM-R) failures reported. From December

Table 3.72: Number of telecoms failures (>10mins)

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	687	651	554	605	605
Scotland	130	119	135	93	92
Network Total	**817**	**770**	**689**	**698**	**697**

Notes:
The Annual Return 2012 reported a figure of 633 delay minutes for 2011/12. This figure was based upon data from the National Asset Data Set (NADS) at Period 13. Please note that this figure has since been revised upwards to 698 when the figures were refreshed for this year's submission. The change in reported totals is due to an additional 65 train delays being transferred to a telecoms incident code outside of period.

Table 3.73: Number of telecoms failures (>10mins) by operating route

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	107	88	102	108	107
East Midlands	39	31	45	22	20
Kent	36	35	21	40	37
London North Eastern	202	190	154	144	142
London North Western	82	59	38	81	85
Scotland	130	119	135	93	92
Sussex	43	34	41	49	48
Wales	117	121	80	76	78
Wessex	27	48	25	30	36
Western	34	45	48	55	52
Network Total	**817**	**770**	**689**	**698**	**697**

Table 3.74: Number of base stations that were supporting traffic each period during 2012/13

Period	*Date From*	*Date To*	*GSM-R BTSs in service (Cumulative)*
1	01/04/2012	28/04/2012	641
2	29/04/2012	26/05/2012	700
3	27/05/2012	23/06/2012	703
4	24/06/2012	21/07/2012	703
5	22/07/2012	18/08/2012	853
6	19/08/2012	15/09/2012	882
7	16/09/2012	13/10/2012	889
8	14/10/2012	10/11/2012	920
9	11/11/2012	08/12/2012	1,061
10	09/12/2012	05/01/2013	1,337
11	06/01/2013	02/02/2013	1,337
12	03/02/2013	02/03/2013	1,337
13	03/03/2013	30/03/2013	1,343

2012, the percentage of incidents attributed to this equipment rose from seven per cent to an average of 33 per cent in January to March 2013. This has predominately been caused by the introduction into service of GSM-R systems from January 2012/13. Most of the issues arise from set-up problems with a mixture of issues with the GSM-R infrastructure and driver errors.

GSM-R incidents in Scotland, where the equipment was trialled have reduced. This reduction is due to the maturity of the system in Scotland and a growing operational capability and competence. Overall incidents occurring in Scotland have decreased, contributing to 13 per cent of the failures in 2012/13 (compared to 18 per cent in 2011/12).

The number of base stations that were supporting operational traffic each period during 2012/13 (including Global System for Mobile Communications Railway system (GSM-R) sites) is shown in Table 3.74.

753 Global System for Mobile Communications Railways system (GSM-R) sites went into live during 2012/13 providing driver to signaller secure communication. These GSM-R sites were all in the southern half of the country to provide GSM-R as a direct replacement for the legacy National Radio Network (NRN) that was switched off at the end of 2012 south of a line drawn between the Severn Estuary and The Wash, as mandated by Ofcom (frequencies used by the NRN were withdrawn by Ofcom and re-used in Europe to support the role out of Digital TV) and the Cab Secure Radio (CSR) driver to signaller radio system. The main areas covered were the Great Western main line from London to Penzance via Bristol and via Westbury, Bristol to Cheltenham, the Cotswolds, Thameside, the North London Line, Southern, Wessex, Kent and the Vale of Glamorgan (as part of Cardiff Area Signalling Renewal). Early system interference and user issues from January 2013 onwards in the south have caused a reversal in the trend of reduction in the number of telecoms failures on those routes including Wessex. In response to this trend we have re-energised the industry focus groups to tackle the emerging issues of system reliability, performance and driver registration issues.

Crossing telephone failures attribute for 30 per cent of the delay incidents. There were 212 train delay incidents greater than ten minutes attributed to crossing telephones in 2012/13 with a total of 9,493 minutes delay, compared to 177 incidents with a total of 6,668 minutes delay in 2011/12. Work has been done to target the worst performing telephones at user worked crossings, and to replace the type of telephones at these sites. This has seen a slight improvement in the overall performance of crossing telephones.

A level crossing workshop is also being formed to focus on level crossing performance following the increase of level crossing telephone failures in 2012/13. The working group will be tracking the progress made through the 2012/13 swap out programme as well as contributing towards the 2013/14 programme that is currently being analysed This working group will also review the crossing telephone instrument performance with a view to selecting a preferred manufacturer for future phone replacements

A trial is currently underway on the London North Western route where all replacement crossing telephones are being replaced with a telephone instrument supplied by DAC, the DAC 705 model.

Comparative benchmarking of crossing phone failures will take place against other routes after this trial has been running for 6 months to determine reliability of the DAC model.

Asset improvement plan

There are three separate performance improvement initiatives operating within telecoms to improve asset reliability, strengthen network robustness and reduce train delays. The telecoms reliability plan has 33 initiatives, 19 of which have been completed to date. These include cable hardening programmes in high cable theft areas, third party fault performance reviews and assessment of equipment rooms so that they have suitable environmental controls. The 2012 crossing telephone swap out program is currently being implemented following the success of the same scheme in 2011. An independent review of the worst performing level crossings was undertaken and the crossings identified are currently having their phones swapped out for the DAC supplied DAC705 model via minor work schemes sponsored by the route. In an extended review of the 2011/12 swap out program, the sites have maintained a high level of performance with a significant reduction in crossing phone failures since implementation.

Telecom train delays that incur more than 200 minutes delay now have a service performance improvement report created to investigate the incident and establish the fundamental cause of failure. Within the report a set of recommendations to prevent re-occurrence are required and these are added to the telecoms service improvement plan as actions. The telecoms service improvement plan then tracks progress to ensure service improvements that have been identified are implemented. A monthly review of repetitive failures was instigated at the start of the financial year to review the top five repetitive asset failures per route. The analysed data was then reviewed and actions were raised for identified problems and added to the repetitive failure log to be logged and tracked. Any national affecting issues raised in the service improvement plan or repetitive failure log are added to the reliability plan. A separate train delay repetitive failure report and crossing telephone repetitive failure report were also created to focus on reducing train delay failures.

Reliability centred maintenance (RCM)

The RCM team and Asset Management Services have pushed ahead with workshops and agreed a business case for continuing the programme to meet the requirements of CP4. Several standards have been through the RCM programme and amended maintenance specifications have been produced.

During 2012/2013, twelve standards have been analysed through the RCM programme and several workshops have been held, all of which are in the process of delivering improved planned preventative maintenance regimes targeting the activities in the areas where it matters. Additionally this process has allowed some significant areas of debate to be opened up, in particular the issues surrounding mast climbing for GSM-R and legacy radio systems, possession planning and the processes involved in Ellipse for telecoms.

Alternating current traction power incidents causing train delays (M11)

Definition

This measure reports the number of overhead line equipment 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, as set out in the Asset Reporting Manual (definition document NR/ARM/M11DF).

Reporting method

The asset reporting manager monitors the failures reported in the Daily National Incident Report and at each period end the summary is sent to our Route Asset Managers to review and verify. They investigate the cause of each traction power incident, and the verified figures are provided back to the asset reporting manager.

Results

Table 3.75 shows the proportion of identified root causes of AC traction power incidents causing train delays. Table 3.76 shows the annual number of AC electrification (overhead line equipment) failures in England & Wales, Scotland, and the network total. Table 3.77 shows the annual number of AC electrification (overhead line equipment) failures for each operating route.

Reporting confidence

This measure was assigned a B2 confidence grade by the previous Independent Reporter for output monitoring. As this measure has not been reassessed since 2009/10 this confidence grade does not take into account the improvements that have been made since that time. We do not believe that this confidence grade is therefore reflective of the current position. However, the confidence grade is reported for completeness.

Commentary

During 2012/13 there were 52 incidents, a slight increase on last year's figure of 50 incidents, but below the average for the last five years. The overall trend is showing improvement.

Table 3.75: Root causes of failure (%)	
Asset Condition	17
Equipment Design	15
Construction Delivery	12
Maintenance Delivery	12
Maintenance Regime	19
Other	25

Table 3.76: Electrification failures: overhead line					
	2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	64	43	56	46	51
Scotland	2	3	5	4	1
Network Total	**66**	**46**	**61**	**50**	**52**

Table 3.77: Electrification failures: overhead line by operating route					
	2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Anglia	13	13	26	21	11
East Midlands	4	4	3	0	2
Kent	0	0	1	0	0
London North Eastern	15	9	14	5	12
London North Western	30	17	10	20	25
Scotland	2	3	5	4	1
Sussex	0	0	0	0	0
Wales	n/a	n/a	n/a	n/a	n/a
Wessex	n/a	n/a	n/a	n/a	n/a
Western	2	0	2	0	1

In Anglia the number of failures reduced from 21 in 2011/12 to eleven in 2012/13. However, this improvement was offset by an increase in the number of failures in London North Eastern and London North Western routes where failures increased from 25 in 2011/12 to 37 in 2012/13.

The reduction in the number of failures in the Anglia route was the result of a significant campaign prior to the Olympics to identify and clear a number of defects on the overhead line equipment. The campaign had a significant effect on the number of incidents on the route, as supported by the reduction in percentage of condition based failures this year.

The approach of a campaign to achieve a stepped increase in reliability has been adopted by the London North Western route. This route has seen an increasing trend in OLE failures and a review is in place to determine if any of these are due to component design issues. In London North Eastern the failure rate was consistent with the long term trend but last year it experienced a very low number of failures. The failures experienced on this part of the network were known design/manufacturing defects with a very low probability on a large population as well as a number of failures associated with construction activities.

There is an activity looking at reliability centred maintenance which focuses on the maintenance regime, as the latest data is showing that this is a significant cause of the failures. These new regimes are currently being trialled prior to implementation.

Following devolution 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.

During the winter months some areas were subject to snow and ice. This extreme cold weather led to tracking and burning of certain conductors causing 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 and icicle removal in tunnels and low clearance structures.

Previously unidentified deficiencies in the Mark one OLE equipment 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.

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 that cause delays 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, as set out in the Asset Reporting Manual (definition document NR/ARM/M12DF).

Reporting method

The asset reporting manager monitors failures reported in the Daily National Incident Report and at each period end the summary is sent to our Route Asset Managers to review and verify. They investigate the cause of each traction power incident and the verified figures are provided back to the asset reporting manager for collation.

Results

Table 3.78 shows the proportion of identified root causes of DC traction power incidents causing train delays in 2012/13. Table 3.79 shows the annual number of DC (conductor rail) electrification failures in England & Wales, Scotland and the network total. Table 3.80 shows the annual number of DC (conductor rail) electrification failures for each operating route.

Reporting confidence

This measure was assigned a BX confidence grade by the previous Independent Reporter for output monitoring. This was because the Reporter found that the data pool was too small to support an accuracy assessment. As this measure has not been reassessed since 2009/10 this confidence grade does not take into account the improvements that have been made since that time. We do not believe that this confidence grade is therefore reflective of the current position. However, the confidence grade is reported for completeness.

Commentary

There were eight incidents during 2012/13 which is the lowest figure in the last five years and below the long term trend of 14.

Of these eight incidents five were in the Sussex Route. In response to this the Sussex team has developed an action plan to reduce the number of failures by mitigating the effect of conductor rail joint breaks by renewing the conductor rail and the replacement of electric track equipment components.

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 or subject to the welding of joints with approximately five per cent of the remaining population in the Sussex route to be addressed during CP4 and CP5.

The analysis of the root causes of failure shows a step change from previous years and a shift to asset condition as a major contributor to the failures. This change is partly a reflection of improved root cause analysis and more consistent reporting and partly a reflection of the poor condition of the signalling power cables and conductor rail.

Table 3.78: Root causes of failure (%)

Asset Condition	88
Equipment Design	0
Construction Delivery	0
Maintenance Delivery	0
Maintenance Regime	0
Other	12

Table 3.79: Electrification failures: conductor rail

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	14	14	14	16	8
Scotland	n/a	n/a	n/a	n/a	n/a
Network Total	**14**	**14**	**14**	**16**	**8**

Notes: Scotland does not currently have any DC (conductor rail).

Table 3.80: Electrification failures: conductor rail by operating route					
	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Anglia	0	0	0	1	0
East Midlands	n/a	n/a	n/a	n/a	n/a
Kent	2	2	6	5	0
London North Eastern	0	0	0	0	0
London North Western	0	1	0	0	0
Scotland	n/a	n/a	n/a	n/a	n/a
Sussex	8	6	3	5	5
Wales	n/a	n/a	n/a	n/a	n/a
Wessex	4	5	5	5	3
Western	n/a	n/a	n/a	n/a	n/a

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, 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
- 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 3.81 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 and is based on a sample size of 311 sites, which is slightly behind the target of 80 per cent for the end of year 4 (CP4) as stated in the Asset Reporting Manual (document NR/ARM/M13PR). Table 3.82 breaks down the average condition grade by AC operating route for the last three years. Kent, Wales and Wessex routes are not reported as they do not currently have any AC traction feeder stations or track sectioning points.

Reporting confidence

This measure was assigned a XX confidence grade by the previous Independent Reporter for output monitoring. This was because the year that this review was conducted was a transitional year for this measure as the reporting process had just been revised and improved. As this measure has not been reassessed since 2009/10 this confidence grade does not take into account the improvements that have been made since that time. We do not believe that this confidence grade is therefore reflective of the current position. However, the confidence grade is reported for completeness.

Commentary

The score for 2012/13 is 2.29, which is an improvement on last year's score of 2.57. The improved score has been achieved by reviewing the data that was used to complete the calculation. This had a significant impact in Anglia whose condition score improved from 2.55 to 2.09 as a result of including high levels of renewals that had been carried out over the past couple of years that were

Table 3.81: Electrification condition – AC traction						
Condition grade	*England & Wales*		*Scotland*		*Network total*	
	No.	*%*	*No.*	*%*	*No.*	*%*
1	57	22	14	30	71	23
2	80	30	18	38	98	32
3	105	40	14	30	119	38
4	22	8	1	2	23	7
5	0	0	0	0	0	0
Average condition grade	**2.32**		**2.18**		**2.29**	

Table 3.82: Average electrification condition – AC traction feeder stations overhead line by operating route			
	2010/11	*2011/12*	*2012/13*
Anglia	2.40	2.55	2.09
East Midlands	2.48	2.45	2.23
London North Eastern	1.99	2.27	2.17
London North Western	3.11	3.02	2.51
Scotland	2.41	2.13	2.18
Sussex	2.81	3.19	3.25
Western	2.03	2.40	2.33
Network Total	**2.56**	**2.57**	**2.29**

omitted from last year's Annual Return. Western's route score has improved due to improved switchgear trip times that are used in the condition methodology. London North West's score has improved as a result of several substations being decommissioned because of re-sectioning and K11 substations removed from service and replaced with new ones. The condition score for London North Eastern improved as a result of three substations being refurbished. Scotland's condition score has slightly increased due to the increasing average age of their assets.

The reason for the Sussex route's score appearing to be slightly worse than the rest of the country is that the route only has one substation. The average condition score is therefore calculated on this substation alone which has now aged by one year since last year and so is in a slightly worse condition. This data will be updated when the next inspection provides real condition information

Electrification condition – DC traction substations (M14)

Definition

This is a high level measure of the condition of direct current traction substations on a scale of one to five, based on visual inspection, 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 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 Network Rail standard. The measure is based on visual inspection and the condition assessment grade is a result of weighted pre-determined questions that consider the age, robustness of design, maintenance/refurbishment history and the operational performance of the HV switchgear, rectifier transformers, rectifiers and DC switchgear. 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.

Results

Table 3.83 illustrates the number and proportional percentage of DC traction 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. Table 3.84 breaks down the average condition grade by operating route for the last three years. East Midlands, Scotland, Wales and Western routes are not reported as they do not currently have any DC traction substations.

Table 3.83: Electrification condition – DC traction						
Condition grade	*England & Wales*		*Scotland*		*Network total*	
	No.	*%*	*No.*	*%*	*No.*	*%*
1	14	5	n/a	n/a	14	5
2	161	58	n/a	n/a	161	58
3	92	33	n/a	n/a	92	33
4	13	4	n/a	n/a	13	4
5	0	0	n/a	n/a	0	0
Average condition grade		**2.38**		**n/a**		**2.38**

Table 3.84: Average electrification condition – DC traction substations by operating route			
	2010/11	*2011/12*	*2012/13*
Anglia	2.11	1.89	1.92
Kent	2.69	2.70	2.54
London North Eastern	1.17	2.01	2.40
London North Western	2.34	2.47	2.10
Sussex	1.77	2.25	2.32
Wessex	2.49	2.22	2.34
Network Total	**2.36**	**2.45**	**2.38**

Reporting confidence

This measure was assigned a XX confidence grade by the previous Independent Reporter for output monitoring. This was because the year the review was conducted was a transitional year for this measure as the reporting process had just been revised and improved during that year. As this measure has not been reassessed since 2009/10 this confidence grade does not take into account the improvements that have been made since that time. We do not believe that this confidence grade is therefore reflective of the current position. However, the confidence grade is reported for completeness.

Commentary

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 2011/12 was 2.45, which represents deterioration compared to the previous year value. For 2012/13 the condition score was calculated using the condition scores for 280 substations (out of a population of 303). The average condition score has improved to 2.38.

The London North Western score has improved from 2.47 to 2.10 as result of refurbishment works that have improved the condition of substation buildings and transformers. Several substations have been decommissioned because of re-sectioning and K11 substations have been taken out of service and replaced with new ones.

The London North Eastern score has degraded from 2.01 in 2011/12 to 2.40 which is as expected as there are a significant number of renewals planned for delivery in 2013/14 for this route.

The little change in the overall results reflects where elements of renewal have taken place within the last twelve months but some assets are degrading gradually.

Network wide equipment obsolescence is one of the main reasons for the deterioration in the scoring in the majority of routes. It is anticipated that the condition scores will improve following planned equipment renewals in the remainder of 2013/14.

Other factors in the worsening of the overall results for some routes include 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 2013/14.

Additionally, an increased loading on current equipment is accelerating the decline in condition at some sites on the Sussex Route. Renewals are planned for delivery in 2013/14 and CP5 proposals have been submitted to identify and address the assets affected.

Electrification condition – AC traction contact systems (M15)

Definition

This is a high level measure of the condition of Network Rail's alternating current contact systems, on a scale of one to five, based on physical wear of the 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. During the reporting year there has been a change in the process for reporting the condition assessments, now taking information from Ellipse – a corporate asset database. This allows the use of a 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 previously.

Results

Table 3.85 shows the number and percentage of the AC contact systems within the five condition grades for England & Wales, Scotland and the whole network, and is based on a sample size and does not cover the total population of wire runs.

Reporting confidence

This measure was assigned a C4 confidence grade by the previous Independent Reporter for output monitoring. As this measure has not been reassessed since 2009/10 this confidence grade does not take into account the improvements that have been made since that time. We do not believe that this confidence grade is therefore reflective of the current position. However, the confidence grade is reported for completeness.

Commentary

This years condition score for the whole network has improved from 1.62 in 2011/12 to 1.40 in 2012/13. An overall shift in the spread of assets being classed as condition grade 1 or 2 can be attributed to the majority of the assets surveyed in 2012/13 being renewed within the year.

Due to variations in the sample sizes, sampling of different equipment and differences in the volume of renewals changing year on year it is inappropriate to make a direct comparison between 2011/12 and 2012/13. A change from 2011/12 to 2012/13 is however mentioned in order to add context to the numbers presented, which should be related to sample size by the reader.

In England & Wales the condition score has improved from 1.62 in 2011/12 to 1.34 in 2012/13. This is largely due to the smaller sample size of OLE being surveyed, 564 wire runs in 2012/13 compared to 860 wire runs in 2011/12. Of that sample a greater number of the wire runs that were surveyed had a condition score of 1 (385). This was due to 345 wire runs being reassessed by the routes as having a condition score of 1 and 40 wire runs being renewed within the year.

For Scotland the condition score has improved from 1.58 in 2011/12 to 1.53 in 2012/13, giving a more consistent view of the condition of the asset. This is due to a larger number of assets being surveyed, 229 in 2012/13 compared to 83 in 2011/12. Previously there was a lack of asset condition data for OLE from the old data collection methodology but Scotland has now adopted the same methodology of asset condition assessment as England & Wales.

Electrification condition – DC traction contact systems (M16)

Definition

This is a measure of the condition of direct current 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 3.86 shows the percentage of the DC contact systems within the five condition grades for England & Wales, Scotland and the whole network. There are no DC traction contact systems in Scotland so the England & Wales results are also the network results. The results are based on a sample size of 73 per cent.

Reporting confidence

This measure was assigned a C4 confidence grade by the previous Independent Reporter for output monitoring. As this measure has not been reassessed since 2009/10 this confidence grade does not take into account the improvements that have been made since that time. We do not believe that this confidence grade is therefore reflective of the current position. However, the confidence grade is reported for completeness.

Table 3.85: Electrification condition − AC traction contact system 2012/13 year total

Condition grade	England & Wales		Scotland		Network total	
	No.	%	No.	%	No.	%
1	503	89	89	39	592	75
2	57	10	138	60	195	25
3	2	1	2	1	4	0
4	1	0	0	0	1	0
5	1	0	0	0	1	0
Average condition grade		**1.34**		**1.53**		**1.40**

Table 3.86: Electrification condition − DC traction contact system 2012/13 year total

Condition grade	England & Wales		Scotland		Network total	
	Km	%	Km	%	Km	%
1	988	30	n/a	n/a	988	30
2	1,487	45	n/a	n/a	1,487	45
3	699	21	n/a	n/a	699	21
4	117	4	n/a	n/a	117	4
5	8	0	n/a	n/a	8	0
Average condition grade		**1.99**		**n/a**		**1.99**

Commentary

The condition of the DC traction contact system degraded slightly from 1.96 in 2011/12 to 1.99 in 2012/13. This is a reflection of the minor movement of asset conditions in the 1 to 3 bands of asset condition and the key poor condition assets of 4 and 5 slightly increasing from 3.54 per cent to 3.78 per cent. 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. The basic level of asset deterioration has been addressed with interventions through asset renewal. These have included route targeting renewals of:

- localised accelerated wear at level crossings that has been caused by the change to electric multiple unit shoe-gear configuration
- poorly performing sections of aluminium steel
- composite in underground railway
- Welding of fish plate joints.

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.

In 2013/14 Network Rail is looking to move from manual gauging to utilising the Electrification Measure Vehicle to improve the accuracy of the condition scores.

Power incidents causing train delays of more than 300 minutes

Definition

This measure reports the number of:

- overhead line equipment component related failures that led 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 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 monitors failures reported in the Daily National Incident Report and at each period end the summary is sent to our Route Asset Managers to review and verify. They investigate the cause of each traction power incident, and the verified figures are provided back to the asset reporting manager.

Results

Table 3.87 shows the annual number of power incidents causing train delays of more than 300 minutes against our Delivery Plan target for 2012/13.

Table 3.87: Power incidents causing train delays of more than 300 minutes (2012/13)					
	2009/10	*2010/11*	*2011/12*	*2012/13*	*DPu12*
England & Wales	69	95	66	64	n/a
Scotland	6	5	5	1	n/a
Network Total	**75**	**100**	**71**	**65**	**78**

Commentary

The number of power incidents causing train delays of more than 300 minutes has continued to reduce significantly from 100 in 2010/11 to 65 in 2012/13.

Within these figures, England & Wales incidents have continued to reduce from 66 in 2010/11 to 64 in 2012/13. Scotland incidents have reduced from five in 2011/12 to one in 2012/13. The overall performance is broadly similar to 2011/12 and is within target (78).

Station stewardship measure (M17)

Definition

This is the average condition rating of each station where Network Rail is the operator or 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 to 5 as represented in Table 3.88. 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 3.89 as the regulatory target.

Results

Table 3.89 shows the station stewardship measure scores for all years from 2008/09 to 2012/13 as well as the CP4 targets for categories A – F and Scotland (all stations). Table 3.90 shows a comparison of SSM scores at completed NSIP stations and non-NSIP stations as well as the CP4 targets for categories A – F and the whole network. Table 3.91 shows the SSM results for Greater Anglia 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 are generated automatically by the system. The confidence rating for Station Stewardship Measure was B2, following the Q4 2011/12 Data Assurance Report by the Independent Reporter, up from B3 previously following the 2011/12 Data Assurance Review. As there has been no Data Assurance Review in 2012/13, the confidence rating is reported as unchanged.

Subsequent to the Q3 2011/12 Data Assurance Report changes have been made to a number of asset life expectancies used in the measurement calculation as agreed with the Independent Reporter. These changes made the values more accurate and coherent but have negligible impact on the overall results of the Station Stewardship Measure.

Commentary

The latest results show an improvement to the scores for stations in categories A to E with the same score reported for category F.

Scotland (all stations) shows a slight degradation of condition back to 2010/11 levels and this is attributed to continued frost heave issues and resultant effect on the overall station condition. Approximately 70 per cent of stations in Scotland were affected in 2012/13 due to sustained low temperatures, which resulted in resources being diverted to priority/critical repair work. Condition scores for these station platforms and condition scores for other planned station work improvements showed a degradation affecting the overall SSM scoring.

Although the overall score continues to improve (approximately 0.7 per cent overall in 2012/13) this is at a slower rate than in preceding years (approximately 1.8 per cent overall in 2011/12). Network Rail believes that the underlying condition remains broadly stable and that the reduction in the scores is driven by two main factors unrelated to maintenance and renewal activity. As unchanged from last year, these reasons are the continued progression of our programme of detailed surveys of

locations where previously there had been 'ADC-lite' surveys and an emerging influence of network enhancement investment where the introduction of additional assets and the improvement of existing co-located assets are contributing to a slight improvement in the scores. This activity comprises enhancements such as platform lengthening, access for all schemes and franchise commitments.

The 'ADC-lite' surveys were employed in an accelerated data collection phase which began in 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, and these additional assets are now being collected as part of this progression, hence contributing to the improved scoring. This is also supported by analysis we have undertaken as part of our work for the Periodic Review 2013.

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 across the portfolio may not be shown for a number of years.

Following the change of franchised arrangements Greater Anglia took full repair and renewal responsibility of 166 stations. The end of year results for these stations has been incorporated in the reported figures. In addition, Table 3.91 shows the SSM figures at the point of transfer from Network Rail compared with the Greater Anglia results at P13, 2013. Reported resultant scores are comparable as expected and remain within the CP4 target.

As part of Condition 18 of Greater Anglia's Station Operator Licence an independent audit was undertaken by Arup (on Greater Anglia's behalf) and a copy of this has been passed to Network Rail.

Table 3.88: 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

Table 3.89: Station stewardship measure

Station Category	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*	*Regulatory target – max. average score at the end of CP4*
A	2.44	2.38	2.30	2.26	2.21	2.48
B	2.47	2.46	2.40	2.37	2.34	2.60
C	2.52	2.52	2.47	2.43	2.40	2.65
D	2.52	2.54	2.47	2.41	2.39	2.69
E	2.57	2.58	2.50	2.43	2.39	2.74
F	2.55	2.56	2.50	2.47	2.47	2.71
Scotland (all stations)	2.39	2.39	2.33	2.28	2.33	2.39

Table 3.90: 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	2.51	2	2.19	25
B	2.60	2.38	28	2.31	38
C	2.65	2.41	85	2.39	160
D	2.69	2.36	65	2.40	232
E	2.74	2.43	50	2.39	617
F	2.71	2.56	125	2.46	1076
Network Total	**2.39**	**2.45**	**355**	**2.42**	**2148**

Notes: 355 stations have had specific station improvements completed as part of the National Stations Improvement Programme (NSIP).

Table 3.91: Greater Anglia Stations

Station Category	*NR Measured SSM score as at end of P13, 2012*	*Greater Anglia SSM score as at P13, 2013*	*Regulatory Target-max average score at end of CP4*
A	n/a	n/a	2.48
B	2.46	2.47	2.6
C	2.44	2.4	2.65
D	2.52	2.5	2.69
E	2.39	2.38	2.74
F	2.66	2.64	2.71

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 one to five. 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 a light maintenance depot by visual inspection and combining into an overall LMD score. As with the station stewardship measure the scale represents the remaining life (as a percentage of the expected life) of all measured assets at an LMD on a scale of one to five as represented in Table 3.92. This 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 of a light maintenance depot is collected together with other relevant asset information by a competent surveyor. New surveys are then 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 the Light Maintenance Depot Stewardship Measure is C2. There has been no data assurance review in 2012/13.

Results

Table 3.92 shows the Light Maintenance Depot Stewardship Measure results for all years from 2008/09 to 2012/13 as well as the CP4 targets for England & Wales, Scotland, and the whole network.

Commentary

The results for 2012/13 show a continuing improvement in the average score for all depots from 2.43 in 2011/12 to 2.39 in 2012/13. The underlying trend of condition is broadly stable with this improvement (1.6 per cent) driven by further detailed data collection from an additional nineteen sites this year (27 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. The LMD stewardship measure in Scotland shows a 7.9 per cent improvement which resulted from completed survey condition scores for four out of the nine Light Maintenance Depots in Scotland. Following a time lapse since the last surveys were recorded the scores have now taken into account the work performed to improve depot asset scores at Cockerhill, Craigentinny, Inverness and Shields in Glasgow.

Table 3.92: Light maintenance depot stewardship measure

Light Maintenance Depots (LMDs)	*2008/09*	*2009/10*	*2010/11*	*2011/12*	*2012/13*	*Delivery Plan target – Max. average score at end of CP4*
England & Wales	2.52	2.47	2.46	2.40	2.38	2.52
Scotland	2.56	2.65	2.67	2.66	2.45	2.56
All LMDs (Network Total)	**2.52**	**2.50**	**2.48**	**2.43**	**2.39**	**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 13 measures for track renewals, four for signalling, nine for telecoms, ten for civils and 13 for electrification and plant.

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

Table 4.1 provides a summary of the renewals volumes for 2012/13 when compared to the Delivery Plan update for 2012 (DPu12).

Table 4.1: Delivery plan measures – Volume renewals			
Full year summary of results 2011/12			
	Plan (DPu12)	***Actual***	***Variance***
Track			
Rail (km)	852	699	(153)
Sleeper (km)	628	501	(127)
Ballast (km)	637	522	(115)
Composite / Plain line km	2,117	1,722	(395)
S&C (equivalent units)	374	361	(13)
Signalling			
Conventional SEU	1,141	978	(163)
ERTMS SEU	0	0	0
Crossrail accelerated (SEU)	0	0	0
Total SEUs	1,141	978	(163)
Level crossings (no.)	79	51	(28)
Telecoms - Station information and surveillance systems			
CIS (monitors)	57	128	71
Public address (speakers)	3,926	4,491	565
CCTV (cameras)	396	472	76
Clocks (no.)	0	38	38
Operational telecoms			
Large concentrators (no.)	7	3	(4)
Small concentrators (no.)	38	23	(15)
DOO CCTV (systems)	60	53	(7)
PETS (no.)	45	47	2
Voice recorders (no.)	64	36	(28)
Electrification			
Overhead Line			
Campaign changes (wire runs)	577	654	77
Re-wiring (wire runs)	97	40	(57)
Conductor rail (km)	35	2	(33)
AC distribution			
HV switchgear (no.)	55	35	(20)
GSP transformer (no.)	0	0	0
GSP cable (km)	0	0	0
Booster transformers (no.)	5	11	6
DC distribution			
HV switchgear (no.)	55	30	(25)
HV cabling (km)	38	30	(8)
LV switchgear (no.)	85	17	(68)
LV cabling (km)	99	6	(93)
Transformer rectifiers (no.)	7	5	(2)
Civils			
Overbridges (sq ms)	5,082	6,641	1,559
Underbridges (sq ms)	103,281	78,829	(24,452)
Bridgeguard 3 (sq ms)	1,893	786	(1,107)
Footbridges (sq ms)	2,990	1,097	(1,893)
Tunnels (sq ms)	6,024	5,449	(575)
Culverts (sq ms)	463	661	198
Retaining walls (sq ms)	1,287	926	(361)
Earthworks (sq ms)	604,917	526,049	(78,868)
Coastal/estuary defence (ms)	770	30	(740)
Other (including major structures) (sq ms)	25,470	23,050	(2,420)

Track renewals

With track activity volumes a degree of variance from forecasts (in the Delivery Plan) is expected. This is due to the details of planned work being refined (e.g. 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 - Table 4.19.

The volume of plain line track renewals delivered in 2012/13 was lower than planned. The planned volume was 2,117 ckm but the actual volume of plain line track renewed was 1,722 ckm (699 km of rail, 501 km of sleepers and 522 km of ballast).

The principal reasons for delivering less plain line track renewal volumes than planned and their composite kilometres (ckm) are:

- DB Schenker (DBS) industrial dispute – 41 ckm
- bad weather – 39 ckm
- access driven losses – 33 ckm
- route driven changes – 32 ckm
- DBS driver issues – 31 ckm.

There was also High Output slippage which occurred mainly 'on site' – due to site conditions (ballast cleaning in particular), plant failure, operator failure or late possessions/isolations (which affected production time and therefore output). In addition there have been issues related to plant reliability and adjacent line open working.

We delivered less renewals volumes than planned in some of the routes specifically due to:

- 72 ckm less on LNE route (this was mostly lost access, route changes and contractor related)
- 59 ckm less on Anglia, Kent and Sussex routes (this was mostly contractor performance and route driven changes)
- 53 ckm less on Western (this was mostly bad weather)
- 25 ckm less on Wessex (this was mostly contractor performance issues).

The volume of Switches & Crossings (S&C) renewals delivered in 2012/13 was marginally lower than planned. This was primarily due to cancellation of work at Gidea Park and Crofton Road. In total we delivered 361 equivalent units, of which 264 were full units.

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 and if only one rail is replaced the length counts as half.

Results

Table 4.2 and 4.3 shows rail renewed for the year compared to the DPu12 forecast for 2012/13 and previous years. This has been split by England & Wales and Scotland and also by operating route.

Table 4.2: Rail renewed

	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*2012/13 (km)*	*DPu12 (km)*
England & Wales	1,049	730	532	698	625	793
Scotland	100	80	55	76	74	58
WCRM	57	n/a	n/a	n/a	0	n/a
Network Total	**1,206**	**810**	**587**	**774**	**699**	**852***

Notes:
*Difference in total due to rounding.

Table 4.3: Rail renewed by operating route			
	2010/11 (km)	*2011/12 (km)*	*2012/13 (km)*
Anglia	-	72	60
East Midlands	-	29	103
Kent	-	29	23
London North Eastern	87	102	134
London North Western	105	187	146
Scotland	55	76	74
South East*	183	-	-
Sussex	-	20	20
Wales	-	27	25
Wessex	-	66	73
Western	157	165	41
Network Total	**587**	**774**	**699**

Notes:
*As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Sleepers renewed (M21)

Definition

This is the total length of track in kilometres where re-sleepering has been carried out, using either concrete, timber or steel sleepers.

Results

Tables 4.4 to 4.11 provide the total kilometres of sleepers renewed and the total kilometres for different types of sleepers renewed.

Table 4.4: Sleepers renewed: all types (km)						
	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*2012/13 (km)*	*DPu12 (km)*
England & Wales	605	403	401	510	464	591
Scotland	73	35	44	57	36	36
WCRM	57	n/a	n/a	n/a	n/a	n/a
Network Total	**735**	**438**	**445**	**567**	**501***	**628***

Notes:
*Difference in total due to rounding.

Table 4.5: Sleepers renewed: all types (km) by operating route			
	2010/11 (km)	*2011/12 (km)*	*2012/13 (km)*
Anglia	-	38	48
East Midlands	-	19	103
Kent	-	15	9
London North Eastern	74	78	106
London North Western	88	143	104
Scotland	44	57	36
South East*	84	-	-
Sussex	-	12	11
Wales	-	17	20
Wessex	-	32	41
Western	155	156	24
Network Total	**445**	**567**	**501**

Notes:
*As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.6: Concrete sleepers

	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*2012/13 (km)*
England & Wales	398	310	305	397	365
Scotland	50	26	30	42	24
WCRM	57	n/a	n/a	n/a	n/a
Network Total	**505**	**335**	**335**	**439**	**389**

Table 4.7: Concrete sleepers by operating route

	2010/11 (km)	*2011/12 (km)*	*2012/13 (km)*
Anglia	-	30	39
East Midlands	-	12	93
Kent	-	14	9
London North Eastern	39	39	86
London North Western	62	117	77
Scotland	30	42	24
South East+	66	-	-
Sussex	-	11	10
Wales	-	5	5
Wessex	-	29	23
Western	138	140	22
Network Total	**335**	**439**	**389***

Notes:
*Difference in total due to rounding.
+As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.8: Timber sleepers

	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*2012/13 (km)*
England & Wales	11	6	6	9	7.1
Scotland	0	1	1	1	0.4
WCRM	0	n/a	n/a	n/a	n/a
Network Total	**11**	**7**	**7**	**10**	**7.5**

Table 4.10: Steel sleepers

	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*2012/13 (km)*
England & Wales	197	88	90	105	92.1
Scotland	23	8	13	14	12.4
WCRM	0	n/a	n/a	n/a	n/a
Network Total	**220**	**96**	**103**	**119**	**104.5**

Table 4.9: Timber sleepers by operating route			
	2010/11	*2011/12*	*2012/13*
	(km)	*(km)*	*(km)*
Anglia	-	1	0.6
East Midlands	-	0	1.9
Kent	-	0	0.2
London North Eastern	1	1	1.7
London North Western	1	2	1.5
Scotland	1	1	0.4
South East+	1	-	-
Sussex	-	0	0.2
Wales	-	0	0.1
Wessex	-	1	0.4
Western	3	3	0.4
Network Total	**7**	**9**	**7.5***

Notes:
*Difference in total due to rounding.
+ As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.11: Steel sleepers by operating route			
	2010/11	*2011/12*	*2012/13*
	(km)	*(km)*	*(km)*
Anglia	-	8	8.6
East Midlands	-	7	7.9
Kent	-	0	0.0
London North Eastern	34	39	17.4
London North Western	25	24	25.4
Scotland	13	14	12.4
South East*	17	-	-
Sussex	-	0	0.0
Wales	-	12	14.5
Wessex	-	2	17.3
Western	14	13	1.0
Network Total	**103**	**119**	**104.5**

Notes:
* As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Ballast renewed (M22)

Definition

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

Results

Tables 4.12 to 4.19 provide the total kilometres of ballast renewed and the kilometres for the different types of ballast renewed.

Table 4.12: Ballast renewed: all types

	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*2012/13 (km)*	*DPu12 (km)*
England & Wales	633	476	483	521	485	600
Scotland	73	34	42	53	37	38
WCRM	57	n/a	n/a	n/a	n/a	n/a
Network Total	**763**	**509**	**525**	**573**	**522**	**637***

Notes:
*Difference in total due to rounding.

Table 4.13: Ballast renewed: all types by operating route

	2010/11 (km)	*2011/12 (km)*	*2012/13 (km)*
Anglia	-	35	39
East Midlands	-	19	44
Kent	-	15	9
London North Eastern	144	146	103
London North Western	140	133	118
Scotland	42	53	37
South East*	85	-	-
Sussex	-	12	11
Wales	-	14	21
Wessex	-	32	116
Western	114	116	24
Network Total	**525**	**573**	**522**

Notes:
*As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.14: Full ballast renewal by excavation

	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*2012/13 (km)*
England & Wales	308	213	187	182	172
Scotland	35	18	7	13	21
WCRM	57	n/a	n/a	n/a	n/a
Network Total	**400**	**231**	**194**	**195**	**192***

Notes:
*Difference in total due to rounding.

Table 4.15: Full ballast renewal by excavation by operating route

	2010/11 (km)	*2011/12 (km)*	*2012/13 (km)*
Anglia	-	30	30
East Midlands	-	11	10
Kent	-	11	7
London North Eastern	36	23	36
London North Western	63	65	38
Scotland	7	13	21
South East+	58	-	-
Sussex	-	11	10
Wales	-	3	5
Wessex	-	17	17
Western	30	13	19
Network Total	**194**	**195**	**192***

Notes:
*Difference in total due to rounding.
+ As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.16: Partial reballast-automatic ballast cleaning

	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2010/11 (km)*	*2012/13 (km)*
England & Wales	175	140	198	224	206
Scotland	20	1	18	21	1
WCRM	0	n/a	n/a	n/a	n/a
Network Total	**195**	**141**	**216**	**245**	**207**

Table 4.17: Partial reballast-automatic ballast cleaning by operating route

	2010/11 (km)	*2010/11 (km)*	*2012/13 (km)*
Anglia	-	1	0
East Midlands	-	1	25
Kent	-	0	0
London North Eastern	74	82	50
London North Western	52	44	52
Scotland	18	21	1
South East*	2	-	-
Sussex	-	0	0
Wales	-	3	0
Wessex	-	0	78
Western	70	92	0
Network Total	**216**	**245**	**207**

Notes:
*As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.18: Scarify-reballast with sleeper relay					
	2008/09 (km)	*2009/10 (km)*	*2010/11 (km)*	*2011/12 (km)*	*2012/13 (km)*
England & Wales	150	122	98	114	108
Scotland	18	15	17	19	15
WCRM	0	n/a	n/a	n/a	n/a
Network Total	**168**	**137**	**115**	**133**	**123**

Table 4.19: Scarify-reballast with sleeper relay by operating route			
	2010/11 (km)	*2011/12 (km)*	*2012/13 (km)*
Anglia	-	4	9
East Midlands	-	7	9
Kent	-	4	1
London North Eastern	34	41	18
London North Western	25	24	27
Scotland	17	19	15
South East+	25	-	-
Sussex	-	1	1
Wales	-	8	16
Wessex	-	15	21
Western	14	10	5
Network Total	**115**	**133**	**123***

Notes:
*Difference in total due to rounding.
+ As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Switches and crossings renewed (M25)

Definition

This measure records the total number of 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 DPu12 forecast 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.

Tables 4.20 to Table 4.26 show the S&C renewed during the year compared to the DPu12 forecast for 2012/13 and previous years.

Table 4.20: S&C equivalent units (EQU)						
	2008/09 (EQU)	*2009/10 (EQU)*	*2010/11 (EQU)*	*2011/12 (EQU)*	*2012/13 (EQU)*	*DPu12 (EQU)*
England & Wales	371	286	308	289	327	338
Scotland	44	33	39	44	34	36
WCRM	74	n/a	n/a	n/a	n/a	n/a
Network Total	**489**	**319**	**347**	**333**	**361**	**374**

Table 4.21: S&C full renewals

	2008/09 (units)	*2009/10 (units)*	*2010/11 (units)*	*2011/12 (units)*	*2012/13 (units)*	*DPu12 (units)*
England & Wales	310	206	240	247	241	260
Scotland	35	25	29	38	23	24
WCRM	74	n/a	n/a	n/a	n/a	n/a
Network Total	**419**	**231**	**269**	**285**	**264**	**284**

Table 4.22: S&C full renewals by operating route

	2010/11 (units)	*2011/12 (units)*	*2012/13 (units)*
Anglia	-	-	17
East Midlands	-	-	15
Kent	-	-	10
London North Eastern	71	63	53
London North Western	54	66	75
Scotland	29	38	23
South East*	76	-	-
Sussex	-	11	16
Wales	-	0	3
Wessex	-	17	23
Western	39	42	29
Network Total	**269**	**285**	**264**

Notes:
* As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.23: S&C abandonment

	2008/09 (units)	*2009/10 (units)*	*2010/11 (units)*	*2011/12 (units)*	*2012/13 (units)*	*DPu12 (units)*
England & Wales	76	61	61	62	69	70
Scotland	6	5	8	9	4	5
WCRM	0	n/a	n/a	n/a	n/a	n/a
Network Total	**82**	**66**	**69**	**71**	**73**	**75**

Table 4.24: S&C abandonment by operating route			
	2010/11 (units)	***2011/12 (units)***	***2012/13 (units)***
Anglia	-	-	6
East Midlands	-	-	4
Kent	-	-	6
London North Eastern	16	10	10
London North Western	13	6	25
Scotland	8	9	4
South East*	8	-	0
Sussex	-	0	1
Wales	-	2	5
Wessex	-	0	12
Western	24	28	0
Network Total	**69**	**71**	**73**

Notes:
* As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.25: S&C partial renewals/reballasting						
	2008/09 (units)	***2009/10 (units)***	***2010/11 (units)***	***2011/12 (units)***	***2012/13 (units)***	***DPu12 (units)***
England & Wales	69	150	113	32	157	130
Scotland	18	16	18	4	26	29
WCRM	0	n/a	n/a	n/a	n/a	n/a
Network Total	**87**	**166**	**131**	**36**	**183**	**159**

Table 4.26: S&C partial renewals/reballasting by operating route			
	2010/11 (units)	***2011/12 (units)***	***2012/13 (units)***
Anglia	-	-	0
East Midlands	-	-	10
Kent	-	-	3
London North Eastern	39	8	101
London North Western	27	8	3
Scotland	18	4	26
South East*	26	-	-
Sussex	-	0	1
Wales	-	3	12
Wessex	-	0	17
Western	21	12	10
Network Total	**131**	**36**	**183**

Notes:
* As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.27: Expenditure on drainage renewals				
£ million	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	5.04	9.20	11.26	17.97
Scotland	0.42	1.07	2.26	2.45
Network Total	**5.46**	**10.27**	**13.52**	**20.43**

Table 4.28: Volumes of drainage renewals			
	Volume of Drainage renewals undertaken (yds)	***Volume of drainage pipes cleaned (yds)***	***Volume of catchpits cleaned out (number)***
England & Wales	38,770	96,948	22,315
Scotland	5,816	6,175	896
Network Total	**44,587**	**103,124**	**23,211**

Track drainage renewals

Definition

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

Results

Table 4.27 shows the drainage renewals expenditure for 2012/13 and Table 4.28 shows the volume of drainage renewals.

Commentary

In 2012/13 we renewed 44,587 yards of drainage compared to 45,522 yards in 2011/12. This represents a sustained increase in the amount of drainage work we are undertaking in CP4 following flooding incidents.

Signalling renewed (M24)

Definition

This measure reports the total number of signalling equivalent units (SEU) which are 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 4.29 to 4.31 show the conventional SEUs renewed for 2012/13 compared to the DPu12 forecast and previous years. Table 4.32 shows the number of SEUs that have reached GRIP stage 4. Table 4.33 shows the number of signalling minor works volumes for 2012/13.

Commentary

During 2012/13 a total of 978 of the planned 1,141 SEUs were commissioned after adjusting for the type of work undertaken. The main commissionings are summarised below:

- 210 SEUs commissioned as part of Water Orton Corridor
- 124 SEUs commissioned through two stages as part of Ely-Norwich re-signalling
- 103 SEUs commissioned as part of Northampton Resignalling
- 76 SEUs commissioned as part of Stourbridge to Hartlebury re-signalling
- 73 SEUs commissioned as part of Newport Area Signalling Renewal Phase 2
- 69 SEUs commissioned as part of Stalybridge re-lock and re-control
- 59 SEUs commissioned as part of East Suffolk re-signalling
- 58.5 SEUs commissioned as part of Leicester PSB Phase 1
- 53 SEUs commissioned as part of Cardiff Area Signalling Renewal.

The main variances to planned SEUs are summarised below:

- Hertford North Integration delayed the commissioning of 118 SEUs from January 2012/13 into May 2013/14 as a consequence of industrial strike action at DB Schenker
- Shrewsbury to Crewe Modular delayed the commissioning of 83 SEUs to June 2013/14 due to technical issues surrounding Modular and Obstacle Detection
- Gatwick rescheduled the commissioning of 41 SEUs to December 2013 to align it with an associated enhancement project
- some of the slippage has been offset by the acceleration of the National Operations Strategy (NOS) Northwest Phase 1 and northwest re-control (37 SEUs).

Table 4.29: Total Signalling renewed per year

	2008/09 (SEU)	*2009/10 (SEU)*	*2010/11 (SEU)*	*2011/12 (SEU)*	*2012/13 (SEU)*	*DPu12 (SEU)*
England & Wales	600	778	800	1,266	978	1,141
Scotland	381	35	2	0	0	0
Network Total	**981**	**813**	**802**	**1,266**	**978**	**1,141**

Notes:
The total includes conventional and ERTMS SEUs.

Table 4.30: Total Signalling renewed per year by operating route

	2008/09 SEU (Non-WCRM)	*2009/10 SEU (Non-WCRM)*	*2010/11 SEU (Non-WCRM)*	*2011/12 SEU (Non-WCRM)*	*2012/13 SEU (Non-WCRM)*
Anglia	52	220	0	40	198
East Midlands	173	274	0	41	59
Kent	0	0	0	321	0
London North Eastern	135	0	150	56	75
London North Western	137	19	117	126	501
Scotland	381	35	2	0	0
Sussex	44	0	0	0	0
Wales		206	199	218	136
Wessex	59	0	114	251	0
Western	0	59	220	213	10
Network Total	**981**	**813**	**802**	**1,266**	**978***

Notes:
The total includes conventional and ERTMS SEUs.
*Discrepancy in totals due to rounding

Table 4.31: Signalling renewed

	2012/13	*DPu12*	*Variance*
Conventional SEU	978	1,141	(163)
ERTMS SEU	0	0	0
Crossrail accelerated (SEU)	0	0	0
Total SEU	978	1,141	(163)

Table 4.32: Signalling - GRIP 4 Volumes			
	DPU12	***Actual***	***Variance***
England & Wales	N/A	657	N/A
Scotland	N/A	8	N/A
Network Total	N/A	665	N/A

Table 4.33: Signalling Minor Works Volumes						
	Cable Route (km)	***Points (per end)***	***Signals***	***Location Cases***	***Main Cables (km)***	***Power Supplies***
England & Wales	8	11	21	78	44	13
Scotland	2	0	1	4	4	0
Network Total	**10**	**11**	**22**	**82**	**48**	**13**

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, with the volumes declared within the period that the level crossing is commissioned.

Results

Table 4.34 shows the number of level crossings equivalent units renewed in 2012/13. Table 4.35 shows this information split by operating route.

Commentary

51 level crossings were renewed across the network this year compared to the 79 that were planned for the year. The key reason for this variance is that ten level crossing renewals that were associated with the National Operations Strategy project slipped to next year due to possession issues.

The remaining variance is due to the packaging of smaller schemes into fewer larger schemes for delivery efficiency which has resulted in work being reprogrammed for completion in 2013/14.

Table 4.34: Number of Level crossings renewed 2012/13 (equivalent units)				
	2009/10	***2010/11***	***2011/12***	***2012/13***
England & Wales	20	9.75	21	51
Scotland	0	0	1	0
Network Total	**20**	**9.75**	**22**	**51**

Table 4.35: Number of Level crossings renewed 2012/13 (equivalent units) by operating route			
	2010/11	*2011/12*	*2012/13*
Anglia	1	0	11
East Midlands	1	1	0
Kent	0	1	0
London North Eastern	2	9	17
London North Western	0	0	8
Scotland	0	1	0
Sussex	0	0	0
Wales	0	0	1
Wessex	0	2	0
Western	5.75	7	14
Network Total	**9.75**	**22**	**51**

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 4.36 - 4.39 show the different types of telecoms renewals for 2012/13. Partial renewals to extend the life of assets are not reported in this measure.

Commentary

Concentrators

Three large concentrators were delivered in 2012/13 compared to seven in our plan. The variance from plan was caused as; two units slipped to 2013/14, one renewal was avoided and one unit (121766 SEA Feltham Concentrator Renewal) was de-scoped due to life extension.

23 small concentrators were delivered compared to 38 in our plan. The variance was caused by seven volumes relating to a project (123087 LNE Concentrator Renewals) not being delivered, six volumes subsequently slipped into 2013/14 due to a delay in commissioning caused by the procurement of long lead items (STS Concentrators), one volume was de-scoped, and one volume slipped into 2013/14 (112228 LNE York Concentrator Renewal) due to a delay in commissioning.

Public emergency telephone systems (PETS)

Of the planned 45 volumes, 47 were delivered. The variance to plan was caused by the acceleration of a renewal for two units at two level crossings due to the Ely to Norwich Re-signalling project.

Driver only operation systems

Of the planned 60 units, 53 were delivered. The variance resulted from six being deferred to 2013/14 due to the length of time the contractor took to produce an agreeable design. The remaining one volume was removed from the baseline due to the consolidation of car stops at Burnham.

Voice recorders

Compared to the planned 64 units, 36 were delivered. The variance was caused by an error with 42 volumes added in through another project (123085 LNE Voice Recorder Renewals) that were not originally envisaged to be part of the plan, in addition 20 of these slipped into 2013/14 and one volume was de-scoped. Two volumes (123087 LNE Concentrator Renewals) were de-scoped and one volume slipped into 2013/14 because of requirements identified during the project development and acceleration of the NOS strategy. One volume (LCS0036 SCO Contribution to Glasgow South Suburban Renewal), was de-scoped due to system expansion.

Station information and surveillance systems (SISS)

During 2012/13, SISS renewal formed a significant part of the telecoms renewals activity with a large proportion of volumes being delivered through public address installation.

We forecast our future volume delivery based upon the asset data in our Decision Support Tool. We sometimes deliver a different level of volume compared to our original plan due to impacts on design, changes in technology, standards, and legislation, configuration and placement of physical assets.

Customer information screens (CIS)

Compared to the plan of 57 units, 128 units were delivered in the year. 105 units were deferred from 2011/12 as a result of a delay in obtaining planning consents at stations with listed building status. 39 units were deferred into 2013/14 on a project to allow PETS volume to be accelerated. The volume and associated budget of the 39 CIS units was transferred to the project for Merseyrail Subsurface public address and LED Renewal. Five units relating to project Yoker CIS were also delivered.

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

Compared to the planned 3,926 units, 4,491 units were delivered in the year. The variance was caused by a number of factors, including programme slippage from 2011/12 of 1,386 units.

A further 757 units slipped into 2013/14. 333 of these relate to a project at Cannon Street reflecting a re-profiled programme following a delay in the contract award. Another 259 units on City Lines LLPA slipped due to Northern Rail being behind programme. There were also 138 units on Liverpool Lime Street PA/VA which slipped due to the change in scope from a PA only project to a PA/VA project. The remaining 27 volumes relate to LNW North West Area PA System Renewals where the programme was de-scoped down to 27 volumes due to a detailed design being received that shows only 27 speakers being required.

241 units were brought forward from 2013/2014 because the contractor demonstrated potential efficiencies in terms of design and installation costs. The remaining difference caused a net decrease of 305 volumes during the year.

Closed circuit television (CCTV)

Compared to the plan of 396 units, 472 units were delivered in the year. The variance was caused by 76 volumes slipping 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 0 units, 38 have been delivered. The variance to the baseline was caused by the deferral of 38 units from 2011/12.

Driver only operations systems

Of the planned 60 units, 53 were delivered during the year. The variance of seven volumes is due to 6 being deferred to 2013/14 as the contractor took longer than planned to produce an agreeable design. The remaining one volume was removed due to the consolidation of car stops at Burnham.

Table 4.36: Telecom renewals – Operational telecoms (number of units)						
	2008/9	***2009/10***	***2010/11***	***2011/12***	***2012/13***	***DPu12***
Large concentrators						
England & Wales	-	2	3	1	3	6
Scotland	-	0	0	1	0	1
Network total	4	2	3	2	3	7
Small concentrators						
England/Wales	-	28	22	24	23	35
Scotland	-	0	6	0	0	3
Network total	83	28	28	24	23	38
Public Emergency Telephone Systems						
England & Wales	-	5	14	12	40	38
Scotland	-	0	0	0	7	7
Network total	44	5	14	12	47	45
Driver Only Operation systems						
England & Wales	-	247	120	117	53	60
Scotland	-	0	0	0	0	0
Network total	68	247	120	117	53	60
Voice recorders						
England & Wales	-	8	13	0	36	63
Scotland	-	0	0	1	0	1
Network total	191	8	13	1	36	64
Notes: Planned figures are from the 2012 Delivery Plan update						

Table 4.37: Telecom renewals – Operational telecoms (number of units) by operating route				
Route	***System***	***2010/11***	***2011/12***	***2012/13***
Anglia	Large Concentrators	0	0	0
	Small Concentrators	2	0	0
	Public Emergency Telephone Systems	14	8	8
	Driver Only Operation Systems	0	0	0
	Voice Recorders	0	0	0
East Midlands	Large Concentrators	1	0	0
	Small Concentrators	0	0	1
	Public Emergency Telephone Systems	0	0	0
	Driver Only Operation Systems	36	0	0
	Voice Recorders	0	0	0
Kent	Large Concentrators	0	0	0
	Small Concentrators	1	0	0
	Public Emergency Telephone Systems	0	0	0
	Driver Only Operation Systems	84	0	0
	Voice Recorders	0	0	0

Table 4.37 Continued: Telecom renewals – Operational telecoms (number of units) by operating route (continued)				
Route	***System***	***2010/11***	***2011/12***	***2012/13***
London North Eastern	Large Concentrators	0	0	1
	Small Concentrators	3	7	12
	Public Emergency Telephone Systems	0	4	32
	Driver Only Operation Systems	0	83	0
	Voice Recorders	13	-	21
London North Western	Large Concentrators	0	1	0
	Small Concentrators	4	17	5
	Public Emergency Telephone Systems	0	0	0
	Driver Only Operation Systems	0	0	0
	Voice Recorders	0	-	8
Scotland	Large Concentrators	0	1	0
	Small Concentrators	6	0	0
	Public Emergency Telephone Systems	0	0	7
	Driver Only Operation Systems	0	0	0
	Voice Recorders	0	1	0
Sussex	Large Concentrators	0	0	1
	Small Concentrators	1	0	0
	Public Emergency Telephone Systems	0	0	0
	Driver Only Operation Systems	0	0	0
	Voice Recorders	0	0	0
Wessex	Large Concentrators	1	0	1
	Small Concentrators	0	0	4
	Public Emergency Telephone Systems	0	0	0
	Driver Only Operation Systems	0	0	0
	Voice Recorders	0	0	0
Western	Large Concentrators	1	0	0
	Small Concentrators	11	0	1
	Public Emergency Telephone Systems	0	0	0
	Driver Only Operation Systems	0	34	53
	Voice Recorders	0	-	7
Large Concentrators Network Total		3	2	3
Small Concentrators Network Total		28	24	23
Public Emergency Telephone Systems Network Total		14	12	47
Driver Only Operation Systems Network Total		120	117	53
Voice Recorders Network Total		13	1	36
Notes: Planned figures are from the 2012 Delivery Plan update				

Table 4.38: Telecom renewals - Station Information and Surveillance Systems (number of units)					
	2009/10	***2010/11***	***2011/12***	***2012/13***	***DPu12 2012/13***
Customer information screen (monitors)					
England/Wales	530	662	449	123	57
Scotland	110	0	0	5	0
Network total	640	662	449	128	57
Public address (speakers)					
England/Wales	287	1,574	1,975	3,299	3,005
Scotland	521	1,723	470	1,192	921
Network total	808	3,297	2,445	4,491	3,926
Closed circuit television (cameras)					
England/Wales	89	748	229	472	396
Scotland	0	0	0	0	0
Network total	89	748	229	472	396
Clocks					
England/Wales	0	127	11	38	0
Scotland	3	6	0	0	0
Network total	3	133	11	38	0
Notes: Actuals for CIS and PA in 2009/10 restated from those in the 2012 Delivery Plan.					

Table 4.39: Telecom renewals - Station Information and Surveillance Systems (number of units) by operating route				
Route	***System***	***2010/11***	***2011/12***	***2012/13***
Anglia	Customer Information Screen (Monitors)	0	0	0
	Public Address (Speakers)	0	900	0
	Closed Circuit Television	0	0	0
	Clocks	0	0	0
East Midlands	Customer Information Screen (Monitors)	0	107	0
	Public Address (Speakers)	0	228	0
	Closed Circuit Television	0	0	0
	Clocks	0	0	0
Kent	Customer Information Screen (Monitors)	0	0	0
	Public Address (Speakers)	239	0	205
	Closed Circuit Television	0	0	0
	Clocks	0	0	0
London North Eastern	Customer Information Screen (Monitors)	4	47	5
	Public Address (Speakers)	280	0	104
	Closed Circuit Television	0	0	97
	Clocks	0	0	0

Table 4.39 Continued: Telecom renewals - Station Information and Surveillance Systems (number of units) by operating route (continued)

Route	*System*	*2010/11*	*2011/12*	*2012/13*
London North Western	Customer Information Screen (Monitors)	52	14	13
	Public Address (Speakers)	541	0	1,407
	Closed Circuit Television	0	0	299
	Clocks	15	2	38
Scotland	Customer Information Screen (Monitors)	0	0	5
	Public Address (Speakers)	1,723	470	1,192
	Closed Circuit Television	0	0	0
	Clocks	6	0	0
Sussex	Customer Information Screen (Monitors)	12	36	0
	Public Address (Speakers)	0	0	0
	Closed Circuit Television	0	0	0
	Clocks	0	0	0
Wales	Customer Information Screen (Monitors)	0	0	0
	Public Address (Speakers)	0	0	0
	Closed Circuit Television	0	0	0
	Clocks	0	0	0
Wessex	Customer Information Screen (Monitors)	474	0	0
	Public Address (Speakers)	0	0	1,222
	Closed Circuit Television	0	0	0
	Clocks	43	0	0
Western	Customer Information Screen (Monitors)	120	245	105
	Public Address (Speakers)	514	847	361
	Closed Circuit Television	748	229	76
	Clocks	69	9	0
Customer Information Screen (Monitors) Network Total		662	449	128
Public Address (Speakers) Network Total		3,297	2,445	4,491
Closed Circuit Television (Cameras) Network Total		748	229	472
Clocks Network Total		133	11	38

Notes:
Actuals for CIS and PA in 09/10 restated from those in the 2012 Delivery Plan.

Telecoms renewals variance

Table 4.40 provides a summary of variances due to deferral of work from 2011/12, slippage of work from 2012/13 to 2013/14, accelerated volumes from 2012/13 to 2013/14 and other removals and additions of volumes during 2012/13.

Table 4.40: Telecoms Volume Overview

		Slippage into year (from 2011/12)		Volume Increase / Decrease		Slippage out of year		Slippage into the year (from 2013/14)	
		Vol	Project code	Vol	Project code	Vol	Project code	Vol	Project code
SISS	CIS	105	106695 Telecoms SISS Renewals			-39	123491 Merseyrail Subsurface PA and LED Renewal	5	129000 Yorker CIS Renewal
	PA	862	112235 MerseyRail LLPA	-195	123949 LNW Midlands Area PA Systems Renewals	-138	123486 Liverpool Lime Street PA / VA	241	128065 Scotland PA Renewals
		163	112244 Marylebone PA / VA Renewal	30	112217 Dunfermline LLPA Renewal	-259	119795 City Lines LLPA		
				133	112252 Cannon Street PA Renewal	-333	112252 Cannon Street PA Renewal		
				-45 -255	118839 North West PA System Renewals LRE0048	-27	118839 LNW North West Area PA System Renewals		
		361	106695 Telecoms SISS Renewals	27	118838 Blackburn Station SISS Renewal				
	CCTV	76	106695 Telecoms SISS Renewals						
	Clocks	38	119461 LNW Managed Stations Clocks Renewal	0	118838 Blackburn Station SISS Renewal				

Table 4.40 Continued: Telecoms Volume Overview

		Slippage into year (from 2011/12)		Volume Increase / Decrease		Slippage out of year		Slippage into the year (from 2013/14)	
		Vol	Project code	Vol	Project code	Vol	Project code	Vol	Project code
Operational	Large Concentrators	1	DDDA13 Bristol SPT Concentrator Ratio	-1	121766 SEA Feltham Concentrator Renewal	-1	DDDA13 Bristol SPT Concentrator Ratio		
						-1	112228 LNE York Concentrator Renewal		
						-1	DD6800 Swindon PSB Concentrator Renewal		
		1	DD6800 Swindon PSB Concentrator Renewal	-1	112242 West Midlands Signalling Centre Circuit Migration	-1	LSC0123 Scotland Concentrator Renewals 2014/15		
	Small Concentrators	1	LSE0044 SEA Small Concentrator Renewals 2011/12	-1	LSC0036 SCO Contribution to Glasgow South Suburban Renewal	-1	LSE0044 SEA Small Concentrator Renewals 2011/12		
				-1	LSC0123 Scotland Concentrator Renewals 2014/15				
		1	DDDA13 Bristol SPT Concentrator Ratio	-1	DDDA13 Bristol SPT Concentrator Ratio	-1	112228 LNE York Concentrator Renewal		
				-6	112254 Guildford SPT Concentrator Renewal				
		1	123209 Lostwithiel SPT Concentrator Renewal	-1	123087 LNE Concentrator Renewals	-6	123087 LNE Concentrator Renewals		
				1	123070 EMCC/West Hampsted	-1	119943 Scotland Concentrator Renewals		
	DOO CCTV			-1	118833 DOO Mirrors, Heaters and Structures Renewal	-6	118833 DOO Mirrors, Heaters and Structures Renewal		

Table 4.40 Continued: Telecoms Volume Overview

		Slippage into year (from 2011/12)		Volume Increase / Decrease		Slippage out of year		Slippage into the year (from 2013/14)	
		Vol	Project code	Vol	Project code	Vol	Project code	Vol	Project code
Operational	PETS			2	112255 Level Crossing Telephone Renewals				
				0	119943 Scotland Concentrator Renewals				
	Voice Recorders			-45	106690 LNE Concentrator Renewal	-1	123087 LNE Concentrator Renewals		
				41	123085 LNE Voice Recorder Renewals	-20	123085 LNE Voice Recorder Renewals		
				-2	123087 LNE Concentrator Renewals				
				-1	LSC0036 SCO Contribution to Glasgow South Suburban Renewal				

Civils activity volumes

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

Results

The tables for bridge renewals and remediation (M23), culverts renewals and remediation (M26), retaining walls remediation (M27), earthwork remediation (M28) and tunnel remediation (M29) on civils activity volumes provide a summary of projects completed during 2012/13.

Table 4.41 shows variances between assets compared to the DPu12 forecast, with the most notable variance to the DPu12 forecast coming from underbridges and earthworks.

Commentary

During the preparation of the DPu12 additional funds became available for civils renewal activities. In order to take account of this the DPu12 plan included assumptions for how it would be distributed by asset and work type and how much additional volume it would potentially deliver. The forecast volume for 2012/13 comprised both the volumes from the existing known workbank and the assumed additional volumes. The additional assumed volume for England & Wales was 67,878 units and 14,328 units for Scotland. This was spread across assets with 73,425 units assumed for earthworks and 8,986 for structures. The additional majority of assumed additional units were allocated to underbridges including 4,560 units for Scotland.

This year we developed and implemented the agreed sustainable asset management policies for both structures and earthworks that resulted in reviews of the workbank post DPu12 forecast. The review and re-profiling of the workbank post DPu12 forecast resulted in changes to the work profile, with additional costs arising from works that did not deliver measureable volume, for example on additional inspections for key assets. In particular it led to more preventative works below £50,000 being

Table 4.41: Civils renewal activity volumes delivered in 2012/13 compared to plan						
	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*	*Planned 2012/13*
Overbridges (sq ms)	8,207	5,235	11,866	7,420	6,641	5,082
Underbridges (sq ms)	68,201	75,298	87,914	71,498	78,829	103,281
Bridgeguard 3 (sq ms)	3,181	2,985	6,276	8,882	786	1,893
Footbridges (sq ms)	1,675	1,271	1,224	1,852	1,097	2,990
Tunnels (sq ms)	38,102	11,664	19,721	28,998	5,449	6,024
Culverts (sq ms)	1,792	1,416	2,340	2,130	661	463
Retaining walls (sq ms)	898	2,153	2,609	12,451	926	1,287
Earthworks (sq ms)	388,635	405,898	386,748	493,323	526,049	604,917
Coastal/estuary defence (ms)	2,441	541	1,185	1,243	30	770
Other (including major structures) (sq ms)	-	-	22,288	26,719	23,050	25,470

undertaken by maintenance teams with no renewals volume recorded.

The delivery volumes achieved were broadly in line with previous years. A number of planned schemes were deferred to 2013/14 due to programming issues and transitional changes arising from devolution. A small number of schemes were rolled into future years, primarily due to programming issues.

Structures changes were most significant for underbridges and other (major structures). Major structures slippage was caused by delays to repairs and repainting to Royal Albert Bridge due to adverse weather conditions. Slippage to underbridges was due to a combination of reasons including access constraints, design and development issues, adverse weather conditions, and re-scheduling to enable more cost efficient solutions.

Environmental issues have had a major impact upon earthworks, contributing 60,779 units to slippage, cancellations and deferrals. Design and engineering issues have led to 18,392 units not being delivered. There have also been significant additions to the plan as a result of reactive works, partly due to the impact of adverse weather conditions.

CP4 Civils Enhanced Spend

Following a request by the government, Network Rail is implementing a programme of enhanced investment over the remainder of Control Period 4 (CP4), to promote economic growth by accelerating work to be delivered by the construction industry.

The programme brings forward works planned for Control Period 5 (CP5), delivering improved asset condition and safety. The planned work is geographically spread to deliver economic stimulus to England & Wales and is suitable for delivery by a broad supply base, to ensure that investment will reach the wider economy.

The value of this investment is £250 million. The funding for this package is in five discrete workbanks which are kept separate from the ongoing CP4 investment programme. These five workbanks are:

- metallic bridge painting and repairs
- hidden critical elements
- spandrel wall stabilisation
- scour protection
- earthworks risk reduction.

Cost and volume statistics for the programme are split between 2012/13 and 2013/14 of CP4. The total volumes delivered within Year 4 of CP4 are shown in Table 4.42. These were delivered against a total investment of £50 million.

The total volumes forecast to be delivered within 2013/14 of CP4 are shown in Table 4.43. These are to be delivered against a total investment of £194 million.

Table 4.42: Volumes delivered within Year 4 CP4	
Workbank	**Volume in 2012/13 (m^2)**
Metallic Bridge Painting and Repairs	6,538
Earthworks Risk Reduction	152,640
Hidden Critical Elements	1,984
Spandrel Wall Stabilisation	3,692
Scour Protection	2,992
Total	**167,846**

Table 4.43: Volumes to be delivered within Year 5 CP4	
Workbank	**Volume in 2013/14 (m^2)**
Metallic Bridge Painting and Repairs	103,990
Earthworks Risk Reduction	814,536
Hidden Critical Elements	61,793
Spandrel Wall Stabilisation	49,871
Scour Protection	62,080
Total	**1,092,270**

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 4.44 shows the different types of bridge renewals and remediation work for 2012/13. Tables 4.45 to 4.47 show the bridge renewals and remediation work for 2012/13 compared to previous years.

Commentary

Overall the amount of remediation (in terms of the number of work items) through preventative repair, strengthening and waterproofing work has reduced from 2012/13 however the total deck area replaced has increased substantially compared to previous years.

In Scotland, a significant milestone achieved was the strengthening of the last five declared discrepancy underbridges between Dundee and Aberdeen, which allowed the removal of the short term network change and reinstatement of RA10 capacity between Dundee and Aberdeen. Also in Scotland the decrease in deck area renewed from 2011/12 was largely due to a greater proportion of the schemes being single span complete superstructure renewals rather than larger volume timber decking renewals on viaducts.

Preventative works on underbridges that are not included in deck replacement included 4,580 units for preventative works as part of the Olympics preparation.

Overbridges exceeded forecast due to high volume work re-programmed for the post Olympic period and the addition of the repainting of Waverley Bridge in Edinburgh for delivery synergy / efficiency with the station re-roofing project. These schemes were not included in the DPu12 forecast.

Table 4.44: Bridge renewals and remediation 2012/13: number by task category						
	Preventative	***Repair***	***Strengthen***	***Replace***	***Waterproofing***	***Total***
England & Wales	39	43	20	60	7	169
Scotland	16	7	12	10	0	45
Network Total	55	50	32	70	7	214

Table 4.45: Bridge renewals and remediation 2012/13: number by task category by operating route				
Route	***System***	***2010/11***	***2011/12***	***2012/13***
Anglia	Preventative	4	3	1
	Repair	8	3	2
	Strengthen	3	6	0
	Replace	3	5	6
	Waterproofing	0	1	0

Table 4.45 Continued: Bridge renewals and remediation 2012/13: number by task category by operating route

Route	*System*	*2010/11*	*2011/12*	*2012/13*
East Midlands	Preventative	0	2	0
	Repair	12	4	4
	Strengthen	0	5	3
	Replace	5	4	1
	Waterproofing	1	1	0
Kent	Preventative	2	3	2
	Repair	7	4	1
	Strengthen	0	0	1
	Replace	0	3	3
	Waterproofing	0	0	0
London North Eastern	Preventative	11	7	1
	Repair	28	12	4
	Strengthen	14	9	2
	Replace	18	16	13
	Waterproofing	1	1	0
London North Western	Preventative	36	20	21
	Repair	41	32	17
	Strengthen	17	10	8
	Replace	20	17	15
	Waterproofing	6	6	7
Scotland	Preventative	14	20	16
	Repair	9	12	7
	Strengthen	5	10	12
	Replace	18	10	10
	Waterproofing	1	1	0
Sussex	Preventative	1	2	5
	Repair	4	3	2
	Strengthen	0	0	2
	Replace	6	2	1
	Waterproofing	0	0	0
Wales	Preventative	-	4	4
	Repair	-	5	4
	Strengthen	-	1	0
	Replace	-	3	11
	Waterproofing	-	0	0
Wessex	Preventative	4	1	3
	Repair	3	5	8
	Strengthen	3	0	1
	Replace	3	1	7
	Waterproofing	1	0	0
Western	Preventative	9	2	2
	Repair	12	1	1
	Strengthen	2	1	3
	Replace	5	1	3
	Waterproofing	3	2	0

Table 4.45 Continued: Bridge renewals and remediation 2012/13: number by task category by operating route			
System	***2010/11***	***2011/12***	***2012/13***
Preventative Network Total	81	64	55
Repair Network Total	124	81	50
Strengthen Network Total	44	42	32
Replace Network Total	78	62	70
Waterproofing Network Total	13	12	7
Network Total	340	261	214

Table 4.46: Bridge renewals and remediation: square area of deck replacement (actual sq m)					
	2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	8,240	12,976	8,672	9,765	19,649
Scotland	3,806	1,722	1,263	1,127	614
Network Total	**12,046**	**14,698**	**9,935**	**10,892**	**20,263**

Table 4.47: Bridge renewals and remediation: square area of deck replacement (actual sq m) by operating route			
	2010/11	***2011/12***	***2012/13***
Anglia	157	378	915
Kent	0	1,038	492
London North Eastern	2,571	2,888	1,570
London North Western	2,909	3,127	1,039
East Midlands	661	657	75
Scotland	1,263	1,127	614
Sussex	985	1,273	75
Wales	-	199	14,667
Western	1,048	77	213
Wessex	341	128	603
Network Total	**9,935**	**10,892**	**20,263**

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

Tables 4.48 shows the culvert renewals and remediation work for 2012/13 and tables 4.49 shows this compared to previous years by operating route.

Commentary

During 2012/13 the number of individual culverts remediated has been reduced compared with previous years. However substantial programmes of maintenance works have been undertaken where the cost does not exceed £50,000. A review by some Route teams has resulted in some culverts being de-scoped for delivery (e.g. Wessex Culverts £400,000 maintenance programme of work carried out on numerous culverts, each below £50,000). In addition the planned replacement of Penrhiwceiber Culvert was cancelled following an engineering review.

Table 4.48: Culvert renewals and remediation 2012/13: number by task category				
	Preventative	***Repair***	***Replace***	***Total***
England & Wales	0	2	6	8
Scotland	0	0	8	8
Network Total	0	2	14	16

Table 4.49: Culvert renewals and remediation 2012/13: number by task category

Route	*System*	*2010/11*	*2011/12*	*2012/13*
Anglia	Preventative	0	0	0
	Repair	0	1	1
	Replace	0	1	1
	Total	0	2	2
East Midlands	Preventative	0	0	0
	Repair	0	0	0
	Replace	2	1	1
	Total	2	1	1
Kent	Preventative	0	0	0
	Repair	0	0	0
	Replace	0	0	0
	Total	0	0	0
London North Eastern	Preventative	0	0	0
	Repair	1	2	0
	Replace	7	14	1
	Total	8	16	1
London North Western	Preventative	0	0	0
	Repair	1	1	0
	Replace	3	1	2
	Total	4	2	2
Scotland	Preventative	0	0	0
	Repair	0	0	0
	Replace	8	8	8
	Total	8	8	8
Sussex	Preventative	0	0	0
	Repair	0	0	0
	Replace	2	0	0
	Total	2	0	0
Wales	Preventative	0	0	0
	Repair	0	0	0
	Replace	0	0	0
	Total	0	0	0
Wessex	Preventative	0	0	0
	Repair	1	1	1
	Replace	0	0	0
	Total	1	1	1

Table 4.49 Continued: Culvert renewals and remediation 2012/13: number by task category				
Route	***System***	***2010/11***	***2011/12***	***2012/13***
Western	Preventative	0	0	0
	Repair	0	1	0
	Replace	0	0	1
	Total	0	1	1
Preventative Network Total		0	0	0
Repair Network Total		3	6	2
Replace Network Total		22	25	14
Network Total		25	31	16

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 4.50 shows the different types of retaining wall renewals and remediation work for 2012/13. Tables 4.51 and 4.52 show the area of retaining wall renewed for 2012/13 compared with previous years.

Commentary

During 2012/13 the total number of retaining walls remediated or renewed and their associated volumes was less than planned. The total volume delivered was 28 per cent less than planned, mainly due to slippage at HNR Blue Brick, Long Roade cutting and Upside retaining wall being re-programmed to align with the possession strategy. Five additional sites were also added during the year including Cornholme retaining wall, Langbank retaining wall and Caerphilly retaining wall which were added due to asset failure.

Table 4.50: Retaining wall renewals and remediation 2012/13: number by task category				
	Preventative	***Repair***	***Replace***	***Total***
England & Wales	1	7	1	9
Scotland	0	1	0	1
Network Total	**1**	**8**	**1**	**10**

Table 4.51: Retaining wall renewed: area (actual sq m)					
	2007/08	***2009/10***	***2010/11***	***2011/12***	***2012/13***
England & Wales	5,787	1,737	1,534	738	900
Scotland	135	0	0	0	0
Network Total	**5,922**	**1,737**	**1,534**	**738**	**900**

Table 4.52: Retaining wall renewed: area (actual sq m) by operating route			
	2010/11	*2011/12*	*2012/13*
Anglia	0	0	0
Kent	170	120	0
London North Eastern	512	558	0
London North Western	128	60	900
East Midlands	0	0	0
Scotland	0	0	0
Sussex	0	0	0
Wales	0	0	0
Western	724	0	0
Wessex	0	0	0
Network Total	**1,534**	**738**	**900**

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

Tables 4.53 and 4.55 shows the numbers of different types of earthwork remediation works undertaken in 2012/13. Tables 4.54 and 4.56 shows this compared to previous years and by operating route.

Commentary

The total volume delivered was 526,049sqm. This comprised 485,929sqm of planned work together with 40,120sqm of reactive work mainly due to repairing failures on the network.

The total volume delivered in the year was 13 per cent less than planned. There was programme slippage of four schemes across three routes, LNW, LNE and Kent due to additional requirements arising from Transport & Works Orders and environmental constraints which accounted for nine per cent of this reduction.

Overall volume for 2012/13 was 11 per cent greater than for 2011/12 and 50 per cent greater than 2010/11.

Scotland delivered more than 38 per cent of the network total volume. This is because of the Scotland ten year rock cutting remediation programme.

Table 4.53: Earthworks Remediation Projects 2012/13: number by task category			
	Preventative	*Repair*	*Total*
England & Wales	51	44	95
Scotland	49	4	53
Network Total	**100**	**48**	**148**

Table 4.54: Earthworks Remediation Projects 2012/13: number by task category by operating route

Route	*System*	*2010/11*	*2011/12*	*2012/13*
Anglia	Preventative		1	0
	Repair		2	2
	Total	0	3	2
East Midlands	Preventative		10	1
	Repair		1	1
	Total	0	11	2
Kent	Preventative		3	7
	Repair		1	1
	Total	0	4	8
London North Eastern	Preventative	13	14	23
	Repair	3	1	14
	Total	16	15	37
London North Western	Preventative	11	7	13
	Repair	3	3	7
	Total	14	10	20
Scotland	Preventative	20	48	49
	Repair	2	4	4
	Total	22	52	53
South East *	Preventative	8	-	-
	Repair	13	-	-
	Total	21	0	0
Sussex	Preventative	-	3	0
	Repair	-	1	5
	Total	0	4	5
Wales	Preventative	-	1	1
	Repair	-	1	2
	Total	0	2	3
Wessex	Preventative	7	2	4
	Repair	23	2	8
	Total	30	4	12
Western	Preventative	-	11	2
	Repair	-	1	4
	Total	0	12	6
Preventative Network Total		59	100	100
Repair Network Total		44	17	48
Network Total		103	117	148

Notes:
* As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Table 4.55: Earthworks Remediation Projects 2012/13: total volume (m^2) for works greater than £50,000			
	Preventative	***Repair***	***Total***
England & Wales	291,714	36,050	327,764
Scotland	194,215	4,070	198,285
Network Total	**485,929**	**40,120**	**526,049**

Table 4.56: Earthworks Remediation Projects 2012/13: total volume (m^2) for works greater than £50,000 by operating route				
		2010/11	***2011/12***	***2012/13***
Anglia	Preventative	-	5,011	0
	Repair	-	1,848	3,695
	Total	0	6,859	3,695
East Midlands	Preventative	-	45,111	927
	Repair	-	2,800	1,140
	Total	0	47,911	2,067
Kent	Preventative	-	13,388	17,405
	Repair	-	3,997	1,245
	Total	0	17,385	18,650
London North Eastern	Preventative	58,828	60,881	160,965
	Repair	1,085	893	10,015
	Total	59,913	61,774	170,980
London North Western	Preventative	55,092	9,843	23,881
	Repair	6,146	615	9,755
	Total	61,238	10,458	33,636
Scotland	Preventative	58,259	190,905	194,215
	Repair	2,120	3,090	4,070
	Total	60,379	193,995	198,285
South East *	Preventative	33,375	-	-
	Repair	29,326	-	-
	Total	62,701	-	-
Sussex	Preventative	-	14,667	0
	Repair	-	693	5,590
	Total	0	15,360	5,590
Wales	Preventative	-	6,555	200
	Repair	-	140	785
	Total	0	6,695	985
Wessex	Preventative	81,873	7,033	77,536
	Repair	22,930	1,233	680
	Total	104,803	8,266	78,216
Western	Preventative	-	104,592	10,800
	Repair	-	900	3,145
	Total	0	105,492	13,945
Preventative Network Total		287,427	457,986	485,929
Repair Network Total		61,607	16,209	40,120
Network Total		349,034	474,195	526,049

Notes:
* As a result of devolution and the creation of ten routes data prior to 2012 for the routes Anglia, Kent, Sussex and Wessex are recorded under South East. Post 2012 data will be recorded under the four separate routes.

Tunnel remediation (M29)

Definition

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

Results

Table 4.57 shows the different types of tunnel renewals work for 2012/13.

Commentary

Tunnel renewals in 2012/13 were less than in the past previous two years. In 2010/11 the total was 49 and in 2011/12 it was 48.

During 2012/13 there been high levels of investment in tunnel works as part of a tunnel maintenance programme.

The variance compared to plan is also due to seven projects totalling 436 units having slipped to 2013/14, mainly due to realignment with possession strategy or due to delays in the tendering process. Severe weather also led to additional reactive works at Kippenross Tunneland Scout tunnel and repairs to Totley tunnel comprising 1,779 sq m completed.

Electrification and Plant renewal activity volumes

Definition

This volume measures are defined in the Network Rail Asset Reporting Manual. The volumes are only declared as delivered and reported each period when commissioned into operational use.

Results

Tables 4.58 and 4.59 set out the electrification and plant renewal volumes for 2012/13 and compare these against the Delivery Plan update 2012.

Commentary

The main reasons for the variances on the volumes delivered compared to plan are described below.

AC Distribution

HV AC Switchgear

All planned volumes were delivered.

Booster Transformers

All planned volumes were delivered.

Table 4.57: Tunnel renewals 2012/13: number by task category

	Preventative	*Repair*	*Total*
England & Wales	18	9	27
Scotland	1	2	3
Network Total	**19**	**11**	**30**

Table 4.58: Electrification and Plant Activity Volumes – network totals

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
AC distribution					
HV Switchgear (circuit breakers)	102	41	57	32	35
AC GSP transformer (No)	1	0	1	0	0
AC GSP cable (km)	0	0	0	0	0
Booster transformers (No.)	5	53	27	2	11
OLE and conductor rail					
OLE re-wiring (wire runs)	25	64	71	49	40
OLE campaign changes (wire runs)	455	490	784	1127	654
Conductor Rail (km)	56	0	2	17	2
DC distribution					
HV Switchgear (No.)	63	64	69	14	30
HV Cables (km)	50	65	22	20	30
LV Switchgear (No.)	139	69	55	13	17
Transformers / Rectifiers (No.)	14	27	39	32	5
LV cabling (km)	0	0	0	7	6
Plant & Machinery					
Points Heaters (No.)	535		641	531	152

The following volumes were additional to plan:

- four volumes accelerated from 2013/14 due to additional resource availability
- two volumes, which were deferred from 2011/12 and not included in DPu12.

OLE & Conductor Rail

OLE Rewiring

The following volumes were de-scoped from plan:

- three volumes were de-scoped as full renewal was no longer required due to better asset information from the new measurement train.

The following volumes were deferred from plan:

- the Great Eastern (GE) Project delivered 26 against a plan of 87 volumes due to significant changes / reductions made by the route to previously agreed access arrangements and severe inclement weather (snow) the remaining 61 volumes were deferred to later years
- five volumes were deferred to 2013/14 due to availability issues from the contractor.

The following volumes were additional to plan:

- two volumes due to new scope
- seven volumes were deferred from 2011/12 which were not included in DPu12
- three volumes that were omissions from previous years reporting.

OLE Campaign changes

The following volumes were deferred from plan:

- nine volumes were deferred to 2013/14 due to lack of maintenance resources to deliver the work
- 50.19 volumes were deferred to 2013/14 due to a robust development of the project which showed that the original planned delivery of the volumes was not achievable
- eight volumes were deferred to 2013/14 to maximise the projects efficiency
- five volumes were deferred to 2013/14 due to design, compatibility and product approval issues
- 18 volumes were deferred to 2013/14 due to a loss in access/review of project delivery.

The following volumes were additional to plan:

- 33 volumes accelerated from 2013/14 due to the routes and contractors reviewing the program of works delivery
- 119 volumes due to reporting clarification
- 13 volumes were deferred from 2011/12 but not included in DPu12
- 2.26 volumes that were omissions from previous years reporting.

Conductor Rail

The following volumes were deferred from plan:

- six volumes have been transferred to a new route specific project for delivery in 2013/14
- ten volumes were deferred to 2013/14 so as to align with available delivery resources
- 16.32 volumes were deferred to 2013/14 due to the Sussex Route review of the projects
- 2.22 volumes slipped into 2013/14 due to the LNW RAM team reviewing the delivery of the project.

The following volumes were additional to plan:

- two volumes were delivered due to the conductor rail being delivered at the same time as track renewal activity.

DC Distribution

AC HV Switchgear

The following volumes were deferred from plan:

- seven volumes were deferred to 2013/14 due to a late award of contract compounded by some contractor performance issues
- 18 volumes were deferred to 2013/14 due to the volumes being procured under a central framework contract which was unable to deliver within the timeframe.

DC HV Cables

The following volumes were deferred from plan:

- 8.6 volumes were deferred to 2013/14 due to the commissioning of the asset being delayed
- three volumes have been transferred to a route specific project for delivery in 2013/14
- three volumes were deferred to 2013/14 due to problems with delivery
- 4.31 volumes were deferred to 2013/14 due to an installation possession being in week 52.

The following volumes were additional to plan:

- 11.17 volumes were deferred from 2011/12 but not included in DPu12.

DC LV Switchgear

The following volumes were deferred from plan:

- 80 volumes were deferred to 2013/14 due to the delivery team being unable to gain possessions to energise the equipment.

The following volumes were additional to plan:

- twelve volumes were deferred from 2011/12 but not included in DPu12.

Transformers / Rectifiers

The following volumes were deferred from plan:

- two volumes were deferred to 2013/14 due to possession delays.

DC LV Cables

The following volumes were de-scoped from plan:

- two volumes were de-scoped due to a reporting error.

The following volumes were deferred from plan:

- 4.4 volumes were deferred to 2013/14 due to the commissioning of the assets being delayed
- 88 (reactive volumes) volumes were deferred to 2013/14 due to routes being unable to deliver volumes under minor works
- three volumes were deferred to 2013/14 as the project is scheduled to deliver DC feeder cables only when discovered to be in poor condition at the time of survey.

The following volumes were additional to plan:

- four volumes were deferred from 2011/12 but not included in DPu12.

Plant & Machinery

Points Heaters

The following volumes were deferred from plan:

- 130 volumes were deferred to 2013/14 due to the projects being under review.

Volumes additional to plan:

- 33 volumes were accelerated from 2013/14 due to projects increasing volumes and only being limited to renewing volumes in the summer periods
- 119 volumes were deferred from 2011/12 but not included in DPu12.

Table 4.59: Electrification and Plant Activity Volumes in 2012/13

	England & Wales 2012/13	*Scotland 2012/13*	*Network 2012/13*	*DPu12 (Network) 2012/13*
AC distribution				
HV Switchgear (circuit breakers)	26	9	35	35
AC GSP transformer (No)	0	0	0	0
AC GSP cable (km)	0	0	0	0
Booster transformers (No.)	0	11	11	5
OLE and conductor rail				
OLE re-wiring (wire runs)	37	3	40	97
OLE campaign changes (wire runs)	523	131	654	577
Conductor Rail (km)	2	0	2	35
DC distribution				
HV Switchgear (No.)	30	0	30	55
HV Cables (km)	30	0	30	38
LV Switchgear (No.)	17	0	17	85
Transformers / Rectifiers (No.)	5	0	5	7
LV cabling (km)	6	0	6	99
Plant & Machinery				
Points Heaters (No.)	146	6	152	Not reported in DPu12

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 our Infrastructure Projects team as larger schemes whilst our Maintenance Property Works team delivered a much greater number of smaller schemes.

Results

Table 4.60 provides the operational property expenditure as a proxy for renewal volumes and provides a comparison with the DPu12 forecast. We will be able to record and subsequently report physical volumes for work types starting in CP5.

Commentary

The main variances between planned and actual volumes (expenditure) for 2012/13 are explained below:

Managed Stations

There was an under spend of £23 million for Managed stations in England & Wales. A number of planned activities were re-phased to 2013/14:

- at Victoria Station, the toilet refurbishment project was reviewed which resulted in an expenditure delay
- at Paddington station, the specification for work on the roof spans fabric, lighting and mechanical & electrical equipment was reviewed and the work was re-phased on spans 1 to 3 to 2013/14
- Charing Cross station platform works were also re-phased due to identification of work required on support structures
- Waterloo station platforms have been technically de-scoped and integrated with work on the concourse flooring and repairs to resolve water ingress issues, again re-phased to 2013/14.

In Scotland the plans for Glasgow Central and Edinburgh Waverley were delivered broadly to plan. Efficiencies and some re-allocation of spends were made at Waverley to invest in lifts & escalators to improve accessibility.

Franchised Stations

The variance in planned volumes for franchised stations is largely explained by re-phasing / deferment of works until 2013/14. This has followed additional planning and analysis time expended to review whole life financial analysis, integration with the TOC Alliances and integration with Access for All projects. In some instances there have been re-phases due to planning and mobilisation delays associated with related works.

In Scotland, the overspend of £1 million was used specifically to improve resilience and invest in priority and emergent works following weather damage.

LMD & Depot Plant

Most under-spend variances were associated with taking account of future depot redundancy plans. Solutions have been generated by utilising current assets in alliance with train operators .e.g. Old Oak Common LMD will be demolished to make way for HS2 and as a further example, shore supply renewal has been deferred / potentially cancelled at Heaton LMD following a review of the TOC future utilisation requirements.

Line-side Buildings (LSB), Maintenance Delivery Unit (MDU) and National Delivery Service (NDS)

Line-side buildings form the major part of the reduced volumes of work executed across these asset types. There has been significant re-establishment of planning, specification generation and scheme / work project management due to re-organisation activities. In addition, some works on LSB assets were deferred due to spend contingency measures as freight depots were planned to form an additional part of the buildings portfolio. It is anticipated that spend will be made in 2013/14 as the LSB data acquisition exercise generates the need for remedial / improvement works to these assets.

Table 4.60 Operational Property expenditure (£m) – 2012/13 prices

	DPu12			*2012/13*			*Variance*		
	Overall	*Scotland*	*England & Wales*	*Overall*	*Scotland*	*England & Wales*	*Overall*	*Scotland*	*England & Wales*
Managed Stations	76	34	42	56	37	19	20	(3)	23
Franchised Stations	136	12	124	115	13	102	21	(1)	22
LMDs	15	1	13	10	2	8	5	(1)	5
Depot Plant	7	2	5	2	1	1	5	1	4
LSBs	17	1	16	13	1	12	4	0	4
MDUs	11	2	9	9	1	8	2	1	1
NDS	4	0	4	2	0	1	2	0	3
Total	**266**	**52**	**214**	**207**	**54**	**152**	**59**	**(2)**	**62**

Section 5 – Safety and sustainable development

Introduction

In this section we report on our principal safety, health and environmental performance measures. It also sets out the initiatives we are taking to improve our safety, health and wellness, and sustainable development risk management arrangements.

Safety performance

In this section we report on aspects of safety which are the responsibility of Network Rail and our contribution to safety within the rail industry. There are two main safety measures - the Passenger Safety Indicator (PSI) which reports passenger safety risk associated with Network Rail activity, and the Workforce Fatalities and Weighted Injuries (FWI) measure, which reports workforce safety. Through these two measures we monitor our contribution to the industry target for CP4 of achieving a three per cent reduction in the risk of a fatality or injury from accidents on the railway for passengers and rail workers.

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

- infrastructure wrong side failures
- category A signals passed at danger (SPAD)
- level crossing events
- irregular working
- 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 design, construction, maintenance and operation of the railway system.

Passenger safety

Definition

The level of passenger safety is measured by the Passenger Safety Indicator (PSI). This measure is derived from a combination of two separate data sources, of which the first source is train accident risk data from the Precursor Indicator Model (PIM). Produced by the Rail Safety & Standards Board (RSSB) every quarter, the PIM provides a guide to the current train accident risk profile and the trends in this profile. It calculates this using precursor events data, such as broken rails or landslips, which are combined into six main groups (infrastructure failures, irregular working, public behaviour at level crossings, objects on the line, signals passed at danger, and trains and rolling stock). A subset of the PIM is calculated, identifying passenger risks only, and it is that number that is used in calculating the PSI. Assessing train accident risk in this way avoids the effect of low frequency, high consequence events that could potentially distort the PSI. Any actual accidents are highlighted in our Safety Health & Environment Performance (SHEP) report.

The second element of the 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 the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 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 2012/13 compared to previous years. Our target for the end of CP4 is 0.24. Figure 5.1 shows the breakdown of the PSI period by period.

Commentary

There were two accidental passenger fatalities in the year at Network Rail managed stations. On 20 March 2013 a male passenger fell while descending the stairs on platform 16 at Leeds station. On 25 March 2013 a male passenger had a heart attack on the concourse at Euston station and subsequently died. The latter incident is not included in our statistics as this is outside of the reportable definition. In 2012/13 there were no passenger fatalities on level crossings at stations. The Passenger Safety Indicator monthly moving average (MAA) year end stands at 0.226 against a target for 2012/13 of 0.242.

During 2012/13 there has been an 11 per cent decrease in passenger major injuries at Network Rail managed stations compared with 2011/12. The major influence on this figure is the reduction in the number of passenger major injuries through slips, trips and falls on Network Rail managed stations. Safety enhancements have been undertaken at a number of these stations in order to mitigate the risk of slips, trips and falls.

Table 5.1: Passenger safety

	2008/09	2009/10	2010/11	2011/12	2012/13
Passenger Safety Indicator (MAA)	0.252	0.215	0.178	0.246	0.226

Notes: The reported figure for 2011/12 has been amended as a passenger died following injuries occurred in an incident in Period 2 of 2011/12

Figure 5.1: Passenger Safety Indicator (broken down by period)

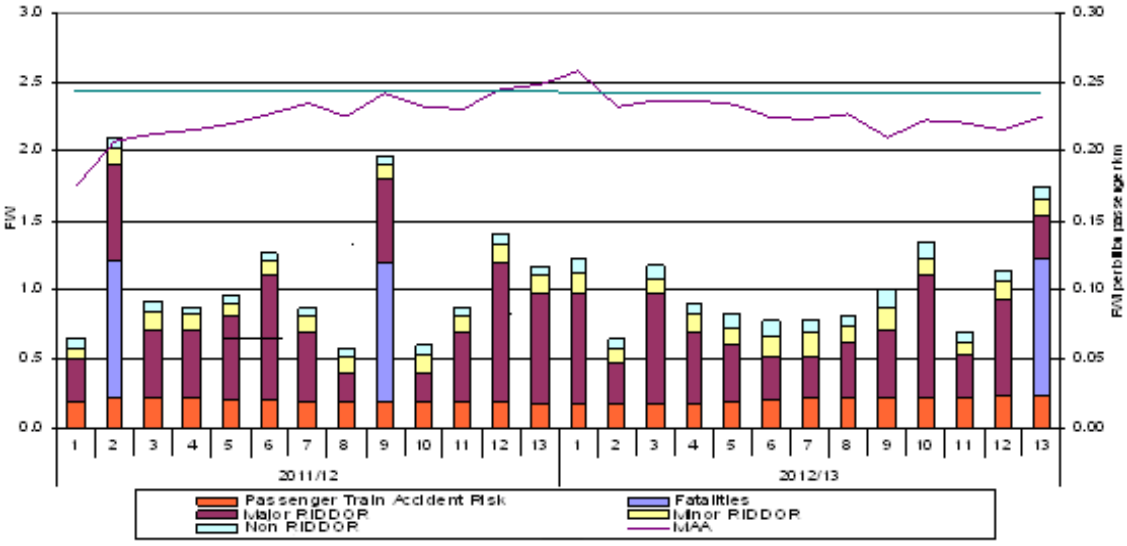
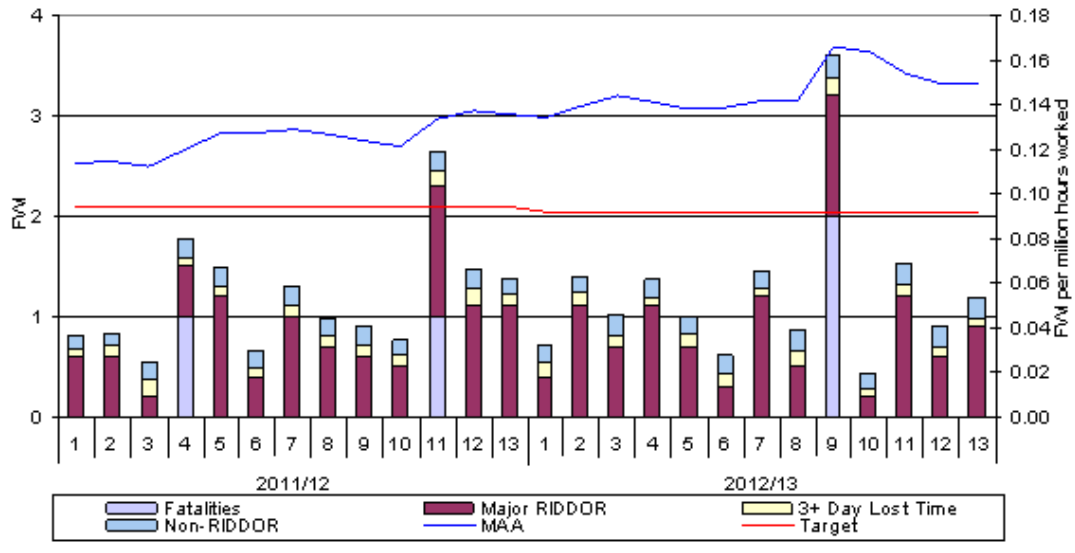


Table 5.2: Workforce safety

	2008/09	2009/10	2010/11	2011/12	2012/13
Fatalities	3	3	1	2	2
Major injuries	130	96	100	98	101
Lost time injuries	198	146	203	314	314
FWI (MAA)	0.152	0.127	0.126	0.136	0.149

Figure 5.2: Fatalities and Workforce Injuries (broken down by period)



Train accident risk as measured by the overall PIM score has increased significantly since the last quarter and the total PIM score, as at December 2012, is now 94.6, its highest level since April 2011. The passenger component of the risk from train accidents has risen by 11 per cent compared to the previous quarter and by 34 per cent when compared to December 2011. The main drivers for this were infrastructure failures (adhesion, flooding and landslips) caused by adverse weather.

Workforce safety

Definition

Workforce safety is primarily measured by the workforce safety fatalities and weighted injuries (FWI) measure. This measure comprises 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 one 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 FWI for 2012/13 compared to previous years. FWI per million hours worked has increased slightly to 0.149 from 0.136 and the target for the end of CP4 is 0.09. Figure 5.2 shows the breakdown for FWI period by period.

Commentary

The FWI target for this year has not been met and the moving annual average (MAA) FWI rate has increased since 2010/11.

There were two workforce fatalities in the year. On 18 November 2012, an off-track team leader from the Ipswich Delivery Unit was fatally injured in a road traffic accident on the A12 near Capel St Mary, whilst travelling alone to a work site. On 4 December, a contractor working in the Great Northern / Great Eastern renewals project team was struck by a train close to Sykes crossing at Saxilby in Lincolnshire.

Slips, trips and falls remain consistently the most common cases of accidents to Network Rail's combined contractor workforce, accounting for 32.1 per cent of all workforce injury accidents, and 48.2 per cent of 3+ days lost time injuries and RIDDOR reportable accidents. The next most common causes of injuries are struck by object, manual handling and contact injuries.

During 2012/13 the improvement in the reporting of accidents continued. The average ratio of 3+ days lost time injuries to RIDDOR major injuries is 3.10 to 1, above the benchmark ratio (as recommended by RSSB) of 3 to 1. The ratio for Infrastructure Projects and Asset Management contractors is 2.11 to 1, which is above the construction industry average of 2 to 1.

System safety

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

Infrastructure wrong side failures

This measure comprises the number of higher risk (hazard index of 50 or above) infrastructure failures. Table 5.3 shows the number of infrastructure wrong side failures for 2012/13 compared to previous years.

There were 68 infrastructure wrong side failures risk ranked 50 or above in 2012/13, compared to 59 in the previous year. Track, structures (including embankments) and power issues remain as the principal causes of such failures.

Category A SPADs

This measure reports all Category A SPADs, which are 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 and 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 2012/13 compared with previous years.

There were 252 category A SPADs in 2012/13, compared to 277 in the previous year (adjusted from 278). The MAA (normalised per thousand signals) is 0.55, eight per cent better than the 2012/13 year end target of 0.60 and last year's figure, also 0.60. We continue to work with rail industry colleagues to address and reduce risks leading to SPADs.

Level crossing events

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 2012/13 compared with previous years.

There has been an 8.5 per cent decrease in the rate of significant level crossing events since 2011/12. There were nine accidental fatalities at level crossings, five of which were road vehicle occupants

(including one child fatality), three pedestrian fatalities, and one cyclist fatality.

Level crossing risks reduced by 5.5 per cent during 2012/13, as measured by the Level Crossing Risk Indicator Model. This represents a 22.8 per cent risk reduction in CP4 to date and we are on target to achieve a 25 per cent risk reduction for the control period.

We are continuing to enhance our strategy for reducing level crossing risk, including the continuation of our annual national advertising campaign aimed at raising awareness for motorists of the dangers of misusing level crossings.

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 MAA for irregular working incidents for 2012/13 compared to previous years.

The MAA of potentially significant and potentially severe irregular working events is 22.69, which is 11 per cent above last year's figure of 20.46. The categories accounting for the greatest proportion of irregular working events are 'protection / isolation', 'signaller error', and 'red zone working'. Our Strategic Business Plan (SBP) for CP5 includes a number of initiatives to reduce risks around taking isolations and keeping our workforce safe when working trackside.

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 2012/13 compared to previous years.

MAA for 2012/13 is 3.09 which is a 29 per cent improvement when compared to 4.36 for the previous year. We will continue to work with rail industry colleagues, representatives of the local communities, and the British Transport Police to further reduce railway crime.

Public safety

There has been a slight decrease in public fatalities (suicides, trespassers and level crossing users) compared to the previous year. Suicides increased marginally from 239 in 2011/12 to 240. There were 40 trespasser fatalities (including two child trespasser fatalities) in 2012/13 compared with 56 in 2011/12 (note that the final classification of suicides / trespasser fatalities can take many months due to awaiting coroners' verdicts).

Table 5.3: Infrastructure wrong side failures hazard ranked 50+

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	-	56	76	53	61
Scotland	-	11	9	6	7
Network-wide	**50**	**67**	**85**	**59**	**68**

Notes:
The figures detailed for 2011/12 are different to those reported in the Annual Return 2012 as a result of updates received throughout the year.

Table 5.4: Category A Signals Passed at Danger (SPADS)

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
England & Wales	-	255	272	248	237
Scotland	-	19	27	29	15
Network-wide	**293**	**274**	**299**	**277**	**252**

Notes: The figure reported in 2011/12 (278) has been amended following the downgrading of one SPAD that was originally reported.

Table 5.5: Level crossing misuse

	2008/09	*2009/10*	*2010/11*	*2011/12*	*2012/13*
Level crossing misuse (MAA) England & Wales	-	26.07	27.77	29.15	27.00
Level crossing misuse (MAA) Scotland	-	2.23	1.61	1.85	1.31
Level crossing misuse (MAA) Network-wide	31.31	28.38	29.38	31.00	28.31
Collisions with road vehicles	21	14	5	10	10
Train striking pedestrian	10	8	4	3	4
Near miss with road vehicle	145	138	113	110	95
Near miss with non-vehicle users	231	209	260	279	259

Table 5.6: Irregular Working					
	2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Irregular working MAA England & Wales	-	20.54	16.61	18.92	21.31
Irregular working MAA Scotland	-	1.15	1.08	1.54	1.38
Irregular working MAA network-wide	32.61	21.69	17.69	20.46	22.69
Potentially significant	347	231	179	209	204
Potentially severe	77	50	51	57	91
Notes: The figures detailed for 2011/12 are different to those reported in the 2011/12 as a result of updates received throughout the year.					

Table 5.7: Criminal damage (malicious acts)					
	2008/09	***2009/10***	***2010/11***	***2011/12***	***2012/13***
Malicious acts per 100 route miles	5.22	4.42	4.42	4.36	3.09

Workforce health surveillance and screening

In line with conclusions made in the 2012/13 ARUP report on poor health data quality, we are continuing to develop processes to improve data quality that will enable us in the future to report confidence grades for all health related data.

Exposure to asbestos and lead

During 2012/2013, there have been no management referrals to our occupational health provider for employee exposure to asbestos or lead.

Health issues

We measure the number of health check failures which cover 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.

For new employees, 94 per cent were deemed fit for work, three per cent were deemed fit with restrictions, one per cent were deemed temporarily unfit for work and two per cent confirmed as unfit for work.

Musculoskeletal referrals

In 2012/13, 1,164 referrals (28.8 per cent) were made to BUPA because of musculoskeletal and connective tissue conditions from a total of 4,045 management referrals, refer to Table 5.8.

The proportion of musculoskeletal referrals diagnosed as being non-occupational in nature has remained relatively stable compared to 2011/2012 at 88.2 per cent, but there has been a reduction in the proportion of diagnoses defined as having an occupational element (from 5 per cent in 2011/12 to 2.5 per cent in 2012/13) and an increase in the proportion deemed to be occupational in nature from 4 per cent (2011/12) to 9 per cent (2012/13). It is not currently possible to identify causative reasons for this

Stress-related absence

As referenced in Table 5.8, of the 4,045 management referrals in 2012/13, 897 (22.2 per cent) were psychological in nature. Of these 897, 84.9 per cent (761) were deemed to be non-occupational in nature, 9.1 per cent (82) had an occupational element and six per cent (54) were occupational in nature.

The number of diagnoses defined as having being occupational in nature increased from 6 per cent in 2011/12 to 10 per cent in 2012/13. It is not currently possible to identify causative reasons for this.

Noise

Table 5.9 provides information in relation to our Noise at Work Health Surveillance programme.

88.8 per cent of employees surveyed (3,236 in total) were found to have acceptable hearing ability (HSE, Category 1), 7.9 per cent were found to have mild hearing impairment (HSE, Category 2), 3.2 per cent to have poor hearing (HSE, Category 3), and 0.1 per cent with rapid hearing loss (HSE, Category 4).

Hand Arm Vibration Syndrome

Figure 5.3 provides detail of newly diagnosed cases of Hand Arm Vibration Syndrome (HAVS) found during our annual health programme. 73 people were newly identified in 2012/13 and RIDDOR reported as having HAVS within the HAVS screening programme. Of those newly identified and RIDDOR reported with HAVS, 69.9 per cent (51) had early HAVS (stages 1 or 2 early) and 30.1 per cent (22) had late stage HAVS (stage 2 late or above).

Employers liability

Network Rail purchases 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. Table 5.10 provides the status of claims at 31 March 2013. The number of open claims reported is a snapshot of the claims which remain open for

consideration at the end of 2012/13. This includes claims open prior to 2012/13 and includes some claims which may have been open for a number of years whether or not any compensation has or will be paid. Table 5.10 includes the number of claims opened and closed during 2012/13.

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 has or will be paid. A claim will be rejected in circumstances where Network Rail has no liability but may be 'open' prior to that and remain open for a subsequent period. Similarly 'closed' claims within 2012/13 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.

Table 5.8: Musculoskeletal and Stress Related Referrals

Musculoskeletal Referrals	*No.*	*%*
Non Occupational Musculoskeletal Referrals	1,027	88.2
Occupational Musculoskeletal Referrals	105	9.0
Occupational Element Musculoskeletal Referrals	32	2.8
Total Musculoskeletal Referrals	1,164	28.8
Stress Referrals		
Non Occupational Stress Referrals	761	84.9
Occupational Stress Referrals	82	9.1
Occupational Element Stress Referrals	54	6.0
Total Stress Referrals	897	22.2
Non specified other Referrals	1,984	49.0
Total Referrals	**4,045**	**100**

Notes: Non-specified other Referrals include nervous system, heart and circulatory, ill-defined and other conditions.

Table 5.9: Results of noise at work health surveillance

	No.	*%*
1 Acceptable Hearing Ability (HSE Category 1)	2,875	88.8
2 Mild Hearing Impairment (HSE Category 2)	255	7.9
3 Poor Hearing (HSE Category 3)	104	3.2
4 Rapid Hearing Loss (HSE Category 4)	2	0.1
Total Screened	**3,236**	**100**

Figure 5.3: Employees Newly Diagnosed Cases of Hand Arm Vibration Syndrome (HAVs)

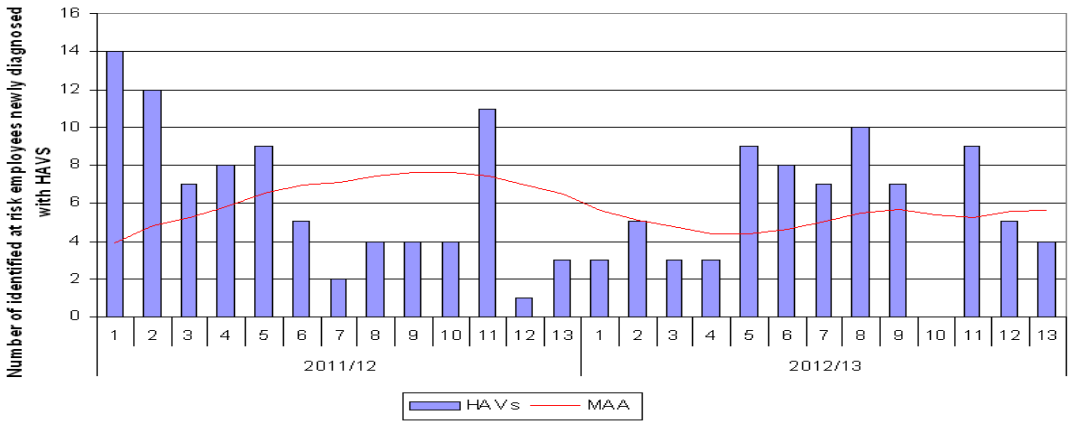


Table 5.10: Status of employer liability claims	**31/3/12**	**31/3/13**
Category	*No.*	*No.*
Open	471	461
Opened (during each year)	-	215
Closed (during each year)	244	232

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.

Table 5.11: Environmental performance

Notes/ Indicator	*Measure*	*2009/10*	*2010/11*	*2011/12*	*2012/13*	*2012/13 target*
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)	-4%	-13%	-14%	-14%	-17% Target: 20% reduction by 2014
2 - Operational recycling	Managed station, office and depot waste mass recycled or re-used	16%	28%	48%	58%	55% Target: 60% diversion from landfill by 2014
3 - Infrastructure recycling	Infrastructure waste mass managed by National Delivery Service recycled, recovered or reused	92%	90%	86%	86%	95% Target: 97% diversion from landfill by 2014
4 - Environmental incidents	Number of environmental incidents (e.g. spillages) categorised as significant	2	2	2	5	6 Target: no more than 6 significant incidents per year by 2014
5 - Land management	Network Rail owned Sites of Special Scientific Interest (SSSIs) rated favourable or recovering status (21 specific sites in England)	82%	100%	100%	100%	100% target achieved Target: 95% of the 21 target sites rated as favourable or recovering by 2010

Network Rail carbon emissions:

In 2012/13 we consumed more gas and less electricity than 2011/12. The net effect on carbon output is that the reduction in both years relative to the 2006/07 baseline was similar at 14 per cent.

Operational recycling

We are on target to achieve the 60 per cent waste diversion from landfill target the end of CP5 Progress has been achieved through the combination of: arrangements with our waste contractors; improvements to recycling facilities at the relevant sites; local education initiatives.

Infrastructure recycling

We do not expect to achieve the target of 97 per cent diversion from landfill. Reduced performance since 2010 is a function of recent changes to asbestos testing legislation which has resulted in landfill of ballast containing traces of asbestos. Further, this measure includes other waste streams for which practical diversion from landfill options are only just becoming clear. We expect to significantly improve performance during the next year, but the diversion from landfill rate improvement will not be realised until early CP5.

Notes

1. Network Rail Carbon Emissions (CO_2):	1.1 Data is calculated using Defra April 2012 Greenhouse Gas (GHG) Conversion Factors.
	1.2 This data relates to the 20 per cent 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.
	1.3 Data for Network Rail managed stations is based on a mixture of actual and estimated meter readings from our energy suppliers. It includes areas of the stations that are used exclusively by Network Rail or are shared by Network Rail and third parties.
	1.4 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 in offices where utilities are paid for within landlord service charges. This consumption was similarly not included in our 2006/07 baseline.
	1.5 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.
	1.6 Due to changes to our supplier arrangements, data for gas oil consumption has been estimated using 2010/11 data. Gas oil consumption was not included in our 2006/07 CO_2 baseline.
2. Operational Recycling:	2.1 This data relates to the target to redirect 60% of waste sent to landfill arising from Network Rail managed stations, offices and depots.
	2.2 Data is provided by our waste management contractors: SITA UK for our managed stations; MITIE for offices; and UK Waste Solutions for depots.
	2.3 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.
	2.4 Waste that is diverted from landfill is either recycled or used to provide energy from waste.
	2.5 This data does not include figures from offices where waste management services are included within landlord service charges. This waste was similarly not included in our previously reported figures.
	2.6 Managed station data excludes Charing Cross and St Pancras Low Level due to different waste management arrangements.
3.Infrastructure Recycling:	3.1 National Delivery Service (NDS) is the internal logistics function for Network Rail. NDS procures and transports key infrastructure materials.
	3.2 Data includes the management, by NDS, of inert ballast, hazardous ballast, rail, concrete, wooden sleepers and scrap metal
	3.3 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 contractor's depots. Note that a certain tonnage will be stockpiled at any one time.
4. Environmental Incidents:	4.1 This data relates to significant environmental incidents, which are classified as being either: a) major spill (typically in excess of 1,000 litres) b) any spill which either has affected or has significant potential to affect a sensitive receptor(s) including surface water or groundwater c) physical damage to a protected site or species d) an environmental incident which has resulted in or has significant potential for prosecution
	4.2 The data does not include contractor and third party incidents on Network Rail sites.
5. Land Management:	5.1 In England, we own and manage 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.
	5.2 Our CP4 target 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.

Environmental incidents

The incidents reported this year all involve hydrocarbon spillages,. Whilst more occurred in 2012/13 than in the previous year, the total is less than the figure that we aim not to exceed annually

Land management

This measure corresponds directly to a programme of improvement works on 21 key SSSIs that we own and manage. These works were completed by 2010/11 and as such this target has now been met.

Performance improvement initiatives

This section sets out the initiatives we are taking to improve our safety, sustainable development, and health and wellness risk management arrangements.

Safety & Sustainable Development strategies

Safety strategy

This strategy establishes a series of principles and measures to move us toward our safety vision of everyone home safe every day. For the first time we have taken the opportunity to set our own agenda for safety. It enables the company to deliver business improvement through more mature safety risk management from CP4 through CP5 and to the end of CP6 (2024) and beyond. The implementation of this strategy started across the company from April 2013.

Sustainable Development strategy

We have finalised the strategy that will deliver our vision for 'a railway fit for the future'. The strategy, which seeks to balance environmental, economic and social factors, defines our strategic outcomes, outputs and objectives through to 2024. It also reviews the fundamental principles of a sustainable business and outlines where we will focus our efforts in the following priority areas:

- safety and wellbeing
- communities
- accessibility and inclusivity
- employees
- energy and resources
- environmental protection
- climate change adaptation
- buildings and land
- value for money.

We are developing a series of implementation plans tthat set out how the strategy will be delivered.

Subject to Safety, Health and Environment (SHE) Committee endorsement, the strategy will be adopted across the company from July 2013.

Health and wellness strategy

We want our people to remain fit, free from harm and with high levels of positive wellbeing. To achieve this, we are currently developing an ambitious employee health and wellbeing strategy focused on each of these areas. Our immediate priorities are focused on improving the way we manage potential occupational hazards, assessing fitness-to-work and improving our information management systems and processes relating to employee health. We plan to focus our short-term efforts on improving prevention and management of Hand Arm Vibration Syndrome and occupational-related respiratory hazards. Whilst our strategy is currently in development, we have already established a cross-organisation Health and Wellbeing Working Group (with broad representation including Trade Union representatives, a cross-industry Ballast Dust Working Group, an internal Hand Arm Vibration Syndrome Working Group and have conducted research into the management of risks arising from welding activities.

We have undertaken a number of organisational and occupational health reviews to help determine:

- the effectiveness, capability and capacity of our current health and wellness arrangements including data systems and processes
- address our key risks and priorities
- obtain an understanding of the current position of employee health and wellness
- establish our health and wellness priorities.

The results of these reviews have helped inform the drafting of our health and wellness strategy that underpins our vision for health and wellness of 'Everyone Fit for the Future'. The strategy describes the activity objectives, outputs and outcomes that will deliver the vision and establish Network Rail as 'a great place to work' and fulfil our people's work-related health needs and aspirations.

System safety

Business critical rules and role-based competence

We have completed extensive modelling of the risks that face our business, using what is known as the 'bow tie' method. For fatalities and weighted injuries data, this involved structured interviews and comparisons with both rail and other industry incidents. This work has been used to identify the necessary controls for the key risks in our business and construct a set of 'candidate' Business Critical Rules (BCR). These rules, when finalised, will replace our current company standards system. We have also identified the mechanism for the controls not covered by BCR, which is to include the control in a Role Based Manual. This fulfils our commitment to have a single reference document for any job.

Starting with the new control framework for Plain Line Track System, the BCR Programme is planned to be implemented, on an asset system by asset system basis, from June 2013.

Workforce competency – recording and monitoring

During 2012/13 we have developed a replacement for Sentinel (the system that monitors and records the competency of employees and contractors on our infrastructure). The new system that will be launched in 2013/14 will enable us to better verify that everyone who accesses the railway has the correct credentials to do so.

Level crossings

117 level crossings have been closed in the year, taking the CP4 closure total from 545 to 662. Network Rail won the International Safety Award for 2013. The crossing closure project is on schedule to meet its 'stretch' target of 750 closures by the end of CP4. Two new modular footbridges at Johnsons Crossing on the Anglia Route and Cooks Crossing on the East Midlands route have been erected so that crossings can be closed and detailed plans are being developed to complete 33 more closures in 2013/14. The project has also surveyed a further 280 sites to prepare for planned closures in CP5.

Spoken audible warning devices have been installed at 23 locations. A crossing barrier 'overlay' for automatic open crossings has been developed and trialled and commissioned for four sites. 13 new mobile safety vehicles have been introduced, staffed by British Transport Police (BTP) covering every Route.

Route-based dedicated level crossing managers have been introduced, starting with Scotland in June 2012 and rolled out to all routes during 2012/13. This was coupled with a comprehensive training package for these roles, and the development of improved guidance material and risk assessment tools.

Research and development for level crossings continues. Three digital red light safety camera systems have been submitted for Home Office type approval and six trial sites have been identified. In addition, systems to identify the location of trains in long signal sections and provide information to either the Signaller or crossing users have been developed. A Global Positioning System (GPS) based solution is being trialled on the Sudbury branch, and the Anglia Route is trialling a system called Wave Train. Furthermore, 'smartcams' are being developed to automatically collect census data, identify user groups, calculate traverse times and quantify misuse data, these are being trialled at Cannock Chase in Staffordshire.

Signalling system

We have undertaken an in-depth review of the role of the signalling system in preventing a catastrophic train accident. The results of this will inform our plan to reduce train accident risks by 50 per cent in CP5. We have commenced work on harmonising the way we assess safety risk across the different asset classes and activities to provide a more coherent picture of the risks we need to manage.

Workforce safety

Workforce safety – ten point action plan

We have identified the following ten key areas where we need to speed up our approach to ensuring the safety of our workforce and contractors:

- roles & responsibilities
- technology interventions
- road vehicle driving
- fair culture
- safety conversations
- safer team
- learning from incidents
- planning safe work
- frontline supervisor
- safe contractors.

The resultant action plan is key to delivering our Safety & Wellbeing strategy, and achieving our target of eliminating all fatalities and major injuries by the end of CP5 or sooner. It is intended to create a sense of urgency and momentum around improving workforce safety.

Each element of the plan, which is led by an Executive Director, is being further developed to identify the detailed actions needed, the owners of these actions and the timescales for completion of each element. All of which are required to underpin the successful delivery of the plan which commenced in April 2013.

Safety leadership and culture

We have implemented a number of programmes aimed at improving our leadership and organisational culture, with a particular focus on safety.

Lifesaving rules

The Lifesaving Rules, commonplace in the oil and gas industry, have been developed to save lives. The way we apply them will help create a fair culture at Network Rail. These eleven rules are based on the main threats to life in our industry over the past twelve years and have been written following consultation with over 1,300 people across the business. The aim is to prioritise the safety measures that save lives; provide a clear mechanism to push-back against unsafe requests; highlight areas where we need to improve and protect people who raise safety issues.

We have reached agreement with trade unions on these rules and the fair culture principles which defines the process for applying the Lifesaving Rules together with the consequences of a rule breach.

The rules are supported by a targeted communications campaign. For six months from April 2013, we will review the application of the rules to provide confidence that we are meeting our commitment to fairness through this process.

'Close Call' reporting

A close call is defined as any unsafe act or unsafe condition that in different circumstances could have led to an accident or personal injury or could have resulted in damage to property or equipment. These are occasions where no one was hurt or nothing was damaged, but this is more by chance than by the application of systemic controls.

In 2012, we extended our close call reporting arrangements so that all Network Rail employees and contractors could report any event that has the potential to cause injury or damage. At the end of 2012/13 a total of 17,430 close calls were reported. The reporting system is being further developed and additional communications put in place to encourage and support its use.

Leading safety conversations

A new approach designed to help us hold more effective and productive safety tour conversations with our employees, contractors and rail industry colleagues, was developed and finalised in 2012. 280 senior managers have been through our Safety Conversation programme, giving them the skills necessary to hold productive discussions with staff at all levels.

Passenger and public safety

Route crime - youths

During 2012/13 we worked with teachers and children to launch Rail Life, a campaign designed to raise awareness of the railway, its inherent dangers, and encourage children to make informed decisions.

The Rail Life level crossings campaign has built on the work of our Community Safety Managers and provides schools with the information and resources needed to bring level crossing safety messages into the classroom. We sent assembly packs to schools close to level crossings, tailored separately for primary and high school students, and lesson plans were made available, providing teachers with a suite of resources to choose from to include in their teaching plans.

We also created the Rail Life website targeted at 11-17 year olds. This is a space for young teenagers to interact and find out more about the railway and level crossings.

Youth crime is a significant contributor to crime on the railway and as such, interventions remain focused on diversionary activities for youths. The current on-going national projects include Street Games and the continued development of the Rail Life website and educational materials.

A recent review of our on-going partnership with the BTP is designed to ensure a collaborative and consistent approach to delivering the Rail Life message into schools which is essential when tackling route crime involving youths. This partnership will co-ordinate volunteers and the community police force and ask them to target schools for visits and interventions in key crime spot areas. Additionally best practice sharing within the routes is also being demonstrated through the ongoing Route Crime Working Groups which are in place to actively tackle route crime.

Route crime – cable theft

Despite recent reductions in the number of cable theft incidents, it still remains a very important and costly issue for the rail industry.

Our on-going initiatives include lobbying government for changes to law around scrap metal dealers which became law in February 2013 and will become enforceable from October 2013, a dedicated BTP task force, increased patrols, intelligence led policing (we have funded extra, dedicated officers to support this), partnership with Serious Organised Crime Agency (SOCA), national intelligence cell with members from BTP, Network Rail and external non-rail partners, use of the Network Rail helicopter, CCTV, forensic marking, trembler alarms and other devices to protect the cable, fast response teams to get trains on the move as quickly as possible, introduction of new types of cable that are easier to identify and harder to steal and the continuing development of a longer term strategy towards cable-free signalling.

Suicides

Mid-platform fencing schemes, intended to separate slow line platforms from adjoining fast line ones are being installed on a number of routes (e.g. on Wessex route at Wimbledon and Earlsfield stations), on the London North Eastern (LNE) route at First Capital Connect stations south of Peterborough, and on Western route in the Thames Valley area.

Reporting

We have closed out all of the recommendations from the RSSB RIDDOR report. The current ratio of major to minor injuries has improved and is now in line with industry standards.

All but one of the recommendations from the 2011/12 independent report of the quality of our safety data and associated systems are closed. Actions are in place to close the outstanding recommendation. All but two of the ten areas covered by the 2012/13 report reached or exceeded the ORR's benchmark. Actions are being developed to address these two areas.

Investigation and regulation

There are no outstanding actions arising from RAIB investigations, although a number have had time extensions to ensure full compliance. There has been a 25 per cent reduction in the number of regulatory enforcement notices issued by the ORR during the year.

Network Rail was prosecuted five times during 2012/13 for breaches of health and safety legislation.

A train derailed at Grayrigg on 23 February 2007. Network Rail Infrastructure Limited (NRIL) pleaded guilty and was fined £4 million at Preston Crown Court in April 2012.

A maintenance worker was seriously injured in 2007 in the Thames Valley area, and in a separate incident a maintenance worker was tragically killed in the same area in May of the same year. NRIL pleaded guilty to breaches of health and safety law and was fined £150,000 at Reading Crown Court in May 2012.

A fatal accident occurred at Fairfield, Wiltshire on 6 May 2009 in which a member of the public was killed whilst using the crossing. NRIL pleaded guilty to health and safety breaches and was fined £356,250 at Southampton Crown Court in June 2012.

A maintenance worker was seriously injured at Cheshunt on 30 March 2010. NRIL pleaded guilty and was fined £100,000 at St Albans Crown Court on 26 February 2013.

On 30 September 2003, a GT Railway Maintenance employee who had been undertaking maintenance on a Network Rail owned machine, was killed when an electrical fault caused the machine to move, trapping the employee inside. NRIL was fined £200,000 at Stafford Crown Court on 22 March 2013.

Assurance

The revised assurance processes for 2012/13 have been put in place and the new corporate audit programme, agreed by the Board and SHE Committee has been successfully implemented. The audit reports presented to the SHE Committee highlight the progress in implementing the findings identified in the audits discussed by both the Executive Committee and the Safety and Sustainable Development Executive Committee.

Governance

The new governance structure has been in place since 1 April 2012 and has successfully provided line of sight from the Board and SHE Committee through all groups tasked with delivering the safety and sustainability agenda.

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 deliver during CP4. Within this section we frequently refer to the Guide to Railway Investment Projects (GRIP). There are eight stages in the GRIP lifecycle reflecting significant business and technical milestones within investments as follows:

- GRIP 1 – output definition – this stage follows the project's validation and securing the authority to initiate. This stage is about identifying what the outputs of the project will be and how they may be achieved
- GRIP 2 – pre feasibility – this stage follows the formal appointment of a Project Manager and addresses the detailed strategy of how to deliver the project outputs
- GRIP 3 – option selection – this stage examines the different engineering options available for delivering the project and selects a single option to be developed
- GRIP 4 – single option development – this stage follows the selection of a single design / engineering option, develops it at a high level and initiates the tendering process to procure suppliers
- GRIP 5 – detailed design – this stage awards contracts and develops a detailed design and implementation plan
- GRIP 6 – constructing, testing and commissioning – this stage focuses on the physical work associated with delivering a project, and ends with completion / commissioning
- GRIP 7 – scheme hand back – this stage follows commissioning and concerns handing back the asset to the asset owner, operator or maintainer
- GRIP 8 – project closeout – this stage follows the successful commissioning / completion of all work packages to meet the client's requirements and the project's success criteria. It covers a controlled closeout, which is achieved by updating, finalising and archiving all project documentation and capturing the lessons learned.

Some highlights for the year include:

Crossrail: Crossrail, which is partly financed by Network Rail, links Maidenhead and London Heathrow Airport in the west with Shenfield and Abbey Wood in the east. Network Rail is delivering the 'on network works' for Crossrail Limited (CRL) which includes enhancements to the existing railway network, on either side of the central tunnels. These works are necessary in order to deliver the required timetable and performance levels.

During 2012/13, GRIP 4 has been substantially completed with a number of GRIP 5-8 contracts being let.

Thameslink: The Thameslink programme will provide the stations and railway infrastructure 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.

During 2012/13, significant works were undertaken including works at key stations in central London:

At **Farringdon**, a new ticket office was fitted out and lifts brought into use before the Olympic Games. The north train shed roof and station frontage works were also completed.

At **Blackfriars**, external works were completed including works to the bridge and the stations roof including the installation of the photovoltaic cells.

At **London Bridge** a programme of enabling works created a new interim ticket office at the front of the station. The train shed over the terminating platforms was removed, and accommodation blocks were demolished to make way for the future station layout and new viaduct connection.

London King's Cross station: Following the opening of the new western concourse in March 2012, extra passenger circulating capacity and new retailing opportunities have arisen. Other enhancements as part of the project include:

- a new platform beneath the eastern range offices
- a new 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.

Reading station: There has been significant progress in delivering the Reading Station Area Redevelopment during 2012/13. Works to the stations include:

- new platforms and platform extensions
- a new train maintenance facility replacing existing facilities
- grade separation to allow trains to cross the Great Western Main Line
- extensive track layout reconfiguration and resignalling throughout the area
- provision for a possible future extension of Crossrail and the introduction of train services from the west to London Heathrow Airport.

The main stations works have been completed including commissioning of the western gateline, a new transfer deck, subway, new relief line platforms 12-15, and northern entrance building. This is in addition to works to relief line connections, tunnels and removal of an existing footbridge.

Birmingham New Street station redevelopment: This redevelopment provides an upgrade to the station allowing greater capacity to support passenger growth to the year 2035 and enhanced station facilities. During 2012/13 significant progress was made towards achieving completion of phase 1 of the scheme – the opening of the new western concourse at the end of April 2013.

North West electrification: This programme delivers AC electrification at 25 kV OLE of various routes in north west England. The programme facilitates the introduction of electric train operation on passenger and freight services on the following routes for completion in 2016:

- Liverpool to Manchester
- Huyton to Wigan
- Preston to Blackpool
- Manchester to Preston.

During 2012/13, implementation works continued on the main works package (OLE, signalling, distribution) for the first phase of the scheme from Manchester to Newton-le-Willows, contracts were awarded for the main works of the second phase (Liverpool to Newton-le-Willows and Wigan) and advance works commenced on the third phase (Preston to Blackpool North).

Northern Hub: This programme consists of a series of journey time improvement projects on radial routes from Manchester and capacity schemes at various locations across the north of England. During 2012/13, works commenced on Stage 1 of the Huyton & Roby capacity project and signalling elements of the Chat Moss capacity project. Consultation for a Development Consent Order (DCO) for the Ordsall Chord commenced and single options were identified for all the journey time improvement and capacity projects except for Oxford Road and Piccadilly.

Barry to Cardiff Queen Street corridor: This project provides an increase in capacity and capability on key lines to provide an additional four trains per hour. Works include new platforms at Cardiff Central and Queen Street stations, renewal of signalling and improved track capacity. During 2012/13, the first phase of the signalling works was completed on the Vale of Glamorgan line and construction of the additional platforms commenced following contracts being let.

Paisley Canal Electrification: Completed in 2012/13, this was a fast track project which has installed a 25kV overhead electrified system on the Paisley Canal line. The electrification of the route brings timetable performance improvements and maximises the utilisation of electric multiple unit rolling stock. Additionally, the scheme has allowed two class 156 diesel multiple units to be deployed elsewhere in Scotland. The project was successfully accelerated and implemented through an alliance initiative between Network Rail and First ScotRail.

Strategic Freight Network (SFN): This programme is designed to add capacity and capability in CP4 to allow an increase in the number of freight trains, along with enhanced gauge and longer trains.

Significant progress was made in delivering the CP4 SFN schemes during 2012/13. Progress includes:

- commencement of on site works for the Ipswich chord as part of the Felixstowe to Nuneaton project. The Nuneaton North Chord (a TIF project that contributes towards the overall capacity output) was delivered in October 2012
- Southampton to WCML W10 / W12 diversionary route bridge demolitions and reconstructions, with W10 clearance completed in January 2013
- redoubling of Chinley South Junction as part of the Peak Forest and Hope Valley to London Train Lengthening project.

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.

Enhancement Expenditure

Actual expenditure incurred on each enhancement programme in 2012/13 and the cumulative total for the first four 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 6.1 Changes approved by the ORR

ID no.	*Project*	*Change*
3.01	Felixstowe to Nuneaton freight capacity scheme	Revised scope, outputs and milestones
3.02	Southampton to Basingstoke W10 / W12 diversionary route	Revised milestones due to project development
12.01	IEP (GWML)	Revised scope, outputs and milestones
13.01	Crossrail	GRIP 6 milestones added due to project development
13.02	Reading station area development	Revised scope, outputs and milestones
14:00	Birmingham New Street Gateway project	Revised scope and milestones
15.25	Train Lengthening - Southern - Package 18 - Charing Cross	Revised milestones
15.26	Train Lengthening - Southern - Package 8 - Kent & Sydenham train lengthening	Revised milestones
15.32	Train Lengthening - Southern - Package 9 - Windsor line	Revised milestones
15.33	Train Lengthening - Southern - Waterloo International integration	Revised outputs and milestones
15.34	Train Lengthening - Southern - Wessex ASDO	Revised milestones
16.01	Power supply upgrade - Route 1- Kent	Revised scope and milestones
16.03	Power supply upgrade - Route 2 - Sussex	Revised scope
16.04	Power supply upgrade - Route 3 - Wessex	Revised scope and milestones
16.08	Power supply upgrade - DC regeneration	Revised scope and milestones
22.01	Bromsgrove electrification	Revised milestones
24.03	Salford Crescent station redevelopment	Revised scope and milestones
25.00	Liverpool - Leeds journey time improvements	Revised scope, outputs and milestones
26.01	Barry - Cardiff Queen Street corridor	Revised milestones
28.00	FTN/GSM-R inclusion of freight-only branch lines	Revised milestones
100.02	North West Electrification	Revised milestones
100.03	North Trans-Pennine electrification	Revised scope and milestones
101.00	Northern Hub phase one	Revised scope, outputs and milestones
32.03	Borders new railway	Revised scope, outputs and milestones
33.05	EGIP - Infrastructure works - GRIP stage 4 development	Revised scope, outputs and milestones
33.06	EGIP - Edinburgh to Glasgow electrification - GRIP stage 4 development plus GRIP stage 5 to 8 advance implementation works	Revised scope, outputs and milestones
33.09	EGIP - Glasgow to Cumbernauld Electrification advance works	New entry
33.10	EGIP - Newton North connecting line – HRIP stage 5-5 implementation	New entry
33.11	EGIP - 2013 advance route clearance programme (other routes) – GRIP stage 5 to 8 implementation	New entry

Table 6.2 Changes requested and still under consideration (as at June 2013)

ID no.	*Project*	*Change*
12.03	IEP (ECML)	Revised scope and milestones due to project development
13.01	Crossrail	Revised scope due to project development
15.26	Train Lengthening - Southern - Package 8 - Kent & Sydenham Train Lengthening	Revised scope and milestones due to project development
15.31	Train Lengthening - Southern - Package 7 - 10 car south west suburban railway	Revised milestones due to project development
17.03	Seven Sisters improved access	Revised milestones due to project development
25.00	Liverpool - Leeds journey time improvements	Revised scope, outputs and milestones due to project development
26.03	Westerleigh Junction to Barnt Green line speed increase	Revised scope and milestones due to project development

Table 6.3 Enhancement expenditure in 2012/13 (£ million at 2012/13 prices)		
	2012/13	**CP4 cumulative**
PR08 Funded Schemes in England and Wales		
NRDF (Network Rail Discretionary Fund)	25	167
NSIP (National Stations Improvement Programme)	41	138
SFN (Strategic Freight Network)	74	108
Performance Fund	22	163
Seven Day Railway Fund	47	79
CP5 Development Fund	22	58
Safety and Environment Fund	20	98
Access for All	39	202
Adjustment due to change of funding from DfT	(20)	(140)
King's Cross	26	357
WCML Committed Schemes	125	190
Thameslink	404	2,113
Intercity Express Programme	22	37
Reading	223	424
Birmingham New Street Gateway Project	33	46
Platform Lengthening – Southern	79	208
Power Supply Upgrade	39	83
Southern Capacity	14	24
ECML Improvements	180	255
ECML Overhead Line Enhancement	4	26
Midland Mainline St Pancras – Sheffield line speed improvements	22	30
Nottingham Resignalling	6	7
Midlands Improvement Programme	6	27
Northern Urban Centres - Yorkshire	6	15
Northern Urban Centres - Manchester	13	34
Liverpool to Leeds Linespeed Improvements	1	3
Western Improvements Programme	24	69
North London Line Capacity Enhancement	1	78
GSM-R on Freight Routes	0	0
Station Security	3	13
PR08 Funded Schemes in Scotland		
Tier 3 Project Development	1	7
Small Projects Fund	5	12
Airdrie to Bathgate	0	247
Paisley Corridor Improvements	7	157
Borders Railway	0	0
Glasgow to Kilmarnock	0	18
Other - Schemes carried over from CP3 and unallocated	**1**	**119**
Total for PR08 Funded Schemes	**1,515**	**5,472**
Non PR08 Funded Enhancements		
Crossrail	119	299
Electrification	168	234
Edinburgh to Glasgow Improvement Programme	53	99
Ayrshire Inverclyde	0	20
Waverley Steps	3	11
Third Party Promoted	63	460
Other – Promoted by Network Rail or DfT	125	479
Funded directly by third parties (inc change in DfT funding)	272	1,247
Total for non PR08 Funded Schemes	**803**	**2,849**
Total Enhancement Expenditure	**2,318**	**8,321**
Notes: Both 2012/13 and CP4 cumulative totals are expressed in 2012/13 prices. This should be taken into account when comparing the information in Table 6.3 with previous Annual Returns.		

England and Wales

Programme ID 1.00 Network Rail Discretionary Fund (NRDF)

Current Project Stage: Various

The NRDF is a mechanism for funding schemes up to £5 million 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 make the best use of the funds available.

The NRDF CP4 budget is £242 million (2012/13 prices).

We have conducted an analysis of the NRDF business cases, in part to inform the discussion around the case for the continuation of the fund in CP5. Our conclusions were that the overall benefit cost ratio of the fund is six, well in excess of the DfT's 'very high' value for money threshold of four. This assessment looked at NRDF schemes completed in CP3 and early CP4.

A detailed list of NRDF schemes can be found within our 'CP4 Delivery Plan 2013 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 DfT. The programme is funded primarily by the DfT and aims to deliver £155 million (2012/13 prices) of station improvements to a minimum of 150 medium sized stations in England and Wales during CP4. In many cases this funding has been supplemented by contributions from TOCs, local authorities and other interested parties raising the potential provision by an additional £59 million. Last years Annual Return reported this as £79 million. This figure has been adjusted as some third party schemes have not been contractualised.

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 make the best use of available funds and to deliver the proposed programme of station works. 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 with 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.

114 projects have been completed in the first three years of CP4 benefiting 219 stations. 61 projects were completed in 2012/13 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 100 stations by the end of CP4.

Progress in 2012/13

The completed projects are listed by Station Facility Owner (SFO) in the next table.

Programme ID 2.00 Completed projects	
SFO	***Stations***
Arriva Trains Wales	Llanelli, Haverfordwest, Llanbradach, Penhelig, Penrhwceiber, Borth, Dinas Rhondda, llwynypia, Pontlottyn, Pontypool & New Inn, Fernhill, Sarn, Cwmbach, Garth (SW), Brithdir, Tir-phil, Ton Pentre, Tondu, Maesteg Ewenny Road, Gilfach Fargoed, Tonypandy, Trehafod, Treorchy, Wildmill, Ynyswen, Ystrad Rhondda, Gowerton, Aberdovey,Baglan, Briton Ferry,Clunderwen, Criccieth, Deganwy, Dyffryn Ardydwy, Fairbourne,Ferryside,Fishguard Harbur, Kidwelly,Kilgetty,Llanbedr,Llandeilo, Llandovery, Llanwrst, Llwyngwril, Minfford, Morfa Mawddach, Narberth, Newtown,North Llanwrst, Pembroke, Pembroke Dock, Penally, Penrhyndeudraeth , Pensarn, Penychain, Pontarddulais, Pontypant, Portmadog, Pyle, Roman Bridge, Saundersfoot, Skewen, Talsarnau, Talybont,Tal-y-Cafn, Leominster and Swansea
c2c	Chalkwell, Ockendon and Shoeburyness
Chiltern Railways	High Wycombe, Solihull and Warwick
East Coast	Peterborough
East Midlands Trains	Derby, Kettering, Loughborough, Wellingborough and Leicester
First Capital Connect	Stevenage
First Great Western	Maidenhead, Oxford, Twyford, Hungerford, Weston Super Mare, Bristol Parkway, Bristol Temple Meads, Didcot, Newton Abbot, Penzance, Slough, Swindon and Truro
Greater Anglia	Tottenham Hale
London Midland	Berkhampstead, Tamworth, Telford and University
Merseyrail	Formby and Maghull
Northern	Alnmouth, Keighley, Bradford Forster Square, Shipley, Darwen, Rainhill, Wigan Wallgate, Wilmslow, Workington and Blackrod
South West Trains	Ascot, Farnborough, Raynes Park and Vauxhall
Southeastern	Bromley South, Deptford, Paddocks Wood, Sevenoakes, Tonbridge and Tunbridge Wells.
Southern	Horsham, Peckham Rye, East Grinstead and Crystal Palace
TransPennine Express	Kendal, Seamer and Windermere
Virgin Trains	Coventry

Programme ID 3.00

Strategic Freight Network (SFN)

The DfT announced in its High Level Output Specification (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. This will be delivered by the schemes (detailed below), each of which provides an enhancement for freight customers. These schemes have been developed with the SFN Steering Group comprising:

- Association of Train Operating Companies (ATOC)
- Colas Rail
- DfT
- Freightliner
- Freight Transport Association (FTA)
- DB Schenker
- Direct Rail Services (DRS)
- GB Railfreight
- Network Rail
- ORR
- Passenger Transport Executive Group (PTEG)
- Rail Freight Group (RFG)
- Transport for London (TfL)
- Transport Scotland
- Welsh Government.

Felixstowe to Nuneaton Freight Capacity Project. Programme ID 3.01

Current Project Stage: GRIP 5-6

The provision of two key physical interventions was identified in the option selection study (completed in March 2009), as follows:

- the provision of a 1.4 kilometre double track chord line between the East Suffolk Line and Great Eastern Main Line known as the '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 2012/13 the SFN Steering Group agreed to the deferral of the works at Ely due to cost escalation and programme delays. The work is now planned for CP5 when it can be delivered alongside the Ely-Soham doubling project (subject to funding availability).

Progress in 2012/13

- the DCO for Ipswich Chord was granted by the Secretary of State for Transport in September 2012
- main design and build contractor for Ipswich Chord engaged through the Multi Asset Framework Agreement
- works commenced on site in January 2013.

Milestones:

The next committed delivery milestone is the completion of the Ipswich Chord by March 2014. The project is on target to meet this date.

Southampton to West Coast Main Line W10 / W12 Diversionary Route via Andover Programme ID 3.02

Current project stage: GRIP 6

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 an increased number of bridges compared to the information recorded in last years Annual Return. The revised scope therefore now includes:

- the reconstruction of 16 overbridges with a standard 'Conarch' solution
- the demolition of three overbridges
- the demolition of two arched overbridges and replacement with a footbridge
- track lowering and slewing at nine overbridges
- the modification of four station canopy awnings
- the modification to eight platforms.

Progress in 2012/13

- work commenced on site in September 2011 and is on target and within budget
- anticipated Final Cost (AFC) reduced to £29.4 million, including £1.7 million of third party funding for increases in scope, from an authority of £32.4 million, a saving of £3 million
- canopy Alterations completed at Romsey
- bridge demolitions and reconstructions completed at Taskers, Broken Cross, Court Drove and work on site at Belvers and programmed for completion by October 2013
- scope of work amended at Church Acre to replace the arched overbridge with a footbridge.

The project achieved W10 Gauge Clearance in January 2013 as planned with the route and is currently being used by W10 diversionary traffic. Work will continue to clear the route to W12 until March 2014.

Milestones for ID 3.02		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 6 Completion	March 2014	March 2014

Channel Tunnel South of London Route Fund. Programme ID 3.03

Following closeout of the project to develop a Channel Tunnel second route during 2012, further studies to explore the feasibility of two alternative schemes intended to support tunnel freight traffic have commenced: Channel Tunnel to West Coast Main Line (WCML) W9 gauge Class 92 diversionary route (Swanley to Fawkham Junction) and Phase 2 of Channel Tunnel to London – Barking and Dagenham European Gauge Clearance.

Current Project Stage: GRIP 1

The output of the WCML W9 gauge Class 92 diversionary route (Swanley to Fawkham Junction) would enable Class 92 electric hauled W9 gauge freight trains to join High Speed (HS1) at Southfleet Junction thereby enabling a diversionary route for the Channel Tunnel to Swanley via Maidstone East portion of the core route.

The output of Channel Tunnel to London – Barking and Dagenham European Gauge Clearance Phase 2 will be to identify and assess the physical infrastructure changes required to develop further the operational capability for freight to and from the Channel Tunnel terminating in the Barking area. It will make an assessment of the feasibility and cost associated with increasing the number of stabling opportunities and flexibility of movement available to GB2 gauge freight traffic in the Barking, Ripple Lane and Dagenham areas.

Progress in 2012/13

WCML W9 gauge Class 92 diversionary route (Swanley to Fawkham Junction)

- a project remit has been prepared
- work has commenced to initiate the scheme with a Vehicle Acceptance exercise.

Channel Tunnel to London – Barking and Dagenham European Gauge Clearance Phase 2

- a project remit has been prepared.

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 2012/13

- 20 of the 49 foul structures have now been gauge cleared. This includes 14 track lowers, four platform modifications, one bridge reconstruction and one bridge notching
- possessions are in place for all the planned works in 2013/14.

No milestones were committed to be delivered during 2012/13.

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 (ECML), 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 2012/13

- Form B Designs for the majority of foul structures have now been completed
- the delivery of works began in April 2013
- possessions are in place for all the planned works in 2013/14.

No milestones were committed to be delivered during 2012/13.

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 2012/13

- an increase in the cost estimate to complete the works led to value engineering to investigate other more efficient alternatives to bridge reconstruction. Due to the presence of a local sewer network track lower was not feasible and in December 2012 it was agreed that a bridge reconstruction provided the right solution
- a funding agreement has been completed with the SFN Steering Group agreeing to fund the balance of works over and above the third party contribution
- the project was re-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 2012/13.

This project is due to be completed within CP4 and is on target to meet that date.

ECML North to WCML (Carstairs) Gauge Enhancement

Current Project Stage: GRIP 3

The project provides 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 2012/13

- site surveys and investigations are complete in England and in Scotland
- outline designs are in the process of being signed off and are informing final estimates and possession planning
- in Scotland two major bridge re-constructions in Edinburgh have increased costs which the Seven Day Railway fund has agreed to cover
- base case and incremental options (additional platform clearance works through York and Newcastle) have been agreed in principle with the SFN Steering Group.

No milestones were committed to be delivered during 2012/13.

This project is due to be completed within CP4 and is on target to meet that date.

ECML North to WCML (Yorkshire Diversionary Routes)

Current Project Stage: GRIP 3

The project provides a W10 and W12 gauge diversionary route to the ECML between Doncaster and Colton Junction.

Progress in 2012/13

- procurement activities complete and contract awarded for outline designs.
- site surveys and investigations have commenced
- outline designs are in process of being signed off and are informing final estimates and possession planning.

This project is not a CP4 committed scheme.

Swinton to South Kirkby Gauge Enhancement

Current Project Stage: GRIP 5-8

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 2012/13

- Form A Designs have been completed for all foul structures
- Form B Designs for the majority of foul structures have also now been completed
- the delivery of works has a fully resourced plan and will commence in October 2013
- possessions are in place for all the planned works in 2013/14.

No milestones were committed to be delivered in 2012/13.

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: Project complete

The project has delivered 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.

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 2012/13

The scope and outputs of the project have been confirmed and the following infrastructure interventions will be required:

- 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. This scheme was completed in April 2013
- Manton Junction – redoubling of the junction to eliminate the current wrong direction operation through Manton Tunnel for services travelling towards Corby. This scheme is due to be completed in September 2013
- Sundon Loop – A new Up Loop between Bedford and Luton on the Midland Main Line enabling freight trains to be regulated amongst slow line passenger services. This scheme is due to be completed in September 2013
- Carlton Road Junction – increase the speed of the junction from 10 miles per hour to 15/20 miles per hour for freight trains to/from the Midland Main Line and the Gospel Oak – Barking line. This scheme is due to be completed in October 2013.

No milestones were committed to be delivered during 2012/13.

This project is due to be completed within CP4 and is on target to meet that date.

2. Felixstowe to Nuneaton via London

Current Project Stage: GRIP 3

The project delivers infrastructure interventions to enable the operation of 662 metre long intermodal trains between Felixstowe Port and Nuneaton via London.

The scope and outputs of the project have been confirmed as modifications to the layout of Ipswich Yard.

Progress in 2012/13

The GRIP4 stage gate milestone has slipped to May 2013 due to technical issues relating to the design.

It is possible that the future milestone of 'works taken into use' milestone may slip into year 1 of CP5. If that proves to be the case, a formal submission for change control to the CP4 Delivery Plan will be made.

Milestones for ID 3.05: Felixstowe via London		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 4 stage gate review	March 2013	May 2013
Works commence	September 2013	September 2013
Works taken into use	January 2014	January 2014

3. Southampton to West Coast Main Line Train Lengthening

Current Project Stage: GRIP 5

Design/Implementation

This project will deliver an increase in freight train lengths up to 775 metres on the route from Southampton to the WCML via Eastleigh, Winchester, Reading, Didcot, Oxford, Leamington to Nuneaton via Tyesley and Coventry.

Progress in 2012/13

The project has continued in development with an increased anticipated final cost of £80 million. This is due to increases in scope at:

- Southampton (due to land issues)
- Eastleigh (following a timetable study)
- Oxford (due to environmental issues including closure of a foot crossing)
- Washwood Heath (additional signalling requirements following signal sighting and design).

The poor availability of access on the route has also led to increased project and Schedule 4 costs.

Sites in detailed design/implementation:

- Southampton Maritime/Redbridge – remodelling to accommodate 775 metre 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 775 metres Goods Loop with 40 miles per hour 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 775 metres looping facility on the Down Main
- Milverton Junction – re-site signals LN 51/52
- Washwood Heath extend Up Goods Loop / Up Derby Slow plus increased exit speeds.

Sites at which commissioning in CP4 is now known not to be feasible:

- Hatton Down Goods Loop - renew Loop for increased entry / exit speed
- Dorridge Down Loop - extend loop with increased entry / exit speed
- Fenny Compton - Down Goods Loop, renew S&C and Track to provide increased entry / exit speed.

Delay in production of the design has prevented use of the planned engineering access for these three sites, which has been relinquished. As no further engineering access is available in CP4 discussions regarding commissioning in CP5 are ongoing. A revised programme is being developed.

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 and enhancement projects thereby working towards delivery of the performance targets agreed in CP4.

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 best 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 2012/13

Delivery in 2012/13 was mostly focussed on project delivery and recognition of benefits as most of the funding was authorised for investment in the first three years of CP4.

Some new authorisations took place including finishing investment in fleet-related schemes aimed at delivery of a material objective for fleet contribution to the overall CP4 objectives (‘fleet challenge’) and a small number of Route based initiatives. In part, new projects were enabled as a result of earlier projects completed more cost efficiently than expected, with further funding for

performance improvement being found beyond the Performance Fund included in the CP4 settlement (the Performance Recovery Fund).

Delivery of schemes in 2012/13 was in accordance with overall forecasts at the start of the year. Significant delivery within a balanced portfolio has included:

- weather resilience work – autumn (e.g. fitment of sanders onto trains) and winter mitigation (e.g. conductor rail heating, train-borne solutions), all of which proved effective in 2012/13
- cable theft mitigation across all key routes
- response to other externally caused delays including fatality management, trespass reduction etc
- fleet challenge improvements to rolling stock
- general infrastructure reliability improvement work
- remote monitoring and other data related projects
- some projects designed to help the 'flow' of trains on the network. For example work to approach controlled signals, improvements to control and innovation.

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).

In general terms, the seven day railway benefit is a reduction in the level of planned disruption to train services. The primary expression of this benefit is in improvements to the PDIs. Other expressions of the benefit include running more trains, improved diversionary route capabilities, shortened possession limits or times, more efficient use of access, improved operator resilience to planned disruption and reduced rail replacement.

We have continued to work with customers 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 2012/13

- since the start of CP4, over 126 projects have been identified
- the majority of the fund is allocated to capital expenditure (capex). A proportion is also supporting operating expenditure (opex)
- for capex schemes, we are supporting infrastructure enhancements to improve network availability. On a number of routes, we are investing to improve access points for employees and road rail vehicles so productive working time is maximised. Looking to CP5, key junctions on the WCML will be improved to enable less disruptive maintenance
- Opex investments include initiatives to increase diversionary route capabilities, such as training to widen driver geographical route knowledge
- national maintenance initiatives are also improving network availability across the routes
- the route categorisation process introduced at the start of CP4 is now embedded in the network access strategy and continues to inform Engineering Access Statements
- non-contractual joint network availability plans (JNAPs) established between routes and some customers, as well as the national freight JNAP, continue to inform network availability requirements and provides a focus for reducing disruption from planned works
- As reported in Section 1, PDI-P and PDI-F were both better than the 2012/13 regulatory target. There will be continued upward pressure on the PDIs through 2013/14 as a result of increased work volumes to deliver our CP4 programmes of work. Control measures are in place and we will continue to monitor this.

Seven Day Railway funded schemes completed since the start of CP4 include:

- an additional platform at Chesterfield reducing rail replacement requirements and optimising access arrangements
- a new stabling facility at Worcester means empty coaching stock moves are reduced and possessions have become less disruptive
- the acquisition of cembre clipping machines to enable a reduction in possession time required for clipping / de-clipping of rail
- the creation of a turnback facility on the Cotswold Line enables possession impacts to be reduced
- the Ramsgate mobile wheel lathe enables a more flexible response to wheel turning thus reducing the number of possessions required to repair rail damage caused by unturned wheels
- Cambridge driver route learning enabled Cambridge to London Liverpool Street trains to be diverted via Stratford when major work took place at Hackney Downs during 2012
- Seven Sisters OLE switch possession arrangements are less disruptive to train services
- access point improvements on Anglia, East Midlands, Kent and Wessex. More efficient access arrangements for plant and employees help minimise disruption and increase productivity
- Paddock Wood hook switch which enables the partial isolation of routes, less disruptive to train services

- route knowledge for the joint line and Cambridge diversions which enables services to be diverted during planned and unplanned disruption
- South Staffordshire signalbox opening at weekends enabling maintenance of diversionary route knowledge
- Stalybridge diversionary route capabilities enables services to be diverted during planned and unplanned disruption
- Hemel Hempstead staircase works reduce rail replacement, enables London Midland to operate a service when the WCML is blocked between Euston / Hemel Hempstead or Milton Keynes / Hemel Hempstead
- reinstatement of down fast platform at Bushey, London Midland services will be able to call at Bushey down fast platform when other lines are under possession
- Birmingham New Street transformers reduce disruption resulting from re-development of Birmingham New Street station
- Selhurst drivers route knowledge, drivers trained on the diversionary route from Victoria via Herne Hill and Stewarts Lane. This enables enhanced services for passengers when engineering works result in fewer paths between Croydon and Victoria
- training for pilot working on the Sussex Route allows the re-introduction of single line working and reduces the need for rail replacement services
- electrification of the down bay platform at Oxted – out-berthing of Class 377 vehicles enables better utilisation of stock and more frequent services when the line is closed north of Oxted
- enhanced security at Tattenham Corner enables rolling stock displaced from other locations during engineering works to berth overnight. This allows greater flexibility and reduces empty coaching stock movements, increases journey opportunities and reduces rail replacement.
- Bath to Bristol signalling enhancement – supports Simplified Bi-Directional Signalling between Chippenham and Bath Spa
- Barnwood S&C reinstatement – extension of journey times for diverted services is minimised
- mobile flash butt welder, automated site welds of rail are higher quality and take less time improving network integrity and reduces access requirements
- motorised trolleys allow inspections in hours of darkness, more efficient use of access and reduces access requirements.

Programme ID 6.00

CP5 Development Fund

This funding in the CP4 settlement was specifically to support the early development of enhancement schemes to be included in the Initial Industry Plan for consideration within the HLOS for England and Wales (specifically where such schemes were not funded elsewhere). The fund has been used with governance and overview provided by the Rail Industry Planning Group.

The CP5 Development Fund budget in CP4 is £65 million (2012/13 prices). A detailed list of CP5 Development Fund schemes can be found within our 'CP4 Delivery Plan 2013 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 CP4 final determination. Our objective is to deliver the schemes authorised from this fund. The following provides a summary of progress with these schemes, some of which have been completed in 2012/13 and a number of which continue beyond.

Current Project Stage: Various

The fund is comprised of eleven categories and a summary of progress in 2012/13 can be found below. A detailed list of all categories and schemes can be found within our 'CP4 Delivery Plan 2013 Enhancements Programme' publication.

1. Energy efficiency

- *on-train metering.* By providing this facility to train operators they are able to opt to use it to measure their trains' actual use of electricity and thereby understand what measures can be adopted to improve and minimise consumption. This project continues into 2013/14
- *photovoltaic cells on Blackfriars station roof.* The Blackfriars station redevelopment is one of Network Rail's first major projects to incorporate the large scale use of photovoltaic (PV) cells. The PV cells which form part of the station roof design and supply up to 70 per cent of the station's electrical needs were installed in 2012/13.

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 2012/13
- *sustainable lineside*. This programme identified biological planting solutions and management

options to mitigate/prevent risks to the operational railway.

- *Thornaby Depot oil pollution.* The project addresses the risk of oil seeping into an adjacent watercourse. The work which included cleaning out a drainage run and installing filters and booms, was undertaken in 2012/13.

3. Infrastructure failure

- Improvement to the design of S&Cs was undertaken in 2012/13.

4. Level crossings, including closure

- Downham Market station barrow crossing was closed in 2012/13
- Tallington footpath crossings were closed in 2012/13
- Whitacre Junction and Hogrills End (Whitacre East) level crossings were closed in 2012/13
- the closures of a further six crossings are being progressed into 2013/14 and beyond (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 660 UWCs.

5. Route crime

- installation of forward facing cameras on the CrossCountry train fleet completed in 2012/13.

6. Security

- improved connectivity to the CCTV Control Hub at British Transport Police's headquarters completed in 2012/13
- national programme of installation of enhanced security measures at key operational locations completed in 2012/13.

7. Signals Passed At Danger (SPADs)

- a project on the LNE 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 has involved lowering the line speed at four of the signals (in the Leeds area) and was completed in 2012/13.

Programme ID 8.00

Access for All

Current Project Stage: Various

The objective of the Access for All Programme is to deliver accessibility improvements at as many stations as possible. The locations have been selected by the DfT in England and Wales (137 stations) and Transport Scotland (TS) in Scotland (18 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 NSIP and station renewals. This is done to make sure synergies and opportunities are exploited and have been achieved through active stakeholder management to minimise business disruption. We have completed 75 per cent of planned station improvements within this framework.

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 2012/13

- option selections agreed with DfT/TS: five
- outline designs signed off: twelve
- detailed designs signed off: 43
- stations completed in 2012/13: 26
- additional funding (£37 million) provided to enable more schemes to be undertaken under the mid-tier Access for All programme
- additional twelve schemes in development ready for CP5 (Subject to SBP agreement)
- an additional five schemes to be delivered in CP4 in Scotland utilising the efficiencies in Scottish allocation
- an additional three schemes to be delivered in CP4 in England utilising the efficiencies in the pogramme.

The completed stations are:

Chadwell Heath, Denmark Hill, Earlsfield, Gloucester, Harpenden, Huntingdon, Long Eaton, Marple, Northfield, Selly Oak, Swanley, Vauxhall, Alnmouth, Bromley South, Camden Road, Gospel Oak, Hyndland, Laindon, Linlithgow, Morpeth,

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 regime 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

Montrose, Perth, Tilbury Town, Hackney Central, Slough and Clapham Junction.

The completed stations under the Mid-Tier Access for All Programme are:

Paddington changing places toilet, Wendover, Various Southern Stations – tactiles.

Programme ID 9.00

King's Cross

Current Project Stage: GRIP 6

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 King's 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
- new platform beneath eastern range offices
- a new 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:

- the creation of a high quality passenger environment
- improved circulation space and additional facilities
- additional commercial opportunities by refurbishment of east and west range offices
- maximisation of the heritage environment within the confines of a Grade 1 listed station.

Progress in 2012/13

Western Range:

- station facilities completed and commissioned including new booking hall, first class lounge, station control room and gateline facilities
- western range office facilities completed and commissioned
- retail facilities completed and in use in the western range, including a pub / restaurant in the old Parcel Yard.

Western Concourse:

- new western station concourse and mezzanine level completed and in use including escalator and lift access plus footbridge link from mezzanine level, through refurbished western concourse, into main train shed
- 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:

- clock tower internal refurbishment works are ongoing.

Roof Refurbishment:

- main train shed roof refurbishment and glazing replacement completed
- PV panels installed, commissioned and generating energy.

Public Realm Works:

- King's Cross Square detailed design works completed

- construction works have commenced - including booking hall access stair canopies for London Underground
- other public realm works including taxi ranks and disabled parking have been completed on behalf of Argent's King's Cross development.

Final Delivery:

This project has a committed final delivery milestone of September 2013 and the project is on target to meet that date.

Programme ID 10.00 West Coast Main Line committed schemes

Programme ID 10.01 Bletchley Re-Modelling Project

Current project stage: GRIP 5-6

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.

Progress in 2012/13

- successful signalling commissioning in December 2012 (Stage 6)
- completed remodel the south end connection of the London Midland Depot at Easter 2013 (stage 7A / 7B)
- platform extension and recovery works ongoing.

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: Phase 3A: GRIP 5-6, phase 3B GRIP 5-6

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.

Phases one and two of the West Coast power supply upgrade were undertaken to support the December 2008 timetable change. There were some residual Phase 2 works identified which were completed in 2012.

Phase three is the implementation of an upgraded 25kV traction power supply between Wembley and Great Strickland and will be completed in CP5.

The traction power supply system will be upgraded to a 12kV Autotransformer (AT) feeding and is being delivered in two parts; North Wembley and Whitmore (Phase 3A) Whitmore and Great Strickland (Phase 3B)

Progress in 2012/13

- significant detailed design and implementation activities for the Phase 3A distribution and on-track works have been completed which support the progressive commissioning of Phase 3A in sections during 2013 and 2014
- Network Change for neutral sections for Phase 3A has been closed out
- completion of GRIP 4 for Phase 3B
- contracts have been awarded for the Phase 3B equipment supply (containerised buildings & autotransformers) and installation works for the delivery of Phase 3B. These comprise over 90 per cent of the total contractor work
- Phase 3B surveys have commenced.

Programme ID 10.03 Stafford Area Improvement Project

Current Project Stage: GRIP 5

The project supports the implementation of a new service specification on WCML 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.

Milestones for ID 10.03		
Activity/Output	***Date***	***Date Met / Expected***
IPC Planning Consent Submission	February 2013	December 2012
GRIP 4 completion	April 2014	December 2012

Progress in 2012/13

- Completed GRIP 4 option selection work and commenced GRIP 5 detailed design
- Norton Bridge alignment now confirmed. Technical and public stakeholder consultation completed August 2012
- Norton Bridge subject to a DCO submitted to Planning Inspectorate December 2012. Process scheduled to complete April 2014
- BPA and National Grid engaged in the project plan to facilitate the pipeline diversions required in the Norton Bridge area. BPA planning consent granted
- In support of the planned IPC submission, the project worked closely with Staffordshire County and Borough Councils, Environment Agency and other stakeholders
- Works commenced on line speed enhancements between Norton Bridge and Crewe.

The 2012/13 delivery plan milestone has been met.

Programme ID 11.00

Thameslink

Current Project Stage: Various

The Thameslink programme will provide the stations and railway systems infrastructure 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 the infrastructure works to achieve this are grouped into three key outputs.

Key Output Zero (KO 0) delivered infrastructure that enabled a consistent train service throughout the Thameslink programme construction period and was completed in March 2009.

Key Output One (KO 1) delivered infrastructure that enabled the operation of 12-car trains between Bedford and Brighton. An improved infrastructure capacity enabled 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 was achieved in time for the May 2012 timetable change.

Key Output Two (KO 2) delivers the headline Thameslink programme infrastructure capability that enables up to 24 train paths per hour between St Pancras International (low level) and Blackfriars stations by December 2018.

The following are some of the key projects in the Thameslink programme.

N280 Outer Areas

On the Midland Main Line, station and platform enhancements have been delivered to accommodate 12-car trains from the introduction of the KO 1 timetable and support the forecast increase in passenger numbers.

This encompassed works at Bedford, Flitwick, Harlington, Leagrave, Luton, Luton Airport Parkway, Elstree & Borehamwood, Harpenden, Radlett, St Albans, West Hampstead, and Mill Hill Broadway stations. Works included track, signalling, power and civils elements as well as station, rail and footbridge works, the majority of which were delivered at stations that remained open for passenger use throughout.

N222 Farringdon Station

Farringdon station has been remodelled to accommodate increased passenger numbers and improve existing interchanges with London Underground and a new interface with Crossrail.

The project has delivered a new station entrance and concourse from Turnmill Street, an extension to the pre-existing London Underground Limited (LUL) 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 has been 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 are covered by a new single span roof above their entire length. A PV cell scheme to produce solar energy for the station has been incorporated into the roof. This is in line with corporate and stakeholder objectives. Blackfriars Underground station has been enlarged and extensively rebuilt with new escalators, lifts and improved customer and staff facilities. The remaining bridge strengthening and final fit-out works will be completed in 2013.

N242 KO1 Signalling

The project has re-signalled Thameslink routes between Kentish Town and Loughborough Junction to accommodate the more intensive service and 12-car trains.

N244 KO1 Electrification & Plant

New substations, including the new Ludgate Cellars at Blackfriars (delivering a 33Kv power supply to the Thameslink core) have been commissioned. The programme has upgraded the electrification system on wider Thameslink routes to provide sufficient power for longer trains.

On the Midland Main Line this involved the installation of autotransformer feeding equipment between Kentish Town and Borehamwood, providing a consistent traction power supply. On the DC third rail electrified network, new substations and additional lineside cabling have been 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 enable Thameslink and Charing Cross services to operate over dedicated tracks improving capacity and reliability. The civils work has been completed. The new track works will be commissioned in January 2016.

N420 London Bridge Station & Bermondsey Dive-under

London Bridge will be redeveloped, creating at street

level one of the largest station concourses in Great Britain (between Tooley Street and St. Thomas Street). It will be a lighter and brighter station, capable of accommodating 66 per cent more passengers and offering a simplified transport interchange hub.

The station will accommodate two additional tracks from the new Borough Viaduct, changing the configuration of the station to nine through tracks and six terminating tracks. This realignment of the infrastructure enables the increase to 18 Thameslink train paths per hour through the station, and a total of 88 train paths per hour into and through the station as a whole. A dive-under will be constructed in the Bermondsey area, which will enable Thameslink services from the Sussex Route to access London Bridge on dedicated tracks.

N421 London Bridge Railway Systems

The railway systems project will upgrade the track, signalling, electrification and telecoms infrastructure at London Bridge station and on its approaches to accommodate the more intense service and longer trains. Approximately 48 kilometres of new plain line will be replaced all of which will be High Performance rail that will improve layout resilience. Over 550 signalling equivalent units will be installed and the bottle neck on the approaches to London Bridge station has been addressed in the design to enabling service groups to stay in lane.

N423 High Capacity Infrastructure

This project includes the commissioning of European Train Control System (ETCS) to support Automatic Train Operation (ATO) between Blackfriars and St Pancras International (Low Level), operational and control changes, and station enhancements works required to deliver the infrastructure capability for 24 train paths per hour.

Progress in 2012/13

Key Output 1 works

Farringdon:

- new First Capital Connect (FCC) ticket office fitted out and lifts brought into use before the Olympic Games
- completed north train shed roof
- completed LUL station frontage works
- new assets handed back to LUL in 2013/14.

Blackfriars:

- completed external works
- completed installation of PV cells
- completed roof and bridge
- remaining bridge strengthening and fit-out works to be completed in 2013/14 including handback of the LUL station areas to LUL.

Borough Viaduct:

- construction of Park Street and Hop Exchange Viaduct completed
- the Borough Market Viaduct completed
- installation of the Borough High Street bridge finished
- construction of railway approach viaduct completed
- infill and market buildings constructed underneath.

KO1 Railway Systems

- Midland Road cross-overs installed and commissioned
- re-signalling completed between Kentish Town and Blackfriars Junction
- autotransformer system (electrification and plant) commissioned on the Midland Main Line
- DC substation upgrades completed.

Key Output 2 works

Rail Systems

- fit-out has commenced at Canal Tunnels, which will connect St Pancras Low Level station to the ECML
- enabling works at London Bridge have commenced, in advance of the first phase of major track works, which commenced in May 2013
- a doubling of the tracks at Tanners Hill has been completed
- new regulating Loop for 12 car trains approaching London Bridge has been brought into use at New Cross Gate
- cable diversions at London Bridge commenced.

Three Bridge Depot Connections and Enabling Works

- completed three of the five track Depot connections
- completed the first phase of HV cable diversions
- completed vegetation clearance on the down side.

London Bridge station

- a programme of enabling works has created a new interim ticket office at the front of the station, relocated the station and TOC employee accommodation and transferred the station control room
- a four storey project site accommodation office has been constructed, recycled from the old Kings Cross project to a site adjacent to London Bridge station
- the train shed over the terminating platforms has been removed, and demolition of accommodation blocks and the old roof has commenced, to make

way for the future station layout and new viaduct connection
- new public toilets were completed before the Olympic Games and utility diversions on the roads around the station are nearing completion
- stage 1 of the main works commenced in May 2013
- high capacity infrastructure to support 24 trains per hour in detailed development.

Programme ID 12.00

Intercity Express Programme (IEP)

Current Project Stage: Various

In July 2012 the Government confirmed the train order with Agility Trains. The multi billon pound contract now moves into the detailed design and implementation phase. For Network Rail 2012/13 year has been one of continued development of the options necessary to deliver the required capability and capacity works. With the confirmed train order the opportunity has been taken to develop a phased delivery programme linked to the emerging train delivery schedule.

As stated in the Annual Return 2012 the original CP4 project was built around a capability project to support a like for like replacement of high speed trains. Over the past year the client remit between Network Rail and the DfT has been updated to reflect the required outputs now sought, the timescales necessary to deliver them and linkages with other infrastructure projects.

Progress in 2012/13

In December 2012, the CP4 Delivery Plan was updated to reflect the confirmed train order. This change focused on the Great Western Main Line (GWML) routes and whilst it saw amendment to some of the development milestones the key change was the introduction of phased implementation milestones.

Capability works will be completed in phases from early 2015 through to late 2017 to enable the introduction of Hitachi Super Express Trains up to 260 metres long on GWML (in test mode from March 2015 and passenger service from spring 2017). Full service introduction will be completed in the summer of 2018. ECML deliveries will now start in summer 2018 and run into 2019. The development and implementation timescales of the specific capacity works on GWML remain unchanged, with completion by December 2017 for the May 2018 timetable.

Great Western Main Line. Programme ID 12.01

The majority of the work in 2012/13 was focused on three main areas: gauging, technical interfaces and capacity and capability works in the Paddington area. DfT agreed the Cotswolds journey time schemes did not sit with IEP and have been removed from the programme.

Capability Works

- gauge clearance GRIP 3 work is continuing. GRIP 3 for known sites was completed in February 2013 and for all other sites is expected to be completed by 31 December 2013
- platform extension GRIP 3 completed in January 2013 and the wider stations work package will complete GRIP 4 in June 2013 following consultation with industry partners
- Paddington area capability works completed GRIP 4 in December 2012. These cover additional OLE works in the station and throat along with some signal relocations
- a study of clearance and performance issues with the current OLE also completed GRIP 3 in mid 2012.

Capacity Works

- at Paddington, a small line speed increase for down main line services completed GRIP 4 in December 2012
- a package of works around the development of suburban platforms (no: 11-14) necessary to support the introduction of EMUs in 2015 through to the full Crossrail service in 2019 also completed GRIP 4 in December 2012
- at Bristol Parkway, the GRIP 3 and GRIP 4 work delayed whilst resources worked on the Filton four tracking and resignalling projects. The development milestone has been amended to complete GRIP 4 in autumn 2013 but the project is scheduled for a December 2017 completion.

Other Works:

- Network Rail continues to provide technical support to the emerging train design and its interface with the infrastructure. This work will continue through the detailed design phase on the train. The estimated completion date of this work is March 2014
- these cover aspects including: wheel / rail interface, acceleration curve, bridge resonance, and traction power changes on the move. The bridge resonance study will complete GRIP 3 in the summer of 2013/14. Studies are confined to eight bridges across the country

Milestones for ID 12.01		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 complete – Paddington to Airport Junction Overhead Line Enhancement Works, Single Option Selection	N/A	June 2012
GRIP 3 complete – Gauge Capability Works, Single Option Selection – Core Routes	April 2012	February 2013
GRIP 3 complete – Gauge Capability Works, Single Option Selection – Non Core Routes	N/A	December 2013
GRIP 3 complete – Stations Capability Works, Single Option Selection	April 2012	January 2013
GRIP 3 complete – Technical Capability Works, Single Option Selection	April 2012	March 2014
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 - All Routes	December 2012	June 2015
GRIP 4 complete – Stations Capability Works, Complete Single Option Development	December 2012	June 2013
GRIP 4 complete – Bristol Parkway Capacity Works, Complete Single Option Development	April 2013	September 2013
GRIP 6 start – Capability Works, site works commence	December 2013	December 2013
GRIP 6 complete – Gauge Capability works (Hitachi test routes)	N/A	March 2015
GRIP 6 complete – Gauge Capability works (mainline routes)	N/A	June 2016
GRIP 6 complete – Stations Capability works (mainline routes)	N/A	December 2016
GRIP 6 complete – Capability Works (all other works)	N/A	June 2017

- during 2013/14 we expect to work on a platform height and stepping distance study. The scope will be agreed by DfT following discussions with Hitachi and First Great Western (FGW).

IEP ECML. Programme ID 12.02

Gauge clearance GRIP 3 work is continuing. A revised train design was issued to Network Rail in July 2011. This led to the identification of additional scope and necessitated a review of work undertaken. A number of routes have been added which require gauge clearance requiring amendments to the interim milestones. GRIP 6 completion remains as September 2014 for the test route and August 2017 for all other routes.

Station capability has been split into two phases. Phase 2 includes additional stations that were identified by the DfT for review in February 2012.

Phase 1 completed GRIP 4 in April 2012 as planned. GRIP 2 studies have commenced for all phase 2 platforms in LNE and Scotland.

OLE alterations – an additional option in GRIP 3 to examine Return Screening Conductor has led to revised interim milestones. The GRIP 6 completion date remains as planned. AFC reduced due to reduced scope, investment authority received to GRIP Stage 5.

Milestones for ID 12.02: OLE		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 4 complete: OLE Capability Complete Single Option Development	August 2012	July 2013
GRIP 6 start: OLE Capability Site works commence	August 2013	January 2014
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	January 2014
GRIP 4 complete (test route only) – Gauge Capability Complete Single Option Development	October 2012	September 2013
GRIP 4 complete – Gauge Capability Complete Single Option Development	October 2013	May 2015
GRIP 6 start (test route only) – Gauge Capability Site works commence	August 2013	January 2014
GRIP 6 start – Gauge Capability Site works commence	August 2014	June 2015
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	Complete	April 2012
GRIP 3 complete: Station Capability Phase 2**, Complete Single Option Selection	June 2013	August 2014
GRIP 4 complete: station capability Phase 2**, Complete Single Option Development	June 2014	April 2015
GRIP 6 start: Station Capability Site works commence	April 2013	April 2013
GRIP 6 start: Station Capability Phase 2. Site work commence	June 2015	August 2016
GRIP 6 complete: Station Capability Complete and ready for IEP operation	August 2017	August 2017

Note:

- station capability phase 1: seven 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.

IEP – ECML Traction Power Supply Upgrade (PSU). Programme ID 12.03

The progress in 2012/13 was:

- contract awarded to National Grid for 400kV feeder station at Essendine near Peterborough
- contract awarded to Yorkshire Electricity Distribution for 132kV feeder station at Ardsley
- following Network Rail refresh of GRIP in 2011, there is an obligation on the project to obtain approval in principle in GRIP Stage 3. This 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 should 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 the Strategic Business Plan submission for upgrade to the 'classic' system which obtained GRIP 1-2 authority in February 2012. DfT has also confirmed that IEP will not operate to Cambridge/King's Lynn, which has led to the removal of those lines of entry in the IEP submission.

Programme ID 13.00

Crossrail and Reading

Crossrail and Reading are separate projects, with different objectives and clients. Both have the potential to provide significant capacity improvements on the 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

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 was completed in March 2012)	October 2011	March 2012
GRIP 4 Complete Outline Design Due to changes in GRIP refresh, GRIP 4 started later 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

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	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

with others on the GWML as there are multiple interfaces between the Crossrail 'on network works' and other projects including electrification and IEP.

Programme ID 13.01 Crossrail

Current Project Stage: GRIP 4

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 23 kilometres of sub-surface railway tunnelled beneath the centre of London.

Network Rail is delivering the 'on network works' for CRL, who in turn is delivering the project for the joint sponsors, TfL and DfT. The 'on network works' comprise of 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 incorporate 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 CP4 Delivery Plan.

Scope of works

The on network works comprise the following infrastructure enhancements along 76 kilometres of existing railway:

- platform extensions at a number of stations from Maidenhead to Abbey Wood and Shenfield to cater for 205 metre long electric trains
- improvements at stations to cater for the increased numbers of passengers
- a 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 2012/13

- we were asked to further revise the Overall Target Price (OTP) after its Key Date 1A (KD1A) submission for delivery of the 'on network works'. As agreed, an amended OTP was submitted to CRL in March 2012. The joint sponsors accepted CRL's recommendation of that OTP and CRL confirmed this acceptance in April 2012
- the GRIP 4 programme for the 'on network works' was substantially completed with circa 85 per cent of work packages by value having successfully gone through GRIP Stage 4 by December 2012. The remaining work packages are due for GRIP Stage 4 completion by the end of 2013. Substantial completion was due in August 2012. This has not been fully met as some work packages were rescheduled to minimise disruption through integrated access planning with other projects and CRL notifying Network Rail of a change to the south east section scope
- work packages for GRIP 6 main works are being phased, some of which commenced in September 2012
- the majority of works being required to take place during the Christmas 2012 possession on the west spur were successfully completed and handed back on time. This includes three bridge demolitions (Old Stockley, Trenches and Middlegreen bridges), one bridge construction (Horton Road bridge) and track and OLE at East of Hayes and Acton.
- two elements of signalling work overran the booked possession:
    - Stockley. 6.5 hour unplanned overrun on the main line possession and 13.45 hour unplanned overrun on relief line possession, causing performance problems for First Great Western and Heathrow Express
    - 3.75 hour planned overrun at Acton on the relief lines resulting in cancellations of Heathrow Connect services.
- since the OTP was accepted, a variation was agreed for Traction Power Supply (TPS) on the West and Northeast spurs
- six major GRIP 5-8 contracts let at southeast section, west outer signalling Phase 0, Stockley main civils, west outer track infrastructure, Acton main civils and west bridge reconstruction.
- successful delivery of Easter 2013 works on the west spur including:
    - twenty-four 32 metre piles were installed at Stockley
    - three bridge constructions (Old Stockley, Middlegreen and Trenches)
    - one bridge demolition (the original Horton bridge)
    - Stockley Ladder Crossover works.

Milestones in the year

- the remaining contracts are due to be let between April and October 2013:
    - Old Oak Common and Paddington Approaches (OOCPA)
    - west inner track infrastructure
    - west stations
    - west outer electrification
    - north east spur.
- Christmas 2013 possessions:
    - east of Hayes crossover
    - OOCPA stage A&B signalling
    - west outer signalling Phase 0
    - Action stage 19B (western access to yard)

Milestone for ID 13.01		
Activity/Output	***Date***	***Date Met /Expected***
Revised Overall Target Price (OTP) for the ONW to be agreed	April 2012	April 2012
GRIP 4 completion of all remaining work packages	August 2012	Substantial Completion – December 2012 Full Completion – December 2013

Programme ID 13.02 Reading Station area redevelopment and southern platforms

Current Project Stage: GRIP 6

Reading station area redevelopment is designed to deliver significant capacity and performance improvements throughout the area for GWML, CrossCountry 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.

Outputs require a minimum of four additional train paths per hour in each direction, six additional platforms (five new, one brought back into use), bringing 125 per cent improvement in through line platform capacity and associated performance [or delay minute] improvements.

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
- provision for possible future extension of Crossrail and the introduction of access from the west to Heathrow Airport.

Progress in 2012/13

- station main works (commissioning of western gateline, new transfer deck, subway, new relief line platforms 12-15, and northern entrance building)
- relief lines east remodelling
- relief lines west and temporary/final depot connections
- southern tunnel civils works
- decommissioning of existing footbridge.

Programme ID 13.03 Reading station southern platforms

Current Project Stage: Project completion

This project encompassed:

- a new south side platform and platform extensions for Waterloo line services
- additional bridge span over Vastern Road.

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

Current Project Stage: GRIP 6

The redevelopment of Birmingham New Street station will upgrade the station 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 DfT, with BCC as client.

Progress in 2012/13

- completion of new train crew accommodation for CrossCountry staff, gaining a sustainability award
- commissioning of new Network Rail operations control room
- completion of structural works for the Moor Street link walkway, with surfacing and fit-out works progressing
- superstructure installed for the east concourse extension
- infill of eastern void substantially completed
- platform upgrades continue. Platforms one, eight, ten, eleven and twelve handed back
- structural works completed for the new north-western station entrance and façade installation nearing completion on the northern side of the station
- plant installed to support phase 1 completion
- construction of new vehicle 'drop and go' and short-stay car park
- fit-out of new western concourse substantially completed, including new lifts and escalators
- extensive public communications campaign undertaken raising awareness of new passenger access routes from phase 1 completion

Following the integration of the south side development (the construction of a new John Lewis department store and the refurbishment of the Pallasades shopping centre), significant construction work has taken place, completion of foundations and three concrete cores for John Lewis and steel superstructure now well under way. Work has

proceeded with minimal disruption to passengers and train operations.

Milestones in the year: no strategic milestones in the delivery plan for 2012/13.

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: GRIP 7

This project had a delivery plan milestone of project implementation by December 2011 which it successfully met.

The scope of the project 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 2012/13:

- majority of assets handed back to asset owners. Snagging works ongoing at Pitsea.

Package 1: Cambridge Island Platform. Programme ID 15.21

Current project stage: GRIP 7

This project had a delivery plan milestone of project implementation by December 2011 which it has successfully met.

This scope of the project was to deliver the necessary infrastructure to allow operation of 12-car trains on the West Anglia route between Cambridge and Liverpool Street, based on Class 317 new rolling stock.

Progress in 2012/13

- majority of assets handed back to asset owners
- remedial works to footbridge glazing, and alterations to platform train dispatch equipment, remain outstanding.

Package 11: West Anglia Outer Twelve-car Trains. Programme ID 15.22

Current project stage: GRIP 7

This project had a delivery plan milestone of project implementation by December 2011 which it successfully met.

This project has allowed 12-car operations on the West Anglia route between Cambridge/Stansted Airport and Liverpool Street, based on Class 317 vehicles 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 fitted:

- Roydon
- Harlow Mill
- Elsenham
- Newport
- Great Chesterford
- Shelford.

Progress in 2012/13

- majority of assets handed back to asset owners. Minor signalling works outstanding at Broxbourne.

Package 4: Gravesend. Programme ID 15.23

Current Project Stage: GRIP 5-6

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 Access for All footbridge and lifts.

Progress in 2012/13

- network and station change established
- investment authority for the implementation stage
- award of the design and build contract
- the design parameters have been ‘frozen’ and detailed design is progressing.

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 Driver Only Operation stations. Programme ID 15.24

Current Project Stage: GRIP 7

This project had a delivery plan milestone of project implementation by December 2011 which it has successfully met.

Platform lengths for twelve-car trains have been provided on all suburban routes from Charing Cross and Cannon Street with the exception of Woolwich Dockyard station and stations east of Gravesend.

Package 18, Charing Cross Station. Programme ID 15.25

Current Project Stage: GRIP 7

This project had a delivery plan milestone of project implementation by March 2013 which it successfully met.

Highlights of this programme:

- Platform extensions and associated infrastructure alterations to Platforms one, two and three at Charing Cross station.

Milestones for ID 15.25		
Activity/Output:	***Date***	***Date Met / Expected***
GRIP 6 Complete	March 2013	March 2013
Infrastructure ready for use	March 2013	March 2013

Package 8: Kent & Sydenham Ttrain lengthening. Programme ID 15.26

Current Project Stage: GRIP 5-6 (Kent) and GRIP 7 (Sydenham)

Our obligation is to provide the necessary infrastructure to facilitate the operational plan assumed with train operators to deliver agreed capacity metrics. The assumed operational plan is described further in route plans.

Highlights of this programme:

- platform extensions and/or associated infrastructure alterations to 74 platforms and one siding, providing ten-car capable infrastructure on the Sydenham Corridor and twelve-car capable infrastructure on the Kent metro routes

Sydenham Route: This part of the project was delivered December 2011.

Progress in 2012/13

- detailed construction, testing and commissioning is ongoing across the Kent stations

Package 2: East Grinstead station. Programme ID 15.27

Current Project Stage: Project completion

The scope of the project 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.

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 twelve-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.

Package 3: 10-car Sussex Suburban Railway. Programme ID 15.29

Current Project Stage: GRIP 5

The scope of this project is to deliver necessary infrastructure works to accommodate ten-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 2012/13

- design activity in progress
- implementation works 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: GRIP 5

The scope of this project is to deliver necessary infrastructure works to accommodate ten-car train operation on Platform three at Battersea Park station.

Progress in 2012/13

- investment authority for GRIP Stages 5-8 has been achieved
- single option development completed and signed off
- principal contractor brought on board to deliver the scheme.

No milestones were committed to be delivered in 2012/13.

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: GRIP 6

This project has a delivery plan milestone of project implementation by December 2012 (Hounslow Loop) and December 2013 (other routes). It has completed the works as per the December 2012 milestone but will not complete all of the other stations by December 2013. This is due to issues with securing possessions. There is currently a change control in the system which shows a completion date in April 2014.

The scope of this project is to deliver necessary infrastructure works to accommodate ten-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 2012/13

- completion of Hounslow Loop and Staines to Weybridge
- detailed design complete at 23 stations
- construction works progressing.

Package 9: Windsor Line. Programme ID 15.32

Current Project Stage: GRIP 5-7

The scope is to deliver necessary infrastructure works to accommodate ten-car trains on routes between London Waterloo to Windsor & Eton Riverside, and also at Clapham Junction for services between London Victoria and Sutton/Epsom Downs via Norbury. This requires platform extensions, 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 three and four), Queenstown Road, Vauxhall and Clapham Junction (platform 14 and 15).

Progress in 2012/13

- detailed design, construction, testing and commissioning has been completed for all stations on the Windsor line, except Queenstown Road (due for completion July 2013)
- detailed design progressed for Clapham Junction Platforms 14 and 15 and construction due to complete December 2013.

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 & Vauxhall – GRIP 6 Complete	December 2011	December 2011
Putney, Barnes, Twickenham, St Margarets, North Sheen, Wandsworth Town, Richmond, Staines, Clapham Junction (3&4)	March 2013	March 2013
Queenstown Road	March 2013, change controlled to July 2013	July 2013
Clapham Junction (14&15)	December 2013	December 2013

Waterloo International Integration. Programme ID 15.33

Current Project Stage: GRIP 5

Part of an overall programme to deliver increased capacity on the Windsor lines by the end of CP4 by bringing platform 20 at Waterloo International into domestic use for ten-car rolling stock.

Progress in 2012/13

- project scope confirmed: Works to open platform 20 at Waterloo International terminal to be progressed and delivered within CP4
- outline design complete
- detailed design submitted for approval
- track, electrification and plant works complete (maintenance delivered).

Wessex Automatic Selective Door Opening (ASDO). Programme ID 15.34

Current Project Stage: GRIP 6

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. There are some locations on the Windsor suburban routes where the cost of extending platforms to allow ten-car trains to call would be prohibitive or offer poor value for money. This project will install radio frequency identification tags within four feet of each platform to allow for automatic train door opening.

Progress in 2012/13

- product acceptance received for Hima Sella track beacons
- procurement of all phases started
- phase 1 implementation complete
- phase 2 beacons delivery received.

Milestones for ID 15.34		
Activity/Output	***Date***	***Date Met /Expected***
GRIP 6 (Phase 1) commenced	October 2012	March 2013
GRIP 6 (Phase 1) complete	January 2013	March 2013
GRIP 6 (Phase 2) commence	February 2013	April 2013
GRIP 6 (Phase 2) complete	December 2013	December 2013
GRIP 6 (Phase 3) commence	September 2013	September 2013
GRIP 6 (Phase 3) complete	January 2014	November 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 4-8 for Kent Phase 1
- GRIP 3 for Kent scope / Phase 2 and 3
- GRIP 5 for December 2013 scope for Sussex
- GRIP 6 for Wessex scope.

Completion will enable longer trains and different rolling stock to operate on the 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 the DfT for the period to the end of CP4.

Progress in 2012/13

- preparation for delivery of infrastructure to enhance traction power capability in Sussex in December 2013
- validation modelling has confirmed the December 2013 Sussex scope. Electric traction equipment scope will be defined further in 2013
- in Kent, infrastructure enhancement is the preferred option. The traction power requirements are being delivered in a phased approach. Phase 1 to accommodate a limited twelve-car operation is proposed to be delivered by December 2013. Phase 2 for the flexibility to operate twelve-car services during the London Bridge high level construction works from December 2014, and Phase 3 enabling twelve-car operations when Kent and Sussex timetable is recast when Thameslink (approx. 2018) is implemented
- delivery of infrastructure to enhance traction power capability in scheduled for June 2013 and December 2013.

Progress to final delivery

The enhancements in Sussex and Wessex are anticipated to be delivered prior to the timetable change and train lengthening dates of 2013.

The Kent Phase 1 Design & Build contract was awarded, which is on programme for completion by December 2013.

The project requirements specification was agreed for Kent Phases 2 and 3, and the completion of GRIP3 Phases 2 and 3 milestone (identification of a single option at all sites) is currently on programme.

There were no milestone commitments during 2012/13.

Route 1 New Cross Enhancement to power supply. Programme ID 16.02

Current project stage: GRIP 5

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.

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 2012/13

- all development (GRIP 4) now completed with full authority gained for the project which is now in detailed design stage
- National Grid has procured the 275/33kV super grid transformers and is on target to provide the supplies as per the delivery plan
- tendering is now complete for both the supply of equipment and detailed design and build contracts which are due to be awarded by May 2013
- construction is due to commence in September 2013.

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: Project closeout

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.

Progress in 2012/13

- scheme handback completed.

Programme IDs 16.08: DC Regeneration

Current project stage: GRIP 6

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 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 by December 2016. Until LUL remove older non compatible stock from the District and Circle lines, the maximum regenerative capability for South West Trains will remain limited 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.

Progress in 2012/13

- a reduction in the forecast completion date for the Waterloo substation from June 2015 to March 2014
- Form A designs have been completed for the Waterloo substation works.
- the contract has been awarded for all works within Kent, Sussex and Wessex
- discussions with LUL have been held regarding the segregation of the electrical supply to the Waterloo and City line and infrastructure interfaces have been agreed.

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Milestones for ID 16.03: (Sussex)		
Activity/Output	***Date***	***Date Met/Expected***
Sussex Substations & Feeder	Dec-13	Oct-13

Milestones for ID 16.04: (Wessex)		
Activity/Output - Other Routes	***Date***	***Date Met/Expected***
Hounslow Loop / Hounslow – Staines - GRIP 6 Infrastructure ready for use	Jun-13	Jun-13
Weybridge via Chertsey/Hampton Court Junction to Guildford via Cobham - GRIP 6 Infrastructure ready for use	Dec-13	Dec-13

Milestones for ID 16.05		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 completion and assets into service	Dec-11	Oct-11

Milestones for ID 16.06		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 completion and assets into service	Dec-11	Dec-11

Milestones for ID 16.07		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 6 completion and assets into service	Dec-11	Dec-11

Milestones for ID 16.08		
Activity/Output – Phase 1	***Date***	***Date Met/Expected***
GRIP 6 commences	February 2013	April 2013
GRIP 6 complete	March 2014	March 2014
Activity/Output – Phase 2	***Date***	***Date Met/Expected***
GRIP 6 commences	February 2017	February 2017
GRIP 6 complete	August 2017	August 2017

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

Programme ID 17.00 Southern Capacity

Gatwick Airport remodelling and passenger capacity scheme. Programme ID 17.01

Current Project Stage: GRIP 4

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 four running lines every 15 minutes. Passenger congestion will be reduced and accessibility improved. The signalling interlocking will be renewed.

These outputs will be achieved through the construction of a seventh platform at Gatwick Airport, 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 five and six 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 2012/2013

- concourse improvements were delivered in advance of the 2012 Olympic and Paralympic Games
- GRIP 6 works have commenced to deliver platform level improvements and the construction of the seventh platform, with the works due to complete during 2013/2014.

Milestones in the year:

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 and remodel the existing station concourse to improve pedestrian flows into the town centre.

Progress in 2012/13

- an amended concourse design has been agreed with the train operators and is being implemented with delivery due by December 2013
- the footbridge was installed, through a push-launch methodology over the live railway, in October 2012
- fit-out works are progressing, delivery of the whole link to Dingwall Road roundabout by late autumn 2013.

The Project is on programme for completion by December 2013.

Seven Sisters Station Capacity Improvement works. Programme ID 17.03

Current Project Stage: Contract award of GRIP 5 to 8

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 one will be improved by the widening of the access staircase.

Scope of works:

- relocation of staff platform accommodation
- widening of stairs to Platform one
- de-cluttering of Platform two
- reinstate Birstall Road entrance (to be used on match days and for emergency access)
- improvements to CIS & CCTV
- additional shelter on platform one.

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	March 2014

Programme ID 18.00 East Coast Main Line improvements

The following projects and schemes will allow an increase in long distance high speed passenger and freight services as part of a programme of ECML schemes identified in the 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 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 2012/13 (access to south end of GN/GE)

This element of the works is now being considered as part of the ECML Connectivity Fund in our CP5 Strategic Business Plan.

Progress in 2012/13 (Route)

- GRIP 4-6 as continued for track renewals, structures and maintenance
- physical works continued for track renewals, bridge renewals, track lowering and cable routeing, with a number of blockades completed successfully
- ongoing stakeholder consultation
- possession / blockade plans are agreed for the remainder of the work
- network change notices continue to be progressed
- recontrol of the route has now been added and embedded within the project scope (although not a CP4 requirement) and will be delivered within the same timeframe
- while progress to date has been to schedule, the loss of planned access on the GN/GE route due to freight train diversions following the Hatfield colliery landslip will require significant replanning. Any changes to completion timescales will be confirmed in the quarterly CP4 Delivery Plan updates.

Peterborough Station Area Capacity Enhancements. Programme ID 18.02

Current Project Stage: GRIP 5

The scheme will generate additional passenger train paths on the ECML at Peterborough by segregating East Anglian traffic from the ECML through the development of new island platforms (six and seven) to the west of the station. East Anglian freight traffic will be accommodated by a 775 metre goods Loop to the west of the station area. 775 metre freight trains will be able to access / egress the Spital Ladder from / to East Anglia will be possible via Platform five.

Extensions to the existing Platforms two and three will be provided to accommodate twelve-car Thameslink trains. Extensions to the existing platforms four and five 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 as part of the Access for All programme.

The rear face of the existing Platform three is to be built out to the Up Fast Line to accommodate southbound LDHS services (funded by the NRDF).

Progress in 2012/13

- GRIP Stage 6 major construction work is underway
- Nene siding alterations commissioned
- new electrical substation commissioned
- signalling stages one to nine complete
- two footbridge deck spans installed
- new Platform six and seven riser walls substantially complete
- new Platform three face (to Up Fast) construction commenced
- pits for new platform lifts under construction.

This project has a committed delivery milestone of GRIP 6 completion by March 2014 and the project is on target.

Milestones for ID 18.02		
Activity/Output	***Date***	***Date M t / Expected***
GRIP Stage 6 commences	January 2013	April 2012
GRIP Stage 6 complete	March 2014	March 2014

Alexandra Palace to Finsbury Park Third Up line. Programme ID 18.03

Current Project Stage: GRIP 6

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 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.

Progress in 2012/13

- the project has successfully completed a significant volume of design and implementation

work. This includes the installation of 15 S&C units, completion of 20 signalling stages, major overhead line remodelling and station platform works at Finsbury Park and Alexandra Palace
- a key programme milestone was achieved over Christmas and New Year 2012. During this high profile possession the overhead line on the Up side at Alexandra Palace was transferred to new portals and redundant structures removed to create space for the new track layout to be installed during future construction phases. A major signalling stage was also completed, including the commissioning of switch and crossing units
- a key programme milestone was achieved during Easter 2013. This required the track and overhead line to be slued at Alexandra Palace station, associated overhead line sluing and commissioning a new platform to create room for the new Up slow line
- depot connections to new Thameslink Depot have been installed on behalf of the Thameslink programme
- possession requirements for 2013 have been defined in conjunction with the National Delivery Service (NDS) planning team and train operating companies for completion of the remaining scope of the project
- a steering group with First Capital Connect has managed station working and operational interfaces at Finsbury Park and Alexandra Palace
- close consultation with East Coast Trains has continued to manage operational interfaces with Bounds Green Depot.

This project has a committed delivery milestone of GRIP 6 completion by December 2013 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: GRIP 6

This project supports the improved use of the Down slow 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 LDHS services south of Alexandra Palace through improved linespeeds.

Progress in 2012/13

- the project has successfully completed 450 metres of track relaying works to increase the passenger line speed on the Down slow line and this work scope will continue through the remainder of the programme
- Finsbury Park platforms three and five were extended to accommodate twelve-car services on behalf of the Thameslink programme. These were commissioned in time for the December 2012 timetable, allowing twelve-car First Capital Connect services to stop in the Down direction
- possession requirements for 2013 have been defined in conjunction with the NDS team and train operating companies for completion of the remaining scope of the project
- a steering group with First Capital Connect has managed station working and operational interfaces at Finsbury Park and Alexandra Palace
- close consultation with East Coast Trains has continued to manage operational interfaces with Bounds Green Depot.

This project has a committed delivery milestone of GRIP 6 completion by December 2013 and the project is on target to meet that date.

Milestones for ID 18.04		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 6 Commences	January 2012	September 2011

East Coast Mainline (ECML) Level Crossings. Programme ID 18.05

Current Project Stage: GRIP 6

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 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
- 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 2012/13

- a new footbridge was successfully installed at

- detailed design has been completed for a diversionary footpath at Ballast Hole level crossing
- a Transport Works Act application is being prepared to close Ballast Hole level crossing following the local council's rejection of the diversion order.

This project has a committed delivery milestone of GRIP 6 completion by October 2013 and the project is on target to meet that date.

Milestones for ID 18.05		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 4 stage gate review complete	September 2012	August 2012
GRIP 6 commences	August 2013	September 2012

Hitchin Grade Separation. Programme ID 18.06

Current Project Stage: GRIP 5-6

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 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 disruption.

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 2012/13

- signalling design complete
- main civils works substantially complete including flyover and chord embankment
- track installed and tamped through chord and flyover
- new junctions from Down slow on to chord and from chord on to Down Cambridge installed
- foundation construction for OLE commenced
- location cabinet staging and other signalling foundation construction commenced.

Milestones in the year:

The works have now been completed and the driver training programme has begun ahead of the December 2013 timetable change.

Milestones for ID 18.06		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 6 complete	December 2013	June 2013

York Holgate Junction Fourth Line. Programme ID 18.07

Current Project Stage: Project completion

This project has eliminated conflicting movements between Down Leeds line passenger services that operate to the north east and Scotland (typically three per hour) and all other passenger services.

This has also reduced a major constraint in developing timetables on the ECML thereby allowing an increase in LDHS services as part of a programme of ECML schemes as identified in the ECML Route Utilisation Strategy. This programme has allowed an increase in services with an improvement in performance even though more trains would be operating.

This project was successfully commissioned into operational use in December 2011.

North Doncaster Chord. Programme ID 18.08

Current Project Stage: 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.

Milestones for ID 18.08		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 4 Single option design completion	December 2011	December 2011
GRIP 5 completion	March 2012	March 2012
GRIP 6 completion	March 2014	March 2014 / TBA through change control process following DCO

Progress in 2012/13

- detailed design completed
- final supporting evidence supplied to the

Infrastructure Planning Commission
- DCO granted permitting construction and granting land acquisition and access
- land acquisitions commenced, access taken
- haul road construction complete and embankment construction started.

This project has a committed delivery milestone as recorded in the delivery plan statement and the project is on target to meet that date. Delivery remains subject to ground conditions being consistent with investigations to date.

First Capital Connect Train Lengthening. Programme ID 18.10

Current Project Stage: Project completion

This project had a delivery plan milestone of project implementation by November 2011 which it has successfully met.

The project provided 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 included, where necessary, the provision of additional driver only operated train dispatch equipment on platforms, and possible relocation of existing equipment.

Programme ID 19.00

East Coast Main Line Overhead Line Electrification Performance Improvements

Current Project Stage: GRIP 6

Scope of works

This project is split into the following distinct elements:

- defect survey – full survey of approximately 1,900 wire runs of the ECML to record all defects, all outstanding campaign changes and any existing non-conformances
- campaign changes – the implementation of eleven 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. Extra wire runs will be delivered as part of additional scope to be delivered by the end of CP4.
- neutral sections – the upgrade of 78 neutral sections to a more reliable type
- renewal of crossover and contact wire – the renewal of crossover / contact wire between Kings Cross and Wood Green
- vegetation – a detailed survey of all areas of critical vegetation with specific regard to OLE will be undertaken. This will be completed in line with the Group Standards for new infrastructure with consideration of future schemes (such as Auto-Transformer) being considered. This will include (where required) clearance back to maintainable boundaries.

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 2012/13

- defect removal and campaign changes, including tunnels, have been completed
- 78 neutral section upgrades now completed
- further vegetation clearance identified and aligned with power supply upgrade works.

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 2014
Defect removal and campaign changes	March 2013	March 2013
Crossover wire, contact wire renewals, defect removal and campaign changes	March 2014	March 2014

Programme ID 20.00

St Pancras – Sheffield linespeed improvements

Current Project Stage: GRIP 6

Scope of works

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 vehicle operated services calling at Leicester, Derby and Chesterfield.

Progress in 2012/13

- commencement of track discipline GRIP 6 works
- partial completion of GRIP 4 outline design for other disciplines
- signal sighting concluded
- completion of detailed structural surveys
- network change notice issued
- heavy maintenance of affected S&C units concluded
- first footpath closed (Ampthill).

Milestones in the year:

Milestones for ID 20.00		
Activity/Output	***Date***	***Date Met/ Expected***
Main Contract award	December 2012	December 2012
Network Change issued	September 2012	September 2012

Programme ID 21.00

Nottingham Resignalling

Current Project Stage: GRIP 5-6

Scope of works

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 2012/13

- implementation of main civils works (pre blockade) completed
- post works timetable plan agreed
- all pre summer works S&C installed
- network change established
- station change established
- planning permission for footbridges (footpath crossings closures) approved
- testing commenced
- signalling installation proceeding to plan.

Milestones in the year:

Milestones for ID 21.00		
Activity/Output	***Date***	***Date Met / Expected***
Civils complete*	December 2012	December 2012

Programme ID 22.00 Midlands Improvement Programme

Bromsgrove Electrification. Programme ID 22.01

Current Project Stage: GRIP 3

Bromsgrove electrification has a key interface with a third party funded project intended for the relocation and construction of a new Bromsgrove station, a pre-requisite for electrification and the extension of the Cross City line services. Third party funding had been unsecured which caused the electrification scheme to be taken out with the change control process. The third party promoters have agreed funding in principle of the new station, which enables the delivery programme to be refreshed during 2012/13. This revision has led to CP5 delivery milestones with electrification commissioning now planned for July 2016 subject to agreements and third party funding of the new station.

The scope of the project includes:

- extension of electrification from Barnt Green to Bromsgrove
- the existing signalling equipment between Barnt Green and Bromsgrove requires immunisation works which will result in complete signalling renewal and control transfer
- permanent way and signalling enhancements at the site of the relocated Bromsgrove station to provide adequate infrastructure to turn back trains
- overbridges between Barnt Green and Bromsgrove which have been identified for either track lowering or bridge reconstruction are being examined due to insufficient clearance for electrification.

Progress in 2012/13

- GRIP Option Selection and Approval in Principle designs. Consultants appointed to undertake the GRIP 3 engineering development, excluding re-signalling. The signalling development will be undertaken using Network Rail's Signal Design Group (SDG). Ground investigations complete with Timetabling and RailSys draft reports issued.
- indicative options were identified with various stakeholders including DfT, TOCs, and FOCs. GRIP 3 preliminary designs have been progressed on preferred option for a 'centre' turn back and the down fast re-aligned based on comparison of safety, operations and cost. Bridge reconstruction is the preferred solution to achieve electrification clearances at affected structures.
- Network Rail's Strategic Business Plan submission seeks funding for resignalling in the

Bromsgrove Area and down to Eckington to be a deliverable in CP5.

- on the station scheme, consultation with the Environmental Agency regarding contamination was completed to enable GRIP 4 designs to be progressed. Worcestershire County Council managed public consultation in January 2013 and planning permission is due later in 2013. Centro project board endorsed Network Rail as the main delivery agent for design and implementation of the new station scheme.

Milestones in the year:

Overall progress is being made on both the electrification schemes with Network Rail, Centro and Worcestershire County Council working collaboratively towards a rail industry solution. GRIP 3 on-going with no milestones programmed in 2012/13.

Redditch Branch Enhancement. Programme ID 22.02

Current Project Stage: GRIP 5

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 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.

A DCO application is required for powers to widen the railway for the double track section and to acquire land outside the rail boundary where agreements with land owners and other parties are not achieved.

Progress in 2012/13

- GRIP 4 designs completed for Approval In Principle.
- public consultations and preparation of substantial documentation to support the application for the DCO application was accepted by the Planning Inspectorate (PINS) on 1 October 2012
- a PINS Public Meeting took place in January 2013. Network Rail has addressed and submitted a significant number of responses to representations made by members of public and questions raised by the PINS Examining Authority. Negotiations progressed with affected land owners, local authorities and affected statutory undertakers
- GRIP 4 close out including estimates based on GRIP 4 design and Multi Asset Framework Agreement (MAFA) Contractor information and Quantitative Risk Assessment based contingency allowance. Signalling scheme plans prepared for approval by Major Schemes Review Panel. Network change consultation completed.

Milestones in the year:

The project schedule has the critical path and project priority through the DCO process allowing GRIP 4 activities to be completed in parallel. GRIP 5 design has been instructed and commissioning remains on target subject to PINS and the Secretary of State making the DCO by November 2013.

Milestones for ID 22.02		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 4 Stage gate Review Complete	April 2012	May 2013

Line Speed Improvements Wrexham to Marylebone. Programme ID 22.03

Current Project Stage: Project completion

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.

Project was completed in December 2011.

Route 16 – South Ruislip Loop (formerly Gerrards Cross bay platform). Programme ID 22.04

Current Project Stage: Project completion

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 22.04 has contributed towards the delivery of an improved track layout in the Northolt/South Ruislip area allowing slow trains to be overtaken which facilitates more flexible timetable arrangements.

Project was completed in December 2011.

Route 17 – Train Lengthening. Programme ID 22.05

Current Project Stage: Project complete

The project supports the industry capacity metric 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 2012/13

- Tranche 1 sites Whitlocks End, Widney Manor, Yardley Wood & Wythall Complete
- Tranche 2. Spring Road, Kidderminster, Cradley Heath, Langley Green, Lye, Rugeley & Hednesford handed back to Asset Management and station facility owner. Snagging at: Droitwich Spa (separate circuits for platform and roadway lighting) & Small Heath (stop board post).

Milestones in the year:

The overall project was well ahead of the planned commissioning date of December 2013 with snagging and final hand backs only outstanding at December 2012.

Milestones for ID 22.05		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 6 complete Tranche 2	December 2013	December 2012

East Midlands Train Lengthening. Programme ID 22.06

This scheme has provided additional carrying capacity on East Midlands routes by operating longer passenger trains. This required platform lengthening to accommodate ten Class 222 vehicle trains at Loughborough and four Class 170 vehicle trains at Stansted Airport. Additionally this project has allowed the full passenger carrying capacity of all trains stopping at Loughborough to be utilised.

Loughborough platform extension

This part of the project was delivered February 2012.

Stansted Airport

This part of the project was delivered December 2011.

Class 170 SDO

This part of the project was delivered February 2011.

Programme ID 23.00 Northern Urban Centres (a) Yorkshire

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, now been contractualised.

Network Rail's CP4 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 projects includes:

Capacity improvements (Leeds area)

Current project stage: GRIP 7

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 opportunities afforded by signalling renewals.

The proposed scope of works includes enhanced stabling and servicing facilities at Skipton to accommodate up to twelve (additional) electric vehicles. 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 2012/13

- the new turnback facility at Horsforth was commissioned on 29 October 2012. This work was delivered in conjunction with signalling renewals between Harrogate and Horsforth, including the two additional signal sections in each direction which were commissioned on the same date
- the remaining platform extensions at Marsden, Mirfield and Mossley were brought into use on 25 March 2013, completing the programme of platform extensions in CP4
- the remaining non-critical works in connection with additional stabling at Skipton were completed in July 2012

- the provision of a turnback facility at Micklefield is not to be progressed in CP4 as it has been confirmed that there is no requirement.

West and South Yorkshire Platform Lengthening, including South Yorkshire Train Lengthening. Programme ID 23.02

Current Project Stage: GRIP 7

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, Deighton Up & Down, Mossley Up, Mossley Down, Marsden Down, Mirfield Down.

Progress in 2012/13

- following the contractualisation of Northern Rail's Operational Plan, further discussions were held to conclude the requirement for platform extensions. As a result of this, there was no requirement to undertake platform extensions at stations in South Yorkshire
- requirements for platform extensions were agreed for a total of five stations.
- following the delivery of platform extensions at Cottingley, Deighton and Mossley (Up platform) in 2011/12, the remaining extensions at Marsden, Mirfield and Mossley (Down platform) were brought into use on 25 March 2013, completing the programme of platform extensions in CP4.

Milestones for ID 23.02

Activity/Output	*Date*	*Date Met / Expected*
Outline Design completion for Marsden, Mirfield and Mossley	September 2012	September 2012
Practical completion	December 2012	March 2013

West Yorkshire Stabling (Northern Urban Centres)

Current Project Stage: Project completion

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 respectively for Northern Rail as part of the DfT's 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. Additional stabling facilities Skipton, Hull Botanic Gardens and Neville Hill are being progressed.

Progress in 2012/13

The following projects were completed in 2012:

- Skipton stabling additional capacity
- Hull Botanic Gardens
- Neville Hill additional stabling.

South Yorkshire - Stabling for Northern. Programme ID 23.03

Current Project Stage: Cancelled

The CP4 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: GRIP 6

The project has provided the infrastructure to allow for operating longer trains in accordance with the Northern Rail Operational Plan by platform lengthening.

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

* This is later than planned due to agreement of the platform stepping work at Swinton and Walkden which is planned to be complete in August 2013.

Progress in 2012/13

- Thatto Heath (Down) platform extension was completed by the North West electrification

project in September 2012
- the permanent platform extension at Bescar Lane was completed in June 2012.

The permanent solution at Bescar Lane is planned to be completed by the end of June 2012.

Thatto 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: GRIP 6

The project provides additional stabling and servicing facilities for Northern Rail's fleet to accommodate the additional Northern Rail rolling stock to meet expected 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 2012/13

- authority for design and implementation of additional shunt neck work was secured in April 2012
- the signalling work to resolve the interlocking of the shunt neck was brought into operation in May 2012 and fully commissioned in October 2012.

The original scope was completed in December 2011. However, additional work was identified to the west shunt neck to bring it into operation.

Milestones for ID 24.02		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 3 Completion	July 2011	July 2011
GRIP 4 Completion	August 2011	August 2011
GRIP 5-6 Completion	December 2011	May 2012 (including additional scope)

Salford Crescent station redevelopment. Programme ID 24.03

Current Project Stage: GRIP 6

This project is to redevelop Salford Crescent station in order to support the operation of six-car units, improve passenger circulation and comply with Disability Discrimination Act 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.

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.

Milestones for ID 24.03		
Activity/Output	***Date***	***Date Met / Expected***
GRIP 5-6 authority	April 2012	April 2012
Start on site	September 2012	September 2012
New footbridge open / old access removed	March 2013	March 2013

Progress in 2012/13

- authority for GRIP stages 5-8 was secured in April 2012, with a reduced AFC of £10.718m (reduction of £0.9m)
- the option being delivered 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. New canopies with integrated CCTV, PA and CIS are being provided. The platform is to be extended at each end to accommodate six-car trains
- a method of working allowing the station to remain open for the majority of the construction phase was agreed with operators
- physical works started on site in September 2012
- works proceeding on schedule, with key completed activities as follows:
    1. lift shaft installed: January 2013
    2. staircase installed: February 2013
    3. podium structure to house new ticket office: February 2013
    4. new footbridge opened: March 2013
    5. demolition of concrete ramp (old access): 31 March 2013
    6. platform extensions into use: 1 April 2013.
- GRIP Stage 4 completed in April 2012.

Milestones in the year:

This project has a committed delivery milestone of completion by October 2014 and is on target to complete GRIP 6 in February 2014.

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

Programme ID 24.04. Route 20 Capacity Enhancements.

Current project stage: Stalybridge – GRIP 5-6 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 2012/13 (Stalybridge Intervention):

- station change for works to Stalybridge station agreed
- Network Change agreed by train operators
- Stalybridge re-modelling and re-control completed November 2012
- Stalybridge station platform works completed January 2013.

Milestones in the year:

The Hadfield line interventions are on hold pending finalisation of the Northern Rail Operational Plan.

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 – Implementation; Manchester to Leeds – Outline Design

The primary output is to stimulate 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.

Scope of works

It has been agreed that the project will be taken forward as two separate schemes: Liverpool to Manchester and Manchester to Leeds.

<u>Liverpool to Manchester</u>

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.

These changes will facilitate achievement of a journey time of 32 minutes from Liverpool Lime Street to Manchester Victoria.

The scope includes:

- rerailing 8,250 yards of rail at various locations between 3m 1080yrds – 20m 1245yrds
- upgrade of S&C to allow 90mph running at Earlestown East & West, Sankey & Newton-le-Willows
- Track lowering and drainage works at Rainhillt
- recanting and realignment (8,759 yards), various locations, between 3m 1051yrds – 14m 366yrds
- design and/or maintenance tamping (5,330yrds)
- spot sleeper replacement
- fencing upgrades
- signalling alterations
- structural remedial works
- level crossing deck replacements (two locations).

This scope of works allows the introduction of the following line speed changes to support SRT changes:

- 3m – 3m72ch increases from 75 – 80mph (UP)

- 3m72ch – 21m60ch increases from 75 – 90mph (UP)
- 3m – 21m60ch increases from 75 – 90mph (DN)
- 22m 40ch – 25m 40ch increase from 40/60 – 75mph (DN)
- 22m40ch – 25m43ch increase from 40/60 – 75mph (UP).

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 GRIP 1 and 2 has looked at the standard hourly timetable to identify the use of pathing time and options to reduce it.

The following single options have been identified for progress to final design and implementation:

- relaxing the approach control through signalling interventions to the down passenger Loop at Dewsbury
- relaxing the approach control at Mirfield East Junction
- increasing the linespeed into the Up Passenger Loop at Marsden.

Significant interfaces

There are interfaces with stakeholders including the DfT, TOCs, FOCs, Merseytravel, Transport for Greater Manchester (TfGM) and West Yorkshire PTE. The scheme has interdependencies with other projects including the Seven Day Railway renewals and resignalling schemes, the Northern Hub and Electrification.

Progress in 2012/13

- GRIP stage 3 complete for Mirfield-Dewsbury
- GRIP stage 4 complete for Mirfield-Dewsbury
- RSSB Derogation approved for approach control changes at Mirfield – Dewsbury
- GRIP 5 commenced for Mirfield – Dewsbury.

Milestones in the year:

The linespeed improvements will be available throughout the identified locations by December 2013 with the exception of the linespeed improvements from 3m – 6m20ch (UP) and 3m – 6m60ch (DN). The project has agreement, through the change control processes, to delay this introduction as it prevents abortive works and associated costs being incurred due to overlapping scope with Northern Hub; Huyton & Roby Capacity Scheme. The remaining line speed improvements will be implemented during 2014. Assessment of impact on the Sectorial Running Time (SRT) changes has been undertaken and is negligible.

Milestones for ID 25.00: Manchester to Leeds		
Activity/Output	***Date***	***Date Met /Expected***
GRIP 3 Marsden work	May 2013	May 2013
GRIP 4 (stage gate review complete) Marsden work	June 2013	June 2013
GRIP 6 commences	August 2013	August 2013
GRIP 6 complete	March 2014	March 2014

Programme ID 26.00 - Western Improvements Programme

Barry – Cardiff Queen Street corridor. Programme ID 26.01

Current Project Stage: GRIP 4

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 twelve trains per hour to 16 trains per hour. 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
- Cogan Junction Loop enhancement
- City Line linespeed enhancement.

These outputs are as agreed with the ORR following the change control approval.

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 Town and Caerphilly stations, and a new platform and passing Loop at Tir Phil funded by the Welsh Assembly Government.

Progress in 2012/13

- successful commissioning of the first Cardiff area signalling renewal (CASR) phase on the Vale of Glamorgan (VOG) in Mar 2013. This has enabled innovative technology to be deployed including Frauscher axle counters and plug coupled

cabling
- work commenced on site with cable route and relay room bases being constructed for the second main stage commissioning, that of the Valleys Line section
- contracts for delivery of the stations works let. New Platform 5 and Cardiff Queen Street under construction
- overall programme for commissioning work developed and consulted with TOCs 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).

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 Central 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 16 trains per hour in the Barry to Queen Street corridor.

Milestones in the year:

The first commissioning was delivered in 2012/13.

This project has a committed delivery milestone of completion by October 2015 and the project remains on target to meet that date. The project gained GRIP 5-8 authority in May 2011.

Cotswold Line Redoubling. Programme ID 26.02

Current Project Stage: Project completion

The objective of this project was to increase capacity and improve performance by redoubling 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 and 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.

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.

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: GRIP 4

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.

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 2012/13

- track design work completed. The works in Wickwar tunnel are being jointly funded by IEP and Gauge Capability projects as all three projects require enhancements within the tunnel
- contract awarded for all the track works
- Network Rail SDG 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 2012/13 finalised allowing all the works to be completed by December 2013 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 2013 and the project is on

target to meet that date.

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	December 2013
GRIP 7 commissioning	December 2012	December 2013

Maidenhead and Twyford (relief lines). Programme ID 26.04

Current Project Stage: Closed

It has been agreed with the TOC and the DfT this project is no longer required to sustain the operational plan.

Programme ID 27.00 - North London Line capacity enhancement

Current Project Stage: Project completion 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):

- four trains per hour Stratford to Richmond
- two trains per hour Stratford to Camden Road (peak hours only)
- two trains per hour Stratford to Clapham Junction
- two trains per hour Clapham Junction to Willesden.

In addition, the enhancements to the North London Line infrastructure have enabled an extension of the East London Line services to Highbury & Islington.

The infrastructure modifications enable segregation of the North London Line and the East London Line 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: GRIP 6

The National Radio Network (NRN) operational licence for southern England (i.e. south of the 'Severn/Wash line') expired at the end of 2012. northern England, Wales and Scotland will lose the NRN licence in December 2015.

The 40 freight-only branch lines south of the 'Severn-Wash' line have been installed with GSM-R base station sub-system equipment, and were brought into live GSM-R operation by the target date of 31 December 2012. The live system provides, as a minimum, a level and quality of driver-signaller communication equivalent to the existing NRN service.

An alternative solution for the freight branches in the north to meet the requirement through roaming onto an equivalent service provided through public mobile network operators was investigated in detail, but has not been pursued for commercial, technical and operational reasons. Consequently, GSM-R will be deployed on the north freight branches in similar manner and to the same design criteria as those in the south.

Progress in 2012/13

- GSM-R in the south has been installed and is in live operation
- discussions with public mobile operators concluded, a decision that progressing this option was not viable
- GSM-R in the north has been designed, contracted and installation works have commenced.

Completion of the implementation of GSM-R on all remaining freight branches will be achieved in 2013/14.

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: nearing completion with specific entrances uncompleted due to listed building issues
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 has provided significant challenges around listed building consent together with buried services diversions. The programme was rephased to allow the key stations which had Olympic links to be completed ahead of the others.

Progress in 2012/13

- Phase 2a completed and handed back
- Phase 2b 80 per cent complete
- Phase 3 Olympic stations completed
- Phase 3 remaining franchised stations 80 per cent completed.

Four schemes at Cambridge, Brighton, East Croydon and Sheffield will not be completed during CP4 due to complex third party schemes at those stations which would mean the works could be abortive. Agreement has been reached with the DfT to provide an element of support for the schemes moving forward.

Programme ID 30.00 - Scotland: Tier 3 Project Development Fund

Fund Purpose:

This fund is primarily aimed at initial development of future projects.

These 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:

Funding:

All project proposals are submitted by Network Rail for approval by Transport Scotland prior to any commitments being made.

There are currently 20 schemes being developed under this fund, eight of which the development work is complete.

Programme ID 31.00 - Scotland Small Projects Fund

This programme comprises 20 projects (including those completed in previous years) at various stages of development / delivery, from output definition to project close out. All projects are programmed to be completed during CP4.

Progress in 2012/2013 of key projects:

Glasgow South Suburban Renewals (GSSR, LLF690)

Current Project Stage: GRIP 6

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 is now partially delivered with Busby Junction final commissioning in July 2013.

Hurlford Line Speed Increase

Current Project Stage: GRIP 7

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. This project has now been delivered.

Midcalder S & C Renewal

Current Project Stage: GRIP 6

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. This is being delivered in conjunction with conversion of Kirknewton level crossing to MCB-OD. The project is now in delivery and is on programme for a May 2013 commissioning.

Dumfries Station Improved Turnback Facility

Current Project Stage: GRIP 6

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. The project is due for delivery in June 2013.

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 in previous year
Grangemouth east facing freight connection. Pre-feasibility completed in previous year. No further work undertaken.		Completed in previous year
G&SW line speed increases. Pre-feasibility completed in previous year. No further work undertaken.		Completed in previous year
Rail enhancement between Aberdeen and the Central belt - output definition		Milestone date not yet agreed
Carstairs Junction remodelling. Further pre-feasibility work undertaken		Completed June 12
Mossend area capacity improvements. Further pre-feasibility work undertaken.		Completed June 12
Motherwell North re-signalling enhancements - option selection		Completed Jan 13
Further electrification of the network - option selection		Completed July 12
Motherwell area stabling. Further pre-feasibility work undertaken.		Completed June 12
Motherwell area stabling – Bridge Sidings pre-feasibility	Oct-13	Oct-13
Carstairs to Haymarket line speed improvements. Option selection work being undertaken.	May-13	May-13
Greenock Central Crossover pre-feasibility	Mar-14	Mar-14
Law – Garriongill line speed improvements pre-feasibility	Milestone not yet agreed	
Milngavie Platform Extension pre-feasibility	Milestone not yet agreed	
Johnstone – Kilwinning line speed Improvements pre-feasibility	Nov-13	Nov-13
Polmadie to Glasgow Central bi-directional working pre-feasibility	Mar-14	Mar-14
Bathgate car park extension pre-feasibility	Apr-13	Apr-13
Highland Main Line journey time improvements.		
Phase 1 - design & construction	Mar-12	Apr-12
Phase 2 – option selection	Jun-14	Jun-14
Aberdeen to Inverness rail improvements - option selection	May-12	May-12
Revised option selection	Dec-13	Dec-13
Dalmarnock station redevelopment - design & construction underway	Sep-13	Sep-13

Stirling North to Dunblane Minor Renewals and Enhancement (previously titled Bridge of Allan)

Current Project Stage: GRIP 7

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. The project was delivered in March 2013.

Barnhill Line Speed Improvement

Current Project Stage: GRIP 5

This involves linespeed improvements between Perth and Barnhill for passenger and freight trains. Structure and track surveys completed. Speed differentials for passenger and freight will be implemented in autumn 2013.

Stirling Middle: Junction Doubling

Current Project Stage: GRIP 6

The doubling of Stirling Middle Junction increases capacity and provides higher linespeed to / from Alloa for both passenger and freight services. The project is now in staged construction with all work due to be commissioned by autumn 2013.

Paisley Corridor Improvements Scheme

Current Project Stage: Project close out

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. The project was delivered in 2012.

Ladybank Junction Enhancements

Current Project Stage: GRIP 4

The project will increase linespeed for trains between Edinburgh and Perth/Inverness by remodelling the route towards Hilton Junction. Single option now agreed and project progressing with a January 2014 commissioning date.

Camelon Line Speed Improvement

Current Project Stage: GRIP 5

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: GRIP 7-8

The project is now complete and the railway between Airdrie and Bathgate has reopened. 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.

We are in the process of closing out some residual accommodation works and land claims, and forecasting a completion report later in 2013.

Paisley Corridor Improvements. Programme ID 32.02

This project sought 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. Substantial completion of the project was achieved in February 2012 with all new infrastructure operational by that date.

Progress in 2012/13

- commencement of an enhanced Ayrshire timetable from December 2012, featuring additional train services and faster journey times
- settlement of final accounts with the main contractors by December 2012.

Milestones in the year:

All remaining project milestones were achieved during 2011/12. This included the signalling re-control milestone, which was originally planned for December 2012 and has been achieved twelve 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. There were no remaining milestones to be achieved in 2012/13.

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 was invited to take the project forward through final development and implementation.

Network Rail assumed the role of Authorised Undertaker in November 2012 via a transfer agreement with Transport Scotland.

A commercial agreement is in place with ORR for Network Rail to deliver the project by June 2015.

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:

A submission was made to the ORR in the summer of 2012 for the inclusion of the development and delivery of the project in the Delivery Plan, which identified future milestones to be met as follows in the table below (Milestone for ID 32.03).

Glasgow to Kilmarnock. Programme ID 32.04

Current Project Stage: Completed

This project was commissioned in December 2009. The works are now complete and the final accounts settled. The project will be formally closed out in 2013.

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. This project has been completed.
- Yoker Depot
  - the project involved enhancement to the existing controlled emission toilet facilities at Yoker Train Maintenance Depot in Glasgow, currently leased to First ScotRail. This project has been completed.
- 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. This project has been completed.
- Shields Depot Enhancement
  - the project (now completed) 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

Milestones for ID 32.03		
Activity/Output	***Date***	***Date Met/Expected***
Commence Mining Remediation	15 November 2012	15 October 2012
Commence Main Works site mobilisation	31 January 2013	7 January 2013
GRIP 4 Stagegate Review	30 April 2013	17 April 2013
Commence Track Laying	29 June 2014	29 June 2014
Route Available for driver training	14 June 2015	14 June 2015
Stations ready for handover to TOC	14 June 2015	14 June 2015
Service Commencement by TOC	6 September 2015	6 September 2015

  - 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 facilities.

- gauge clearance in central Scotland at 46 sites.

This project has been completed.

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. The Airport owners accepted that the platforms are complete in April 2013. The land transfer can now be finalised. 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: Project completion

Network Rail provided covered, well lit, with CCTV improved access, including step free and Disability Discrimination Act compliant access, between Waverley station and Princes Street, in Edinburgh, by delivering:

- three banks of two up & down side by side covered and lit escalators with CCTV connecting with the existing internal station mezzanine link bridge and Mall shopping precinct
- the removal and reconstruction of seven varying flights of stone steps, which are covered and lit to modern standards
- a new pedestrian entrance to Waverley station on Princes Street which is capable of being closed and secured during station closure hours
- the provision of two 16 person lifts, located within the existing station footprint but adjacent to the Princes Mall Shopping Centre, which connects 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 which also includes a ramped access which provides step free access from Princes Street to the station platforms.

Progress in 2012/13

- Phase 2 works completed in July 2012 with the installation of the two new 16 person lifts and access from Princes Street across the Mall roof to the lifts providing step free access from Princes Street to platform level.

Milestones for ID 33.02		
Activity/Output	***Date***	***Date Met/ Expected***
Phase 2 Completion	July 2012	July 2012

Edinburgh Gateway (formerly Gogar) Intermodal Interchange. Programme ID 33.03

Current Project Stage: GRIP 5

This project forms part of the Edinburgh Glasgow Improvement 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 2012/13

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 delivery of the Edinburgh Tram project. As a consequence the Detailed Design cannot be completed and only some of the advance works have been undertaken. The project was therefore 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 been undertaken in 2012/13. This has mainly included advice to City of Edinburgh Council and Transport Scotland on potential alternative design solutions to address the Edinburgh Tram interface issues and liaison with Scottish Water and adjacent land owners on the utility diversion works.

Although the Edinburgh Tram dispute has now been resolved and physical works have recommenced, timescales for the implementation of this project cannot yet be provided. Now that the tram works are nearing completion, Network Rail is currently discussing appropriate timescales for the delivery of this project with Transport Scotland with a view to removing it from the 'Projects Outwith the Change Control Process' list in the near future.

Edinburgh Glasgow Improvement Programme (EGIP); Haymarket North Lines Electrification. Programme ID 33.04

Current Project Stage: Project completion

This project formed part of the Edinburgh to Glasgow Improvements Programme (EGIP). It electrified the northern two tracks (the North Lines) of the Edinburgh to Glasgow route between Edinburgh Waverley and Haymarket Central Junction. Electrification of this section of the Edinburgh to Glasgow facilitates the reliable operation of the new Airdrie to Bathgate services, as introduced in December 2010.

The Electrification through Haymarket North Tunnel into Princes Street Gardens was completed March 2011.

Edinburgh Glasgow Improvement Programme - EGIP Infrastructure Project. Programme ID 33.05.

Current Project Stage: GRIP 5

The Edinburgh Glasgow Improvement Programme (EGIP) is a key component of the Scottish Government's future transport strategy. EGIP will deliver more frequent and faster rail services between Edinburgh and Glasgow.

EGIP contains two main constituent Projects, the electrification of the main Edinburgh to Glasgow via Falkirk line (Project No. 33.06) and a number of inter-related infrastructure projects that provide the additional capacity required to operate the enhanced services post electrification (Project 33.05).

It is now proposed that EGIP will be implemented in a number of Phases. The Initial Phase, to be delivered in CP5, will electrify the Springburn to Cumbernauld route and the main Edinburgh and Glasgow route. It will also include a number of the infrastructure projects.

The following schemes will be delivered as part of EGIP Initial Phase:

- Edinburgh Waverley station infrastructure Capacity: Abbeyhill 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
- Springburn Re-Modelling
- new EGIP Rolling Stock Depot
- intermediate Edinburgh & Glasgow station platform lengthening works.

The following schemes will be delivered as later Phases of EGIP.

- Glasgow Queen Street high level station concourse works
- Croy station turnback
- Greenhill Upper Junction enhancement
- Winchburgh Junction enhancement
- Almond chord
- Winchburgh Junction to Dalmeny Junction upgrade
- Hyndland Turnback.

Progress in 2012/13

GRIP Stage 4 development work was completed on the above projects, with the exception of the New EGIP Rolling Stock Depot, Intermediate Edinburgh & Glasgow station platform lengthening works and Glasgow Queen Street high level station concourse works. These schemes were only introduced into the scope of EGIP at the time of the HLOS announcement and as a consequence are progressing through earlier stages of the GRIP process.

Preparatory work has also been progressed on the confirmation of scope, timescales and funding requirements in CP5 for EGIP Initial Phase.

Edinburgh Glasgow Improvement Programme (EGIP) - Electrification Project. Programme ID 33.06

Current Project Stage: GRIP Stages 5-8 for 2013 advance works and Cumbernauld electrification

This project forms part of EGIP. It will electrify the core Edinburgh to Glasgow via Falkirk High route, and undertake the majority of route clearance works on the linked diversionary route (via Falkirk Grahamston and Cumbernauld), and northern extensions to Stirling, Dunblane and Alloa.

The project covers approximately 230 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.

The outputs from this phase of the project will be completion of a package of advance route clearance works at 14 structures, and electrification of the route between Springburn and Cumbernauld.

Progress during 2012/13:

2012 advance route clearance works were completed as per the programme – 28 structures in total.

Following a commercial submission to ORR, and both its and Transport Scotland's agreement to RAB fund further advance works, contracts were awarded in October 2012 for the next tranche of advance route clearance works during 2013 through to mid-2014, and to undertake electrification of the route between Springburn and Cumbernauld for electrified services to run on that route from May 2014.

Local Councils have signed off the majority of Form A designs for advance 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 TOC for delivery of the 2013 route clearance works and Cumbernauld Electrification, and constructive engagement and input has been received from customers during the formulation of access plans for 2014.

Cumbernauld Electrification advance works are progressing well, with OLE installation due to start in late June 2014.

Preparatory work has also been progressed on the confirmation of scope, timescales, and funding requirements in CP5 for the electrification, and for the infrastructure elements of EGIP Initial Phase (Project 33.05).

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***
GRIP4 complete ; All Schemes (except those detailed above)	December 2012	December 2012
GRIP3 complete ; Intermediate E&G station Platform Lengthening Works	March 2013	March 2013
GRIP4 complete ; New EGIP Rolling Stock Depot	June 2013	June 2013

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 2012 advance works	May 2013	May 2013
Completion of GRIP Stage 5 to 8 for 2012 advance works	June 2014	June 2014
Completion of Cumbernauld Electrification	June 2014	May 2014

Milestones for ID 33.07		
Activity/Output	***Date***	***Date Met/Expected***
Complete GRIP 4 Stagegate 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

Milestones for ID 33.08		
Activity/Output	***Date***	***Date Met/Expected***
Award GRIP 4 to 8 Contract	June 2012	June 2012
Commission 25kV OLE	November 2012	November 2012
Complete Works	March 2013	March 2013

Edinburgh Glasgow Improvement Programme – Haymarket Station Capacity. Programme ID 33.07

Project Stage: GRIP Stage 5 to 8 implementation

This Project forms part of 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 :

- 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 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 2012/13

- completion of detailed design
- completion of structural steelwork frame for new building
- completion of new building concrete deck
- installation of new platform canopies.

Paisley Canal Electrification Additional CP4 Alliance Project Performance – Rolling Stock. Programme ID 33.08

Scope of works

Network Rail has installed 25kV overhead electrified contact system on the Paisley Canal Line. The physical works comprise the electrification of the line from Corkerhill Depot Junction to Paisley Canal station. The section from Shields Junction to Corkerhill Depot Junction is already electrified and is utilised to service Shields and Corkerhill Light Maintenance Depots.

Installation of approximately 8.8 single track kilometres of 25kV OLE, provision of driver only operation platform equipment; a limited clearance OLE contact wire height in conjunction with track lowers at foul overline structures; parapet protection works at overline structures; and immunisation and electromagnetic conductivity works to cable routes, equipment and station domestic wiring installations.

This project is a Network Rail / First ScotRail Alliance initiative to improve timetable performance and maximise the utilisation of existing electric multiple unit (EMU) rolling stock.

This introduced EMU operation to the following stations: Dumbreck, Corkerhill, Mosspark, Crookston, Hawkhead and Paisley Canal.

The project is supported by Transport Scotland and has been added to the Scotland RAB for CP5 and beyond.

Electrification of the route has allowed two Class 156 vehicles to be deployed elsewhere in Scotland. This provides additional resilience for short-term strengthening for special events and helps support alternative transport facilities during Scottish Government Trunk Road refurbishment projects such as the Kessock Bridge refurbishment scheme near Inverness. This has required strengthening of services north and west of Inverness to cater for increased usage due to the planned bridge closures and modal shift to rail by commuters.

The re-deployment of existing rolling stock resources also contributes to the rolling stock required to operate the Borders railway project.

Progress during 2012/13

This was a fast track project with a short timescale from detail design through construction to commissioning of the OLE and full implementation of electrified services between Glasgow Central and Paisley Canal.

The OLE was tested and commissioned in November 2012. This allowed a partial EMU service to commence prior to the December 2012 timetable change when full EMU introduction took place.

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 GWML from Maidenhead (the furthest western extent of the Crossrail project) and to deliver the scope of works described below.

Scope of works

The detailed scope required for this project includes the extension of electrification on the core route as noted below:

- from Maidenhead to Reading
- depot at Reading
- Reading to Newbury
- Reading to Didcot Parkway
- Didcot Parkway to Oxford
- Didcot Parkway to Wootton Bassett Junction
- Westerleigh Junction to Bristol Parkway
- Bristol Temple Meads to Bristol Parkway
- Bristol Temple Meads to Bristol Parkway (Filton)
- Wooten Bassett Junction to Thingley Junction
- Thingley Junction to Bristol Temple Meads
- Bristol Parkway to Newport
- Newport to Cardiff Central
- Cardiff Central To Swansea

Additional scope includes:

- Acton to WCML
- Thames Valley passenger branches (Windsor, Marlow, Henley).

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 remit is being executed by Network Rail delivering 25kV AC overhead electrification between Maidenhead, Oxford, Newbury, Bristol, Cardiff and Swansea and is further detailed in the activity tables above.

Outputs

This project facilitates the further introduction of electric train service operation on GWML between London and Swansea.

Significant interfaces

- 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 IEP is planned to introduce a fleet of electric and bi-mode Super Express Trains capable of 125 miles pep hour on key business routes on the GWML
- 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. The project 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
- SCADA project: suitable solution for electrical control that meets the timescales for GWML electrification is to be established
- Cardiff Area Signalling Renewal (CASR) project: a joint programme to take advantage of signalling possessions / blockades for electrification work is to be established
- layout enhancements in the Bristol and Oxford areas
- W12 gauge clearance between Didcot to Bristol and Reading and Acton.

Key assumptions

- 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 and Airport Junction already exists for Paddington to Heathrow services
- changes to the existing OLE system 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
- provision of new National Grid supply point at Didcot, Melksham and Imperial Park
- 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 by:

- September 2015 Didcot IEP test section
- December 2016 Didcot to Oxford
- December 2016 Reading to Newbury
- December 2016 Didcot to Bristol Parkway & Chippenham
- May 2017 Chippenham to Bristol Temple Meads
- December 2017 Bristol to Cardiff
- May 2018 Cardiff to Swansea.

Network Rail's specific commitments:

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.

Bristol to Cardiff

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.

Cardiff to Swansea

Cardiff to Swansea electrification is currently being developed with completion of GRIP 3 in QTR1 2014.

Procurement of High Output Plant System (HOPS)

- work with adjacent line open (ALO)
- construct an average of one equivalent tension length per shift (six hours)
- carry all materials to site
- install two conductors simultaneously, at design tension.

The HOPS will be formed of three consists:
- Consist 1 foundations (not just piling)
- Consist 2A main steelwork and small part steelwork and Consist 2B wiring – can be split, each with its own traction units
- Consist 3 Finishing and measuring.

Key assumptions
- delivery of electrification of 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.

Milestones for ID 100.01		
Activity/Output	***Date***	***Date Met/Expected***
DfT target for Electric train services between: London and Newbury, Oxford and Bristol	December 2016	December 2016
Bristol and Cardiff	December 2017	December 2017
Cardiff and Swansea	May 2018	May 2018

Milestones for ID 100.01: Bristol to Cardiff		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 complete	Single option selection	April 2013
GRIP 4 complete	Single option developed	October 2015
GRIP 6 start	Construction begins	January 2015
GRIP 6 complete	Energised infrastructure available	June 2017

Milestones for ID 100.01: London to Newbury, Oxford & Bristol		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 complete	Single option selection	April 2013
GRIP 4 complete	Single option developed	January 2015
GRIP 6 start	Construction begins (OLE)	September 2013 OLE Foundation commence
GRIP 6 Completion	Energised infrastructure available	June 2016

Milestones for ID 100.01: Cardiff to Swansea		
Activity/Output	***Date***	***Date Met/Expected***
GRIP 3 complete	Single option selection	QTR1 2014
GRIP 4 complete	Single option developed	TBA
DfT target	Electric train services between Cardiff and Swansea	May 2018

Milestones for ID 100.01: High Output Plant System (HOPS)		
Activity/Output	***Date***	***Date Met/Expected***
High output base	Construction complete/available for use	May 2013
Consist 1	Piling system available for use	January 2014
Consist 2	Structures system available for use	January 2014
Consist 3	Wiring system available for use	May 2014

North West Electrification (NWE). Programme ID 100.02

Current Project Stage: GRIP 5-6

The NWE programme incorporates AC electrification at 25 kV OLE of various routes in North West England. The programme facilitates the introduction of electric train operation on passenger and freight services on the following routes:

- Liverpool to Manchester
- Huyton to Wigan
- Preston to Blackpool
- Manchester to Preston.

The current target is for electrification to be completed in 2016. 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) followed by main works (foundations, masts, OLE, signalling, telecoms and 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, 2 and 3. The programme therefore covers a range of project phases from outline / detailed design to implementation.

Progress in 2012/13

- implementation works have continued on the main works package (OLE, signalling, distribution) for Phase 1
- award of implementation contracts for the main works package for Phase 2. Works on site have commenced
- start of advanced civils works on Phase 3.

Milestones in the year:

Milestones for ID 100.02		
Activity/Output	***Date***	***Date Met / Expected***
Phase 2 Main Works: Completion of GRIP 4.	September 2012	September 2012
Phase 2 Main Works: Start of GRIP 6	November 2012	November 2012
Phase 3 Civils Enabling Works: Completion of GRIP 4	July 2012	July 2012
Phase 3 Civils Enabling Works: Start of GRIP 6	October 2012	October 2012

A change to the Delivery Plan was introduced in the June 2012 update, to amend the milestone for completion of GRIP 4 for Phase 2 Main Works to September 2012. This reflected the need to incorporate the Northern Hub track remodelling works at Huyton. This revised milestone was achieved.

North Trans-Pennine Electrification. Programme ID 100.03

Current Project Stage: GRIP 5

This programme has been divided into two separately managed sets of outputs:

- Trans-Pennine Electrification (West)
- Trans-Pennine Electrification (East).

The current scope of each programme is for the design of 25kV AC overhead electrification and associated power supplies and distribution for the following routes:

Trans-Pennine Electrification (West)

- Manchester Victoria to Stalybridge Junction
- Guide Bridge West Junction to Stalybridge National Grid Feeder station
- Ashburys West Junction to Philips Park Junction/Baguley Fold Junctions.

Trans-Pennine Electrification (East)

- Stalybridge National Grid Feeder station (exc) to Copley Hill East Junction
- Neville Hill West Junction to Colton Junction
- Micklefield Junction to Selby station
- Hambleton East Junction to Hambleton North Junction
- Hambleton South Junction to Hambleton West Junction.

The current target is for electrification of all routes to be completed in 2018. The interim completion of the North Trans-Pennine Electrification (West) routes in 2016 will align with the outputs of North West Electrification.

Progress in 2012/13

- GRIP Stage 2 Feasibility was completed in June 2012
- GRIP Stage 3 Single Option Selection for civils enabling works on North Trans-Pennine Electrification West was completed in March 2013
- GRIP Stage 3 Outline Design for North Trans-Pennine Electrification East commenced in October 2012.

Milestones in the year:

The GRIP 2 report for the overall programme of works was completed in June 2012.

Single option selection (GRIP 3) for structures enabling works for North Trans-Pennine Electrification West was completed in March 2013.

A change to the Delivery Plan made in the December 2012 update, to introduce mandatory milestones for GRIP Stage 6 for the civils enabling and main works for Trans-Pennine Electrification West and for GRIP Stage 6 for Trans-Pennine Electrification East.

The change introduced two separate outputs of the programme between East and West.

Milestones for ID 100.03		
Activity/Output	***Date***	***Date Met / Expected***
North Trans-Pennine Electrification *Feasibility Complete*	June 2012	June 2012
North Trans-Pennine Electrification West *Civils enabling works: GRIP 3 (stage gate review complete)*	March 2013	March 2013

Programme ID 101.00 - Northern Hub

Current Project Stage: GRIP 3

The Northern Hub programme consists of a series of journey time improvement projects on radial routes from Manchester and capacity schemes as various locations across the north designed to enhance the capability of the rail network to stimulate economic growth.

Journey time improvement projects are:

1. Preston line
2. Calder Valley
3. Marple line
4. Hope Valley
5. Chester line

Capacity projects are:

1. Huyton & Roby
2. Ordsall Chord
3. Manchester Victoria
4. Rochdale
5. Chat Moss
6. Manchester Oxford Road
7. Manchester Piccadilly
8. Castlefield Corridor
9. Manchester Airport
10. Chinley
11. Dore & Grindleford

All the interventions are all currently in the Option Selection stage except for elements of Huyton & Roby and Chat Moss capacity projects. Specific elements of these projects have been accelerated to align with the timescales of the North West Electrification Phase 2 project on the same stretch of route and are now in detailed design and construction.

The Northern Hub is planned to be completed in two stages, with target completion dates of December 2016 and December 2018 for the various

interventions as follows:

By December 2016:

- Preston Journey Time Improvement (JTI)
- Calder Valley JTI
- Huyton & Roby
- Ordsall Chord
- Manchester Victoria
- Rochdale
- Chat Moss

By December 2018:

- Marple JTI
- Hope Valley JTI
- Chester JTI
- Manchester Oxford Road
- Manchester Piccadilly
- Castlefield Corridor
- Manchester Airport
- Chinley
- Dore & Grindleford

Individual projects will be completed at different timescales prior to the overall completion dates depending on the scope of works, interfaces and consents required.

Progress in 2012/13

- works have commenced on Stage 1 of the Huyton & Roby capacity project and signalling elements of the Chat Moss capacity project
- consultation for DCO for the Ordsall Chord has commenced and two stages of consultation have been undertaken. Designs have been revised as a consequence of feedback received
- single options have been identified for the all JTI and capacity projects except for Oxford Road and Piccadilly. The latter two remain to have a single option identified but initial consultation with key stakeholders has commenced to identify their preferences at these key city centre locations
- revised governance arrangements have been introduced and the Northern Hub now forms part of the North of England Programmes which also includes NW Electrification and Transpennine Electrification
- an Industry level plan has been developed to co-ordinate all the activities associated with the train service changes planned for December 2016 and December 2018
- scoping of other works required to support enhanced services along the affected routes and maintain current performance levels has commenced.

Milestones in the year:

A change to the CP4 Delivery Plan was introduced in the December 2012 update, to add in additional scope and milestones to fully describe the Northern Hub. This reflects the further announcements of funding for the Northern Hub in March and July 2012.

All the GRIP 3 stagegates have been completed for the Hope Valley and Calder Valley line interventions.

The GRIP 3 stagegate for the Ordsall Chord has been deferred pending the outputs of the final stage of consultation for the DCO in May 2013. The date for submission of the DCO remains as August 2013.

Remaining milestones remain on plan for achievement in the remainder of CP4. However, should a proposed change to planning legislation be enacted in 2013, the use of DCOs will be reviewed for other Northern Hub interventions.

Programme ID 102.00 – Swindon to Kemble Redoubling

Current Project Stage: GRIP 6

This enhancement will provide capacity for four train paths an hour (each direction) between Cheltenham Spa and Swindon. The linespeed remains unchanged. The planned completion is Easter 2014 to coincide with Swindon Area resignalling and re-control to Thames Valley Control Centre and so optimise the efficiency this would realise to the programme.

The scope of the project works include:

- redoubling the railway between Swindon Loco Junction (78m 20ch) and Kemble (90m 74ch), based on predominately slewing works to the existing single line and the relaying of a new second track, associated signalling and other discipline works
- additional intermediate infill signalling is to be provided between Kemble and St Mary's crossing, and between this crossing and Standish junction. This new signalling is to include associated cable routes, telecoms and signalling power supplies. Consideration shall be given to possible implementation of modular signalling elements. This line of the route is controlled from Gloucester Signal Control so the works can be developed in two parts
- provision of a new footbridge in Stroud. This would facilitate the diversion of one foot crossing over the operational railway and the extinguishment of another.

These outputs are as agreed with the ORR following change control approval.

The work includes two other work streams (which have separate funding provision):

- planned earthwork renewals at locations in Purton and Minety

- the relocation and renewal of two crossovers outside Swindon station.

Progress in 2012/13

- contract award to the principal contractor in August 2012
- commencement of site works December 2012 with the planed earthworks
- preparation for the 23 day blockade of the line in August/September 2013
- coinciding the Swindon to Kemble and SASR programmes for Easter 2014
- selection of the agreed location of new footbridge in Stroud and submission of the design for prior approval
- the project remains on programme for commissioning at Easter 2014.

Significant Interfaces

- prime interface with SASR to coincide planned works split between the enhancement and renewal
- GWML electrification – the project is a pre-requisite to the planned disruptive works in CP5 in the Bristol area as this enhancement will allow for a robust diversionary route for South Wales services when the line is closed at Bristol Parkway/Severn Tunnel.

Programme ID 103.00 – East London Line Phase 2 (ELLP2)

Current Project Stage: Project completion

The project has delivered infrastructure to allow a four trains per hour (tph) service to run in each direction between Old Kent Road Junction and Clapham Junction.

Additional outputs include:

- better integration of rail services with other modes of transport
- improved access between East and South-West London
- additional capacity to accommodate growing demand.

Scope of Works

- package 2: Old Kent Road Junction: Construction of a new double junction controlled from London Bridge ASC, to provide a connection to Rail for London's (RfL) East London Line with associated track, structures, power and signalling works and SCADA modifications to enable electrical power control from Lewisham ECR. Extend GSMR coverage to new Silwood Lines.
- package 3: Clapham Junction: Conversion of Platform 2 into two separate four car platforms with associated track re-modelling, signalling, installing a facing crossover and doubling a section of track.

This project was successfully commissioned into operational use in December 2012.

Programme ID 104.00

Station Commercial Project Facility (SCPF)

Current Project Stage: Various

The Station Commercial Project Facility is a joint rail industry initiative involving Network Rail, TOCs, local authorities and DfT. This is funded primarily by DfT and aims to deliver £100 million worth of commercially focused station improvements in England and Wales during Control Period 4 (CP4). In many cases funding is supplemented by TOCs, local authorities and other interested parties raising the potential provision by an additional £33 million.

The aim is to reduce industry costs by funding station improvements that generate an increased financial return. As a result of investing in assets that generate increased income, the DfT is able to achieve a higher value for the franchise when it is let. Additionally, financial benefits are realised through the creation of a new revenue stream that reduces the level of subsidy or a possible revenue share arrangement.

Twelve projects have been completed in the last year of CP4 benefiting 17 stations. 32 projects planned for completion in 2013/14.

Progress in 2012/13

The completed projects are listed by delivery agent in the table Programme ID 104.00.

Programme ID 104.00: Completed projects	
Delivery Agent	***Stations***
Network Rail	Kings Cross accelerate gate line renewal
Network Rail	Driver Only Operation - Strood
First Great Western	Extension of car park at Charlbury
Southeastern	Waterloo East Balcony ticket gating
Southeastern	Rochester station new ticket office and gating
Southeastern	Strood car park expansion
First Great Western	Hanborough car park expansion
First Great Western	Langley car park expansion
First Great Western	Radley car park expansion
First Great Western	Pangbourne car park expansion
South Yorkshire PTE	Dore & Totley car park expansion
Northern Rail	Sandbach car park expansion
Northern Rail	Congleton car park expansion
Northern Rail	Crossfalts car park expansion
Northern Rail	Guide Bridge car park expansion
Northern Rail	Sowerby car park expansion
Northern Rail	Todmorden car park expansion

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August 2013