

Network Rail
CP4 Delivery Plan
Network Availability -
Implementation Plan (v2)

MARCH 2010



Contents

INTRODUCTION	4
Document purpose	4
Overview	5
Project definition.....	7
ASSET MANAGEMENT.....	9
Maintenance.....	9
Track	12
INVESTMENT PROJECTS.....	15
Introduction.....	15
Enhancements	15
Signalling and Electrification	15
Building and civils.....	16
Crossrail and Reading	17
Thameslink.....	17
FTN/GSM-R	17
Electrification	18
Other project delivery techniques being used	18
Constraints to network availability improvements	18
NETWORK DEVELOPMENT	20
Introduction.....	20
Interface with <i>7 Day Railway</i> principles	20
CP4 projects & programmes	20
OPERATIONS AND CUSTOMER SERVICES	21
Introduction.....	21
Network access.....	21
Single line working	23
Route initiatives	25
Olympics.....	30
MEASURES	31
Introduction.....	31

PDI Graphs	32
Use of PDI as a management metric	33
Network availability reporting system (NARS)	33
Output Forecasts	34
MANAGEMENT OF THE PROGRAMME.....	36
Introduction.....	36
Overview of activities	36
Project management milestones	37
Cross industry processes	37
Allocation of benefits.....	37
Engineering planning process	37
PASSENGER ROUTE CATEGORISATION.....	39
Introduction.....	39
RISK	42
APPENDIX 1 SUMMARY MILESTONE PLAN	43
APPENDIX 2 PROGRAMME GANTT.....	44
APPENDIX 3 PDI FACT SHEET	51
APPENDIX 4 SEVEN DAY RAILWAY FUND - SUMMARY OF PROPOSED SCHEMES	52
Schemes authorised for GRIP 1-3	52
Schemes being considered for GRIP 1-3 development	53
Other possible schemes	54

Introduction

Document purpose

This is the first update of the Network Availability Implementation Plan that was published in draft form in July 2009 and issued in September 2009. This plan details the next steps towards delivering the regulated outputs for network availability.

We are committed to achieving the regulated network availability outputs as measured by the Possession Disruption Indices (PDI's) for passenger (P) and freight (F) train services. The regulated outputs for network availability are a 37% improvement in PDI-P (i.e. a reduction of the index from 1.0 to 0.63) for passengers, while ensuring the level of disruption as experienced by freight customers' remains the same at an index of 1.0.

In addition we have made a number of additional commitments in conjunction with the Minister and DfT and following extensive consultation with the industry. These are covered by the Route Categorisation proposals.

We have also initiated the production of Joint Network Availability Plans (JNAPS) with each of our main operators which will identify the specific commitments plans for improving network availability for that operator's services.

Specific purposes for this document are to enable the ORR and the governance group to sanction and monitor progress and to get passenger and freight train operator's (TOC/ FOC) endorsement of plans.

We face a number of challenges including a number of major projects as well as the delivery of the Olympics strategy.

The document contains:

- Agreed project aims;
- The current status of the activities that will deliver the network availability outputs, building on the September 2009 implementation plan;
- An indication of activities in development with timescales; and
- The status of future activities, some of which are being developed and others which will need to be identified as the control period progresses.

We will agree with the ORR a date for the next update.

Neil Henry

29th January 2010

Overview

The improvement in the PDI will be delivered by a programme of activities across all of Network Rail's delivery functions and supported by changes to operational processes. These activities will be optimised against delivery of the all the CP4 output targets.

This document includes activities in the following planning stages:

- Work in progress – to be delivered by currently ongoing management activities or projects; and
- Planned improvement – to be delivered by activities or projects which have been identified, but are still in definition, or which have yet to be identified.

In this update we have grouped the activities under the following headings to reflect our new organisational structure and in each section we describe the activities that are planned to contribute towards the delivery of the regulated PDI outputs

- Asset Management
 - This function covers the maintenance and track renewal activities
 - There are a number of nationally driven maintenance activities and process changes that are described here. Routes are also undertaking improvements to the maintenance process and these are summarised in this section and the route specific application is described in the Operations and Customer Services route section.
 - The track glide path of reducing possession lengths is a major contributor to the reduction in PDI-P and this section covers the proposals to deliver this.
- Investment Projects
 - This function covers enhancement projects (excluding major schemes) Signalling and Electrification, Buildings and Civils and the implementation of major projects.
- Network Development
 - This function is responsible for the sponsorship of major projects and the initial development of schemes
 - Major projects can require significant disruption to services and there are opportunities at the early stage of a project to engage with out customers to agree an access framework that minimises the impact on the end users
 - Network development will influence the scheme design so as to facilitate installation with the minimum of disruption. A recent

example is the innovation is the installation of FTN-GSM-R masts so that they can be installed in non disruptive periods.

- Operations and Customer Services
 - The network access programme has been introduced that is aiming to improve a number of operational processes around possessions. These are enablers to the initiatives in the other functions. A recent pilot on the Wessex route of a number of these techniques has demonstrated the reduction in disruptive access that can be achieved
 - The specific network availability plans for each of our operational routes are covered in this section.

The final sections cover Measures, Management of the Programme, Route Categorisation and Risks.

Project definition

The following project aims have been agreed.

Purposes of the project

- To deliver substantial improvements in network availability to passenger operators, and to at least maintain the current level of availability to freight operators;
- To achieve the top level regulatory outputs, including a 37% reduction in passenger disruption as measured by the PDI-P;
- To allow the TOCs and FOCs to run additional train services at times that address suppressed customer demand, where there is an industry business case; and
- To demonstrate progress in meeting CP4 targets to outside stakeholders.

Customers of the project

- The Train Operators (on behalf of the travelling public);
- The Freight Operators (on behalf of their customers);
- ORR;
- Department for Transport (DfT), Transport Scotland (funders); and
- Passenger Focus.

End results from the project

Increased access to the network for TOCs and FOCs including:

- Shorter possessions; and
- Appropriately timed possessions
- Achievement of network availability regulatory outputs;
- Productivity and efficiency gains through changes to the technology and processes used to maintain, renew and enhance the network;
- More time within possessions available for productive use through changes to operational processes.
- Delivery of Route Categorisation and JNAP commitments

Wider success criteria

- Improved customer (TOC/ FOC) satisfaction;
- The project complements the achievement of all other CP4 outputs;

- Improvement in working timetable compliance (WTT) and other underlying KPIs;
- Rail replacement road service is minimised on key trunk routes according to the criteria of the route categorisation initiative;
- Additional services operated where there is a demand.

Asset Management

Maintenance

Introduction

The maintenance initiatives are being developed at both national and route level.

At a national level there are a number of new products and processes that are being investigated or which have already been introduced

The proposals build on the experience gained on the West Coast Main Line by the Efficient Engineering Access (EEA) programme, where infrastructure improvements, use of new products and changed methods of working combined to improve network availability. The mix of these initiatives varies on each route but will deliver improved network availability.

New Products under investigation

Rolling green zone

This is a mobile light-weight protection system to protect staff by creating a green zone. This will support greater flexibility in carrying out maintenance activities with the adjacent line remaining open.

S&C video inspection

The proposal will reduce the amount of track access required at complex S&C, where the track access is limited and in addition it will reduce the manpower required to carry out the inspections by removing the constraints of the link with track access. It will improve safety by removing staff from the track by allowing elements of the inspection to be completed in an office environment.

Plain line recognition

This proposal will reduce track access requirements for plain line inspections. It will also improve safety by removing staff from the track, with elements of the inspection instead being completed in an office environment.

Mobile flash butt welder (MFBW)

This introduces an automated site welding method that will reduce access requirements for welding by 1 to 2 hours. Trials to date have demonstrated proof of concept and applicability to 2 key delivery areas; re-railing programmes and replacing defective rails.

New methods implemented nationally

These initiatives have been implemented nationally and will significantly contribute towards the current good PDI performance.

Rail head repairs

This avoids cutting rail out and replacing it when defects are detected, hence significantly reducing access requirements. The equipment has been delivered to all depots and training completed. More than 750 sites have been delivered to date.

Lightweight stressing

This reduces the set up time when stressing is undertaken by ½ - 1 hour per site, hence reducing access requirements / amount of disruption. The equipment has been delivered to all depots and training complete. The number of sites delivered to date exceeds 200.

Revised method of crossing repairs

This extends crossing life and reduces the requirement to carry out crossing replacements which need more access. The equipment has been delivered to all depots and training completed. More than 130 sites have been delivered to date.

The above initiatives are now routinely part of maintenance and will continue to mitigate the impact of disruptive access.

Changes to current methods of working

There are a number of other initiatives being developed that will result in reductions to the maintenance access requirements (see also *Network Access* section describing the progress against network access initiatives).

Changed method of track inspection and frequency

The track maintenance standard has been revised to permit reduced frequencies of planned maintenance where approved following a risk assessment. To support this change a motorised trolley with lighting to provide even and sufficient lighting has been developed. This allows inspections to be undertaken in hours of darkness in accordance with the patrolling and inspection standards.

Reliability centred maintenance of signalling equipment (RoSE)

RoSE identifies and applies the right cyclic maintenance for individual railway assets; this means that two, identically designed, assets can have different maintenance needs based on factors such as usage and environment (i.e. a risk-based approach). This replaces the original cyclical frequency which delivered the same maintenance to all assets of a particular design.

Progress is reported separately for the RoSE project. The impact on network access requirements will be assessed in detail following the development of the revised maintenance approach.

Single line working

This is reported as a separate section in this report.

Remote condition monitoring

With the introduction of remote condition monitoring (RCM), the asset can be monitored in service to assess its performance and determine likely failure modes. Predictable failure modes allow more efficient scheduling of planned maintenance for repair and replacement, allowing maintenance activity to move from “find and fix” to “predict and prevent”.

Through the year 2009-10 there has been an increase of 1,744 in RCM sites, with the main increases on the WCML and Edinburgh to Glasgow routes. Supporting processes and procedures have been developed. The proposed future strategy for RCM has been documented.

Train borne inspection (excluding video inspection)

The transformation programme for RCM is developing train borne inspection and the use of information. The activity streams include ultrasonic testing, ground penetrating radar, track geometry, and gauging. The impact on access requirements will be assessed in detail following the development of the revised methods.

Route Maintenance Plans

Routes have been evaluating their own particular requirements, in order to develop route specific solutions. They are looking at a range of initiatives that include:

Improved access points (including improved access lighting)

New and better access points are required to reduce both travelling time and access time to critical assets. During periods of perturbation there is a need to reduce the response time to failed assets. Additional and improved access points will assist in the reduction of this time. This will enable access to undertake maintenance in a safe manner. Improved trackside access points for ongoing maintenance and enabling night time inspections are important benefits.

Junction lighting

This will provide lighting of sufficient intensity, evenness and extent. This will enable patrolling, inspection and maintenance to be undertaken in the hours of darkness in accordance with the patrolling and inspection standard. This will also support changes to the changed maintenance regime. Moving Switch & Crossing (S&C) inspections onto night time will allow the spread of this activity throughout the week, reducing peak daytime access requirements. With 7 sites implemented on WCML, a cost effective solution has been developed and supporting procedures completed. This solution is acceptable to train operators.

Removal of red zone prohibition areas

The proposal is to build new cesses and areas of safety in order to remove existing red zone prohibited areas. This will allow a more flexible approach to inspection and patrolling, taking activities away from current disruptive possession slots to midweek days thus also utilising staff roster times more effectively.

Lookout operated warning systems (LOWS)

LOWS allows many mid week day opportunities to access the track. The ability to undertake activities within red zone access allows for the inspection of track assets under traffic and moves activities away from valuable track possessions.

Track

Introduction

Track initiatives to improve network availability are grouped into three projects; the introduction of modular switches and crossings (S&C), the development of standard plain line track renewals, and improvements to and increasing reliance on high output systems for delivery of plain line track renewals.

Over 300 core possessions are currently taken per year for S&C renewals. Improvements in S&C work focuses on the development of lean construction techniques to speed delivery processes and the deployment of modular pre-fabricated track sections for more rapid replacement of S&C units. To deploy modular S&C panels, 'tilting wagons' have been procured to transport manufactured units to site and new techniques are being developed to install the units.

Currently around 1,900 possessions of greater than 8 hours are taken per year for standard plain line track renewals and high output track replacement (HOTR). The vast majority of midweek possessions for HOTR are eight hours or less.

Improvements to the planning and delivery of high output track renewals focus on maximising productivity in short access durations, working around timetable and location constraints, while utilising opportunities for using the adjacent line open capability of the system whenever practicable.

Progress to date

Modular S&C

Preparations are ongoing for system proving of 8 hour modular S&C renewals at Beeston. Two trailing crossovers and 800m of plain line have been installed as part of verification and validation trials. Mark 2.0 tilting wagons have now completed the third renewals worksite and operational validation continues. The next S&C site using the tilting wagons will be Allington West, within the London North East Route, in early 2010.

Standard plain line

The track programme will start a standard plain line renewals trial at Grangetown on London North East Route in the fourth quarter of 2009/10. Various methods of delivery are being used over six weekends; the maximum delivery will be 705 yards in 24 hours in week 45. These methods will provide standard repeatable solutions for plain line renewals which can be used where high output equipment and methods cannot be deployed.

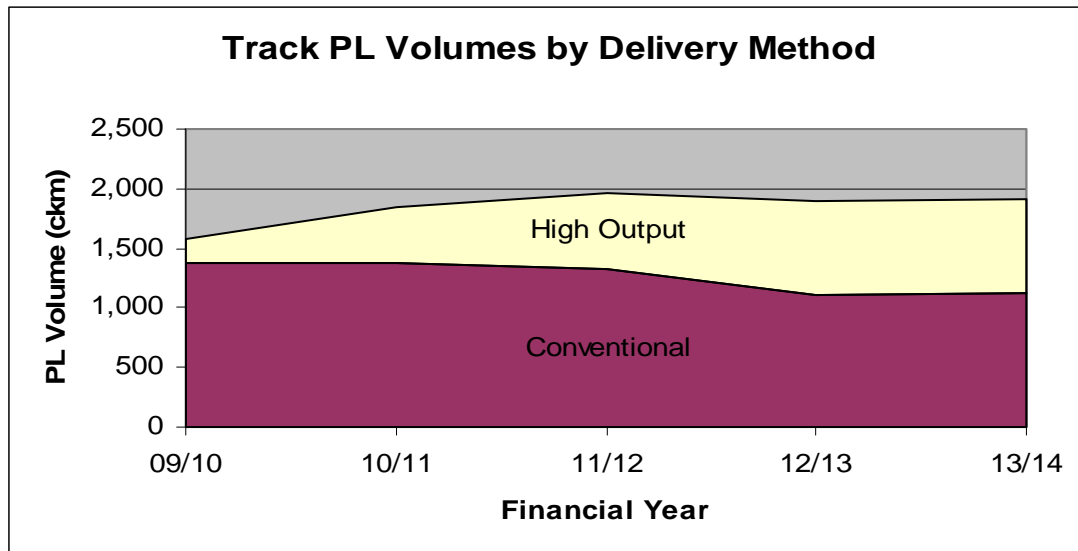
High output track renewals

Work continues to maximise the utilisation of HOTR techniques for the delivery of plain line renewals. A new national high output contract commenced on 1 January 2010, with a new contractor in place. This new contract will help Network Rail deliver significantly increased high output volumes with less access than would have been required using conventional techniques.

The graph below illustrates the planned increase in high output volumes through CP4. Exploiting high output's capacity to make effective use of short duration

possessions, and offer single line working opportunities remains a key feature in supporting plans to achieve a 37% increase in network availability. By the end of the control period we plan to deliver up to 60% plain line by high output methods. This compares with 13% in 2009/10.

A new high output ballast cleaning system has been delivered to the UK. Testing and commissioning has now commenced on Network Rail's test track in Nottinghamshire, in readiness for the scheduled introduction into service on the WCML in May 2010. Manufacturing of a new track relaying system continues in Switzerland, with introduction planned in 2011.



Lean construction techniques

The development of lean construction techniques will continue, to optimise the use of time within possessions and reduce the duration of possessions required for routine track renewals work.

Track glide path

The table below describes the generic glide path for track renewals. This glide path defines the progressive reductions in normal maximum weekend possession duration by year for track renewals possessions. The actual possession times will be varied by up to 1 to 2 hours from route to route to take account of local service patterns.

Application	Phased application across CP4				CP5
	2010/11	2011/12	2012/13	2013/14	2014/15
Proof of concept locations (pilots only)	27hrs	16hrs	8hrs + HCR	8hrs + HCR	8hrs + HCR
WCML (S)	12hrs	12hrs	8hrs + HCR	8hrs + HCR	8hrs + HCR
Cat A routes	37hrs	27hrs	16 hrs	8hrs + HCR	8hrs + HCR
Other routes	Conventional	37hrs	27 hrs	16 hrs	8hrs + HCR

The track CP4 glide path shows a reduction in maximum weekend possession durations to 16 hours on key routes and 27 hours on second tier routes. Further reductions beyond these durations are dependent on specific requirements, the cost, benefits and practicability of meeting these.

The track programme covering the 2011/12 business plan year has been planned in accordance with the above glide path. The majority of track renewals worksites for this year were planned at no longer than 27 hours on key routes and 37 hours on other routes. This represents a significant reduction from previous years and has been facilitated by the three initiatives described above. Exceptions to these maximum durations were driven either as a result of engineering deliverability considerations or as a result of customer preference.

Note. HCR = Half Capacity Railway: 2 tracks open on a four track section & 1 track open on a two track section.

Investment Projects

Introduction

Techniques to achieve *7 Day Railway* principles have been developed across a range of assets to facilitate delivery within shorter possession durations. However many case the new techniques are not cost efficient and their use must be planned carefully so that it does not compromise delivery of cost targets in CP4.

The overall strategy for reducing disruption in CP4 has been to bring forward the development of possession strategies for projects in CP4. This has been achieved through much earlier visibility of the annual projects work banks. To date, work banks for all assets up to the end of 2013 are already available and the remaining work banks up to April 2014 should be available early in 2010. This represents a significant leap forward allowing more efficient planning of all delivery resources, including possession access.

With possession strategies now available for the most disruptive work in CP4, possession planning resources can be effectively used to develop solutions to minimise disruption. The network availability forecasting model will be used to set availability targets for routes and programmes of investment work.

A number of techniques and equipment have been either introduced or developed. These will be deployed where it makes best use of access and financial resources, according to the prioritisation criteria and availability constraints being developed for each key strategic route. The following sections detail the progress which has been made to date.

Enhancements

The enhancements work bank for the whole of CP4 has been developed and is being reviewed nationally to identify access conflicts and, as far as possible, to smooth the impact of access requirements over time and across the network. Enhancements works will also benefit from development made in other programmes that reduce disruption, for example modular switches and crossings and modular and 'plug and play' signalling.

Signalling and Electrification

Signalling 'plug & play'

This development increases the utilisation of rugged 'multi-pin' connectors to make interconnections between signalling components. This facilitates more rapid assembly and installation of a new signalling system on site. The 'plug and play' approach also facilitates more accurate and sophisticated simulation of interfaces to signalling equipment prior to assembly. This allows more comprehensive testing prior to equipment leaving the works, potentially reducing testing time required in situ.

'Plug and play' will both:

- remove duplication in signal testing, and
- transfer signal installation and testing work from the trackside to the factory

This will result in a lower volume of trackside signal testing and installation works, since thorough facility testing will have verified system operation prior to signalling equipment leaving the manufacturers works. This will reduce the level and duration of possessions required for signal renewals

With plug couplers fitted to all signalling equipment and tail cables, the disconnection and reconnection of signal circuits at the start and end of possessions will also be quicker facilitating shorter possessions.

Parts 2 & 3 of the signalling works testing handbook have recently been republished, covering the use of 'plug and play' techniques.

The Invitation to Tender (ITT) went out on 23 December 2009 for the 'Development of a Generic Design for a Location Case fitted with Plug Couplers' and is due to be returned in late January.

The first application of 'plug & play' plugs is on Barry signalling renewals which take place later this month as part of the South Wales Re-signalling programme.

From the middle of 2010 all new signalling projects will introduce signalling 'plug & play' where possible.

Modular signalling equipment

The trial of lightweight modular signalling equipment reached a significant milestone with the installation of two Dorman signal bases at Cardiff on 17 November 2009, using pyramid and rectangular bases. This development considerably reduces the possession duration required to install ancillary signalling equipment.

Axle counters

The introduction of axle counters over CP3 has reduced the amount of testing requirements for re-signalling schemes compared with track circuit detection. This has been most notable recently on WCML and East Midlands re-signalling schemes.

Staged testing of new signalling interlocking has been used to gradually re-introduce functionality during a complete re-signalling. This has reduced risk of overruns and reduced overall disruption (a recent example was Glasgow re-signalling in December 2008).

Building and civils

In general, the operational property work bank consumed relatively little access. However, in the last two years significant planning efforts have been made to reduce the access footprint for major stations work at Birmingham New Street and Kings Cross.

The civils programme has now developed work banks for projects through to the end of March 2013, and will imminently have a more definitive CP4 work bank. This situation is unprecedented and the work bank is now being optimised with other parts of the investment programme to reduce the impact of disruption and improve resource utilisation.

In terms of construction methods, several demonstration sites in 2008 proved the ability of Network Rail construction teams to deliver a range of under-bridge schemes in radically reduced timescales. This was through the use of lean construction techniques and extensive pre-fabrication of bridge superstructure components. In addition, techniques such as 'launching' new bridge decks are being used to reduce the disruption caused when heavy lifts of bridge decks are used. An example of this is the Angel Lane road bridge at the site of the London 2012 Olympics.

Crossrail and Reading

Network Rail have agreed a protocol with First Great Western, which is in effect a preferred customer approach to access and supplements discussions which take place with all operators. The project approach has been developed in line with Network Rail policies on *7 Day Railway* and Route Categorisation, to create an access footprint for the programme which meets requirements.

The combined Crossrail and Reading construction footprint is designed around a 2 track timetable period pattern. Previously under-used diversionary routes, such as the Chilterns, are being strengthened in harmony with Evergreen 3, to keep passengers and freight moving throughout the construction programme.

The construction programme for Reading is not timetable period based because as a node there are more options available.. However, the same principles apply. We have used timetabling adjustments effectively, for example flexing platforms used by operators to maintain full operational service during the prolonged closure of platform 3 for bridge construction.

Engineers for the Crossrail / Reading programme are undertaking constructability reviews where change to the access profile and subsequent costs are included in order to inform option design. This will ensure that construction staging aligns before Invitation to Tenders are issued.

In some instances, such as works at Reading in Christmas 2010 (2011 Timetable), our customers have preferred a blockade to extended degraded working. This is exceptional and only where such a consensus exists have extended diversionary timetables been used. Improvements to rail / bus interchange facilities have been agreed and implemented jointly as part of that agreement.

Thameslink

The access requirements plan for the Thameslink programme, between 2012 and 2014, has been submitted to NDS and Operational Planning to identify potential reductions in disruption. In parallel, the Thameslink team are conducting their own review of access needs to identify where new techniques such as modular S&C could be used to limit the need for disruptive access.

FTN/GSM-R

Innovations in the design and installation of FTN-GSM-R masts have enabled masts in most areas of the country to be erected within 'white space' periods in the timetable, to the extent that the FTN-GSM-R team are no longer making

requests for disruptive possessions. The new modular mast and platform design is unloaded from a wagon by crane and the mast is erected using a built in hydraulic piston located on the bottom of the mast. Installation times of six hours are now routinely being achieved and approximately 35 masts being installed per period without disruption to train services. 395 sites have been built using this method so far. The majority of the remaining 1600 GSM-R mast sites will be built using this modular technique.

Electrification

The electrification programme for CP4 focuses on Liverpool-Manchester and Western routes. Advance planning has already started to consider how to minimise the disruption on the Liverpool-Manchester route, looking at timetable solutions that avoid the use of buses and introducing techniques such as use of the rewiring train.

Other project delivery techniques being used

Lean construction

The introduction of 'six sigma' and other lean techniques has been used to speed delivery processes and eliminate non value added activities from the delivery 'critical path' within a possession. Lean construction is already in use, particularly within track where this has already delivered availability improvements.

Improved survey and inspection techniques

The introduction of improved visual survey techniques using pre-recorded video footage and virtual reality modelling, for example in signal sighting on the Edinburgh – Waverley project has reduced the need for disruptive access to sites prior to work commencing.

Process improvements

Process improvements to align possession limits and electrical isolations are also under development. This is with a view to simplifying and speeding up possession hand over / hand back arrangements.

Constraints to network availability improvements

There are a number of renewals and enhancements projects where the ability to deliver within network availability constraints adds significant costs to delivery and will not be affordable for any but the most critical routes; these types of project are summarised below:

Major structures works including tunnels and over-bridges

- Extensive station re-modelling
- Earth and rock cuttings
- Major electrification renewals
- 3rd Rail electrified line feeder cable renewals
- Signalling type A and B major renewals schemes

- Junction remodelling and complex S&C works

In summary, the majority of 'standard' renewals will be deliverable in 8 hours but there will still be a significant amount of disruptive access required for the above exceptional work items. These will be planned within cost and availability constraints in order to meet both the regulatory outputs for network availability and overall cost.

Going forward, project plans for 2011 and the remainder of CP4 are being robustly challenged to ensure that plans deliver not just the best efficiency but also minimise disruption. Project Managers have been challenged to reduce the amount of disruptive access and a review of all projects planned until December 2011 against compliance with the Route Categorisation proposals has been undertaken. Those projects that do not comply are being challenged to improve the level of compliance.

Network Development

Introduction

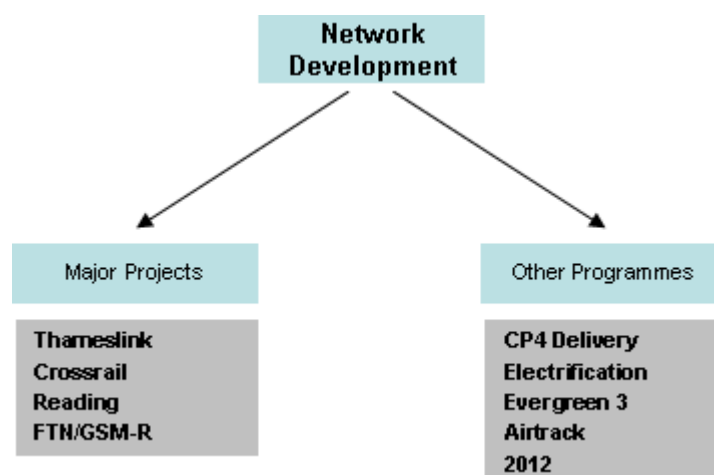
Network Development provides sponsorship for the majority of projects being developed and delivered in CP4 and CP5. The sponsor teams take a clear remit from the client and then manage the development phase of the project (Grip 1-3) through to a single option and clear definition of the output. In Grip 4 the project manager and sponsor work together to define and develop the single option of an enhancement. Delivery of this option is the responsibility of the project manager within Investment Projects but the sponsor remains the owner of the outputs of the project and clients remit through to completion.

Interface with *7 Day Railway* principles

There is an important interface between the planning of a project and the planning of the operation of the railway around that project. It is recognised that access planning should be specifically addressed as part of the formal agreement of the project during its early stages.

CP4 projects & programmes

There are a number of schemes being developed during CP4 and their delivery will need to be carefully co-ordinated to secure optimal access plans which balance project efficiencies with *7 Day Railway* principles. The diagram below highlights the major projects and other programmes which fall within the sponsorship remit of Network Development.



Details of the some of these, and the interface with network availability, are included within the *Investment Projects* section.

Operations and Customer Services

Introduction

A number of activities around operational processes required for track access have been grouped into a programme of works known as the Network Access programme. These are required as enablers for a number of the work deliverer's initiatives.

The Olympics are major event for which a special strategy has been devised, as outlined at the end of this section.

Network access

Network access is a transformation project team working within Operations & Customer Services. There are a number of work streams aimed at reducing the risk to track workers placing protection for possessions and reducing the time taken to get people on the track carrying out work activities. With critical work activities having to take place in far more demanding timescales it is imperative that we reduce time lost in making arrangements for activities to take place.

One of the key aims is to provide the business with a reliable and predictable suite of possession arrangements that are aligned to delivery plans, site geometry, asset arrangements and infrastructure complexity. A particular focus is the set-up and hand-back capabilities within a possession; with a target of allowing no more than 60 minutes in total to be taken for the combined activities of the arrangements (dictated by the contributing factors previously mentioned). This will be centred on critical track activities that support the *7 Day Railway* and detailed plans are being assessed to target where possession efficiencies are required across the delivery functions.

Initiatives

Track occupancy permit (TOP)

The Track Occupancy Permit System (TOP) is a method of protection for people carrying out work activities. The new protection process is derived from a track warrant procedure used in Canada. The system has been broken down to three elements to support the trials of the process:

- TOP zero is a single work group with no rail movements to replace T2/T12 protection and encourage red zone working reduction
- TOP light is a number of workgroups and a maximum of two trains or on-track plant (OTP). This will replace the majority of maintenance T3 activities and some track renewal activities.
- TOP heavy involves multiple workgroups and multiple train or OTP movements, replacing large scale engineering works e.g. conventional track renewals.

TOP zero and TOP light are currently on trial on the Western Route and TOP heavy will be piloted later this year subject to satisfactory review of process.

Alternative T3

To reduce the risk to track workers from placing detonators and possession limit boards, a revised T3 possession process has been developed and trialled on a number of areas across the network. The removal of the activity will eliminate the risk to the person placing protection.

The trials of alternative T3 are currently on hold pending analysis of trial data and review with stakeholders. Once these activities have taken place a robust plan can be mapped out for the way forward.

Engineering line clearance (axle counter sweep - process improvements)

On certain areas where train detection is afforded by axle counters there are processes that require a 'line clear' sweep of the possession, to ensure that no vehicles have been left within the possession and that it is safe to hand back for normal operational use. This activity has a number of ways of being achieved but is usually carried out by road-rail vehicles having to travel between the extreme limits of the possession.

This process can require an allowance of up to 120 minutes to be factored into scarce engineering access time. As this process has to be used when there is more than one train or on-track plant (OTP) machine, it is particularly restrictive for renewals activities.

The network access team are currently involved in working groups to develop proposals which support a reduction in time required; using smarter ways of working within the current safety case but also challenging safety case requirements where appropriate.

The high output ballast cleaner (HOBC) is a critical activity that greatly reduces the access time required for conventional track renewals. It starts a program of work on the West Coast Mainline from May 2010 and the team is developing proposals to eliminate the need for a 'sweep' for this activity by introducing other control measures.

Planning and delivery

The Network Access team is reviewing current planning and deployment procedures. This is in order to determine a proof of concept and guidelines for enabling a possession and isolation to be delivered within 30 minutes.

The team will focus on areas and activities where the reduction in time taken will give significant production and access benefits. It will build on best practice developed through the Thameslink and Crossrail projects.

Electrification improvements

A number of projects are in progress to deliver improvements in how isolations are delivered; through changes to instructions, process, planning and delivery. The aim is to have a process that allows isolations to be taken within 30 minutes.

Improvements in how we deliver AC isolations are part of the planning and delivery work stream, targeted at critical activity possessions.

A number of changes to DC Lines instructions have been trialled in 2009 and will continue in 2010. The outputs from the trials are being used to make formal changes to instructions and processes.

One of the key activities is referred to as B3 which streamlines the process for applying straps, reducing the amount of straps required. This makes the process less time and resource dependant, increasing the time available for work based activities.

On track machines working outside a possession

A new procedure has been written and the network access team have gained approval via a temporary non-compliance (TNC) from Railway Safety Standards Board to trial a new process across the network under controlled conditions. To date a number of trials have taken place on Western and Wessex areas and these will continue until sufficient data can be gained and analysed. This will then be used to support national implementation with introduction into the Rule Book.

The procedure allows for either a tamper or stone blower to work on plain line, provided it is the only activity taking place. It increases the available work time by reducing the time required in setting up and giving back protection arrangements.

Smarter operations

The network access team has been working closely with colleagues on the Wessex Route on a number of operational work streams that formed the Wessex *90 Day Challenge*. The trials have concluded and a formal review is taking place to determine lessons learnt and how to take these forward.

Single line working

For the purposes of this work-stream Network Rail is defining single line working (SLW) as any of the methods of operating trains past adjacent work sites. SLW can be delivered through one of the following methods:

- Full bi-directional signalling;
- Simplified Bi-Directional Signalling (SIMBIDS)
- Traditional SLW methods, involving pilot-men, hand-signallers, etc

Constraints

A number of constraints have historically made SLW operation difficult, with the result that the industry has employed other methods of operation. Infrastructure constraints include the lack of key pieces of infrastructure; for example appropriately located facing crossovers, signals for cross-over movements. Operational constraints include the lack of competent available resources for hand-signalling, crossing keeper, pilot-man duties or the lack of suitable walking routes for train-crew to change ends. In terms of capacity, where the SLW is for

an extended length or where line-speed is significantly reduced, the impact could render the operation of train services past the work-site as unfeasible. SLW plans need an operationally resilient train plan providing adequate time for required operating procedures including briefing of drivers, setting back trains through crossovers and hand-signalling communications. Any deviation from the plan can result in significant levels of disruption.

Programme of activities to facilitate and support single line working

We have put together a programme which seeks to manage the impact of the above constraints and provide a framework to support effective plans for the operation of services past a work-site with an adjacent line open.

An important element of this is determining sections where there is a requirement for SLW, above and beyond that which is currently planned today. For those sections where a requirement for SLW has been identified, detailed feasibility assessments will be needed. Every location identified for SLW will have very unique requirements, which may include schemes which require funding in order to effectively and safely operate with an adjacent line open.

A number of the other work streams are focused on enabling consistently robust standards in the planning and implementation of SLW. This includes template guidance for planners and operational staff. The programme also includes the continued development of high output operations, which are based on an adjacent line being open.

The following table details the main projects and activities identified at this time.

Project	Activities	Date
Develop proposals for additional SLW in conjunction with routine maintenance works	Identify candidate sections for SLW	Feb-10
	Carry out feasibility studies for candidate SLW sections identified	Dec-10
	Develop proposals for potential schemes to facilitate SLW (including possible 7DR funding requirements & GRIP proposals)	Jul-11
Develop framework for maintenance teams working with an adjacent line open	Safe system(s) of work for track workers: Rolling green zone	Jun-11
	Detail what additional activities can be carried out (with ALO) if LOWS is installed	Jun-10
	Develop processes & briefing materials for teams working with an adjacent line open	Dec-10
Further development of high output operations (based on adjacent line open)	Develop process for planning T2 requirements as part of the timetable	Dec-10
Training and support framework for planning SLW	Develop good practice guide for train planning teams planning SLW	Apr-10
	Develop and implement generic model for planning SLW	Mar-11

	Develop and implement training programme for train planning teams	Mar-11
Operations good practice manual	Arrange workshop to agree content for good practice manual	Feb-10
	Develop good practice manual for operations	Jun-10
	Consult and distribute good practice manual	Sep-10

Route initiatives

Introduction

We have developed route remits for each of our operational routes that describe the operator's aspirations and the plans to deliver these.

The route remits were prepared following extensive local consultation with the operators on the route, so as to understand their aspirations and what would lead to reduced disruption. The remits cover the implementation of nationally driven initiatives on the route as well as route specific schemes that are unique to each route and will facilitate the improvement in network availability. These constitute the network availability plans at a route level.

The route remits are now being augmented by Joint Network Availability Plans that are being developed jointly with each operator. These take into account the Route categorisation proposals.

We have identified 27 projects that are in Grip 1-3 development of which 16 have reached GRIP 3. The estimated AFC of these projects is £115m. A number of other schemes are being considered for future Grip 1-3 development.

The projects include schemes to improve maintenance practices in specific areas and route specific infrastructure improvement schemes. We have determined a list of appraisal criteria that we will use to assess the relative benefits of each of the schemes, so as to achieve the optimum improvement in the PDI measures per pound of spend. The overall value of the possible schemes exceeds the 7 day railway funding made available in the periodic review, so the list of schemes is subject to a business case appraisal. It is worth therefore noting that it will not be possible to meet all the operators' aspirations during this control period.

We have put in place governance measures to ensure that projects are evaluated against the criteria established by the Industry Governance Group and that funding is authorised for those projects that will make a tangible difference to our customers.

The plans for our Routes to deliver improved network availability are summarised in the following section. It is to be noted that where local maintenance schemes are being developed, these will largely be based upon initiatives and schemes outlined earlier in the document, under the *Asset Management (Maintenance)* section. Maintenance schemes are developed at Route level to meet specific requirements, but are supported by the national Maintenance function.

Summary Route Plans

Anglia

The key network availability priority for passenger operators is the ability to consistently run the base weekend timetable. Some operators want to run additional services and the use of SIMBIDS to run weekend train services where possible.

Anglia aims to improve network availability through local maintenance schemes and infrastructure enhancements which will improve productivity within possessions taken.

Rolling green zone, access point schemes and trackside facility improvements will be employed to reduce access requirements as outlined under the Maintenance section of this document.

In terms of infrastructure enhancements being evaluated, turn back facilities (removing ground frames or adapting them so that they can be controlled by signal boxes) would increase access for customers to stations that cannot currently be served by train in particular possession scenarios. In addition, a number of schemes to improve OLE capabilities are being investigated as means of making possessions more productive.

Anglia is affected by the 2012 Olympics construction. The Olympic Construction Rail Plan is already in place, but where possible the project delivery teams are taking into consideration *7 Day Railway* principles. For example, in July 2009, trains were able to continue running whilst a new town centre link bridge was constructed over 11 running lines at Stratford.

Kent

Southeastern, the single largest operator on the Kent Route desires predictability, a cyclic possession pattern and the ability to run an increased percentage of published services.

On Kent, Network Rail plans to improve network availability by building on the existing diversionary route strategy through improvements to the co-ordination of access planning and better utilisation of diversionary routes. This will be supported by a number of locally developed maintenance schemes. Schemes under development include access points, ATWS, hook switches, removal of red zone prohibitions and junction lighting.

It is to be noted that the SLC2 timetable is predicated on development of the High Speed patronage. As such, 52 hour possessions will not be taken on routes to be operated by the new Class 395 services between December 2009 and July 2010 (except for essential maintenance which will take place on Sundays).

Significant enhancement works planned for Thameslink, East Kent re-signalling and Crossrail will impact on network availability. A cross functional and multi-disciplinary Programme Delivery Group (PDG) has been established to manage the impact of these works.

London North Eastern

The network availability aspiration for operators on LNE is to consistently run the base timetable at weekends. Some operators want the ability to run the same frequency of trains on Sunday as occurs on Saturday. In addition, some operators want to run specific earlier or later trains.

There are a number of critical 2 track sections on the London North Eastern Route, which will inform the development of initiatives to improve network availability.

Infrastructure enhancements have been proposed for critical sections. These would enable increased use of single line working (bi-directional working, Simplified Bi-Directional Signalling or traditional single line working) and reduce the need for diversions where relatively short sections are under possession.

In addition to this, maintenance schemes such as access points, junction lighting, LOWS and removal of red zone prohibition are being considered.

There are no major CP4 projects which will interface with *7 Day Railway*. However, as discussed under the *Investment Projects* section of this document, the access requirements for route enhancement and renewal schemes will be informed by *7 Day Railway* principles.

London North Western

The December 2008 timetable saw the introduction of *7 Day Railway* principles (in the form of EEA) to the south end of the West Coast Main Line. The December 2009 timetable saw the introduction of *7 Day Railway* principles to the northern end of the West Coast Mainline; extended to Carlisle, Manchester and Liverpool (excluding Weaver-Preston). We are now exploring initiatives to best optimise network availability across the whole of the London North Western Route.

As part of the ongoing work, an initial list of candidate sections for additional single line working on London North Western Route has been collated. This list will be prioritised to focus on the key pinch points, whereupon feasibility studies will be required to develop detailed proposals; including any schemes which may be required to facilitate single line working.

Access points, junction lighting, LOWS and removal of red zone prohibitions are some of the schemes which are already being implemented as a result of EEA. Work continues to identify further schemes for GRIP development.

Evergreen 3, Birmingham New Street development and Liverpool-Manchester electrification are major projects which would impact network availability on LNW during CP4. Access requirements will be carefully managed in accordance with *7 Day Railway* principles. Our customers will continue to be consulted as part of the process to develop access plans. The same approach will be adopted for major signalling renewal schemes planned for CP4 (e.g. Bletchley and Water Orton – both in 2012).

Midland & Continental

Our customers seek to operate the full working timetable without disruption to services on either midweek nights or weekends.

Midland & Continental plans for improving network availability focus on alleviating the Midland Main Line pinch points through a combination of local maintenance schemes and infrastructure enhancements.

The maintenance schemes are based upon the nationally supported initiatives, as outlined under the *Maintenance* section of this document. These are grouped under; adjacent line open (fixed and mobile warning systems to allow more routine maintenance under traffic), mechanised / design patrolling (to reduce daylight hours patrolling) and efficient engineering access (largely based upon the EEA initiatives already being implemented on the West Coast Main Line).

In terms of enhancement schemes, these focus upon slow line capacity and line speed improvements, enabling increased availability when the fast lines are blocked.

The Thameslink programme would impact network availability on Midland & Continental. Network Rail is developing plans to mitigate potential disruption relating to the Thameslink programme. The Midland & Continental Route organisation is fully engaged with the Kent Route, to ensure that access planning is joined up.

Scotland

In Scotland, the customer aspirations are for less disruptive access on the West Coast Main Line and East Coast Main Line.

The Edinburgh and Glasgow via Falkirk route (E&G) has been used as a pilot for the use of fixed junction lighting. This has generated improved maintenance inspection opportunities at 6 junction sites along the route. Scotland will also plan to improve access for both the cross border operators and freight traffic.

A number of S&C renewals have already been installed by the track renewals contractor based on trialling *7 Day Railway* principles and techniques, which has reduced the levels of disruptive access required in Scotland.

We are investigating a number of further initiatives and plan to have a defined set of projects by April 2010.

Sussex

On Sussex, passenger operators aspire to have full working timetable (WTT) compliance seven days a week. Existing freight operators wish to maintain current levels of access during weeknights, and enhance access at weekends where possible.

Sussex led initiatives to improve network availability are based primarily upon employing further single line working and local maintenance schemes. Additionally, the use of motorised hook switches will reduce the time it takes to

gain traction current isolation, making possessions more productive. Fixed junction lighting and RRV access are some of the other schemes being considered. Sussex is focusing primarily on the Brighton Mainline and East / West Coastway.

Wessex

South West Trains and First Great Western both aspire to have the network available to enable them to operate their normal working timetable (WTT) seven days a week. CrossCountry want specific route access particularly on Friday and Sunday afternoons while DB Schenker and Freightliner want to run services seven days a week in consistent pathways with fewer diversions.

The focus on Wessex has been to reduce weeknight and weekend disruption on three main passenger routes – Waterloo to Weymouth, Waterloo to Portsmouth Harbour and Waterloo to West of England – and to provide through paths for freight traffic from Eastleigh and Southampton.

The Wessex Route plan is heavily informed by the recently concluded Wessex 90 Day Challenge which involved trialling a number of *7 Day Railway* projects and initiatives which reduce the impact of engineering works on the train service and increase productive working time in access opportunities. Use of these projects and initiatives is now being built into the Wessex access strategy. The output is also being reviewed for potential roll-out of schemes nationally.

In terms of schemes being developed, planned infrastructure enhancements will offer increased flexibility of operations and timetabling and allow for extended mid-week possession opportunities, resulting in reduced disruptive possession requirements, in particular for maintenance work, and increased single line working capacity. A number of local maintenance schemes are also being progressed; largely based upon those discussed under the *Maintenance* section above. In addition schemes for Hoists (to enable the lifting of heavy equipment vertically to the track side, where access is currently difficult), motorised hook switches (to reduce electrical isolation times) and TOWS / tunnel lighting are being considered.

As discussed under the *Investment Projects* section of this document, the access requirements for route enhancement and renewal schemes will be informed by *7 Day Railway* principles. Schemes on Wessex requiring significant access include W10 gauge enhancement works, works at Waterloo and platform extensions.

Western

On Western, our customers want to see a reduction in the frequency and duration of two line blocks though the effective use of the existing bi-directional signalling capability.

The Western Route will focus on a number of key sections, which align with identified critical pinch points for network availability. These are Bristol-Birmingham, Didcot-Swindon-Bristol, Wales and Marches, Didcot-Oxford and Exeter-Plymouth.

The schemes which are being developed on Western are section specific, designed to address the particular availability constraints on each section. Some of these are potential add-ons to existing route enhancement schemes where, in certain cases, a cost effective enhancement is possible to an existing project.

There are schemes which focus upon better use of single line working and bi-directional signalling capabilities. Other schemes are based upon upgrading the infrastructure (e.g. revised track layout in the Cardiff Central station area to reduce disruption during track maintenance), but there is also a scheme investigating the introduction of new technology (to reduce the frequency and duration of access requirements). An evaluation of a W10 gauge cleared route around Reading is also planned; this would ensure that 9" 6' containers can still be conveyed when work is planned between Reading and Leamington Spa. In addition, there is a scheme to mitigate the impact of Crossrail and Reading works.

As on other Routes nationally, Network Rail will also develop local maintenance schemes to meet the requirements of the key sections identified.

Crossrail and Reading are both schemes that would impact network availability on Western. Access requirements will be carefully managed in accordance with *7 Day Railway* principles. These projects will be managed cross functionally, and across disciplines to minimise Network Rail's access footprint. Our customers will continue to be consulted as part of the process to develop access plans. In addition, there are a number of significant enhancements planned through CP4, for which this type of approach will be required when planning access.

Olympics

In terms of Network Rail engineering access through the Olympics period, a zone based approach has been adopted; with Zone 1 denoting the highest level of priority for train operator access to the network. For locations within Zone 1 (focused on routes into Stratford, primarily within the M25 boundary but including Shenfield), there will be no disruptive maintenance access during the period of the Olympic Games. For Zone 2 (focused primarily on routes into London termini within the M25 boundary but also including Reading and outer London airports) access will be severely limited. Key routes within Zone 3 (longer distance services into London termini) will all be open later at night to allow for the passage of later last trains to allow spectators to get home. Zone 4 has designated areas where there will be large events held in other parts of the country (for example football matches and the sailing at Weymouth) to ensure they will be open to allow for the movement of spectators for these events. Zone 5 covers the rest of the network where most of the maintenance access will remain as current. Maps detailing the Zones are available on request.

Further information regarding access for specific lines and locations is published within Section 8 of Rules of the Route 2011. This is a specific Olympic Games section which has been subject to industry consultation.

Information on Olympics construction projects can be found under the *Summary Route Plans (Anglia)* section above.

Measures

Introduction

Network availability is measured through the possessions disruption index (PDI), an indicator developed jointly with ORR following industry consultation. Disruptions to passenger and freight traffic are measured through separate indicators.

The passenger index measures the level of disruption to passenger services weighted by passenger volumes and values of time when possessions take place. The freight index is a similar measure, weighted by the number of freight movements.

The PDI's define the regulatory outputs as an index at a network level compared against the possessions disruption experienced in 2007/8, the last complete year before the indicators were developed. The output trajectories are shown in figure 1 below:

Figure 1 PDI Output trajectories					
Possessions disruption index	2009/10	2010/11	2011/12	2012/13	2013/14
Passenger	1.02	0.91	0.83	0.68	0.63
Freight	1.00	1.00	1.00	1.00	1.00

In addition to the PDI results, a number of other measures around network availability are produced each month and supplied to the industry in the Possessions Indicator report.

The ORR reporter has carried out a review of the data integrity and the computational accuracy for the PDI's. They have made a number of recommendations for action by April 2010 that we are addressing.

PDI Graphs

The 2009/10 PDI graphs for passenger and freight are shown below: (PDI-P graph is produced one period in areas and so shows P9 results, PDI-F shows P10 results)

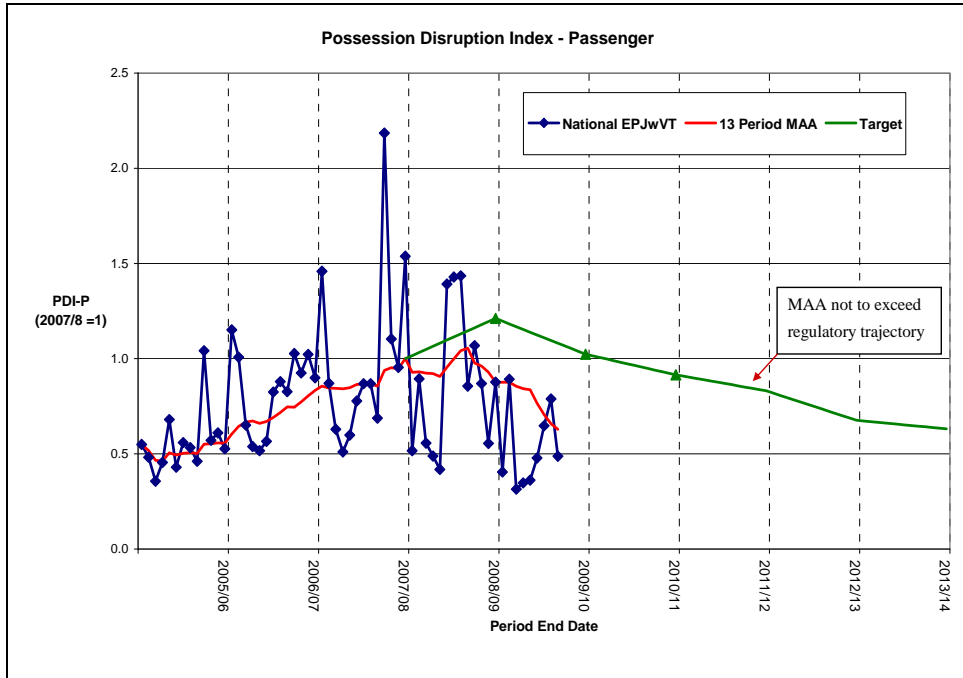


Figure 1 Possession Disruption Index - Passenger

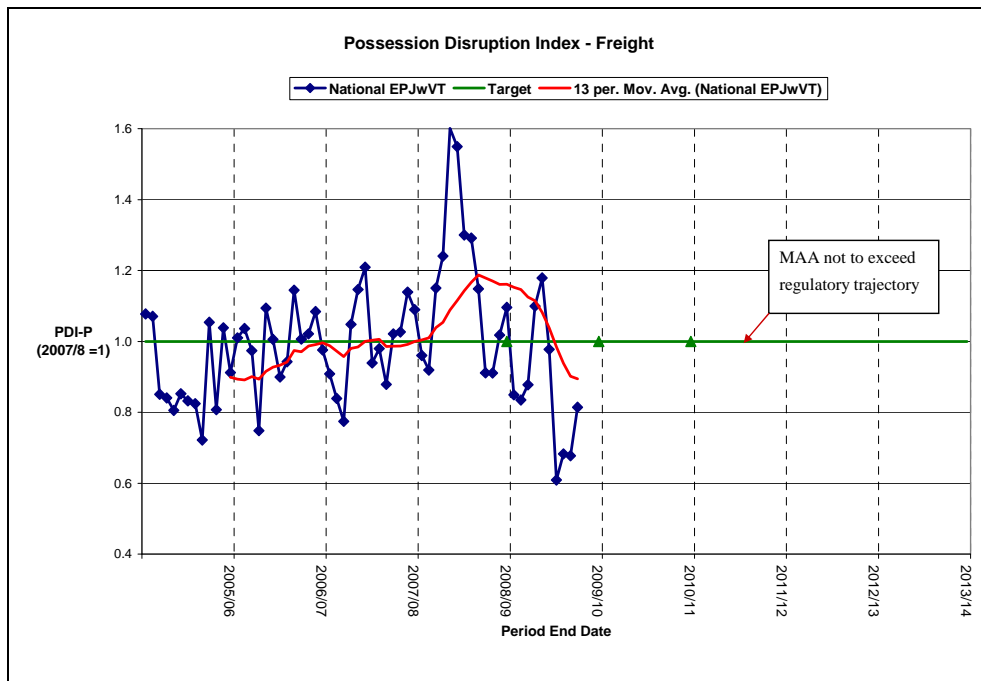


Figure 2 Possession Disruption Index – Freight

Use of PDI as a management metric

We are currently delivering a series of engagement activities to impart a broad awareness of the impact of PDI, along the lines of what was achieved for the improvement of the PPM measure. A PDI guide with fact sheets has been circulated to planning and delivery teams within Network Rail to enable teams estimate the PDI consequence of their typical activities and an awareness of the measurable impact that disruption causes (see Appendix 3). We are now providing details of the PDI's by operator in the Possession Indicator report.

To help understand the PDI for passengers (PDI-P), the target will be disaggregated by route and allocated to projects. This will be used to set the access constraints that will govern the choice of delivery techniques to be adopted, consistent with achieving other regulatory outputs such as cost performance at a project level. The disaggregated PDI-P by route will be available in summer 2010 when the new network availability reporting system (NARS) is commissioned. We will also disaggregate the forecasts for the PDI measures to provide forecast by route and operator.

In the interim the following will apply:

- The Network Access Unit will take account of the impact on the PDI index before granting disruptive possessions.
- The working timetable compliance measure, disaggregated at the passenger train operator level is being produced each period.

Communications plans are in place so that everyone is aware of both the importance of the PDI and the principles that they are expected to adhere to.

The PDI's are reviewed as part of the monthly business review process.

Network availability reporting system (NARS)

We are currently developing a new reporting system to produce the PDI's accurately, reliably and seamlessly at the end of each period. The system will calculate both the passenger and freight metrics according to the parameters defined with the approved ORR models. The NARS system will automate and replace the current manual procedures for producing the PDI's.

Integral to the NARS system is the ability to forecast the metrics by a number of scenarios to assist in the management of the measures.

The system will be scalable and will be built on the robust Oracle platform with a Business Objects front end in compliance with Information Management approved architectural principles and strategies.

We anticipate that the NARS system will replace the existing manual reporting system from the summer 2010.

Output Forecasts

The top-level regulatory output targets were calculated using a bespoke forecasting model during 2008. This included assumptions from Network Rail's Strategic Business Plan as to the volumes of maintenance, renewals and enhancement activities and the impact on number and duration of possessions throughout the control period. We have used the same model to produce updated forecasts which reflect actual possessions in 2008-9 and the possessions plan in 2009-10. These already show early improvements compared with the original forecasts as we work to reduce the level of disruption caused by possessions. We have then applied a trajectory to the possession requirements for maintenance and renewals based on the activities described in this plan. In the case of maintenance activity, which currently drives a significant volume of midweek night possessions, there is a significant benefit to freight due to the nature of its traffic patterns. The improvements in the passenger indicator are largely driven by the programme to reduce the duration of possessions for renewals, particularly in the track asset category.

The revised forecasts for 2009/10 are closer to the emerging actual indicators than the original forecast, and suggest that our plans will enable us to achieve the regulatory outputs in each year of the control period. There remain some risks to the achievement of these forecasts. These are mainly based on uncertainties concerning the actual possession plans for renewals and enhancement activities later in the control period, where the detail is still under development. There are a number of mitigations to these risks in our output plans and our general business planning processes. These include:

- Assessment of the impact on availability outputs when planning potentially disruptive work (an extract from the forecasting model has been produced to enable this);
- The change control mechanism for enhancements projects requires the impact on outputs, including network availability, to be considered;
- The development of initiatives to reduce the disruptive impact of possessions in key locations.

PDI – P Forecast

The table below is the forecast of the contribution of that each activity will deliver towards the overall 37% improvement (reduction) in PDI-P.

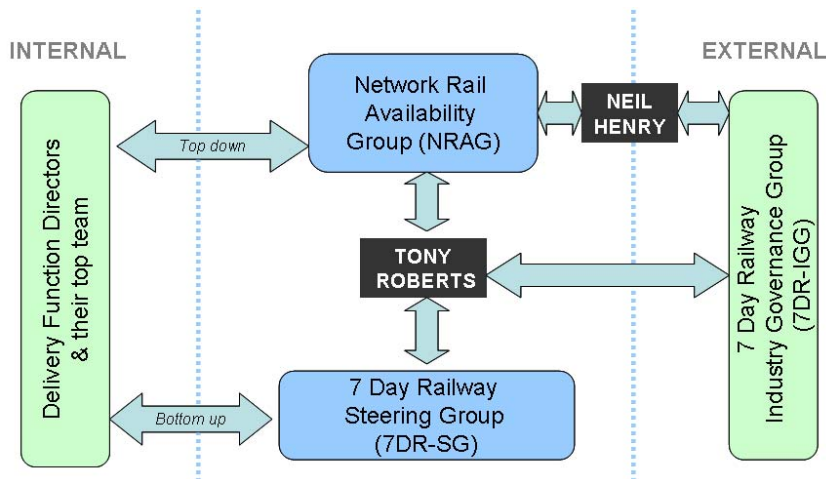
Activity	CP4 Reduction
Maintenance	-2%
Renewals	-18%
Enhancements	-4%
7DR schemes/other	-13%
Total	-37%

PDI – F Forecast

We have assumed that the do nothing scenario would result in a 16% worsening of the PDI-F. Our plans are therefore based on delivering a 16% improvement (reduction) compared to the do nothing scenario.

Activity	CP4 Reduction
Maintenance	-8%
Renewals	-5%
Enhancements	1%
7DR schemes/other	-4%
Total	-16%

Management of the programme



Introduction

The Network Availability Plan will be delivered through a number of processes involving Network Rail's Asset Management, Infrastructure Projects, Network Development, National Delivery Service and Operations and Customer Services functions. Ownership of the plan is with the Director of Operations and Customer Services and is managed by the Head of Operational Planning and Performance.

This plan is supported by the functional heads and has been developed by input from those functions listed above. The plan will be available to our stakeholders including the train and freight operating companies and the ORR.

Overview of activities

Day to day project management within Operations and Customer Services will be managed by the Programme Manager (Change) within Operational Planning and Performance supported by representatives from each of Network Rail's routes and functions.

Network Rail Availability Group

This is a recently established group chaired by Head of Operations Planning and Performance, with senior level representation from functions across the company. The group will integrate network availability commitments into a single coherent internally consistent commitments statement, communicating this to impacted parties on an ongoing basis. The Group will provide ongoing direction and oversight to enable the company's plan to deliver on the company's national network availability commitments.

7 Day Railway Industry Governance group

The Head of Operational Planning & Performance chairs a network availability governance group consisting of industry members which meets every 8 weeks to monitor progress on the plan.

7 Day Railway Steering group

An internal Network Rail steering group chaired by the Programme Manager (Change) meets every 4 weeks to monitor actions and report on progress with representatives of each Network Rail Route and the functions responsible for delivery of each element of the plan. This group manages the costs of the project insofar as monitoring expenditure authority against the allocated funding for Network Availability in Network Rail's delivery plan.

Detailed actions are managed by identified individuals in the appropriate function working to specific timescales as outlined in the plan. The actions will be monitored by the steering group and the industry governance group will also check compliance to the plan at its 8-weekly meetings.

Monthly business reviews

Network availability compliance measures are reviewed each period by the Director of Operations and Customer Services during monthly business reviews with the Route Directors and their teams.

Project management milestones

The milestone plan will be subject to review by the ORR to enable Network Rail to issue a final plan by the end of February 2010.

Cross industry processes

It is noted that there are a number of mechanisms in the industry where there is lack of or even a negative business case for one party to implement an improvement which would benefit the whole; for example the training of train drivers for diversionary routes.

Any important issues will be highlighted as they arise and will be addressed through the governance group on a case by case basis.

Allocation of benefits

With a network wide operational measure such as PDI it is difficult to allocate specific improvements to an individual initiative or project.

This document contains a number of actions to enable the improved local management of PDI in order that management practices will contribute to improvement. However, for planning purposes it is likely that overall improvement targets cannot be disaggregated beyond a certain point.

Engineering planning process

Network Rail has recently restructured the undertaking of the various aspects of engineering planning activity. This will support Network Rail's Control Period targets; including the requirement to increase network availability. Possession planning is therefore informed by *7 Day Railway* principles. Previously

responsibilities for the possession plan were spread between teams within Infrastructure Investment, Infrastructure Maintenance and National Delivery Service. Responsibility for all of these possession planning activities now lies with the NDS organisation, this having become effective in September 2009.

The possession plan is developed on a national basis but owned by 15 out based local delivery planning teams who are aligned with Network Rail's Operations & Customer Service areas. Overseeing the 15 out based teams is the central NDS team in Milton Keynes, who plan and allocate engineering resources and possession support services on a national basis. The central team also manages the compensation regime for train operators affected by engineering planning activity. The national plan integration team who are co-located with the out based teams (but report to the central team) provide a network wide internal change control process. This ensures that the impact of emerging engineering plans on the operational railway is clear for both internal and external stakeholders, including our Customers.

We have held a cross functional Network Availability workshop to ensure that there is a single aligned strategy across all initiatives that touch on network access and which may potentially involve conflict. Following this it is proposed to set up an Access Management Group that will take forward the development of an integrated access planning and timetabling process.

A further workshop has been held between the NDS and NAU planning teams to embed the network availability requirements into the access planning process and to develop a set of guidelines that the planners can be used by the access planners.

Passenger route categorisation

Introduction

Since the first version of the Network Availability Implementation plan was produced Network Rail has been in discussions with the Secretary of State for Transport, the Association of Train Operating Companies (ATOC), Passenger Focus and our passenger and freight customers. This has resulted in a set of protocols which will reduce disruption to passengers and the freight haulage industry caused by engineering works.

In December 2009 a joint statement was issued by Network Rail and ATOC with support from passenger focus

PASSENGERS TO GET BETTER WEEKEND AND BANK HOLIDAY TRAIN SERVICE

Pledge to keep one route to Scotland open at all times

Network Rail and the Association of Train Operating Companies (ATOC), with support from Passenger Focus, today announced an initiative to further reduce the need for replacement buses at weekends and bank holidays.

The industry aims to keep passengers on trains rather than have their rail journey interrupted by a bus journey. Achieving this will be a significant step towards the industry's vision of a seven-day railway.

Additionally, a rail route will always be available between London and Scotland.

Twenty key routes that carry 60% of all weekend passengers have been identified for special attention. Network Rail and train operators aim to offer a rail journey in almost all circumstances between key stations on these routes. The only exception is when the demands of rail improvement work make achieving this aim impractical. This commitment will be progressively introduced over the next two years.

Iain Coucher, Network Rail chief executive, said: "Today's punctual, reliable and safe railway has seen passengers flocking back. Their expectations for a decent service at weekends and at bank holidays have grown and we must respond. Keeping passengers on trains and off buses is our aim. We're working towards that and today's commitment sets us firmly on that path."

Michael Roberts, ATOC chief executive, said: "Train operators are delivering an ever better and more reliable service to their customers. With record levels of punctuality, we need to look at further ways of improving services, to attract more passengers to rail. One way to achieve this is to ensure that, as far as possible, rail journeys at weekends and bank holidays are not interrupted by the need for a bus journey."

Anthony Smith, Passenger Focus chief executive, said: "We are pleased that Network Rail and the train operators have signed up to our pledge, making a clear commitment to keep passengers on trains wherever possible rather than use buses, and to ensure certain towns and cities are connected by train at almost all times. We have been asked by the government to monitor this."

The 20 key routes

Trains will be able to operate between the stations shown below at weekends and bank holidays unless exceptional circumstances make it impractical.

<u>Route</u>	<u>Intermediate stations served on the route</u>
Birmingham - York (including Nottingham)	Derby, Sheffield, Leeds
Birmingham - Plymouth	Bristol
Birmingham - Southampton	Coventry, Oxford, Reading, Basingstoke
Birmingham - Manchester Piccadilly	Stoke on Trent, Manchester Piccadilly
Edinburgh Waverley – Glasgow Queen Street via Croy	Falkirk
Leeds - Manchester Piccadilly	
Leeds - Bradford	
London Bridge - Ashford International via Tonbridge	Orpington
London Bridge - Dartford	
London Bridge - East Croydon	
London Charing Cross - London Bridge	
London Euston - Glasgow Central (including to Birmingham, Manchester and Liverpool)	Coventry, Birmingham New Street, Wolverhampton, Preston
London King's Cross - Edinburgh	Peterborough, Doncaster, York, Newcastle
London Liverpool Street - Cambridge / Stansted Airport	
London Liverpool Street – Shenfield	
London Paddington - Cardiff Central (via Bristol Parkway and Temple Meads and including Heathrow Airport)	Reading, Swindon, Bristol Parkway, Newport, Bath Spa
London St Pancras - Sheffield (including Nottingham)	Luton, Leicester, Derby
Victoria - Brighton	East Croydon, Gatwick Airport, Haywards Heath
Victoria - Gillingham	Bromley South
Waterloo - Weymouth	Woking, Basingstoke, Southampton, Bournemouth

The regulatory target Network Rail has been set a regulated target by the ORR of reducing the disruption experienced by passengers because of planned engineering work by at least 37% by April 2014 and is well on course to achieving this target.

Seven-day railway Several years ago the idea was conceived to significantly reduce the amount of time taken to do big pieces of vital rail improvement work thus enabling a better service to be offered to passengers at weekends and bank holidays. New engineering methods have had to be created, new machinery and

technology introduced to make this vision a reality. Work is ongoing but good progress is being made.

For example, the replacement of a set of points has traditionally taken 54 hours. We have already halved the time taken to less than 27 hrs but our target is to reduce this even further.

Planning These commitments will now become progressively embedded in the railway's forward work and improvement schedule over the next 2 years.

Freight flows

	Traffic Flow	Normal Routing	Agreed Diversionary Route		Traffic Flow	Normal Routing	Agreed Diversionary Route
1	Humber-side Ports to Aire Valley power stations	Scunthorpe / Doncaster	Brigg / Lincoln	14	Ayrshire - Longannet	Paisley / Stirling	Winchburgh, Forth Bridge
2	Channel Tunnel Traffic	Sevenoaks / Tonbridge	Redhill or Maidstone	15	Carstairs – Grangemouth	Motherwell /Cumbernauld	Springburn (not all gauges)
3	Southampton – West Midlands	Winchester / Reading, DCL	Laverstock / WLL & WCML	16	West Midlands – South Yorkshire	Water Orton / Derby / Beighton	Lichfield or Nuneaton / Leicester & Toton / Sheffield
4	Felixstowe – West Midlands	GEML / NLL / T & H/ WCML	Ely / Manton / Nuneaton or Grantham / Syston and Castle Donnington	17	Peterborough – NLL	ECML	West Anglia
5	Mendip Quarries – South East	Berks & Hants	Melksham & Swindon	18	Peterborough – Doncaster	ECML	Spalding / Lincoln
6	Bristol Ports – South Wales	Severn Tunnel	Gloucester / Chepstow	19	Peak Forest from / to West	Chinley	Stockport
7	Avonmouth – Didcot	Badminton	Box / Berks & Hants	20	Sheffield – Leeds	S & K	Doncaster / Wakefield
8	Bristol Ports & South Wales – West Midlands	Barnet Green	North & West or Swindon & DCL	21	Doncaster – Cottam/West Burton	South Yorkshire Joint Line	Gainsborough or Woodhouse (run-round)
9	West Midlands – Trafford Park	Penkridge / Crewe / Stockport	Nuneaton (run-round) & Styal or Stoke / Macclesfield	22	North East – Aire Valley power stations	Colton – Milford	ECML / Doncaster (run round)
10	WCML – West Yorkshire	Diggle	Calder Valley	23	Northallerton – Teeside	Yarm	ECML / Darlington (run round)
11	Crewe – Preston	WCML	Manchester (not all gauges)	24	Teeside – Tyne	Durham Coast	Stillington
12	Crewe – Liverpool	Runcorn	Manchester, Chat Moss	25	Skipton – Carlisle	S & C	ECML / Hexham
13	Preston – South West Scotland	WCML	S & C / G & SW or ECML	26	Newcastle – Edinburgh	ECML	Blyth & Tyne or Hexham / WCML

Risk

This section provides an extract from the Network Rail risk register which has been collated for the network availability programme.



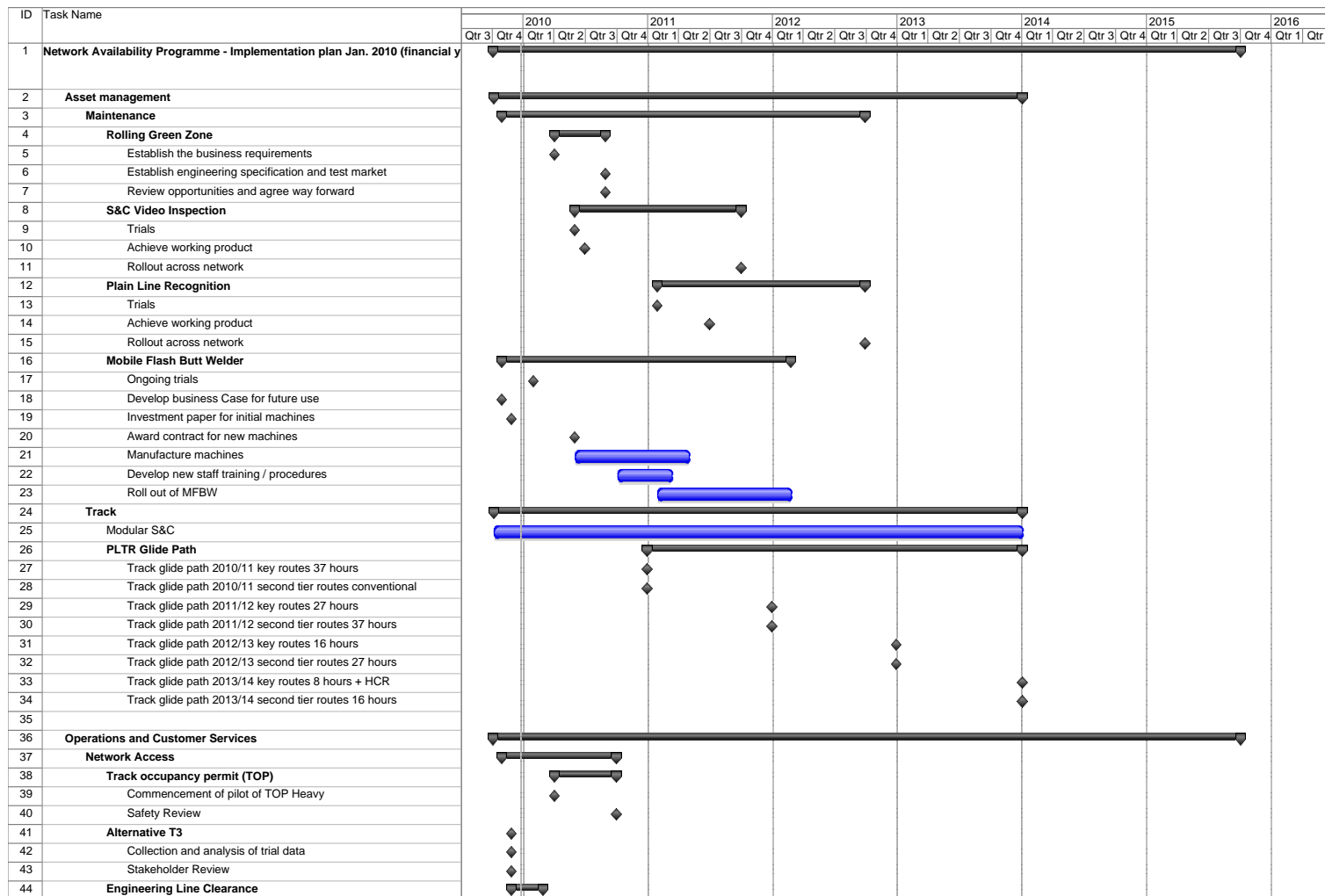
Risk Register

Record Type	ID	Risk Title	Current Risk Score	Post Risk Treatment Risk Score	Linked Impacts
Risk	190595	Planned NA and transformation initiatives will not deliver the required improvements in the regulated outputs	Significant (5)	NIL (0)	
Risk	190607	Insufficient time and funding	Minor (4)	NIL (0)	
Risk	190596	Workbank assumptions made in strategic business plan are no longer valid	Minor (4)	NIL (0)	
Risk	190597	Disruption from Major Project activity will have a significant adverse impact on PDI-P and PDI-F	Minor (4)	NIL (0)	
Risk	190608	Unable to make use of ALO and half capacity timetable	Minor (4)	NIL (0)	
Risk	190601	Network Availability requirements clash with other CP4 output requirements	Minor (4)	NIL (0)	
Risk	190593	IP and Asset Management unable to deliver the CP4 programmes within the CP4 constraints	Minor (4)	NIL (0)	
Risk	190606	Critical projects do not deliver the planned benefits	Minor (4)	NIL (0)	
Risk	190604	Inability to accurately forecast the PDI measures	Minor (3)	NIL (0)	
Risk	190599	Focus on delivering rail replacement bus targets will have an adverse impact on the PDI-P and PDI-F	Minor (3)	NIL (0)	

Appendix 1 Summary milestone plan



NETWORK AVAILABILITY IMPLEMENTATION PLAN - MARCH 2010												
		2009/10			2010/11				2011/12	2012/13	2013/14	2014/15
		J	F	M	Q1	Q2	Q3	Q4				
Asset Management - Maintenance Initiatives	Rolling Green Zone - business requirements				◆							
	Rolling Green Zone - agree way forward					◆						
	S&C Video Inspection - Trials					◆						
	S&C Video Inspection Roll out								◆			
	Plain Line Recognition trials								◆			
	Rollout across network									◆		
	Mobile Flash Butt Welder - ongoing trials				◆							
	Roll out of MFBW									◆		
Asset Management - Track Initiatives	Modular S&C											◆
	Track glide path 2010/11 key routes 37 hours							◆				
	Track glide path 2011/12 key routes 27 hours								◆			
	Track glide path 2012/13 key routes 16 hours									◆		
	Track glide path 2013/14 key routes 8 hours + HCR											◆
Route initiatives - Anglia	Improved OHL equipment capability									◆		
	Turnback facilities									◆		
	Mobile green zone							◆				
	Increased tamper productivity							◆				
	Trackside access & facilities								◆			
Route initiatives - Kent	Access Points								◆			
	ATWS											◆
	Hook Switches									◆		
	Junction Lighting											◆
	Removal of Red Zone prohibitions											◆
Route initiatives - LHE	Access Points								◆			
	Junction Lighting								◆			
	Removal of Red Zone prohibitions								◆			
	Lows								◆			
									◆			
Route initiatives - M & C	Adjacent Line Open								◆			
	Mechanised/Design patrolling								◆			
	Efficient Engineering Access								◆			
	Chesterfield 3rd platform									◆		
	Sharnbrook to Kettering capacity improvement						◆					◆
	Wellingborough to Harrowden – line speed improvements											◆
												◆
Route initiatives - Sussex	RRV Access							◆				
	Storage Areas							◆				
	Fixed Junction Lighting								◆			
	Motorised Hook Switches								◆			
Route initiatives - Wessex	Additional crossovers									◆		
	Additional loops									◆		
	Fast line platforms									◆		
	Conversion of No. 16 crossover								◆			
	Improved access points								◆			
	New storage areas								◆			
	Hoists								◆			
	Motorised hook switches								◆			
	TOWS and tunnel lighting								◆			
									◆			
Route initiatives - Western	Bi-Di use Didcot-Swindon-Bristol								◆			
	SLW between Bristol and Birmingham								◆			
	Additional point ends Cardiff Central station area											◆
	W10 gauge cleared route around Reading											◆
	Swindon - Kemble signalling evaluation										◆	
Network Access	Introduction of OTM Curve Assisted Laser								◆			
	Track occupancy permit (TOP)											◆
	Alternative T3 - stakeholder review		◆									
	Engineering Line Clearance				◆							
	Planning and Delivery				◆							
	Electrification improvements				◆							
	On Track machines Working Outside Possession				◆							
Route Categorisation	Full introduction of route categorisation principles								◆			
									◆			
Single Line Working	Develop proposals for additional SLW								◆			
	Further development of high output operations (based on ALO)								◆			
	National maintenance ALO framework								◆			
	SLW Training and support framework								◆			
	Operations Good Practice Manual						◆					
Management of Programme	7DR - Industry Governance Group Meeting	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
	Network Rail Network Availability Group Meeting	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Network Rail Steering Group Meeting	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Measurements	Network Availability Reporting System (NARS)				◆							
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>◆ Completed ◆ Action required</p> <p>◆ Revised date ◆ On track</p> <p>◆ On Hold</p> </div>												

Appendix 2 Programme GANTT



ID	Task Name	2010				2011				2012				2013				2014				2015				2016	
		Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2		
173	Sussex																										
174	RRV Access																										
175	Authority																										
176	Implementation complete																										
177	Storage Areas																										
178	Authority																										
179	Implementation complete																										
180	Fixed Junction Lighting																										
181	Authority																										
182	Implementation complete																										
183	Motorised Hook Switches																										
184	Authority																										
185	Implementation complete																										
186	Wessex																										
187	Additional crossovers																										
188	Outputs																										
189	Authority																										
190	Implementation complete																										
191	Additional loops																										
192	Outputs																										
193	Authority																										
194	Implementation complete																										
195	Fast line platforms																										
196	Outputs																										
197	Authority																										
198	Implementation complete																										
199	Conversion of No. 16 crossover																										
200	Outputs																										
201	Authority																										
202	Implementation complete																										
203	Improved access points																										
204	Outputs																										
205	Authority																										
206	Implementation complete																										
207	New storage areas																										
208	Outputs																										
209	Authority																										
210	Implementation complete																										
211	Hoists																										
212	Outputs																										
213	Authority																										
214	Implementation complete																										
215	Motorised hook switches																										
216	Outputs																										
217	Authority																										

Appendix 3 PDI fact sheet

<h1>Possession Disruption Indicator (PDI)</h1> 	
<h2>Fact sheet</h2> October 2009	
PDI explained	The Possession Disruption Index (PDI) is the regulated output that measures the amount of rail network that we withhold from our customers. The PDI is made up of two metrics - (PDI-P) for passenger and (PDI-F) for freight, base lined against 2007/8 values.
PDI CP4 target	<p>The regulated network availability output for CP4 is to progressively reduce passenger disruptions by 37% while ensuring there is no increase to the level of disruption experienced by freight customers.</p> 
What changes?	Engineering works will be delivered in possession durations that fit better with times of low customer demand.
<h3>Possession Disruption Index for passengers (PDI-P)</h3>	
PDI-P explained	PDI-P measures the excess journey time experienced by passengers as a result of disruptive possessions, weighted by passenger volumes and the economic value of the additional journey time incurred.
Quick PDI-P calculator	$\text{PDI-P} = \frac{\text{Additional journey time} \times \text{Value of time}}{\text{Total kilometres}}$ <p>for each day summed by service group</p>
What can I do to improve the PDI-P?	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Use possessions that avoid disruption to customers when it is practical to do so <input checked="" type="checkbox"/> Make use of techniques and facilities that minimise disruption <input checked="" type="checkbox"/> Use suitable diversionary routes where possible <input checked="" type="checkbox"/> Plan your possessions to maximise the amount of rail network made available to our customers <input checked="" type="checkbox"/> Do not request more or longer possessions than required for the work <input checked="" type="checkbox"/> Give back parts of a possession when it is not required
<h3>Possession Disruption Index for freight (PDI-F)</h3>	
PDI-F explained	PDI-F measures weighted possessions by the number of freight movements that would have taken place if there was no possession
Quick PDI-F calculator	$\text{PDI-F} = \frac{\text{Total km hrs unavailable due to possessions} \times \text{Volume of freight traffic}}{\text{Total track km hrs} \times \text{Amount of freight traffic}}$ <p>for each day and strategic route section</p>
What can I do to improve the PDI-F?	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Use possessions that avoid disruption to customers when it is practical to do so <input checked="" type="checkbox"/> Use suitable diversionary routes <input checked="" type="checkbox"/> Make use of Single Line Working (SLW) to avoid whole line blocks <input checked="" type="checkbox"/> Give back parts of a possession when not required

Appendix 4 Seven day railway fund - Summary of proposed schemes

Schemes authorised for GRIP 1-3

No	Route/ Function	Project Description	Benefit	IP Number	GRIP 3 comment	Estimated PDI-P change	Estimated PDI-F change
1	Kent	Maintenance initiatives	Reduce disruptive access	116608		0.001319	0.0028
2	LNE	Crowle and Thorne Crossovers	Facilitate SLW	113225	No benefit, closed	0.000000	0.0000
3	LNE	OLE York-Colton, allow independent isolation	Reduce disruptive access	113229		0.000550	0.0012
4	LNE	Tursdale, Ferry Hill crossovers for SLW	Facilitate SLW	113231	No benefit, closed	0.000000	0.0000
5	LNE	Thirsk, Tollerton crossovers for SLW	Facilitate SLW	113232	No benefit, closed	0.000000	0.0000
6	LNE	Templehurst, Hambleton wired crossovers for SLW	Facilitate SLW	113243		0.006713	0.0141
7	LNE	Ground frame conversion for efficient isolations	Facilitate SLW	113247	Revised to Mod Bi Di	0.000000	0.0000
8	LNE	Mod Bi-Di Stoke to Colton	Facilitate SLW over a large section of ECML	113247		0.015188	0.0319
9	LNE	Bi-Di to Fletton to Connington Sth for SLW	Facilitate SLW	113248	No benefit, closed	0.000000	0.0000
10	LNE	OLE depot independent feeds	Reduce disruptive access	113250		0.001156	0.0024
11	M&C	Chesterfield platform for half capacity railway	Reduce disruptive access	104212		0.002772	0.0000
12	M&C	LSI slow lines Bedford - Sharnbrook for half capacity railway	Provide additional capacity to reduce disruption when some lines under possessions	113344		0.014206	0.0298
13	M&C	Capacity Sharnbrook-Kettering North-Corby to enable full capacity on diversionary route	Enables full capacity service to be operated over diversionary route	113345	Combined with 113334	0.000000	0.0000
14	M&C	Maintenance initiatives removal of red zone prohibited areas and adjacent line open	Reduce disruptive access	115107	Authorised for GRIP 4	0.000719	0.0015
15	M&C	Maintenance initiatives site access and cable routes (efficient engineering access)	Reduce disruptive access	115108	Project descoped, revised GRIP 4 paper for Feb	0.003281	0.0069
16	M&C	Maintenance initiatives new patrolling process (design patrolling)	Reduce disruptive access	115109		0.004524	0.0085
17	Sussex	TOWs and Tunnel lighting	Reduce disruptive access	114455	on hold		
18	Sussex	Access points	Reduce disruptive access	114456	GRIP 4 to March panel	0.000813	0.0017
19	Sussex	Isolations (hook switches and floaters)	Reduce disruptive access	114457	GRIP 4 to March panel	0.002331	0.0049
20	Sussex	Fixed lighting	Reduce disruptive access	114458	GRIP 4 to March panel	0.001263	0.0027
21	Sussex	Storage areas	Reduce disruptive access	114459	GRIP 4 to March panel	0.001056	0.0022
22	Wessex	Waterloo to Weymouth timetable study	Identify options for reducing disruptive access	112774		0.000044	0.0001
23	Western	Bath to Bristol signalling enhancement	Enables full capacity service to be operated over diversionary route	105945	Implment July 2011	0.000063	0.0001
24	Western	Bristol Birmingham Route; Level crossing controls crossovers for SLW	Facilitate SLW	110432	Grip 3 output report expected feb 2010	0.012500	0.0263
25	Western	Didcot-Swindon timetable investigation for SLW	Identify options for reducing disruptive access	112088	study complete, mtce reviewing options	0.000025	0.0001
26	Western	W10 diversion study	Reduce disruptive access	114611	GRIP 2 March 2010	0.000031	0.0001
27	Western	Cardiff Area re signalling to enable station to operate in two halves	Reduce disruptive access	DDDB10	GRIP 4 to March panel	0.004106	0.0086

Schemes being considered for GRIP 1-3 development

No	Route/ Function	Project Description	Benefit	GRIP 3 comment (if applicable)
44	M&C	Thameslink sustainability	Provide sustainable access after Thameslink upgrade	Paper prepared
28	Anglia	Anglia Maintenance initiatives	Reduce disruptive access	
29	LNE	Maintenance Initiatives	Reduce disruptive access	Paper being drafted
30	LNW	Chiltern Evergreen 3	Facilitate SLW	
31	Mtce	S&C gantry	Reduce disruptive access	Paper being drafted
32	Mtce	Mobile flash butt welder	Reduce disruptive access	Paper being drafted
33	Mtce	Mobile maintenance workshop	Reduce disruptive access	Being trialled on Wessex, if successful paper will be drafted
34	Wessex	Additional operational resources for SLW	Facilitate SLW	
35	Wessex	DS DF Xover Clapham Earlsfield	Facilitate SLW based on output from the Wessex TT study	
50	Wessex	UF US xover Clapham Earlsfield	Facilitate SLW based on output from the Wessex TT study	
51	Wessex	DF DS xover Raynes Park	Facilitate SLW based on output from the Wessex TT study	
52	Wessex	D&U xover Eastleigh	Facilitate SLW based on output from the Wessex TT study	
53	Wessex	Loops at Micheldever and Winchester	Reduce disruptive access based on output from Wessex TT study	
54	Wessex	Fast line platforms at Earlsfield	Facilitate SLW based on output from the Wessex TT study	
36	Wessex	Poole-Wool reverse crossover direction	Facilitate SLW	
37	Wessex	Maintenance schemes	Reduce disruptive access	
38	Western	Thames valley platforms for 2 track railway	Reduce disruptive access	
39	Western	Newport-Chester strategy for SLW	Reduce disruptive access	
40	Western	Maintenance schemes	Reduce disruptive access	Draft based on output from Didcot-SwindonTT study
41	Western	Improvements to OTM process	Reduce disruptive access	Submitted but not approved. RG seeking further info.
47	Western	Gloucester - Seven Tunnel LSI	Reduce diversion time penalty in linen with Route categorisation	Paper being drafted
48	Western	Cotswold line turnback facility	Reduce disruptive access	Paper drafted

Other possible schemes

No	Route/ Function	Project Description	Benefit	GRIP 3 comment (if applicable)
43	LNW	Undefined maintenance initiatives	Reduce disruptive access	
45	Scotland	Undefined schemes	Reduce disruptive access	
46	Western	Filton Bank renewal	One off reduction in disruptive access for a renewals item	To be funded by IP and decision re recovery made later
42	Western	Kemble Standish signals	Enables full capacity service to be operated over diversionary route	Agreed part of Swindon-kemble scheme, 7 Day railway funding not required.

The AFC of the schemes currently under GRIP 1-3 development is £ 115m.