

Strategic Business Plan: Definition of CP5 enhancements

January 2013



	Page
Introduction	3
Summary	7
England & Wales CP5 enhancement programme	9
England & Wales - Committed Projects	10
England & Wales - funds to deliver specific outcomes	37
The Electric Spine	51
London and the South East	66
North East	84
London North West	94
Wales	98
Western	101
Scotland CP5 enhancement programme	112
Scotland - Committed Projects	113
Scotland - Funds to deliver specific outcomes	120
Scotland - Other Scottish projects	128

Introduction

This document provides more detail of the enhancements proposed for Control Period 5 as summarised in Network Rail's Strategic Business Plan (SBP).

Projects within this document are grouped into a number of categories:

- “Committed” Projects – These are projects that the England & Wales, and Scottish governments committed to providing funding for ahead of publishing their High Level Output Specifications.
- Funds to Deliver Specific Outcomes – Experience of using funds in CP4 has demonstrated the value of such an approach giving the industry flexibility to determine the most cost effective way to deliver outputs.
- The Electric Spine - A major north-south rail electrification and capability enhancement, increasing regional and national connectivity and supporting economic development by creating a high-capability 25kV electrified passenger and freight route from the South Coast via Oxford and the Midlands to South Yorkshire.

Other projects (those projects “named” in the High Level Output Specifications and projects required in addition to those committed and named that are required to deliver the capacity metric), not captured under the above, have been grouped by region.

Tables showing the CP5 expenditure for individual projects and funds can be seen at the front of each section: as follows:

- England & Wales
 - Committed Projects
 - Funds to Deliver Specific Outcomes
 - The Electric Spine
 - London and the South East
 - North East
 - North West
 - Wales
 - Western
- Scotland
 - Committed Projects
 - Funds to Deliver Specific Outcomes
 - Other Scottish Projects

Below we describe the processes we have adhered to in order to ensure that the projects included in our plans are efficiently costed and are supported by our stakeholders.

Project requirements

The Initial Industry Plan (IIP) was published in September 2011. The plan set out a series of possible enhancement projects for CP5. The enhancements proposed were informed by the Route Utilisation Strategies (RUSs).

The RUSs examined the rail network at a specific point in time and identified where it would not be able to accommodate forecast demand. This was primarily in terms of capacity, but the RUSs also considered performance and connectivity. Where the demand could not be accommodated, the RUSs sought to find appropriate and best

value solutions. The general principle adopted was for simpler and lower cost interventions to be considered before turning to more complex and expensive solutions. In the first instance, optimising the use of existing infrastructure was examined and timetabled solutions were usually sought as preferable to infrastructure works (subject to there being no unacceptable performance impact). The various options were then evaluated using the DfT's appraisal criteria and recommendations made.

Since the IIP, the High Level Output Specifications (HLOSs) were published by Transport Scotland and the DfT on 21 June 2012 and 16 July 2012 respectively. These had been informed by the IIP and the RUSs.

The biggest driver for efficiency is in the identification of the appropriate solution to an output requirement. Identifying the wrong solution or scope could result in a significant amount of expenditure being inefficiently incurred.

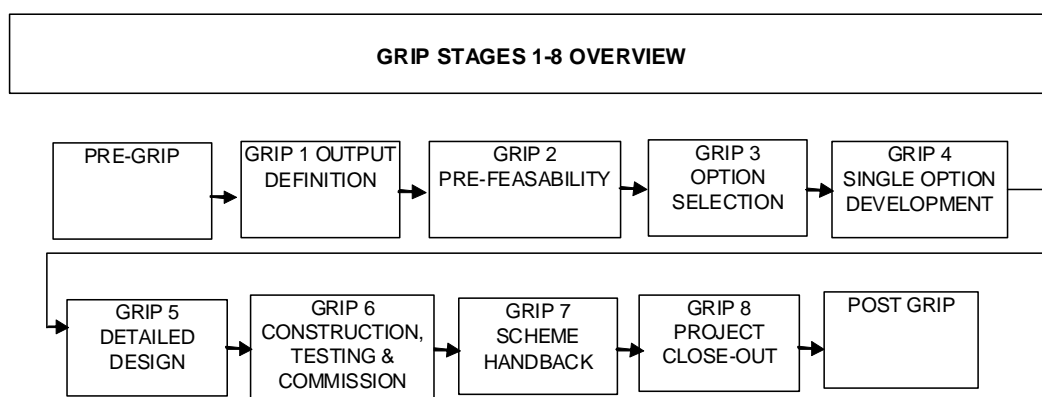
Industry engagement

The key interface within Network Rail for the ongoing development of the overall plan for each route is with Principal Strategic Planners for England, the Head of Strategy & Planning (Wales) for Wales, and the Head of Strategy & Planning (Scotland) for Scotland.

The industry is engaged in a number of ways in the development and delivery of the projects; through one-to-one dialogues on specific projects, and also more formally through the Route Investment Review Group (RIRG).

Project development

Our projects are developed through the Governance of Railway Investment Projects (GRIP) framework. The constituent projects are at varying stages of development within this framework. The final specification for each project and the construction plan are not confirmed until completion of GRIP 4.



The GRIP framework is a multistage process that runs from pre-project definition through to full construction and project close-out. The earlier stages of GRIP are associated with project definition, pre-feasibility, and option selection. It is estimates from these GRIP stages that have informed the majority of enhancement projects that are new to CP5 (the “Funds” set out in the HLOS are given a fixed level of funding for Network Rail to deliver against within CP5 rather than for projects already identified) consequently it is not appropriate to provide a full list of projects for each Fund at this stage.

A recent review by Nichol's (the independent reporter) concluded that: '.....RUS and GRIP are robust processes that are comparable to good practice in other delivery organisations.'

This finding was also further corroborated through Network Rail's enhancements efficiency and benchmarking workstream that assessed the processes of a number of rail and non-rail companies, both within the UK and abroad.

There are sufficient stop and review points by stakeholders and functional experts prior to committing to the full scheme to help identify outputs, and subsequently scope, both efficiently and successfully. Therefore it has been concluded that GRIP is an efficient methodology for Network Rail to use in the development of its enhancement projects.

Improving efficiency in CP5

Estimates for CP5 enhancements projects were produced using CP4 and earlier cost data. Consequently, in order to take account of the more recent efficiency improvements, and the scope for further improvements in CP5, a top down efficiency overlay has been applied. This overlay has been informed through our efficiency and benchmarking workstream.

Opportunities for improvements were identified through qualitative discussions with external comparators, and through reviewing the individual benchmarking studies undertaken by the renewals teams of building and civils, track, electrification, and power and signalling, to look for read across efficiencies that could be applied to the enhancements portfolio.

More detailed quantitative comparisons to external parties were not possible due to the complexities of comparing projects that (almost by definition) are not regularly repeated, the lack of maturity in the relationships with comparators, and the different data capturing processes.

A series of internal cost and process benchmarking exercises were conducted. A high level review was carried out on the cost base of enhancement projects with respect to the other asset groups, followed by a detailed review of 92 enhancement projects across a number of years and at differing levels of GRIP maturity. Unit cost information was investigated to understand how the costs of similar items varied across the business. The review of work was undertaken by a mixture of external consultancy (Sweett Limited) and Network Rail staff. Further comparisons of enhancements estimates against the Unit Cost Model (UCM) were also undertaken.

The efficiency and benchmarking workstream identified opportunities for efficiency gains in the below key areas:

- Cost Control – From estimating to final account – use of a standardised cost book and work breakdown structures with detailed programme management.
- Longer and funded tender periods – allowing the market more time and resources to deliver more innovative solutions.
- Collaboration/ Alliancing – use of pain/gain share agreements to deliver innovation and reductions in project delivery.
- Stage 5-8 products – increased use of GRIP in the delivery stage with cost control.
- Project Delivery process including work bank management – have a consistent project team with unified goals and good contract, change management and negotiation skills.

- Access Windows – Improved longer term planning allowing better access to the network and an understanding of how this drives project costs.
- Review of contract costs and challenge – greater challenge on rates for contract variations and amendments with a standard method of measurement linked to a consistent cost breakdown structure. The latter allows project teams to better understand potential cost irregularities and to make appropriate challenge to contractors.

Quantitative estimates of the scope of potential efficiency gains were derived from the various assessments undertaken.

Portfolio risk effects

While projects have been costed on an individual basis, we have assessed the benefits gained from delivering the suite of enhancements as a portfolio, and applied this as a top down overlay to all projects that were not committed prior to HLOS.

Risk and efficiency overlays

The below table shows the top down overlays that have been applied to all new projects (i.e. the not committed / baseline projects):

	2014/15	2015/16	2016/17	2017/18	2018/19
Efficiency profile	1%	2%	4%	7%	12%
Risk overlay	3.75%	3.75%	3.75%	3.75%	3.75%
Net reduction	4.7%	5.7%	7.6%	10.5%	15.3%

Depots and Stabling

Throughout this document we have followed the general approach adopted by the Office of Rail Regulation in the CP4 Determination and assumed funding for rolling stock depots and stabling would flow directly from DfT to franchised Train Operating Companies thus facilitating the procurement of rolling stock within the franchise competitions.

Summary

England and Wales projects

	CP5 expenditure (£m in 2012/13 prices)
Committed projects The Crossrail Programme, Reading Station Area Developments, Great Western Electrification, North West Electrification, the Northern Hub Programme, Trans-Pennine Electrification, the Intercity Express Programme, East West Rail, the Thameslink Programme, Stafford capacity upgrade, and West Coast Power Supply Upgrade.	6,212
Funds to deliver specific outcomes The Strategic Freight Network, East Coast Connectivity, Passenger Journey Improvement, Station Improvement, Development, and Level Crossing Safety.	1,177
The Electric Spine A major north-south rail electrification and capability enhancement.	1,417
Other projects located in:	
London and the South East	
Sussex traction power supply upgrade, Anglia traction power supply upgrade, Kent traction power supply upgrade, Wessex traction power supply upgrade, Reading, Ascot to London Waterloo Train Lengthening, South London HV traction power upgrade, East Kent resignalling phase 2, Uckfield line train lengthening, Redhill additional platform, London Victoria station capacity improvements, Bow Junction, West Anglia main line capacity increase, New Cross Grid, Service Improvements in the Ely Area, Waterloo.	923
London North East	
LNE routes traction power supply upgrade, Bradford Mill Lane capacity, Stevenage and Gordon Hill turnbacks, MML long distance high speed services train lengthening, Leeds and Sheffield capacity, Huddersfield station capacity improvement, Micklefield turnback, East of Leeds capacity.	214
London North West	
North West Train Lengthening, Walsall to Rugeley electrification, Chiltern Main Line Train Lengthening	98
Wales	
Welsh Valley Lines Electrification	305
Western	
Bristol Temple Meads station capacity (incl. Digby Wyatt Shed), Dr Days Junction to Filton Abbey Wood capacity improvements, Oxford corridor capacity improvements, West of England Diesel Multiple Unit capability works, Thames Valley Electrical Multiple Unit capability works, Western access to London Heathrow Airport; Thames Valley branch lines electrification, Acton (Great Western Main Line) to Willesden (West Coast Main Line) electrification	440

Scotland projects

	CP5 expenditure (£m in 2012/13 prices)
Committed projects EGIP Electrification (Springburn to Cumbernauld) EGIP Electrification (Glasgow to Edinburgh via Falkirk High) EGIP (Edinburgh Gateway Station) EGIP Infrastructure works Borders Railway	613
Funds to deliver specific outcomes Scottish Stations Fund Scottish Strategic Rail Freight Investment Fund Scottish Network Improvement Fund Future Network Development Fund Level Crossings Fund	144
Other Scottish projects Aberdeen to Inverness Improvements Phase 1 Highland Main Line Journey Time Improvements Phase 2 Rolling Programme of Electrification (Scotland) Motherwell Resignalling enhancements Motherwell area stabling Carstairs Junction Remodel Edinburgh South Suburban Electrification	673

England and Wales

CP5 enhancement programme

England & Wales - Committed Projects

	CP5 expenditure (£m in 2012/13 prices)
Crossrail Programme	1,444
Reading Station Area Developments	143
Great Western Electrification	930
North West Electrification	197
Northern Hub	620
Trans-Pennine Electrification	272
Intercity Express Programme (IEP) – great western and East Coast Main Line	365
East West Rail	351
Thameslink Programme	1,654
Stafford Area Improvement Scheme	154
West Coast Power Supply Upgrade	82
Total	6,212

Crossrail

Operating route(s): Anglia, Kent, and Western

Project reference code: CR001

Output

The Crossrail project will deliver a new integrated railway route through central London from Maidenhead and Heathrow in the west to Shenfield in the north east and Abbey Wood in the south east.

The joint Sponsors of the Crossrail project, the Department for Transport (DfT) and Transport for London (TfL), set-up a company called Crossrail Limited (CRL) to act as the delivery agent. Network Rail is one of CRL's delivery partners.

The Crossrail project benefits are as follows:

- New Crossrail train services will provide direct links from Maidenhead and Heathrow to Paddington in the west to Shenfield and Abbey Wood in the east. With up to 24 Crossrail trains an hour running through the central section in each direction (at peak times) a total of 10% will be added to London's rail-based transport capacity;
- 28 existing surface stations will be upgraded with many of these stations also receiving platform extensions.

CP5 output driver

The responsibility for the design and construction of the works outside of the central tunnel section - known as the 'On Network Works' (ONW) - was transferred to Network Rail when Royal Assent was granted to the Crossrail project in July 2008.

The Protocol, which was established between Network Rail, Crossrail Limited (CRL) and the Department for Transport (DfT) on 27 November 2009 and subsequently amended in version 6.0 on 16 November 2011, and version 7.0 on 9 May 2012 details Network Rail's obligation to deliver the ONW. It authorised the completion of design development for the ONW to the end of GRIP Stage 4 and provided a process for agreeing an Overall Target Price (OTP) for GRIP Stages 5 to 8, to be Regulatory Asset Base (RAB) funded.

On 01 December 2011 Network Rail submitted its Key Date 1A (KD1A) submission to CRL. This was followed by an amended Overall Target Price (OTP) which was submitted to CRL in March 2012. The joint sponsors for the Crossrail project (DfT and TfL) accepted CRL's recommendation of that OTP and CRL confirmed this acceptance on 29 April 2012.

The Route CP5 maintenance submissions will contain an allowance to facilitate future maintenance regimes once the Crossrail services start to operate.

Scope of works

The scope of works that Network Rail is responsible for is listed below:

Track

- Layout changes and turnback capability at Maidenhead, Slough, West Drayton, West Ealing, Hayes and Harlington, Ilford, Chadwell Heath, Gidea Park and Shenfield;
- two new tracks from Plumstead to Abbey Wood to support the Crossrail train service;
- remodelling at the interfaces between the Crossrail Central Tunnel section and the existing Network Rail infrastructure at Pudding Mill Lane, Plumstead, Royal Oak and on the approaches to Paddington;
- remodelling at Old Oak Common depot to facilitate the Crossrail rolling stock depot; and
- track lowering beneath a number of bridges between Stockley and Maidenhead.

Structures

- A major new elevated junction at Stockley and a new dive-under at Acton;
- reconstruction of a number of bridges between Stockley and Maidenhead and between Plumstead and Abbey Wood; and
- new bay platforms at Maidenhead, Slough and Shenfield.

Signalling

- Re-signalling of the Great Western Main Line between Paddington and Reading;
- modification to the signalling of the Great Eastern Main Line between Stratford and Shenfield; and
- design and provision of a new control centre facility at Romford.

Electrification

- All four tracks of the Great Western Main Line will be electrified between Stockley and Maidenhead and new OLE structures will be fitted to the listed Maidenhead Railway Bridge.

Telecoms

- Station and lineside telecoms systems will be provided in order to meet Crossrail requirements.

Stations

- A new station will be constructed at Abbey Wood. Stations at Ealing Broadway, Ilford, Romford, Slough and Maidenhead will be refurbished;
- new modular station buildings at Acton Main Line, West Ealing, Southall and Hayes and Harlington; and
- platforms will be lengthened and step-free access will be provided at a number of stations.

Traction Power

- Upgrade of the traction power supply system.

Other Works (not part of the ONW) cash funded by CRL

- Advanced works and asset protection works at Paddington Station, Ilford Depot and the tunnel interfaces at Royal Oak, Plumstead and Pudding Mill Lane.

Significant interfaces

There are multiple interfaces within Network Rail with:

- Other projects (Reading Station Area Redevelopment (RSAR), Thameslink Programme, Intercity Express Programme (IEP), Great Western Electrification, High Speed 2 (HS2), ERTMS, FTN and GSM-R);
- routes (Western, Anglia, Kent);
- enhancements (such as the Kent Train Lengthening Programme);
- CP4 & CP5 Renewals (such as the Great Eastern rewiring);
- maintenance;
- tunnel spoil removal; and
- outside party works.

Key assumptions

The following key assumptions have been identified:

- The systems installed by CRL in the Central Tunnel Section will be compatible with the surface railway infrastructure;
- the delivery and integration of the whole Crossrail system, management of interfaces and achievement of the required 95% Public Performance Measure (PPM) remains the responsibility of CRL; and
- interfacing projects are funded and delivered on time by other parties.

Activities and milestones

Activity	Output	Date
GRIP 4 (stage gate review complete)	Detailed design option confirmed	Completion of most work packages by December 2012
Main works GRIP 6 start	Start on site	Work Packages phased to start from September 2012
Main works GRIP 6 complete	Assets commissioned	Completion of most work packages by July 2018
Start of full Crossrail service		December 2019

Reading station area redevelopment

Operating route(s): Western

Project reference code: CR002

Output: Capacity

CP5 output driver

The intended outputs include a minimum of four additional passenger train paths per hour in each direction, five additional platforms, a 125 per cent improvement on through line platform capacity and a 37.7 per cent improvement in performance (train delay minutes).

Scope of works

- A new Thames Valley signalling centre replacing the existing Reading signal box (completed).
- Four new platforms on the north side of the station and a new Transfer Deck by May 2013.
- A new south side platform and platform extensions for Waterloo line services by July 2012.
- Grade separation at the east end of the station via the former dive under from the Waterloo line to the north side of the station.
- New train maintenance facility located to the west of Reading station including replacing the existing facilities, which will be demolished to enable the track layout reconfiguration, now enhanced to cater for additional capacity for HLOS + IEP trains and modern equivalent depot facilities by November 2013.
- Grade separation by provision of elevated main lines to the west of the station by December 2014.
- Provision of a new grade-separated eastern chord from Oxford Road Junction to the north side of the station by April 2015.
- Grade separation of the main lines.
- Extensive track layout reconfiguration and re-signalling throughout the area.
- Passive provision for a possible future extension of Crossrail.

The Transport and Works Order Act was successfully enacted on 28 October 2009 thereby securing the lands needed to undertake the project.

Significant interfaces

- Asset renewals and enhancements programmes for signalling, telecoms and track
- GWML route enhancement projects
- Crossrail
- Great Western Main Line Electrification
- Intercity Express Programme
- Thames Valley EMU Capability Works

Key assumptions

- Funding for CP5 is made available.
- Previous funding for the New Train care facilities was based on a like for like replacement, and enhancements for additional trains including IEP and HLOS.
- In June 2009 the DfT revised the requirements for the depot to incorporate change in train fleets using the new depot facility. This resulted in additional

scope being added to the project. On 24 June 2011, the project reached agreement with the ORR for additional funding to cover this work.

- Any additional requirements should be made clear in sufficient time to enable delivery of the facilities without negative impact on the programme.

Activities and milestones

Activity	Date
Key output 1: Additional station platforms commissioned with increased capacity	By May 2013
Follow-on works: non key output 1 deliverables	By March 2014
Key output 2: FGW depot fully operational	November 2013
Key output 3: Reading West Junction grade separation	January 2015
Key output 4: West Country grade separation	April 2015

Great Western Electrification

Operating route(s): Western and Wales

Project reference code: DP001

Output: Electrification

CP5 output driver

To extend the electrification of the Great Western Main Line (GWML) from Maidenhead (the furthest extent of the Crossrail project) and to deliver the scope of works described below.

Scope of works

The scope required for this project includes the extension of electrification on the core route as noted below:

- Maidenhead to Wootton Bassett
- Wootton Bassett to Patchway
- Patchway to Severn Tunnel Junction
- Severn Tunnel Junction to Cardiff
- Reading to Newbury
- Didcot to Oxford
- Filton South Junction to Patchway
- Wootton Bassett to Bristol Temple Meads via Bath
- Stoke Gifford Junction to Bristol Temple Meads
- Depot at Reading
- Bridgend to Swansea

The project is being executed by Network Rail in two steps – Maidenhead to Oxford, Newbury and Bristol, and Bristol to Cardiff and Swansea (excluding Cardiff to Bridgend).

Significant interfaces

- Crossrail
- Welsh Valleys Electrification
- The Intercity Express Programme (IEP)
- Reading Station Area Redevelopment
- Western Mainline Signalling Renewal
- GW Mainline W10/12 gauge enhancement

Activities and milestones

The DfT target is for electrification to be completed for electric train operation to Newbury and Oxford by December 2016. Completion of electrification to Bristol and Cardiff will align with the Intercity Express Programme (IEP).

North West Electrification

Operating route(s): LNW

Project reference code: DP002

Output: Electrification

CP5 output driver

This programme facilitates the introduction of electric train operation on passenger and freight services on the routes shown below. The current programme would support key output dates (timetable change dates) as set out in the table below. In the case of each timetable change date, the output is defined as the provision of an electrified route to provide the opportunity for the operation of electric traction between the points stated.

Date of timetable change	Provision of electrified routes for services between
December 2013	Manchester (Piccadilly) to the West Coast Main Line
December 2014	Liverpool to Wigan, Liverpool to Manchester (Victoria and Piccadilly)
May 2016	Preston to Blackpool
December 2016	Preston to Manchester (Victoria and Piccadilly)

This project also offers the opportunity to increase capacity, which would be realised by the introduction of electric units on a number of services currently operated by diesel units.

Scope of works

The scope of work includes 25kV AC overhead electrification (OLE) and associated power supplies / distribution for the following routes, including all running lines and crossovers (except where indicated):

- Bootle Branch Jct – Earlestown East Jct
- Earlestown West Jct – Earlestown South Jct
- Newton-le-Willows Jct – Deal Street Jct
- Parkside Jct – Lowton Jct
- Ordsall Lane Jct – Castlefield Jct
- Deal Street Jct – Manchester Victoria East Jct including platforms 3 to 6 at Manchester Victoria
- Deal Street Jct – Euxton Jct
- Preston Fylde Jct – Blackpool North including platforms 1 to 8 at the latter
- Huyton Jn – Springs Branch Jn
- Ordsall Lane Jct – Windsor Bridge South Jct

Other works to deliver the electrification will include signalling immunisation, track lowering and bridge reconstructions on the above routes.

This project does not include associated ancillary works necessary to enable the introduction and operation of EMUs and other electric traction (eg rolling stock clearance, depots / stabling works or platform lengthening as a result of the operation of EMUs).

Blackpool Line Upgrade – During project development, the opportunity was identified to combine the electrification main works from Preston Fylde Junction to Blackpool North with full resignalling of the route and track renewals / remodelling. Development has begun of a new combined project, to encompass resignalling, telecoms, track renewal / remodelling and installation of OLE and distribution equipment. The project will develop enhancement options, including line speed improvements.

Significant interfaces

- Northern Hub
- West Coast power supply upgrade
- Trans-Pennine Electrification

Activities and milestones

The target for completion of the programme is December 2016.

Northern Hub

Operating route(s): LNW & LNE

Project reference code: DP003

Output: Capacity

CP5 output driver

The outputs from the Northern Hub are designed to facilitate the economic growth of the North of England through value for money improvements to rail services. The key rail service improvements that would support economic growth were identified in the Northern Way Conditional Output Statement (April 2009) with Network Rail's strategy for delivering these improvements published in the Manchester Hub Rail Study Report (January 2010). This report identified a series of improvements that delivered a BCR (including Wider Economic Benefits) of 4.0 and later work by GMPTE identified an annual contribution to the Northern economy of £2bn gross value added.

The specific outputs of the Northern Hub are designed to enhance the capability of the rail network across the North of England beyond that delivered in Control Period 4 to provide:

- capacity for forecast passenger growth;
- faster and more frequent inter-regional services with increased direct links between Northern cities;
- improved services on key commuter corridors to support the sustainable development of the cities;
- direct journeys from a wider range of towns/cities to Manchester Airport;
- freight capacity required to 2030.

Some of the proposed works for the Northern Hub were announced in advance of HLOS in statements by the Chancellor in March 2011 and March 2012, whilst the remainder were included within the HLOS in July 2012. The two categories are addressed in the 'Scope of Works' section below.

Scope of Works

a) Committed Pre-HLOS

- Works announced in advance of HLOS by the Chancellor in March 2011 and March 2012:-.

Intervention Description	Comments
Ordsall Chord	New railway line in west Manchester providing a direct route, for the first time, between Manchester Victoria and Manchester Piccadilly
Manchester Victoria	To address the increased passenger numbers a provision of £1m has been agreed towards the Manchester Victoria redevelopment project for delivery in 2014
Huyton and Roby Capacity Stage 1	First stage of four tracking at this location. Stage 1 delivers the third track for an interim layout. Stage 2 is delivered later (see next section)
Preston JTI	Infrastructure improvements between Salford Crescent and

	Euxton Junction via Bolton to provide journey time savings
Chinley Capacity	Provision of overtaking and turnback facilities
Dore & Grindleford Capacity	Doubling of the single line between Dore West & Dore Station Jct and provision of freight recessing facilities
Marple JTI	Infrastructure improvements between New Mills and Ashburys to provide journey time savings
Hope Valley JTI	Infrastructure improvements between Dore and New Mills South Junction to provide journey time savings
Calder Valley JTI	Infrastructure improvements between Manchester and Bradford to provide journey time savings

b) HLOS scope

- The HLOS in July 2012 covered the scope detailed below:-

Intervention Description	Comments
Manchester Oxford Road station	Remodelling to provide capacity to accommodate longer, more frequent trains
Manchester Piccadilly station	Provision of two additional through platforms (15 & 16)
Manchester Airport 4 th platform	Additional capacity to accommodate extra services from Manchester city centre in CP5
Manchester Victoria Capacity	Layout alterations to provide capacity and flexibility
Core Manchester Performance	Castlefield corridor and Ordsall Lane junction capacity and performance improvements
Chat Moss Capacity	Headway improvements to provide additional capacity between Liverpool to Manchester via Newton-le-Willows
Huyton & Roby Capacity Stage 2	Completion of the four tracking between these stations. Stage 1 delivered a third track and was announced pre-HLOS
Chester JTI	Infrastructure improvements between Earlestown and Chester to provide journey time savings
Rochdale Capacity	Provision of an overtaking and turnback facility

Significant interfaces

- Northern Urban Centres
- Manchester Victoria redevelopment
- Strategic Freight Network
- North West Electrification Programme
- Trans Pennine Electrification
- Manchester Rail Operating Centre
- Leeds to Liverpool JTI
- DfT Rolling Stock strategy
- CP5 renewals plans
- HS2

Key assumptions

- Delivery of Manchester Victoria station redevelopment is achieved during 2014.
- That the Journey Time Improvements between Manchester Victoria and Stalybridge are delivered through the CP4 Leeds to Liverpool scheme with delivery deferred to CP5.
- The timeline for obtaining consents allows delivery in CP5.

- No funding for depot and stabling works has been included in any of the Northern Hub projects.

Activities and milestones

- GRIP 2 was completed in February 2011.
- GRIP 3 has been completed for Huyton Stages 1 & 2.
- GRIP 3 is forecast to conclude in August 2013 for the central Manchester interventions and April 2013 for all other interventions.
- Huyton Stage 1 will be completed in time for the planned timetable change in December 2014.
- The Ordsall Chord, Huyton Stage 2, Rochdale, Calder Valley JTI, Chat Moss Capacity, Preston JTI, Manchester Airport 4th platform and Manchester Victoria infrastructure will be available for use for the December 2016 timetable change.
- The remaining interventions will be available for use for the December 2018 timetable change.

These milestones will be confirmed at the conclusion of GRIP 3.

Trans-Pennine Electrification

Operating route(s): LNE and LNW

Project reference code: DP022

Output: Electrification

CP5 output driver

This project facilitates the introduction of electric train operation on passenger and freight services. The current programme would support a key output date (timetable change date) of December 2018, with the provision of an electrified route to provide the opportunity for the operation of electric traction between the following points:

- Manchester Victoria to Stalybridge
- Manchester Piccadilly to Stalybridge
- Manchester to Leeds
- Leeds to York
- Leeds to Selby

This project would provide an electrified route from Philips Park / Baguley Fold to Ashburys West Junction, which has the potential to provide diversionary routing for electric services as well as empty coaching stock movements of electric multiple units. It would also provide electrified East Coast Main Line diversionary routes from Doncaster to York via Leeds and from Doncaster to Leeds via Hambleton South and West Junctions. This project offers the opportunity to increase capacity, which would be realised by the introduction of electric units on a number of services currently operated by diesel units. It also has the potential to reduce the cost of operation of rail services and reduce carbon emissions.

Electrification of these routes also supports the following strategic priorities:

- Increasing capacity and reducing journey times between key cities aligned with other route improvements;
- Facilitating commuter travel into the major urban areas of the North of England and support economic growth.

Scope of works

The scope of Trans-Pennine Electrification includes 25kV AC overhead electrification and associated power supplies and distribution for the following routes, including all running lines and crossovers (except where indicated):

- Manchester Victoria to Stalybridge Junction (including platforms 1 and 2 at Manchester Victoria)
- Guide Bridge West Junction to Stalybridge National Grid Feeder Station
- Ashburys West Junction to Philips Park Junction / Baguley Fold Junctions
- Stalybridge National Grid Feeder Station to Copley Hill East Junction
- Neville Hill West Junction to Colton Junction
- Micklefield Junction to Selby Station
- Hambleton East Junction to Hambleton North Junction
- Hambleton South Junction to Hambleton West Junction

Other works will include signalling immunisation, track lowering and bridge reconstructions on the above routes.

This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. rolling stock clearance, depots / stabling works or, platform lengthening as a result of the operation of electric trains).

Significant interfaces

- North West Electrification
- Northern Hub
- Northern Urban Centres
- Strategic Freight Network
- National SCADA Renewal
- Huddersfield Station Capacity Enhancement
- Micklefield Turnback
- East Coast Main Line Power Supply Upgrade Phase 2

Activities and milestones

The target for completion of the project is December 2018.

Intercity Express Programme (IEP) – Great Western Main Line capability

Operating route(s): Western

Project reference code: WW027

Output: Capability

CP5 output driver

The key output is for GWML infrastructure to be fit for IEP operation to the declared timescales. Some of the key deliverables are listed below (but they are not limited to the below):

- infrastructure gauge clearance for the IEP which will in turn require:
 - completion of physical gauge clearance works;
 - certificate of Gauging Authority;
- completed and updated operational arrangements at stations including platform extensions; and
- updated Sectional Appendix.

Deliverables related to capacity schemes required for the operation of enhanced timetables are contained within a separate project.

Scope of works

The scope of works on includes development, design and implementation works to introduce Intercity Express trains up to 260m long to replace the current class 43 (HST) fleet and some class 16x train services on the GWML from 2017 onwards. The constituent parts of the infrastructure capability works are as follows:

- gauge clearance for the new IEP train on specific routes across GWML;
- a review of station operations at all stations where IEP trains are due to stop; this may result in the following changes:
 - platform extensions;
 - selective door opening;
 - revisions to permissive working (attaching/detaching/platform sharing) arrangements;
 - alterations to signal controls and signal locations to deal with changes to train operations;
- enhancements to overhead line equipment between Paddington and Heathrow Airport Junction; and
- Interface between the emerging IEP train design and the Network Rail infrastructure
 - Bridge Resonance
 - Acceleration Curve
 - Platform Stepping Distances
 - Traction Power Changes
- Assisting Hitachi Rail Europe Ltd in the Train/Infrastructure Compatibility process through the provision of testing routes.

IEP is proposed to operate over the following:

- core routes:
 - London to Cardiff/Swansea/Carmarthen;
 - London to Bristol/Weston Super Mare/Taunton (via Bath and Parkway);
 - London to Gloucester/Cheltenham;

- London to Oxford/Worcester/Hereford; and
 - London to Newbury/Westbury/Exeter;
- diversionary routes:
 - Westbury to Bath Spa;
 - Gloucester to Severn Tunnel Junction;
 - Cardiff to Bridgend via Barry;
 - Castle Cary to Exeter via Yeovil; and
 - Reading to Waterloo.

Significant interfaces

- Reading Station Area Redevelopment - the Reading station project has been separately specified by the DfT to include provision for bi-mode and electric IEP formations works will be completed before IEP arrives on the Great Western Main Line.
- Crossrail - the IEP project has developed effective interfaces with the Network Rail Crossrail project which will lead to an integrated programme of works being developed to enable both projects to deliver in line with current commitments.
- Great Western Main Line Electrification – the electric and bi-mode IEP trains will make use of the electrification of the Great Western Main Line between London, Oxford, Bristol and Swansea.
- IEP depot facilities; the IEP project will work with the Train Service Provider to develop the proposed IEP depot facilities across the Western route.
- Western mainline signalling renewal – the existing signalling equipment along much of the route requires immunisation works. The proposed timescales for electrification will drive amendments to the existing signalling renewal plan for the route.
- IEP Capacity schemes
- Other CP4 enhancement schemes (i.e Swindon – Kemble redoubling) and potential CP5 schemes (Bristol Temple Meads station capacity (including the Digby Wyatt Shed) and Oxford corridor capacity improvements).

Key assumptions

- The rolling stock procured by DfT will be compatible with the characteristics of the Network Rail infrastructure defined in the Train Infrastructure Interface Specification (TIIS) and will meet the requirements of the Train Technical Specification (TTS).
- All IEP depot and depot access works are not part of this submission (part of Train Service Provider contract requirements).
- No train alterations required to meet station operation requirements (e.g. SDO) are part of this submission (part of Train Service Provider contract requirements).
- Great Western mainline works specifically exclude works covering traction power .
- No infrastructure work is required to address ballast displacement and aerodynamic effects.
- Pantograph design for IEP will allow 2 pantograph operation without any modification to OLE infrastructure.
- Pantographs can be raised at linespeed without any modification to OLE infrastructure. Feasibility work will confirm this.
- Existing signalling arrangements can support IEP splitting and joining requirements.

Activities and milestones

GRIP 3 stations capability – complete October 2012
GRIP 3 gauge capability – complete December 2012
GRIP 4 Paddington capability – complete December 2012
GRIP 3 technical capability – complete March 2013
GRIP 4 stations capability – complete April 2013
GRIP 4 gauge capability – complete December 2013
GRIP 6 capability – start December 2013
GRIP 6 technical interface – complete December 2014
GRIP 6 capability (Testing Routes) – complete March 2015
GRIP 6 capability (mainline routes) – complete June 2016
GRIP 6 capability (remaining routes) – complete June 2017

Intercity Express Programme (IEP) – East Coast capability

Operating route(s): LNE

Project reference code: NE001

Output: Capability

CP5 output driver

The key output is for ECML and core diversionary route infrastructure to be fit for IEP operation to the declared timescales. Some of the key deliverables are listed below (but they are not limited to the below):

- infrastructure gauge clearance for the IEP which will in turn require:
 - completion of physical gauge clearance works;
 - certificate of Gauging Authority;
- completed and updated operational arrangements at stations including platform extensions; and
- updated Sectional Appendix.

Scope of works

The scope of works include development, design and implementation works to introduce Intercity Express trains up to 260m long to replace the current fleets of class 43 (HST) on the ECML from 2018 onwards. The constituent parts of the infrastructure capability works are as follows:

- gauge clearance for the new IEP train on specific routes across ECML, this includes provision of a test route;
- a review of station operations at all stations where IEP trains are due to stop; this may result in the following changes:
 - platform extensions;
 - selective door opening;
 - revisions to permissive working (attaching/detaching/platform sharing) arrangements;
- overhead line alterations; and
- traction power upgrade.

IEP is proposed to operate over the following:

- Core routes:
 - London to Aberdeen/Inverness;
 - London to Leeds/Skipton/Harrogate/Lincoln/Hull;
- Diversionary Routes
 - Hitchin to Peterborough via Ely;
 - Peterborough to Doncaster via Lincoln;
 - Doncaster to Gilberdyke via Goole;
 - Doncaster to York via Knottingley;
 - Stockton to Ferryhill; and
 - Newcastle to Carlisle via Carlisle.

Significant interfaces

- Thameslink Programme
- CP5 HLOS projects
- ECML power supply upgrade programme

Key assumptions

- The rolling stock procured by the DfT will be compatible with the characteristics of the Network Rail infrastructure defined in the Train Infrastructure Interface Specification (TIIS) and will meet the requirements of the Train Technical Specification (TTS).
- Platform lengthening scope excludes locations where selective door opening operation has been agreed with the DfT, ORR and train operators.
- Any train alterations required to meet station operation requirements (e.g. SDO) will be progressed by the DfT with the Train Service Provider.
- All IEP depot and depot access works are excluded from this submission (part of Train Service Provider contract requirements).
- All assembly plant and assembly plant access works are excluded from this submission (part of Train Service Provider contract requirements).
- No infrastructure work is required to address ballast displacement and aerodynamic effects.
- Pantograph design for IEP will allow 2 pantograph operation without any modification to OLE infrastructure.
- Pantographs can be raised at linespeed without any modification to OLE infrastructure. Feasibility work will confirm this; and existing signalling arrangements can support IEP splitting and joining requirements.

Activities and milestones

Gauge capability

GRIP 3 - complete March 2013

GRIP 4 (test route only) - complete September 2013

GRIP 4 - complete July 2014

GRIP 6 - complete August 2017

Station capability

GRIP 3 - complete June 2013

GRIP 4 - complete June 2014

GRIP 6 - start April 2013

GRIP 6 - complete August 2017

OLE

GRIP 4 - complete February 2013

GRIP 6 - start August 2013

GRIP 6 - complete August 2017

Intercity Express Programme (IEP) – East Coast power supply upgrade

Operating route(s): LNE

Project reference code: NE028

Output: Capacity

CP5 output driver

The output is traction power supply capability to meet Thameslink requirements and enable the introduction of Intercity Express trains on the ECML.

Scope of works

For the ECML mainline between Wood Green and Bawtry the scope of works is to upgrade from the existing Classic arrangement to an Autotransformer (AT) feeding system, this has 2 main elements:

- National Grid 400kV feeding supply transformers; and
- conversion of overhead line feeding from the existing “Classic” arrangement to an Auto Transformer Feeding system.

The remainder of the ECML will remain on Classic feeding. This includes Doncaster to Leeds, for which feasibility is complete confirming the need for an additional transformer at Ardsley

Significant interfaces

- Thameslink Programme
- CP5 HLOS projects
- E&P asset renewals

Key assumptions

- Sufficient funding will be available from Thameslink Programme to deliver their requirements.
- AT upgrade is not required on the Hitchin to Cambridge/Kings Lynn.
- National Grid meet the timescales commitments in their feasibility study.
- Works are delivered according to the track access strategy based upon West Coast midweek and weekend access arrangements.
- Only minimal replacement of OLE masts is required.
- Only minimal replacement of the catenary (AWAC) is required to mitigate the effects of raising the fault level from 6kA to 12kA.
- The rolling stock procured by the DfT will be compatible with the traction power draw characteristics of the Network Rail infrastructure defined in the Train Infrastructure Interface Specification (TIIS) and will meet the requirements of the Train Technical Specification (TTS).

Activities and milestones

National Grid 400kV Feeder Stations

GRIP 6 - start December 2013

GRIP 6 - complete October 2015

Autotransformer Feeder System Upgrade

GRIP 4 outline design – complete August 2014

GRIP 6 – start November 2013

GRIP 6 Corey’s Mill to Welwyn (Thameslink requirement) – complete May 2015

GRIP 6 Wood Green to St Neots – complete April 2016

GRIP 6 St Neots to Bawtry – complete August 2017

Classic System Reinforcement Ardsley Feeder Station

GRIP 6 Ardsley (Leeds – Doncaster) - start October 2013

GRIP 6 Ardsley (Leeds – Doncaster) – complete March 2014

East West Rail

Operating route(s): LNW, Western and East Midlands

Project reference code: NW002

Output: Capacity

CP5 output driver

The objective of this project is to provide additional network capacity to provide direct connectivity between Oxford and Aylesbury with Milton Keynes and Bedford. This improved connectivity is designed to facilitate economic growth in the area through residential and commercial development along the line of route.

Scope of works

The proposed works include:

- A second running line between Bicester Town and Water Eaton
- Double track Bicester Town to Bletchley and Aylesbury – Aylesbury Vale Parkway.
- New station at Winslow
- New high-level platforms and track remodelling at Bletchley
- New loop between Aylesbury and Princes Risborough
- The scope of works in the Oxford area is currently under development

Development of the Electric Spine may identify further works to be required on this route. The scope of such additional works is subject to that programme.

Significant interfaces

- Project Evergreen 3 Phase 2 (Bicester – Oxford)
- Oxford / Thames Valley resignalling
- Oxford corridor capacity improvements
- The Electric Spine
- Thameslink
- High Speed 2

Key assumptions

- The incremental works required to accommodate EWRL services between Wolvercot and Bicester will be delivered concurrently with the Evergreen 3 Phase 2 project, and funding for these works will be made available prior to the start of CP5.
- Funding will also be made available to develop the project towards GRIP Stage 4 prior to the start of CP5.
- There will be opportunities to close sections of the East West route for extended periods to allow construction.
- That no works are needed to increase capacity between Bletchley and Milton Keynes.

Activities and milestones

Development work is currently underway to identify the programme of works. However it is assumed that the works between Bicester and Water Eaton will be delivered with those for Evergreen 3 Phase 2 and in the Oxford area with the wider works in that area.

Thameslink Programme

Operating route(s): Anglia, East Midlands, Kent, LNE, and Sussex

Project reference code: TL001

Output: Capacity

CP5 output driver

A regulatory protocol with the DfT has been established for the Thameslink Programme. Our obligation under the protocol is to deliver the scope of works described below.

Scope of works

The Thameslink Programme has phased delivery over three key outputs. Key output 0 allows for a consistent train service at present levels to run throughout the Thameslink Programme construction periods. The work required to facilitate this was completed in March 2009. It allows for up to 15 trains per hour to run between St Pancras International (Low Level) and Blackfriars stations.

Key output 1 provides an improved train service capacity of up to 16 train paths per hour between St Pancras International (Low Level) and Blackfriars stations. The work required to facilitate this was completed in April 2012. In December 2011 the infrastructure works to allow 12 car train length operation between Bedford and Brighton was completed.

Key output 2 provides for the completed Thameslink service giving a further improved train service of up to 24 train paths per hour between St Pancras International (low level) and Blackfriars stations by December 2018. This phase also provides the necessary infrastructure to allow a considerable number of these services to be operated through the London Bridge corridor (facilitating the implementation of a long standing service aspiration) and the radical improvement of passenger facilities at London Bridge station.

Significant interfaces

The following major infrastructure programmes are scheduled to be undertaken concurrently with the Thameslink Programme. These include:

- Crossrail
- Intercity Express programme - East Coast infrastructure capability and ECML power supply upgrade
- London Underground upgrades
- Alexandra Palace to Finsbury Park capacity improvements
- DC power supply enhancement programme
- London & South East enhancements including platform extensions.

Other interfaces include:

- Network Rail Routes for Kent, Sussex, East Midlands, LNE and Anglia that will all be affected by maintenance, network operations and performance of the Thameslink Programme.
- DfT re-franchising programme for the new Thameslink franchise that combines all services currently operated by First Capital Connect, some South Eastern services and all Southern services.

Key assumptions

The DfT managed Thameslink Rolling Stock Project delivers rolling stock on schedule that is in compliance with the Train Infrastructure Interface Specification.

Activities and milestones

- Key output 1 completed in April 2012.
- Key output 2 to give 24 train paths per hour between St Pancras International (low level) and Blackfriars stations by December 2018.

Stafford Area Improvement Scheme

Operating route(s): LNW

Project reference code: WW001

Output: Capacity

CP5 output driver

The Stafford area has been identified as a capacity constraint on the West Coast Main Line, which limits the opportunity to fully exploit the capacity offered by the recent modernisation of the route and limits the ability to provide additional capacity to cater for future forecasted demand growth.

The capacity and performance constraints in the Stafford area are due to the number of conflicts that exist between the flows of traffic at various flat junctions in the area, such as Trent Valley, Doxey and Norton Bridge. Current levels of infrastructure performance at these locations also impacts on overall performance of the route.

The project's remit is to address the capacity and performance constraints in the Stafford area, in line with the requirements of the DfT's service specification, issued in August 2009 and entitled 'WCML Post IEP'. A fast line, standard off-peak hour timetable to deliver this has been developed by Network Rail and agreed by DfT in August 2009. This provides two additional fast line paths to/from Euston in the off peak, one additional path per hour in each direction on the Birmingham-Manchester axis and one additional freight path per hour in each direction through Stafford.

Scope of works

The capacity improvements will be delivered through the provision of a grade separated junction at Norton Bridge area, to connect the slow lines north of Stafford to the Stone line without conflicting the WCML fast lines. To increase flexibility in the Stafford station area, a new 775m capable freight recess facility will be developed by connecting the existing Salop No1 siding and the Down Goods Loop. In addition, a series of line speed enhancements will be developed in the Trent Valley Junction and Doxey Junction areas and the slow lines between Doxey and Norton Bridge.

Significant interfaces

It is planned that infrastructure works in the Stafford area will take place in conjunction with the planned Stafford signalling renewal programme.

The ability to implement the final project option will be dependent on a successful planning application through the Infrastructure Planning Commission (IPC process).

The infrastructure options are being developed in such a way so as to not prejudice the development of HS2.

Key assumptions

Complete delivery of the project is dependent upon a successful planning application through the Infrastructure Planning Commission (IPC) process. This planning application must be successful and support a scheme that will meet the required outputs.

Activities and milestones

Key programme delivery milestones will be determined following GRIP 4. The planned timeline includes:

- GRIP 4 – complete April 2014;
- GRIP 6 Stafford – start February 2014;
- GRIP 6 NB – start October 2014;
- GRIP 6 Stafford – practical completion December 2015;
- GRIP 6 NB – practical completion August 2017;
- GRIP 6 infrastructure in operation – complete December 2017.

West Coast Power Supply

Operating route(s): LNW

Project reference code: WW002

Output: Capacity

CP5 output driver

The overall programme for the power supply upgrade will support the Stafford specification and the North West electrification programme by provision of the required AT infrastructure from Weaver Junction to Wigan Springs Branch Junction along the WCML and from Winwick Junction to Liverpool Edge Hill.

Scope of works

The scope of the overall programme is to deliver an upgraded traction power supply system to support the operation of the Stafford specification. Provision for growth in electric freight is no longer part of the scope. This reduction in scope has been agreed with the Department for Transport.

Phase one was completed in time for the December 2008 timetable change. Phase two was complete as of March 2012.

Phase three is the implementation of an upgraded traction power supply across the balance of the route and is to be completed during CP4 and CP5. It will renew and upgrade the remainder of the 25kV power supply equipment on the WCML between North Wembley and Whitmore (Phase 3A) and between Whitmore and Great Strickland (Phase 3B) with an upgraded Autotransformer (AT) traction power supply and distribution system. The power supply upgrade works required in the route section from Great Strickland to Carstairs (Phase 3C) are no longer required.

Significant interfaces

- North West Electrification programme.
- LNW route 25kV traction switchgear renewal.
- Renewal of 25kV traction sole user assets at Rugby and Stafford.
- Stafford area improvements.

Key assumptions

Possession requirements are assumed to be covered by the Rules of the Route.

Activities and milestones

Phase 3A: North Wembley – Whitmore

GRIP 6 – complete September 2014

Phase 3B: Whitmore – Great Strickland

GRIP 6 – start January 2014

Weaver Junction to Springs Branch Junction – complete November 2014

Springs Branch Junction to Euxton – complete June 2015

Oxenholme South – complete October 2015

GRIP 6 – complete February 2017

England & Wales - funds to deliver specific outcomes

	CP5 expenditure (£m in 2012/13 prices)
Strategic Freight Network (SFN)	206
East Coast Connectivity	245
Passenger Journey Improvement	309
Station Improvement	206
Development	144
Level Crossing Safety	67
Total	1,177

Planning Oversight Group has agreed the further disaggregation shown in the table below:

Fund	Statement	Further breakdown proposed
Strategic Freight Network	£206m ring fenced	No
East Coast Connectivity	£247m max	No
Passenger Journey Improvement	£309m max	£206m Journey Time Improvement £103m NRDF
Station Improvement	£206m max	£103m Improvements to Passenger Experience at Stations £103m Access for All
Development and Innovation	£144m	£57m CP6 Development £52m Innovation £36m HS2 Development
Level Crossing Safety	£67m ring fenced	No

Strategic Freight Network (SFN)

Network Rail's obligations

The continuation of the SFN fund was announced in the DfT's High Level Output Specification (HLOS) in July 2012. An allocation of £206m has been granted to fund improvements identified by the industry to continue rail freight expansion in England and Wales whilst stimulating wider economic growth and environmental benefits.

Network Rail is working with stakeholders to identify the best use of available funds and to deliver schemes that are funded by the SFN programme.

Objective

The objective is to enhance the network used by freight trains to facilitate growth of the freight market and to reduce conflict between freight and passenger traffic.

Governance

The Director of Network Strategy and Planning is the fund holder for SFN. Authorisation of draw down and spend is as set out in Network Rail's Investment Regulations but schemes are also required to have been supported by the Strategic Freight Network Steering Group (SFNSG). A cross-industry group oversees the development of the SFN and currently consists of representatives from DfT, the Welsh Government, Transport Scotland, Freightliner, DB Schenker, GB Railfreight, Network Rail, DRS, the Freight Transport Association, Rail Freight Group, ATOC, Transport for London, the PTE Group and the ORR (as observers).

The SFNSG will oversee the prioritisation of schemes and allocation of funding for scheme development and delivery.

Funding is to be allocated for the delivery of schemes to enhance the SFN and can take the form of development funding (for potential future schemes fitting the criteria), research and development activities, as well as capital investment. The schemes prioritised are assessed against the nine objectives of the Strategic Freight Network, as described in the document "Britain's Transport Infrastructure – Strategic Freight Network: The Longer Term Vision" and to support one or more of these objectives. They are:

- Longer and heavier trains
- Efficient operating characteristics
- 7-day and 24-hour capability
- W12 loading gauge
- UIC GB+ (or 'European') gauge freight link
- New freight capacity
- Electrification of freight routes
- Strategic rail freight interchanges and terminals
- Strategic freight capacity initiative

The allocation of funding should be for schemes which potentially benefit more than one operator and have a good economic case. The fund is not intended to support investments where the benefits to individual stakeholders are sufficient to warrant them funding the scheme directly.

Scope of works

A number of projects are currently being developed as candidates for funding in Control Period 5, including West Coast Main Line capacity north of Preston, Great Western Main Line gauge enhancement (W10 and W12 to Bristol) and Southampton to West Coast Main Line capacity.

Experience has shown that there needs to be sufficient flexibility within the SFN fund to allow for changes in the portfolio if there are changes in demand, synergies are identified with other schemes, additional funding becomes available or there are changes in the cost drivers of schemes. To this end, the SFN Steering Group has a long list of schemes which will be considered, including further development of the Felixstowe to Nuneaton corridor.

East Coast Main Line Connectivity

Project Reference Code: NE023

Network Rail's obligations

To work with the industry to develop plans to deliver works within a maximum CP5 expenditure of £247m on ECML to improve capacity and reduce journey times

Objective

The objective is to enhance the network to facilitate growth of the passenger and freight services on the ECML

Governance

The Route Managing Director, LNE is the fund holder for ECML Connectivity. Authorisation of draw down and spend is as set out in Network Rail's Investment Regulations but schemes are also required to have been supported by the ECML Programmes Board. This is a cross-industry group consisting of representatives from DfT, Freight Operating Companies, Train Operating Companies, Network Rail, the Freight Transport Association, Rail Freight Group, ATOC, Transport for London, the PTE Group and the ORR (as observers).

The ECML Programme Board will oversee the prioritisation of schemes and allocation of funding for scheme development and delivery.

Scope of works

Building on the Route Utilisation Strategies for the ECML (from London to Edinburgh), GRIP 1 modelling has identified the key capacity constraints on the route, including:

- Conflicting moves in the Peterborough area
- Lack of platform capacity and conflicting moves at Doncaster station
- Conflicts on the 2 track sections between Doncaster and York, Northallerton and Ferryhill South Jct and Newcastle and Edinburgh

The programme will ultimately comprise a prioritised list of capacity/journey time enhancement schemes. Stakeholder consultation, timetable modelling and economic appraisal will be used to determine which interventions represent the best value for money.

Development and Implementation of infrastructure enhancements between Kings Cross and Doncaster will be developed in conjunction with the ECML ERTMS programme.

Key assumptions

- Standard regulatory consents (Network Change and Station Change), planning permissions and particular consents (e.g. TWA / IPC) are likely to be required.
- Economic appraisal will confirm the business case for each proposed intervention
- The introduction of new timetables is not within the scope of this programme.

Passenger Journey Improvement

Network Rail's obligations

To make available funds up to a limit of £309m during CP5, this enabling fund will be termed the Passenger Journey Improvement Fund.

Objective

The Secretary of State wishes to see improvements in passengers' journey experiences and is making available up to £309m over CP5, targeted at the improvement of several aspects of the passenger service offer. It is expected that activities will be focused on three areas; journey time improvement, performance/reliability improvement and other enhancement opportunities that emerge, often as increments to asset renewal activity, such as projects to reduce station transit time for passengers.

Governance

The process for governance is still being developed, but it is likely to be focused on splitting the fund into the specific areas listed above, and then forming an appropriate cross-industry governance group to allocate the funding based on defined assessment requirements. This requirement would generally be a WebTAG consistent industry business case (but the use of a different methodology could be agreed with ORR and DfT) and considers the financial impact on each affected industry partner and the socio-economic benefits to society.

An outline (qualitative) appraisal of the likely value to be delivered by the scheme should be carried out as early as possible in the development of the scheme, no later than the completion of GRIP 1. A more detailed (usually quantitative) appraisal should be completed at the end of GRIP 3.

The fund is not expected to be disaggregated to specific geographic areas but will instead be prioritised based on a 'best case' approach. Proposals will be put forward from many different industry forums, but it is expected that the regular Route Investment Review Group meetings, where Train Operating Company, Freight Operating Company and Network Rail representatives discuss future investment opportunities, will be the prime originator of schemes.

Scope of works

It is expected that most schemes, in particular those within the categories of journey time improvements and other discretionary improvements, will involve incremental enhancements linked to renewals as this is likely to provide the greatest value for money. However, stand-alone enhancement schemes are also possible, including those part-funded by third-parties.

Network Rail Discretionary Fund (NRDF)

Network Rail's obligation

The fund is a mechanism for funding minor schemes which can either be linked to renewals or standalone schemes, which have a positive whole-industry business case. It is primarily aimed at schemes that will result in an increase in the capacity or capability of the network.

For a scheme to be eligible for this fund it must meet the following criteria:

- it provides a positive industry-wide business case in terms of the NPV; and
- the net cost of the scheme (i.e. the amount that will be drawn down from the NRDF) must not exceed £5m, without the prior agreement of DfT.

Our obligation is to work with stakeholders to identify the best use of available funds and to deliver the schemes that are funded through NRDF. As part of the process of updating the CP5 Delivery Plan we will routinely provide a list of schemes authorised to draw down from the fund as we progress through the control period.

Governance

The Director, Network Strategy and Planning is the fund holder for NRDF. Authorisation of draw down and spend is as set out in Network Rail's Investment Regulations but schemes are required to have been supported at the appropriate Route Strategy Planning Group (Network Rail's internal cross-functional group where local investment opportunities are reviewed) and will generally have been discussed at Route Investment Review Group (at which Network Rail shares its forward renewals plans with TOCs and FOCs and discusses opportunities for enhancements to the network). We propose to use RIPG to take an oversight on the use of NRDF funds, although the use of funds and delivery of projects will still be driven through local engagement. This process involves consultation with the relevant train operators.

Eligibility rules

Schemes with a total cost in excess of £5m are eligible where additional funding is provided by Network Rail or others to ensure the draw down on the NRDF is within this limit.

The fund is not intended to support investments where the benefits to individual stakeholders are sufficient to warrant them funding the scheme directly. Therefore where the benefits of a scheme:

- will accrue wholly to a single third party, it would generally be funded as a third party scheme; or
- are sufficient for Network Rail to justify funding the scheme, we would be expected to fund it ourselves.

Approval from ORR is not required before an individual scheme is progressed. However, the independent regulatory reporters will assess a sample of schemes to ensure compliance with the criteria. It is therefore important that all relevant details relating to the scheme are retained as part of the project file. As ORR's acceptance criteria includes

efficient delivery it is most important that the efficiency rigour that is applied to all stages of a renewal scheme is also applied to NRDF schemes.

Dialogue with ORR may be required where the implementation of a scheme would have an adverse impact on the profits or cash flow of an industry partner.

Appraisal

The appraisal is based on a value for money assessment (using a methodology agreed with ORR and (DfT) and considers the financial impact on each affected industry partner and the socio-economic benefits to society.

An outline (qualitative) appraisal of the likely value to be delivered by the scheme should be carried out as early as possible in the development of the scheme, no later than the completion of GRIP 1. A more detailed (usually quantitative) appraisal should be completed at the end of GRIP 3.

Schemes will be judged against a “hurdle rate” expressed in terms of a target Benefit to Cost Ratio and other criteria set from time to time to assist in the allocation of the available funding.

Draw down from the fund

The amount that will be drawn down from the NRDF as a result of implementing the scheme (the scheme cost) is determined as follows:

- for stand-alone schemes, the scheme cost is that determined at the completion of GRIP 5 (including risk and contingency allowances and net of any third party contributions); and
- for enhancements linked to a renewal scheme the percentage of the overall scheme cost which is attributable to the enhancement is identified at GRIP 3. This percentage would then be applied to the actual completed scheme cost to determine the amount of NRDF funding required.

Schemes which can be funded by the NRDF

It is expected that most schemes will involve incremental enhancements linked to renewals as this is likely to provide the greatest value for money. However, stand-alone enhancement schemes are also possible, including those part-funded by third-parties.

The fund can be used for improvement initiatives that deliver:

- improvements in train service performance that will benefit more than one party. This does not include initiatives that deliver sufficient schedule 8 benefits within a five year period to cover the scheme costs, as we would be expected to fund these schemes;
- reduction in train journey times, possibly as a result of line speed improvements. Schemes that reduce walking journey times at stations are also eligible. The latter can result from new entrances and exits to the station, which will be used by rail passengers;
- station facilities improvements such as providing waiting rooms, shelters and customer information systems. The benefits are attributed to the passengers who board or interchange at the station;
- platform lengthening (when part of a larger capacity change scheme); and
- enlargement of freight capability in a specific area for which there is specific demand.

This list is not intended to be exhaustive.

Stations Improvement

Network Rail's obligations

To make available funds to the Stations Board (SB) up to a limit of £206m during CP5, this enabling fund will be termed the Stations Improvement Fund (SIF).

Objective

The objective of the SB is to meet the requirements set out in the Secretary of State's HLOS publication of July 2012 as follows:

The Secretary of State wishes the industry to improve the passenger experience at stations and is making available up to £103m over CP5 to fund station infrastructure improvements, including better passenger information and up to £103m over CP5 to fund 'Access for All' measures to provide easier access for older or disabled passengers and those with small children. She looks to the industry to seek funding contributions from other sources to further fund station infrastructure improvements.

Governance

Director, Operational Services is the fund holder for the SIF.

The SIF shall be disaggregated to meet the requirements set out in the HLOS Statement with £103m allocated to 'Access for All' (AfA) measures and £103m allocated to station infrastructure improvement (including passenger information).

AfA measures will be proposed by Local Delivery Groups (LDG)¹ based on existing award allocation criteria and the Transport Minister will provide final approval for the schemes to be taken forward. There may be instances where the Transport Minister is required to specify AfA measures.

The SB is to act as 'trustee' to the Director, Operational Services for the station infrastructure investment element of the fund. Investment will be proposed by LDG and SB will approve funding providing projects meet the agreed criteria. SB will make recommendations to the Director, Operational Services regarding governance and risks associated with projects funded by the SIF.

SB is a cross-industry body consisting of train operating owning group representatives, Department for Transport, Transport Scotland, Office of Rail Regulation and Network Rail senior management. SB will be co-chaired by a Network Rail & Train Operator representative. The Train Operator representative will be elected by SB. Secretariat for the SB and administration of the fund will fall to Network Rail

The SB will additionally offer the industry strategic guidance on stations – for example, facilitation of related policy development and dissemination of best practice - in order to achieve improved passenger experience at stations.

If additional station investment funds become available in Control Period 5, SB will be suitably placed to oversee the management of these funds to ensure efficiency and effectiveness of delivery.

¹ There are currently 17 LDGs established. LDGs are locally formed delivery groups made up of NR & TOC representatives.

Priorities for investment will be informed by the Secretary of State's desire to see an improvement in passenger satisfaction, alongside development of strategic priorities such as the construction of the electric spine, facilitation of commuter travel in urban areas and increased capacity:

The Secretary of State seeks an improvement in passenger satisfaction, as measured by Passenger Focus's National Passenger Survey. Whilst she is not setting a target in this area, the Secretary of State believes that better information, particularly during disruption, is an effective and low cost way of achieving passenger satisfaction improvements.

Although no specific target has been set, National Passenger Survey (NPS) data will be utilised where practicable to assess the benefit of investment. Progress against satisfaction will be measured and presented to SB by Local Delivery Groups (LDG) responsible for implementing station improvement projects.

Purpose

The purpose of the SIF is to improve accessibility & passenger satisfaction through an investment programme that will include:

- Station facility enhancements
- Station accessibility enhancements
- Passenger information enhancements

Scope of the Stations Improvement Fund:

- At this stage, all stations are in scope. One of SB's first activities in CP5 will be to review and define scope.

CP6 Development

Network Rail's obligation

Our obligation is to deliver the development of schemes that are authorised to draw down from this fund. As part of the process of updating the CP5 Delivery Plan we will routinely provide a list of schemes authorised to draw down from the fund as we progress through the control period.

Objective

The fund will be used to develop schemes which are considered likely to be required and funded for delivery during CP6 as part of the next periodic review.

Governance

The Director, Network Strategy and Planning is the fund holder for the CP6 Development fund. Authorisation of draw down and spend is as set out in Network Rail's Investment Regulations. Schemes will be prioritised by Network Rail following discussion with customers and funders at the appropriate industry planning fora including Rail Industry Planning Group. Qualifying schemes will generally have been discussed with DfT as part of the HLOS development process or will be in support of joint industry activity to plan for CP6. The Director, Network Strategy and Planning is responsible for maintaining a forward programme for disbursement of the fund to provide clarity on the use of the fund throughout CP5. We propose to use RIPG to provide an oversight on the use of the CP6 Development fund.

Eligibility rules

The fund will be used to develop schemes not otherwise funded in CP5 through the PR13 settlement, and which are considered likely to be required, and funded for delivery, primarily during CP5. The fund would generally cover early stage development costs and separate funding would generally be required for detailed design work and other significant costs such as Planning Consents processes.

Appraisal

CP6 Development fund schemes will be subject to the value for money test appropriate to the type of scheme under consideration.

Schemes to be developed in CP5

A list of schemes authorised to draw down from the fund is shown below and will be updated as we progress through the control period.

Innovation

Network Rail's obligations

To make available funds to the Technical Strategy Leadership Group up to a limit of £52m during CP5.

Objective

The objective of the innovation fund is to meet the requirements set out in the Secretary of State's HLOS publication of July 2012 as follows: The Secretary of State wishes the industry to prepare for the future and, to this end, is providing £52m over CP5 to fund innovation. The funding for innovation reflects the Secretary of State's desire to support the development, demonstration and introduction of new technologies and business innovations to improve the performance and cost-effectiveness of the railway.

Governance

The Director of Network Strategy and Planning is the fund holder for the Innovation Fund but the expenditure against this fund will be driven by and governed by the Technical Strategy Leadership Group which is a cross industry body working under the strategic direction of RDG and facilitated by RSSB. Once the CP5 allocation of funds for Innovation to TSLG has been confirmed by POG, RSSB will draw down the money to fund the TSLG Innovation activities in accordance with an MOU between RSSB and NR (Under development between Paul Plummer and Anson Jack). Both NR and RSSB will not exercise any control over the choices of expenditure and priorities which will be set through the production of an annual plan, the Innovation team will present this to the Rail Delivery Group. The governance arrangements were endorsed by RDG on the 16th July 2012. To operate within the priorities agreed within the annual plan level, TSLG has established these governance arrangements specifically for the oversight and management of this funding and this includes the creation of an enabling innovation team, and the establishment of a core group of TSLG members to provide oversight to this team.

Purpose of the Innovation Fund:

- Cut costs
- Increase profitability
- Increase the "modal use" of rail
- Increase revenues
- Enhance capacity
- Optimise the performance and efficiency of the whole railway
- Boost GDP/Economic growth through enhancing the capability of the transport system and supporting UK companies where appropriate
- Address market failure
- To enable the industry to reach a self-funding position for innovation development in the long term
- Enable and accelerate the introduction of innovation

Scope of the Innovation Fund:

- GB rail network
- The Innovation Fund supports short, medium and long term innovations
- It will be broad in both coverage and outlook, to include technical, business model, operational, process and supply chain innovation

- It supports the delivery of both short-medium term industry plans as well as the medium-long term strategy described by the Rail Technical Strategy
- It supports the delivery of the Enabling Innovation agenda
- The Innovation Fund can be accessed by all parts of industry and is open to proposals from any organisation/consortium
- Consideration of policy implications of the funded innovations
- For the avoidance of doubt, the Innovation fund will not fund projects that would ordinarily be funded by individual industry organisations
- Projects may be co-funded.

High Speed 2

HS2 Project is of national importance and affects travel patterns in both England and Scotland. HS2 Client is DfT and, Sponsor is HS2 Limited. NR Project leader is the Head of High Speed Rail Development.

NR's project is to support and influence the development of HS2 so that NR protects both its narrow business interests, and the wider interests of the users of the national rail network.

Activities include technical, administrative and interface support for the Design, Integration and Operation of HS2.

Output driver

Prime output driver for HS2 is increased capacity to relieve forecast capacity constraints on the West Coast Main Line and associated economic benefits.

NR's prime output driver at time of writing is the protection of assets owned by NR, and integration and protection of operations, both TOC and FOC related, on the classic rail network, such that NR can support the Hybrid Bills for both phases of the project.

Scope of works

HS2 Limited Scope of works:

Phase1 – London West Midlands (LWM) – London Euston, Old Oak Common, Northwest to Handsacre with a spur along the water Orton corridor to Birmingham Centre. It includes also works (CP6) to WCML North to allow Classic Compatible trains to run. These works are now in the public domain in that they have been consulted and design development is ongoing.

Phase2 – The Y Network or Leeds Manchester Heathrow (LMH) – extends Phase 1 to connect to Manchester, Leeds and Heathrow and cities in the midlands – details subject to public announcement in October 2012, and so now the details are not available for comment or planning.

NR Scope of Works:

NR's scope of works refer solely to NR's responsibilities as described in the output driver and include:

- Technical and project management input to HS2 limited via staff seconded in to HS2 limited
- Input to integration of HS2 with the national rail network both from a transport management perspective and operations/control perspective
- Helping HS2 with project development at all physical interfaces with the national network, including making scope recommendations to HS2 limited and to DfT
- Consideration of the description of detailed design, construction and operational activities that HS2 limited may propose
- Protection of existing assets and input to asset management/maintenance considerations for the new assets

Level Crossings Risk Reduction

Network Rail's obligations

To make available funds to the Level Crossings Risk Review Committee (LCRRC) up to a limit of £67m during CP5, this enabling fund will be termed the Level Crossings Risk Reduction Fund (LCRRF).

Objective

The objective of the LCRRF is to meet the requirements set out in the Secretary of State's HLOS publication of July 2012 as follows: The Secretary of State specifically wishes the industry to reduce the risk of accidents at level crossings. In accordance with advice from ORR she has made a ring-fenced provision of £67m over CP5 to facilitate the achievement of this outcome by enabling Network Rail to invest to reduce risk.

Governance

The Director of Operational Services is the fund holder for the LCRRF but the expenditure against this fund will be driven by and governed by the LCRRC which is NR body working under the strategic direction of cross industry Level Crossings Strategy Group (LCSG).

Once the CP5 allocation of funds for LCRRF been confirmed, NR will establish the required delegated authorities for the LCRRC to fund risk reduction at level crossing activities in accordance with the Level Crossings Risk Reduction & Safety Enhancement Strategy for CP5 (Under development within National Level Crossings Team). Priorities for investment will be set by NR's desire to close or bridge level crossings and a KPI to reduce system risk attributable to level crossings by 50% (subject to the required funds being made available) in CP5. Progress against this KPI will be measured and presented to LCSG and NR's Main Board via IP, quarterly. These governance arrangements are identical to the CP4 governance authority for risk reduction at level crossings and will continue as BAU.

Purpose

The purpose of the LCRRF is to reduce risk at level crossings through a programme approach of investment in safety enhancements that will include:

- Closures
- Bridging
- Technical innovation
- Betterment of risk management
- Sub delegation of authority to encourage local initiatives

Scope of the Level Crossings Risk Reduction Fund:

- All level crossings on the NR infrastructure.

The Electric Spine – Midland Main Line Electrification

	CP5 expenditure (£m in 2012/13 prices)
Midland Main Line Electrification	540
Derby station area remodelling	84
Total	624

The Electric Spine – Additional Works

	CP5 expenditure (£m in 2012/13 prices)
Oxford – Bletchley – Bedford Electrification	121
Basingstoke to Southampton DC to AC conversion	163
Basingstoke to Reading (Southcote Junction) Electrification	46
Nuneaton – Coventry – Leamington – Oxford Electrification	208
Leicester Capacity	72
Midland Main Line Capacity (Bedford-Sharnbrook-Kettering-Corby)	145
Electric Spine: Coventry to Leamington Spa Capacity	38
Total	793

As part of the DfT's High Level Output Specification (HLOS) for CP5 announced on 16th July 2012, the rail industry was requested to develop a major north-south rail electrification and capacity enhancement referred to as the 'Electric Spine'. The objective was to increase regional and national connectivity and support economic development by creating a high-capability 25kV electrified passenger and freight route from the South Coast via Oxford and the linking into the Midland Main Line Electrification scheme to South Yorkshire.

The development of the scheme includes gauge clearance for large containers and, where appropriate, electrified links to adjacent electrified routes, depots and freight facilities. It will also consider journey time enhancements, freight capacity to cross the 'spine' at Leicester and the conversion of a section of the existing Southern 'third rail' (750V DC) electrification system to 'overhead' 25kV AC system between Southampton to Basingstoke.

This newly identified Electric Spine Programme brings together schemes previously announced and the electrification of other routes to form a continuous 'spine'.

This section outlines the schemes that form part of the programme. The Electrification of the Oxford-Bletchley-Bedford line is viewed as a priority for early delivery, to ensure that the new link could open as electrified railway to link with the electrified Midland Main Line. Electrification of Oxford to Nuneaton, Basingstoke to Southampton and the Midland Main Line Capacity schemes are new schemes, announced in the HLOS and are currently at GRIP 0. The programme for these later schemes currently contains the uncertainty associated with early stage development.

Midland Main Line Electrification

Operating route: East Midlands / London North Eastern

Project reference code: DP005

Output: Electrification

CP5 output driver

To create an electrified route north of Bedford to link the core centres of population and economic activity in the East Midlands and South Yorkshire.

Scope of works

The core scheme will involve provision of OLE at 25kV AC for the following sections of the route:

- Bedford to Sheffield via Derby;
- Kettering to Corby;
- Trent Junction to Nottingham.

Separate costs for the following additional route options may be developed as potential increments to the core scheme:

- Trent Jan to Clay Cross South Jct (Erewash valley line)
- Matlock Branch
- Sheffield to Doncaster and Sheffield to Leeds
- Up and Down Hendon lines from Silkstream Jct to Watling St Jct
- Carlton Road Jct to Junction Road Jct
- Corby-Manton-Syston.

It is expected that the ruling linespeed on the route will increase from 110mph to 125mph following works committed in CP4. The electrification equipment will therefore be designed to cater for the following speeds:

- passenger services – 125mph;
- freight trains up to RA8 – 75mph;
- freight trains of RA9 or RA10 – 60mph.

Power supplies are being developed against a train service specification in three parts. This is based on the services that would convert to electric traction in the following scenarios:

- Electrification of the core routes (the core scheme);
- Further electrification of the specified additional route options.

This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. rolling stock clearance, depots / stabling works or platform lengthening as a result of the operation of electric trains).

Significant interfaces

- Nottingham station area resignalling/remodelling
- Line speed increases between London and Sheffield
- Gauge capability project including Syston – Stoke
- Derby station area resignalling/remodelling
- Midland Mainline Leicester capacity scheme
- Midland mainline long distance high speed services train lengthening

- Sheffield station area remodelling
- Dore Junction doubling – part of Northern Hub
- East West Rail (Bedford Area)
- North Trans-Pennine electrification (National Grid power supply requirements north of Sheffield)
- MML Capacity Enhancement Schemes
- National SCADA programme

Activities and milestones

An outline programme for MML electrification has been developed. It is currently assumed that MML electrification will be completed in late CP5/early CP6, although this is particularly dependant on the significant interfaces with East Midlands re-signalling works, capacity works between Syston and Wigston (Leicester Capacity) and other MML capacity schemes.

Derby station area remodelling

Operating route(s): East Midlands

Project reference code: NE003

Output: Journey time improvements

CP5 output driver

To deliver reduced journey times, improved performance and operational flexibility through the segregation of services through Derby Station. The project will provide a remodelled track and signalling layout that will segregate services approaching Derby from the north from those services approaching Derby from the south and west, and thus remove the current bottleneck situation at Derby Station.

This once in life time opportunity is aligned to planned signalling and track renewals in the area. In addition to the benefits listed above the project will:

- support delivery of journey time improvements as part of the Electric Spine on the MML;
- maintain declared infrastructure capability regarding rolling stock gauge.

Scope of works

- Signalling renewal and remodelling in station area
- Track renewal and remodelling in station area
- Construction of a new station platform
- Incremental enhancement to track and signalling layout to segregate flows
- Possibility of alterations to existing station platforms in order to facilitate track layout

Significant interfaces

There are significant CP5 signalling and track renewals linked to this project. Other interfacing schemes are:

- re-control and re-lock of signalling at Derby;
- station renewal works;
- planned maintenance works;
- NSIP programme of works;
- East Midlands Signalling Renewals at Derby;
- St Pancras to Sheffield LSI;
- LDHS Train Lengthening;
- Midland Mainline Electrification.

Key assumptions

- Current capacity of the infrastructure shall not be reduced by the options proposed.
- Currently declared infrastructure capability regarding rolling stock gauge shall be maintained.
- The current capacity of each platform may be reduced, however each shall be required to accommodate a 10 car (10 x 26m) train and at least one platform available from all routes will accommodate charter services.
- Pedestrian flow modelling at stations affected will not need to be undertaken unless significant alterations to platform lengths or station facilities are proposed.

Activities and milestones

GRIP 2 Stage Gate Review was completed in July 2011.

GRIP 3 (initial) development will be completed by September 2012.

It is assumed that the remainder of GRIP 3 and GRIP 4 -8 will be delivered in CP5.

GRIP 3 Complete	-	25/06/14
GRIP4 Complete	-	10/08/15
Commissioning Complete	-	26/12/17
GRIP 5-6 Complete	-	12/02/18
GRIP 7 Complete	-	10/08/18

Electric Spine: Oxford – Bletchley – Bedford Electrification

Operating route: Western / LNW / East Midlands

Project reference code: DP026

Output: OLE Electrification

CP5 output driver

The scheme provides electrification of the reopened railway from Oxford to Bedford (via Bletchley). It develops and delivers the electrification of the link.

Scope of works

The scope of this project includes provision of 25kv AC overhead electrification and associated power supplies / distribution for the route, including running lines and crossovers. Other works will include signalling immunisation, track lowering and bridge reconstructions.

This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. rolling stock clearance, depots / stabling works or platform lengthening as a result of the operation of electric trains).

Significant interfaces

- The Great Western Electrification Programme
- The Midland Main Line Electrification Programme
- Evergreen 3 Project
- OARS (Oxford Area Renewal of Signalling)
- South Coast – West Midlands freight capacity enhancements
- Oxford - Leamington – Nuneaton Electrification
- Oxford corridor capacity improvements
- Bletchley Resignalling
- High Speed 2
- Thameslink

Activities and Milestones

Electrification of the route from Oxford to Bletchley will be undertaken in conjunction with the East West Rail project, with completion by December 2017. Electrification of the route from Bletchley to Bedford will be determined by the timing of the electrification of the Midland Main Line.

Electric Spine: Basingstoke to Southampton DC to AC conversion

Operating route: Wessex

Project reference code: SE025

Output: Electrification (where appropriate, to replace DC)

CP5 output driver

To develop a project to enable freight and 'Cross Country' services on the route to operate with a form of electric traction when further sections of the network are electrified. For the main passenger routes between London Waterloo and the south west, there may be the potential to provide lower whole life costs of the electrification, power enhancement and energy savings. Additionally increased power availability is expected to provide greater acceleration, reduced journey times and potential capacity increases for more frequent services between Southampton and London.

The HLOS also requires the industry to develop a longer-term proposition and business case for the systematic upgrade from DC to AC of the whole Southern network, for consideration for future control periods. The strategic case for conversion of the whole Southern network from 750V DC third rail to 25kV AC OLE has identified journey time improvements, safety benefits, renewal cost savings and operating cost (energy and maintenance) savings as the main benefits.

Scope of works

- To develop a scheme for conversion from DC to AC of the route between Basingstoke and the port of Southampton
- To consider and recommend options for expanding the geographic scope of such conversion on the Wessex Route, with an aim to optimise the benefits to be gained from conversion or replacement of rolling stock and from a rolling programme of electrification within Wessex
- To consider the case for electrification of the W12 gauge freight diversionary route between Southampton and Basingstoke via Laverstock, including the routes into Salisbury station
- To identify the implications for Southern Railway operations into Southampton Central, either in terms of fleet conversion to dual voltage, retention of DC on the affected section of the route, or by alteration to service patterns
- To consider the need for any infrastructure changes required to enable the electric operation of freight services, including (but not restricted to) the provision of reception sidings, run-round facilities, loco headshunts etc.
- Dependent on emerging rolling-stock strategies, to consider the implications of conversion on power supply, depot, maintenance and stabling facilities for both passenger and freight operators
- To continue to develop and refine the business case for wholesale conversion from DC to AC across all routes in the South (Wessex, Sussex and Kent), to increase confidence that the forecast benefits can be realised in practice
- Subject to the case being proven, to develop a recommended rolling programme for further conversion of routes in Wessex, Sussex and Kent, taking into account DC systems renewals profiles, rolling stock strategies (freight and passenger), signalling and track renewals, and scale of benefits

This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. rolling stock clearance, depots / stabling works or platform lengthening as a result of the operation of electric trains).

Significant interfaces

- Basingstoke to Reading electrification.
- Renewals and enhancement strategy for the route
- Rolling stock depots and Freight terminal infrastructure interfaces
- Wessex W12 gauging project via Andover
- Southampton to West Coast Main Line freight train lengthening project
- Southampton to West Coast Main Line freight capacity project
- Rolling stock conversion and cascade strategies

Activities and Milestones

The scheme was proposed in the HLOS and is currently at GRIP 0. It will be developed during CP5 and, subject to the findings of that development, the delivery would be expected to commence in CP5. The determinants of the delivery date will include:

- The geographical scope of the preferred solution; a wider scope would require extended timescales for implementation
- Conversion of passenger rolling stock; it would need to be converted in time to make use of the AC system, and that this work will be funded and delivered by other stakeholders collaborating in this scheme
- A rolling stock strategy would need to be in place to support design, depot, change over locations and timetable scoping decisions
- The technology to enable trains reliably to switch between systems on the move at high speed can be developed, tested and proven. A cost and risk efficient solution can be found to infrastructure changeover (i.e. switching off the DC system and switching on the replacement AC system), and to any requirement for long sections of dual electrification systems
- Sufficient contractor and electrification resource would need to be available to adequately support development and implementation
- New grid feeding and supply points would need to be operational in the required time frame to support electrification changeover

Electric Spine: Basingstoke to Reading (Southcote Junction) Electrification

Operating route: Wessex

Project reference code: DP024

Output: Electrification

CP5 output driver

To enable the more efficient operation of stopping passenger services on the Reading-Basingstoke line, replacing diesel with electric traction. It will also enable freight operators to use electric traction on freight flows emanating from Southampton Docks towards London or the south end of the West Coast Main Line.

The scheme would be an incremental step towards enabling 'Cross Country' passenger services to operate electric trains (once the line north of Oxford to Coventry/Birmingham is electrified at a later date).

Finally, the London & South East RUS recommended that further development be undertaken with a view to offering fast electric shuttle services operating between Basingstoke/Reading/Paddington. This scheme would act as an enabler for this RUS recommendation.

Scope of works

The core works will involve electrifying overhead at 25kV AC the following section of the route (including all crossovers): Southcote Jct to Basingstoke Station (required platforms) with provision for DC/AC changes at Basingstoke for cross-country passenger and freight services.

This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. rolling stock clearance, depots / stabling works or platform lengthening as a result of the operation of electric trains).

Significant interfaces

- The GWML Electrification Programme
- The Reading Station Area Redevelopment Project
- The Southampton to West Coast Main Line Freight Capacity Project
- The DC-AC Conversion Project
- Electric Spine Southampton to Basingstoke AC electrification
- Thames Valley EMU Capability Works

Activities and milestones

The scheme was proposed in the HLOS and is currently at GRIP 0. It will be developed during CP5 and, subject to the findings of that development, delivery will commence in CP5.

Electric Spine: Nuneaton – Coventry – Leamington – Oxford Electrification

Operating route: LNW / Western

Project reference code: DP025

Output: Electrification

CP5 output driver

To enable freight, 'Cross Country' and other local passenger services on the route to operate with a form of electric traction when further sections of the network are electrified. Additionally, the Coventry to Nuneaton element of the scheme, in particular, would enable the provision of a diversionary route for planned engineering works and for use in times of perturbation.

Scope of works

The core works will involve delivery 25kV AC OLE electrification on the following sections of route (including all crossovers):

- Oxford to Nuneaton, comprising Coventry to Gibbet Hill Junction to Milverton Junction to Leamington Spa Junction to Oxford North Junction.
- Stations along the route are at Nuneaton, Bedworth, Coventry, Leamington Spa, Banbury, Kings Sutton, Heyford, Tackley and Oxford.

This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. rolling stock clearance, depots / stabling works or platform lengthening as a result of the operation of electric trains).

Significant interfaces

- Leamington Spa to Coventry Capacity Enhancement
- The GWML Electrification Programme
- The Reading Station Area Redevelopment Project
- The Southampton to West Coast Main Line Freight Capacity Project
- The Southampton to Basingstoke DC to AC Conversion Project
- East West Rail Project
- Evergreen 3
- Gibbet Hill Jct to Milverton Jct re-doubling scheme
- Banbury North and South Resignalling
- OARS (Oxford Area Renewal of Signalling)

Activities and Milestones

The scheme was proposed in the HLOS and is currently at GRIP 0. It will be developed during CP5 and, subject to the findings of that development, delivery will commence in CP5.

Electric Spine: Leicester Capacity

Operating route: East Midlands

Project reference code: NE032

Output: East – West rail freight and passenger capacity

CP5 Output Driver

- To enhance the rail infrastructure around Leicester to meet the passenger and freight growth forecasts
- To contribute to a package of freight enhancements on the Felixstowe to Nuneaton (F2N) route

Scope of works

This scheme will provide additional track capacity between Syston and Wigston to enable increased freight movements through the Leicester area. A number of measures to increase the capacity for freight and 'Cross Country' passenger services on the Felixstowe to Nuneaton corridor have been examined as a method of accommodating demand on the corridor. These include (this is not an exhaustive list):

- Provision of additional tracks between Wigston Jct and Syston Jct on the east side. These would become the up and down slow lines with the existing main lines becoming fast lines.
- Works to reduce conflict between East West and core Midland Mainline services. This could include grade separation in the Wigston Jct and Syston Jct areas.

Significant interfaces

- Electric Spine – Midland Main Line Electrification
- Syston-Stoke gauge enhancement
- Birmingham to Stansted journey time improvement project

Activities and Milestones

The scheme is expected to be delivered during CP5.

Electric Spine: Midland Main Line (MML) Capacity (Bedford-Sharnbrook-Kettering-Corby)

Operating route(s): East Midlands

Project reference code: NE029

Output: Capacity

CP5 output driver

The electrification timetable study for MML (beyond 2018) has identified that the aspiration for a sixth Long Distance High Speed (LDHS) service, in conjunction with an increased quantum of Thameslink services cannot be delivered on the existing infrastructure. In addition it is not possible to path 1600t northbound freight services beyond Wellingborough or route longer, heavier freight services via Market Harborough.

The opportunity exists to obtain more from the MML, either in terms of capacity, capability or journey times but not with the specified combination of service quanta, calling patterns and infrastructure. The areas between Sharnbrook Jct and Syston South (including Wigston North Jct) and between Bedford and London St Pancras are the most restrictive areas to achieve the desired TSS and a compliant timetable. Junctions such as Wigston, Harpenden, Radlett and Carlton Road create fixed points within the timetable restricting how services can use this area.

The capacity improvements support the efficient delivery of the Electric Spine on the MML.

Scope of works

There are already a number of infrastructure projects upgrading infrastructure north of Bedford on the MML (see interfaces below), but further interventions have been identified to provide the required additional capacity to meet the desired specification. These include:

- Kettering – Corby/Manton capacity (including doubling the track to Corby);
- Bedford – Kettering capacity (a number of options ranging from re-introduction of fourth track, to various loops and linespeed increases on the slow lines);
- Kettering – Wigston (options include loops at in the Desborough area and at Wigston);
- Bedford area capacity improvements

Significant interfaces

There are a number of interfacing projects which could affect the scope of the MML Capacity Schemes. These include:

- Midland Main Line Electrification (Bedford to Sheffield via Derby, Nottingham and Corby) (CP5 scheme);
- Derby station area resignalling/remodelling (CP5 scheme);
- Syston to Wigston capacity (CP5 scheme);
- Gauge Capability project – potential for early works to achieve structure clearances;
- Syston – Stoke Gauge Enhancement (CP4/5 scheme);
- potential train lengthening and associated platform extensions on the MML (CP5 scheme);
- Linespeed increases (CP4 project).

Key assumptions

Further analysis is required to assess capacity between Kentish Town and Flitwick to determine the optimum combination of infrastructure interventions and train service specification necessary to deliver the outputs along this section of the route.

It should be noted that capacity analysis undertaken so far has not examined the implications of any additional passenger or freight services from the Oxford – Bletchley – Bedford line operating along the MML north of Bedford. The timing of the introduction of these services will be critical to establishing when any infrastructure works are required.

The results of both the above analysis are likely to drive the requirement for further interventions not yet identified.

As a result of the continued DfT review of the IEP programme, it is not possible at this stage to be definitive about the electric rolling stock to be used on the MML post electrification. For the purposes of power supply design, assumptions have been made regarding the types and lengths of electric rolling stock, based on the use of IEP, class 323 and class 319 units.

Some of the proposed interventions should be delivered in advance of electrification (such as doubling the Kettering to Corby line), as they would support the electrification access strategy offering opportunities to limit the impact of possessions and provide potential diversionary routes, both during and post electrification implementation. Implementation of some of these schemes may impact on the electrification timescales.

Other key assumptions include:

- re-modelling in the Leicester area (between Syston and Wigston) will be undertaken;
- resignalling of Derby and recontrol of Leicester PSBs will be undertaken in CP5 and will be delivered before OLE energisation is required;
- applications for development consent will be obtained on an individual site specific basis.

Activities and milestones

Currently these schemes are at GRIP 0 and need development to GRIP Stage 2 to review the options, identify proposed scope, costs, risks and timescales.

An outline programme for MML electrification has been developed. It is currently assumed that completion of MML electrification will be delivered in mid-late CP5/early CP6, although this is dependant on the significant interfaces with East Midlands re-signalling works. This will need to be reviewed, once there is an understanding of the timescales for these schemes and their separate and combined interaction with the electrification timescales.

Electric Spine: Coventry to Leamington Spa Capacity

Operating route(s): LNW

Project reference code: WW005

Output: Capacity

CP5 output driver

The West Midlands and Chilterns Route Utilisation Strategy (RUS) has identified that there is a capacity gap on the line between Leamington Spa and Coventry in the peak hours and on-train crowding on services on that line. Furthermore there is a lack of connectivity between Derbyshire, Yorkshire and the North East to Coventry and Birmingham International suppressing rail demand.

The RUS recommended the diversion of the Reading to Newcastle CrossCountry service from the Solihull line to the Coventry corridor to improve connectivity and also identified a requirement to accommodate freight growth on the line, as defined by the Strategic Freight Network (SFN) forecasts.

This project is now part of the 'Electric Spine' programme, specified in the DfT's July 2012 HLOS, and contributes to its strategic objective to increase capacity between Oxford and Nuneaton via Leamington Spa - Coventry for passenger and freight services.

Scope of works

- Increased capacity by track doubling the single track section between Milverton Junction and Kenilworth South Junction, including associated structural works to embankments and cuttings.
- Existing single track to be realigned to enable the second track to be installed on the adjacent formation.
- A new bridge span is required over the A46 trunk road for the second track. Existing bridges will need strengthening (subject to further detailed assessment during development) and parapet barrier improvements.
- Signalling and power supplies to be installed on the new double track railway.

The SFN project requires the existing loop facility at Kenilworth to be retained.

Excluded from the scope is the doubling of the single track section between Kenilworth North Junction and Gibbet Hill Junction.

Significant interfaces

- Electric Spine national programme: Nuneaton to Oxford.
- Strategic Freight Network project (Southampton to WCML capacity)

There is also a proposal for a new station on the line at Kenilworth, which, if progressed, will be funded as a separate third party project. A future franchise could include additional local services, subject to sufficient additional capacity being available.

Key assumptions

- This project excludes capacity interventions on the Coventry corridor and at Coventry station to accommodate the increased passenger and freight services.
- No track doubling is required between Kenilworth North Junction and Gibbet Hill Junction.
- All electrification scope and costs are incorporated within Electric Spine; Oxford to Nuneaton.
- Any enhancements to Kenilworth loop will be funded by a separate project.

Activities and milestones

Milestones	Date
GRIP 3 Complete – Single Option Selected	April 2014
GRIP 4 Complete – Single Option Scoped Defined	November 2015*
GRIP 6 Complete – Project Commissioned	August 2018**

*Subject to the requirements for a planning consent application.

**Commissioning programme to be validated once the interface and integration with Electric Spine is developed.

London and the South East

	CP5 expenditure (£m in 2012/13 prices)
Sussex traction power supply upgrade	106
Anglia traction power supply upgrade	128
Kent traction power supply upgrade	53
Wessex traction power supply upgrade	54
South London HV Grid (Wimbledon) upgrade	62
Reading, Ascot to London Waterloo Train Lengthening	23
East Kent resignalling phase 2	38
Uckfield line train lengthening	11
Redhill additional platform	25
London Victoria station capacity improvements	9
Bow Junction	44
West Anglia main line capacity increase	44
New Cross Grid	12
Service Improvements in the Ely Area	32
Waterloo	282
Total	923

Sussex traction power supply upgrade

Operating route(s): Sussex

Project reference code: DP008

Output: Capacity

CP5 output driver

The main output driver for this scheme is the operational support for the changes to train services on the Sussex routes.

Scope of works

- The scope of work required to support the CP5 train service alterations is being developed as part of the Route Asset Strategy process.
- The locations of specific interventions are subject to completion of detailed system modelling.

Significant interfaces

This project has key interfaces with the following CP5 programmes of work:

- The DfT's procurement programme for new and cascaded rolling stock;
- The completed CP4 platform lengthening programme;
- The completion of the CP4 traction power enhancements;
- Thameslink Key Output 2 infrastructure (traction power);
- Thameslink Rolling Stock procurement;
- Development work on the December 2018 timetable;
- Any journey time reduction programmes.

Key assumptions

- Train lengthening programmes will absorb all other costs associated with track / signalling / structures / stations and other railway systems.
- The Thameslink scheme will progress according to its December 2018 timelines and provide the identified capability for any additional cascaded rolling stock.

Activities and milestones

GRIP 2 and part Grip 3 will be carried out in CP4.

The client remit currently states that infrastructure and output availability will be completed by the end of CP5 (March 2019).

Anglia traction power supply upgrade

Operating route(s): Anglia

Project reference code: DP009

Output: Capacity

CP5 output driver

The main output driver for this scheme is the operational support for the changes to train services on the Anglia routes.

The aim of the project is to provide enhancements to the existing traction power infrastructure required to support the forecast increase in electrically operated rolling stock for CP5. The project will develop the requirements for electric traction power for the December 2018 timetable specification for the Great Eastern route and the West Anglia routes. It will also consider the implications associated with future service increases and rolling stock changes in CP6 (funding outside the CP5 SBP)

Scope of works

The scope of works required to support the above alterations to train services is being developed as part of the Route Asset Strategy process.

Significant interfaces

This project has key interfaces with the following programmes of work:

- Crossrail and Thameslink (Services to Cambridge);
- Great Eastern main line capacity improvement;
- West Anglia main line capacity improvement;
- ECML Power Supply Upgrade Phase 1.

Key assumptions

- Train lengthening programmes absorb all other costs associated with track / signalling / structures / stations and other railway systems.
- Crossrail provides full AT capability between Pudding Mill Lane and Shenfield.
- Traction power and other infrastructure upgrades required as a result of the possible introduction of new rolling stock between Liverpool Street and Norwich will be funded and delivered by other projects
- The Distribution Network Operators (DNO) or the National Grid (Supergrid) supply will be available in the required timescales.
- No works or upgrade required to depot facilities (Including power supplies)
- AT feeding between Springfield and Colchester will not be required for the CP5 timetable specification

Activities and milestones

GRIP 2 and part GRIP 3 will be carried out in CP4 unless agreed otherwise. GRIP 3-8 should be assumed to be carried out in CP5. The Client remit currently states completion of infrastructure and Output availability by the end of CP5 (March 2019).

Kent traction power supply upgrade

Operating route(s): Kent

Project reference code: DP011

Output: Capacity

CP5 output driver

The main output driver for this scheme is the operational support of the CP5 (Dec 2018) train service on the Kent routes.

The overall aim is to enable operation of the full post-Thameslink Key Output 2 timetable with trains running at maximum length. This increases train lengths on most routes in Kent, either (1) directly by new Thameslink KO2 stock for Thameslink services or (2) indirectly through cascaded stock for non-Thameslink services.

Scope of works

The incremental scope of work required to support this train service is being developed as part of the Route Asset Strategy process. At present the identified works are in the following packages:

- Grove Hill and High Brooms Substation Upgrades (Conversion to 33kV);
- Traction Power Upgrade (Gravesend to Gillingham : 12 Car 465 Operation);
- Canterbury and Thanet area resilience for 12 car services.

Significant interfaces

This project has key interfaces with the following CP5 programmes of work:

- The DfT's procurement programme for new and cascaded rolling stock;
- The completed CP4 platform lengthening programme;
- The CP4 traction power upgrades on the Kent routes;
- Thameslink Key Output 2 infrastructure;
- Development work on the December 2018 timetable;
- The journey time reduction programme.

Key assumptions

- Train lengthening programmes will absorb all other costs associated with track / signalling / structures / stations and other railways systems.
- The Thameslink scheme will progress according to its December 2010 timelines and provide the identified capability for any additional cascaded rolling stock.
- The CP4 delivery plan interventions that cater for the 12 Car Class 465 operation on all 3 routes to Dartford are completed. This includes the extension to Gravesend. This scheme will also cover works required for this operation on the Hayes Branch and on the route to Chislehurst.

Activities and milestones

GRIP 1-2 will be completed in CP4 with GRIP 3 in progress. GRIP 3-8 should be assumed to be completed in CP5. The Client Remit currently states that infrastructure and output availability will be completed by the end of CP5 (March 2019). However, changes to support 12 car Class 465 trains between Gravesend and Gillingham may be required by June 2015. The feasibility of achieving this requirement is yet to be established.

Wessex traction power supply upgrade

Operating route(s): Wessex

Project reference code: DP015

Output: Capacity

CP5 output driver

The main output driver for this scheme is the operational support of the train service on the Wessex routes for 10-car train lengthening on the route from Reading to London Waterloo.

The key aims are to:

- The operation of 10-car trains between London Waterloo and Reading based upon specified substitutions within the Dec 2014 timetable specification.

Scope of works

The scope of works required to support this train service has been developed from existing modelling and desk analysis. Alternative rolling stock usage and modification of existing rolling stock has already been considered. The latter proposal is not endorsed by the TOC, South West Trains.

Significant interfaces

This project has key interfaces with the following CP5 programmes of work:

- the DfT's procurement programme for new and cascaded rolling stock;
- the completed CP4 platform lengthening programme and traction power supply enhancements;
- the CP5 Project: Waterloo to Reading Platform Extensions;
- the Reading project;
- the journey time reduction programme;
- GWML Electrification programme (Reading Area).

Key assumptions

- Train lengthening programmes absorb all other costs associated with track, track circuits, signalling, structures, stations, berthing, etc.
- The Reading and GW Electrification schemes will progress according to their December 2010 timelines and provide the identified capability for any additional cascaded rolling stock.

Activities and milestones

GRIP 1-2 will be completed in CP4 with GRIP 3 in progress.

GRIP 4-8 should be assumed to be carried out in CP5.

Client remit currently states that infrastructure and Output availability will be completed by the end of CP5 (March 2019).

South London HV Grid (Wimbledon) Upgrade

Operating route(s): Wessex

Project reference code: DP021

Output: Capacity

CP5 output driver

The key aim is to expand the capability of the traction power system to facilitate the reliable operation of future enhanced train timetables and increased train lengths in the inner area of the Wessex, Sussex and Kent Routes. The Wimbledon supply point, along with the New Cross supply point, provides electric traction and signalling supplies to the broad South London inner area.

The continued increase in draw from these supply points due to train service improvements required by the HLOS and, for example, also linked to major projects such as Thameslink, requires the strengthening of the main grid connections along with enhancements to improve resilience across the supply system.

Scope of works

The scope of work required to support this train service is outlined in the South London HV Strategy dated 8 October 2010. This identifies the requirement to strengthen the Wimbledon Grid site in line with National Grid (NG) proposals for this site. NG are proposing to link their New Cross Grid site to their Wimbledon Grid site, thereby enabling more efficient resilience measures to be provided should either Grid site not be able to provide power.

At present the identified works are in the following packages:

- Wimbledon Grid Point Upgrade and connection to the existing Network Rail traction power system;
- Upgrade to identified feeder cables to support the load transfer arrangements.

Significant interfaces

This project has key interfaces with the following CP5 programmes of work:

- New Cross Grid Upgrade (as defined in Section 16.02 of the CP4 Delivery Plan, which has a completion date in early CP5);
- Long Term Planning Policy for trains, timetables and rolling stock in the inner areas of Wessex, Sussex and Kent.

Key assumptions

- The Thameslink and other schemes will progress according to their December 2010 timelines and provide the identified capability for any additional cascaded rolling stock.
- New Cross Grid and HV feeder alterations will be complete by December 2015.
- Minor changes to the Reading Grid point are included as part of DP015 Route Traction Power in Wessex.
- Byfleet Grid point will be developed in late CP5 (subject to service interventions noted for CP6 delivery). This has not been included in the funding request.

Activities and milestones

GRIP 1-2 will be completed in CP4 with GRIP 3 in progress.

GRIP 4-8 should be assumed to be carried out in CP5.

Reading, Ascot to London Waterloo train lengthening

Operating route(s): Wessex

Project reference code: SE002

Output: Capacity

CP5 output driver

The key output is the provision of extra capacity between Reading and Waterloo by enabling longer trains to operate.

Scope of works

Develop a scheme allowing 10-car train services to operate between Reading, Ascot and London Waterloo. The project excludes the route from Ascot to Ash Vale. The project includes a review of options to allow 10-car services to stop at Feltham and Egham.

Significant interfaces

The project interfaces with:

- Wessex Traction Power Supply Upgrade project;
- Feltham Re-signalling & Wokingham Re-control project;
- Waterloo Major Development;
- Reading Station Area Redevelopment project;
- 10-car south west suburban railway project which is being implemented during CP4;
- Wessex Traction Power Supply Upgrade in CP4 (known as the Route 3 Power Supply Enhancement project).

Key assumptions

- The study of traction power system reinforcement requirements is addressed by the CP5 Wessex Traction Power Supply Upgrade Project (DP015)
- 10-car trains will be not longer than 204m (e.g. Class 458 strengthened with Class 460 vehicles or similar).
- Turnback facilities are maintained at Wokingham and Ascot but no additional allowance for splitting and joining is required.
- Existing substandard signal standbacks, other than those contained within the scope of the Feltham Re-signalling project, are not to be addressed unless the signal is moved and the deficiency can be rectified at an affordable cost.
- The works can be contained within the current property boundary and be undertaken under permitted development.
- That at Ascot it is feasible and acceptable to abolish the existing London end DDA access barrow crossing by providing lifts on the recently constructed footbridge and provide an additional footbridge span onto platform 3
- Whilst the impact on train berthing will be assessed, no depot funding will be required as part of this project

Activities and milestones

Completion of the following GRIP stages:

GRIP 2	-	25/03/11
GRIP 3	-	30/06/14
GRIP 4	-	30/06/16
GRIP 5-8	-	31/03/19

East Kent re-signalling Phase 2: Enhancements

Operating route(s): Kent

Project reference code: SE006

Output: Capacity

CP5 output driver

The key driver for the enhancements is the provision of capability and capacity to facilitate the future time table (December 2018) through the Medway towns, operational cost reduction and improved integration of the railway with other forms of public transport. The outputs to be delivered include:

- Increase in capacity to 15tph;
- Provision of 12-car platforms for Class 465 stock;
- New Station at Rochester;
- Headway improvement to 2 minute planning headway;
- Journey time reduction;
- Reduced maintenance/operation and schedule 4/8 costs.

There may be increased power supply requirements arising from the 12-car operation, reduced headways and increased frequency following the implementation of the proposed enhancements in this scheme. A separate Power Supply Upgrade project, CP5 Kent Services Enhancements will address the traction power requirement.

Scope of works

- Two additional signal sections to reduce headways between Rochester and Gillingham.
- Speed improvements between Longfield and Sittingbourne.
- Platform extension to accommodate 12-Car Class 465s at the following stations:
 - 1) Strood
 - 2) Rochester (delivered as part of new 3 platform station)
- Turnback facilities at Rainham and associated station infrastructure changes.
- Tunnel and junction lighting between Rochester Bridge Junction and Gillingham.
- Control Track Switches (CTS) and Lockout Devices between Rochester and Gillingham.
- Provision of lighting, cameras and monitoring equipment for driver only operation (DOO) capability for 12-Car services at Strood, Rochester, Chatham, and CD/RA at Gillingham.
- Relocate Rochester station to Corporation Street, scope include a new 3 platform station and new infrastructure including subway, track and signals.

Significant interfaces

The enhancements will be delivered as part of the East Kent Re-signalling Phase 2 renewal scope of works. The relocation of the Rochester Station is aligned with Medway Councils objectives and interface with their Regeneration programme for the Medway towns.

The implementation is programmed around Thameslink KO2 and Crossrail programmes. It also interfaces with the Gravesend remodelling project.

Key assumptions

The scope of works currently identified will be sufficient to deliver the required output, primarily the delivery of the December 2018 timetable and achieve the required business case benchmark.

- Land can be procured for the planned works at Strood.

- Land for the new station at Rochester will be leased at a peppercorn rate to Network Rail by Medway Council.
- Medway council will allow the decking of their car park at Rainham to be used as a substitute for the spaces that will be lost as part of the provision of turnback at the station.
- RSSB will provide derogation for the platform curvature at Strood and Rochester.
- The enhancements will be delivered as part of the Renewals project and that there will be funds available in CP4 to support the cost profile required to meet the Easter 2015 commissioning.
- No depot works and funding have been allowed for.
- Scope excludes any traction power supply upgrade.
- Any requirement to replace pre-1976 rail in the line speed improvement area to be funded by Track Renewals.

Activities and milestones

GRIP 4	-	07/13
Commission	-	12/15
GRIP 5-6	-	02/16
GRIP 7	-	09/16

Uckfield line train lengthening

Operating route(s): Sussex

Project reference code: SE011

Output: Capacity

CP5 output driver

The key output is the provision of extra capacity between East Croydon and London Bridge, and on the Oxted Line by enabling longer trains to operate.

Scope of works

Develop a scheme allowing 10-car Class 170/171 (23m) stock to serve the eight station locations between Edenbridge and Uckfield including work to extend 12 platform faces and relocate 2 signals.

Significant interfaces

The scheme should make passive provision (e.g. when moving signal infrastructure) for future electrification of the route served by 12-car x 20m vehicles.

Key assumptions

- Options reliant upon use of Selective Door Opening (SDO) are unlikely to be feasible assuming reinforcement of the existing Class 170/171 fleet (comprising 4-car and 2-car units without corridor connection) as units could be assembled in any combination to make a 10-car train thus limiting the scope for savings that this functionality would otherwise enable. However this assumption should be revisited if the emerging rolling stock strategy identifies opportunities to utilise corridor connected units.
- That 10-car trains will be not longer than 236m (e.g. Class 171 2x4-car & 1x2-car units); therefore platform length is a minimum of 237m (single direction) or 238m (bi-directional) including 1m allowance from stop boards to top of ramps. The terminating platform at Uckfield to be 243m.
- The project's primary aim is to provide additional train capacity to be utilised further towards London, it is therefore assumed the project will result in negligible increased passenger numbers using the Uckfield Line and provision of additional passenger facilities at these locations will not be required as part of this scheme.
- Land fenced into the railway at the London end of the Down platform at Haver can be transferred into Network Rail ownership and that works at all other locations can be contained within current property boundaries & ownership.
- The works can be undertaken using Network Rail's Permitted Development Rights.

Activities and milestones

Completion of the following GRIP stages:

GRIP 4	-	05/14
GRIP 5	-	31/09/16
GRIP 6	-	31/03/18
GRIP 7	-	31/09/18
GRIP 8	-	31/03/19.

Redhill additional platform

Operating route(s): Sussex

Project reference code: SE016

Output: Capacity

CP5 output driver

Additional operational resilience and platform capacity at Redhill.

This key output shall allow for full operation of the proposed post KO2 timetable (December 2018). In addition to Thameslink services via Blackfriars, this includes additional Victoria services splitting/joining at Redhill and additional Reading to Gatwick via Redhill services.

Scope of works

- Provision of an additional 12-car 270m platform scheme at Redhill.
- Provision of platform accommodation including WCs, canopy (90m), waiting shelter and stairs / lift connection to the existing subway and ticket hall.
- Alterations to track and signalling infrastructure required for parallel move functionality.

Significant interfaces

- Redhill Station car park redevelopment scheme by Solum Regeneration.
- Southern proposal for access improvements between ticket office and subway.
- It is understood that the capability provided by this project is a key assumption of the Thameslink KO2 timetable. The KO2 timetable is currently under development and is planned for introduction in December 2018.
- Redhill/Reigate area signalling re-control project.

Key assumptions

The project will provide passenger handling facilities associated with the new platform.

The project will not provide any additional station staff accommodation, ticket office or gate line facilities.

- The existing Westpac Mk4A interlocking may not be successfully modified for the needs of this project and will be replaced with a new Computer Based Interlocking system (SSI).
- The works can be contained within the current property boundary and be undertaken using Network Rail's Permitted Development Rights.
- Freight run round capability will be retained through Platform 0/London direction cess.
- It will be acceptable to introduce an 8-car restriction in the Down direction on Platform 1.

Activities and milestones

Completion of the following GRIP stages:

GRIP 2	-	25/03/11
GRIP 3	-	15/06/12
GRIP 4	-	01/02/17
GRIP 5	-	01/11/17
GRIP 6	-	31/03/18
GRIP 7	-	31/06/18
GRIP 8	-	31/03/19

London Victoria Station capacity improvements

Operating route(s): Sussex

Project reference code: SE018

Output: Station capacity

CP5 output driver

The project will increase passenger capacity at London Victoria station.

Scope of works

- Remove retail units, and realign and extend gatelines to Kent (Platforms 1-7) and Sussex (Platforms 9-12) sides.
- Widen Platform 8.
- Reconstruct fire exits, provide new fire escape stairs and install a goods lift in the Left Luggage building.
- Remove retail units next to the escalators on Sussex concourse.
- Construct a Gatwick Express ticket office behind the escalators on the Sussex concourse.
- Relocate the gateline and CIS on the Sussex concourse (Platforms 15-19).
- Relocate the switch room and spiral staircase access to CIS for Platforms 1-7.
- Relocate Platform 7 screen, vehicle gate and seating, and displace the adjacent retail units.

Significant interfaces

- Alignment of the congestion relief proposals, as far as possible, with the planned Property/Retail Masterplan.
- London Underground Victoria Station Upgrade (VSU) project.

Key assumptions

- A technical solution can be found that alleviates pedestrian congestion at the station.
- Train operators will support amendments to station change; including relocation/removal of retail units or additional gatelines etc.
- Options can be delivered within a Listed Building Environment

Activities and milestones

GRIP 2	-	01/03/11
GRIP 3	-	14/05/12
GRIP 4	-	11/04/14
GRIP 5	-	30/07/15
GRIP 6	-	09/09/16
GRIP 7	-	22/11/16
GRIP 8	-	04/09/17

Great Eastern Main Line Capacity Improvement (Bow Junction)

Operating route(s): Anglia

Project reference code: SE021

Output: Capacity

CP5 output driver

The project is to provide optimum use of capacity released on the Electric Lines into Liverpool Street Station following diversion of most peak suburban services through the Crossrail tunnel (due to open in 2019). The overall aim is to reduce overcrowding on the Chelmsford and Southend Victoria routes. The project shall aim to implement Option D2 included within the July 2011 London and South East RUS to increase mainline services up to 28 trains in the busiest hour (from an assumed 24 tph following implementation of earlier RUS recommendations).

Scope of works

- Undertake timetabling, rolling stock utilisation and performance study to validate the preliminary assessment that two additional morning peak services from Chelmsford and one additional service from Wickford can be timed without additional rolling stock and with acceptable PPM. To also identify inter-peak stabling requirements.
- Reconstruction of Bow Junction to optimise the layout allowing more up direction trains to access the Up Electric line on the London side of the new Crossrail tunnel portal. Works to include associated signalling and OLE modifications.
- Provision of turnback facilities in the Chelmsford and Wickford areas.

Significant interfaces

- Crossrail Project
- Beaulieu Park new town/station development (Chelmsford)

Key assumptions

- That no additional traction power reinforcement will be required west of Shenfield.
- That additional power modelling is being undertaken under a separate CP5 Traction Power scheme to confirm that supplies are sufficient east of Shenfield.
- That a site for stabling will be available along the Lea Bridge corridor or that the timetable can accommodate more remote alternatives.
- All other work can be accommodated within the current operational rail boundary and be undertaken using Network Rail's Permitted Development Rights.

Activities and milestones

Completion of the following GRIP stages:

GRIP 2	-	09/05/13
GRIP 3	-	15/05/14
GRIP 4	-	04/09/15
GRIP 5	-	05/01/17
GRIP 6	-	13/11/17
GRIP 7	-	29/01/18
GRIP 8	-	03/12/18

West Anglia main line capacity increase

Operating route(s): Anglia

Project reference code: SE022

Output: Capacity

CP5 output driver: To relieve overcrowding and absorb additional forecast growth on the West Anglia Main Line the project shall aim to incrementally implement recommendation C2b included within the July 2011 London and South East RUS. It will develop a scheme targeted at increasing the frequency of Lea Valley line services to Stratford to 4 trains per hour (tph) in the 'peaks' (currently 2tph). The infrastructure provided will allow off-peak services to be increased to a similar frequency if required.

The holistic longer-term approach to increasing capacity on the West Anglia route is to provide an additional pair of lines from Coppermill Junction northwards through Brimsdown to Cheshunt. This scheme will implement the first part of this, and is intended to address the medium-term demand arising from industrial and residential developments in the vicinity of Tottenham Hale, Northumberland Park and Angel Road stations.

Network Rail's proposals have considerable support from the local stakeholder group, which has indicated a willingness to fund further extension of the CP5 scheme if required; particularly with a view to achieving a 4 tph service at the three stations mentioned immediately above.

Scope of works

- Undertake timetabling, rolling stock utilisation and performance study to explore options for providing 2 additional peak services from the Lower Lea Valley to Stratford.
- Provide additional infrastructure required to achieve the above service provision at an acceptable level of performance; additional track at Coppermill Junction and north thereof, with associated signalling & OLE modifications. New platforms will be provided at all stations served by the new line.

Significant interfaces

Anglia Traction Power (DP009)

Emerging proposals for Crossrail 2 (which suggest the northern part of the route may be via the Lea Valley)

Key assumptions

- Power modelling is being undertaken under a separate CP5 Traction Power scheme to make sure that supplies are sufficient
- That no additional stabling facilities will be required for the rolling stock to operate the revised service.
- Works can be accommodated within the current operational rail boundary and be undertaken using Network Rail's existing Permitted Development Rights, or where additional land is required this can be secured for an affordable cost and planning permission obtained.
- That the level crossing at Northumberland Park can be closed to vehicular traffic.

Activities and milestones

Completion of the following GRIP stages (the possibility of earlier implementation in line with stakeholder aspirations is being investigated):-

GRIP 2	-	06/06/13
GRIP 3	-	19/03/14
GRIP 4	-	15/01/15
GRIP 5	-	04/04/16
GRIP 6	-	10/02/17
GRIP 7	-	27/04/17

New Cross Grid

Operating route(s): Kent

Project reference code: SE026

Output: New Cross Grid upgrade

CP5 output driver

The CP4 element of this scheme was funded in the PR08 final determination. Further funding is required to enable the CP5 completion of this project.

Scope of works

These works form part of an eight year programme spanning two control periods and scheduled to be completed in December 2016. It includes the following works:

- Modification and extension of National Grid's existing 275kV substation at New Cross, to provide a replacement to the existing 66kV railway power supply feed.
- Provision of two new 33kV supply points to the railway system, for the onward transmittal of traction supplies.
- Short term remedial repairs to a number of transformers in the area, to enable them to remain in reliable service until 2015 when the new supplies are commissioned.
- Eventual decommissioning of the existing 66kV system at New Cross.

Significant interfaces

- Thameslink programme
- Regenerative braking project
- National SCADA project
- Platform extension projects
- Traction power supply renewals
- Separation of LUL power supply system

Key assumptions

- The current practice of freight services not using all contracted paths will continue and there will be no significant shift from diesel to electric hauled freight.
- DC services will remain limited to 5.1MW per train in high current areas and 3.4MW per train in other areas.
- No specific requirement to improve journey times or rolling stock performance.

Activities and milestones

Activity	Output	Indicative date
Commence project implementation (GRIP 5)	Start of project delivery phase	Q3 2009
Completion of National Grid works	Works by others, required before Network Rail works	Q4 2014
Commission into service new traction supplies from New Cross Grid	End of main project delivery phase	Q3 2015
Completion of 66kV decommissioning	Removal of redundant infrastructure	Q3 2016
Project close-out (GRIP 8)	Project completion	Q4 2016

Service Improvements in the Ely Area

Operating route(s): Anglia

Project reference code: SE027

Output: Capacity

CP5 output driver

Ely North Junction has been identified as a constraint to increasing passenger and freight services in the Ely area. This project is to develop a scheme which improves capacity in the area by focussing upon constraints at Ely North Junction.

There is an aspiration to double the services on the

- Kings Cross / Cambridge to Kings Lynn line.
- Cambridge to Norwich line.
- Ipswich to Peterborough line.
- Stansted to Birmingham line.

The London & South East RUS forecasts considerable freight growth along the Felixstowe to Nuneaton Route.

Scope of works

The Project is to:

- Provide appropriate infrastructure improvements at Ely North Junction to allow for the increase in train capacity.
- Reduce the headways and junction margin to a maximum of 3 minutes.
- The area covered by this project is just north of Ely station to Queen Adelaide Crossings.

Significant interfaces

- Ely West Curve Project (West Curve to Kings Lynn and West Curve to Norwich moves).
- Strategic Freight Network proposals Felixstowe to Nuneaton Phases 1 and 2 (including Ely area).
- Level Crossing Changes in the region.

Key assumptions

- Ely West Curve project will be completed during CP4 to provide bi-directional working round the curve.
- Within the life of any new infrastructure required as a result of this project it is expected that ETN will become electrified. Therefore passive provision should be made to allow for this in the design and build.
- Line speeds through Ely North Junction will not be reduced as a result of this project.
- Closure of Ely North Level Crossing.

Activities and milestones

GRIP 2 - December 2012

GRIP 3 - February 2013

Further GRIP stages are to be confirmed at the conclusion of GRIP 2.

Waterloo

Operating route(s): Wessex

Project reference code: SE028

Output: Capacity

CP5 output driver

The primary driver of this project is to provide capacity to meet demand and the forecast growth into and at London Waterloo station.

In 2010/11 Waterloo station was the busiest London rail terminal. It has experienced significant growth in the last decade and further growth is forecast. A long-term view is being considered, which includes understanding options for providing capacity to meet forecasts beyond the L&SE RUS time horizon and considering both main line and suburban future capacity requirements. This CP5 enhancement at Waterloo station and its approaches will form a part of that overall strategy.

Scope of works

High level options to be developed through the GRIP process for CP5 delivery and beyond are currently being defined. These will offer solutions that meet the CP5 capacity output requirements and will cover both track/platform and station requirements.

Significant interfaces

- Reading, Ascot to London train lengthening
- A possible Crossrail 2 regional scheme
- AC electrification
- Re-signalling
- Commercial development of Waterloo International and other sites in the vicinity of the station

Key assumptions

- The chosen CP5 solution can be delivered with an acceptable level of disruption to the train service.
- Any land that may be required beyond the existing station boundary can be acquired.
- Any impact of future demand growth on the onwards London transport network can be managed outside of this project.
- Clapham Junction and Wimbledon Congestion relief schemes will be delivered in CP5.

Activities and milestones

Pre-GRIP study – 31/01/2013

CP5 project delivery – 31/03/2019

Further interim milestones and decision points will be developed during the course of the pre-GRIP study.

North East

	CP5 expenditure (£m in 2012/13 prices)
LNE routes traction power supply upgrade	59
Bradford Mill Lane capacity	6
Stevenage and Gordon Hill turnbacks	26
MML long distance high speed services train lengthening	30
Leeds and Sheffield capacity	49
Huddersfield station capacity improvement	9
Micklefield turnback	18
East of Leeds capacity	17
Total	214

LNE routes traction power supply upgrade

Operating route(s): LNE

Project reference code: DP007

Output: Capacity

CP5 output driver

The aim of this project is to provide improvements to the existing traction power capability to support the forecast increase in electrically operated rolling stock on the ECML.

The ECML mainline between Wood Green and Bawtry is to be upgraded an autotransformer (AT) feeding system during CP5 (project NE028) as part of the Intercity Express Programme. This further project will review the requirements for traction power supplies on the remainder of the route using an integrated train service specification.

Power supply upgrades are strategic in nature and take more than one control period to develop and implement. It is considered necessary to continue the development of this projects in CP5 for likely delivery in late CP5 and CP6 following completion of the works between Wood Green and Bawtry (NE028) in 2017. This includes discussion with and studies by National Grid for Supergrid transformers.

Scope of works

The scope of works will be confirmed following traction power supply modelling. Options will include the conversion to an autotransformer Feeding System (ATFS) for the remainder of the EMCL between Bawtry and Edinburgh and on the Hertford Loop.

Significant interfaces

- Intercity Express Programme
- ECML Power Supply Upgrade Phase 1
- ECML Connectivity
- Trans-Pennine Electrification
- MML Electrification
- Edinburgh – Glasgow Improvement Programme (EGIP)
- Hertford North Integrated Facility
- ERTMS Programme

Key assumptions

- Implementation works will commence in late CP5 and continue into CP6
- Access (possessions and/or isolations) will be available as required.
- Additional capacity will be provided above the timetable/train service specification to meet Network Rail E&P RAM policy.

Activities and milestones

GRIP2 complete – December 2012

GRIP 3 complete – March 2014

GRIP 6 complete – CP6

Bradford Mill Lane capacity

Operating route(s): LNE

Project reference code: DP019

Output: Capacity

CP5 output driver

To accommodate the capacity metric into Leeds through an additional hourly service from Halifax to Leeds.

Scope of works

Provision of parallel moves into Bradford Interchange from Leeds and Halifax through;

- an additional crossover between platforms 1 & 2 at Bradford Interchange
- relocation of the existing Bowling Jn crossover close to Mill Lane Jn together with bi-directional signalling

Significant interfaces

- Signalling renewal
- Northern Hub
- Leeds and Sheffield capacity
- Bradford Mill Lane resignalling

Key assumptions

- Completion with the planned signalling renewal in CP5

Activities and milestones

- GRIP 2 completed September 2011
- GRIP 3 complete March 2014
- Full implementation with the resignalling scheme in CP5 with programme subject to confirmation.

Stevenage and Gordon Hill turnbacks

Operating route(s): LNE

Project reference code: NE004

Output: Capacity

CP5 output driver

Provide efficient resourcing for peak capacity on Inner Suburban services.

Scope of works

- Potential for additional crossovers and turn-back at Stevenage (which may include an intervention at Langley Junction)
- Potential for island platform / turn-back facility at Gordon Hill (Hertford Loop)

Key assumptions

- All planned works (e.g. between Alexandra Palace and Finsbury Park) will be completed in CP4.
- Stations will be able to accommodate additional passenger flows without the need for infrastructure interventions.
- Sufficient room is available within the existing relay room at Langley Junction to accommodate three geographical signalling sets needed for the new facility at Stevenage Station.
- Sufficient land owned by Network Rail exists to locate the turnout / track from (and including) Langley Junction to Stevenage Station.
- No cost included for any land purchase.
- The project will secure necessary disruptive track access requirements.
- That innovative technical solution or construction approach (e.g. modular) will not be required.
- That derogation to Standards will not be required.
- Assuming that standard regulatory consents (Network Change and Station Change) and planning permissions will be required and not any particular consents (e.g. TWA / IPC).

Significant interfaces

There are no CP5 renewals links to this project. Interfacing schemes are:

- Hertford North Integration Facility;
- ECML PSU (121945 and 121948) (CP4 and CP5);
- Alexandra Palace to Finsbury Park (CP4);
- Thameslink Programme (CP4 and CP5).

Activities and milestones

GRIP 3 completed – March 2014

GRIP 4 complete – March 2015

GRIP 6 complete – September 2017

MML long distance high speed services train lengthening

Operating route(s): East Midlands

Project reference code: NE009

Output: Capacity

CP5 output driver

To improve infrastructure capability to enable the introduction of longer trains on the MML on selected services in order to accommodate forecast levels of passenger growth and reduce crowding on MML LDHS between London St. Pancras and Nottingham, Derby and Sheffield.

Specifically this is to be achieved through infrastructure alterations or operational control measures (or a combination of the two) that will:

- accommodate the proposed increased train lengths up to a maximum of 10 x 26m/12 x 20m vehicles at all stations for services operating on Midland Main Line Long Distance High Speed (LDHS) services between London St. Pancras and Corby, Nottingham, Derby and Sheffield;
- Depots, Stabling and Gauge Clearance are specifically excluded, as operational plans and the procurement of rolling stock become clearer further work will be required with the industry to finalise the requirements.

Scope of works

- Operation control measures at platforms
- Platform Extensions
- New foot bridges
- Minor signalling changes

Significant interfaces

- Station renewal works
- Planned maintenance works;
- NSIP programme of works;
- East Midlands Signalling Renewals at Nottingham and Leicester
- St Pancras to Sheffield LSI
- Derby Remodelling
- MML Electrification
- MML Capacity schemes
- Electric Spine

Key assumptions

- This project shall deliver infrastructure capability only and does not address capacity of infrastructure, namely station capacity and depot capacity (other than the accommodation of the lengthened vehicles)
- Current capacity of the infrastructure shall not be reduced by the options proposed
- Maximum train length is constrained by the layout at London St. Pancras. Initial analysis indicates potentially significant costs associated with accommodating trains at the maximum length of 10 x 26 metre. Trains longer than 10 x 26 metre vehicles certainly could not be accommodated without significant rebuilding.
- Further demand analysis is being undertaken to determine the length of train required to meet peak demand and this analysis will be used to inform the GRIP 3 study.
- Feasibility work to date has not included assessment of 12x 20m vehicles to operate the Corby/Leicester service.
- Currently declared infrastructure capability regarding rolling stock gauge shall be maintained

- Existing station facilities out with platforms and associated assets (e.g. CCTV and CIS) are sufficient for the lengthened services/growth
- Rolling-stock shall be assumed to be a maximum of 10 x 26m IEP type & 12x 20m EMU type vehicles and sufficient numbers of vehicles will be available to TOC.
- No structural strengthening or alteration will be required
- No major junction remodelling or re-signalling will be required.
- Works can be undertaken within ROTR, but that disruptive track access will be secured as required
- IPC or other planning consents will not be required
- Innovative technical solutions will not be required
- Internal and external resources will be available as required in GRIP 3-8, including specialist commissioning resources

Activities and milestones

GRIP 2 Complete

GRIP 3 -8 will be delivered within CP5 aligned to available renewal funding

Leeds and Sheffield Capacity

Operating route(s): LNE

Project reference code: NE016/018/019/025/026

Output: Capacity

CP5 output driver

To provide for the capacity metric into Leeds and Sheffield by:

- accommodating additional services;
- accommodating longer trains.

Scope of works

- Additional platform capacity at Leeds Station. Options being developed include:
 - increasing capacity in low-numbered platforms 1-5;
 - increasing the operational length of platform 17;
 - creation of an additional through platform through joining platforms 13 and 14.
- A programme of platform extensions to allow longer trains to operate on a number of routes in West and South Yorkshire into Leeds and Sheffield.

Significant interfaces

- Huddersfield Station Capacity Improvement
- Northern Hub
- Trans Pennine Electrification
- East Coast Main Line Connectivity
- East of Leeds capacity
- Micklefield turnback

Key assumptions

- Additional land purchase will not be required.
- Disruptive track access will be available.
- Stations will be able to accommodate additional passenger flows.

Activities and milestones

GRIP 2 April 2013

GRIP 3 December 2014

GRIP 4 February 2016

GRIP 5 May 2017

GRIP 6 January 2019

Huddersfield station capacity improvement

Operating route(s): LNE

Project reference code: NE021

Output: Capacity

CP5 output driver

This named scheme maximises the value of Trans Pennine Electrification and provides the capacity into Leeds and Sheffield to meet the capacity metric.

Scope of works

The current scope of work provides for 4 x 23 metre trains to operate to/from Leeds and Manchester and 3 car trains between Huddersfield and Sheffield and currently includes;

- Potential extension of Platform 1 Eastwards to provide a longer Penistone bay (platform 2) to accommodate peak hour train lengthening on the Sheffield – Huddersfield route
- Potential extension of Platform 4
- Potential remodelling of east end of station layout to give longer Platform 5, 6 and 8 and altered access to the stabling sidings

Significant interfaces

- Northern Hub
- Trans Pennine Electrification
- Leeds and Sheffield capacity
- Track Renewals planned in CP5
- Renewal of Huddersfield station roof in early CP5
- Huddersfield signalling recontrol in CP5

Key assumptions

- Disruptive track access will be available
- No land purchase is required.

Activities and milestones

GRIP 2 February 2013

GRIP 3 November 2014

GRIP 4 August 2015

GRIP 5 September 2017

GRIP 6 September 2017.

Micklefield turnback

Operating route(s): LNE

Project reference code: NE022

Output: Capacity

CP5 output driver

To accommodate the capacity metric into Leeds.

Scope of works

To accommodate the provision of the capacity metric into Leeds through provision of an island platform with a turnback facility (bay platform) facing Leeds allowing operation of a peak hours shuttle service.

Significant interfaces

- Northern Hub
- Trans Pennine Electrification
- Leeds and Sheffield Capacity
- East of Leeds capacity
- Planned S&C renewals at Peckfield and Micklefield Jn in CP5

Key assumptions

- Disruptive track access will be available.
- No Land purchase will be required.
- Scope is subject to further development.

Activities and milestones

Previous development work was undertaken as part of Northern Urban Centres in CP4. It is proposed to commence development of this scheme with East of Leeds Capacity and the programme is subject to confirmation.

East of Leeds capacity

Operating route(s): LNE

Project reference code: NE030

Output: Capacity

CP5 output driver

Provision of the capacity metric into Leeds through enhanced capacity on the corridor to the east of Leeds.

Scope of works

The feasibility study will determine the exact scope of works but options to be considered may include but are not restricted to:

- improved access to/from Neville Hill, including the conversion of the Goods lines to passenger use, east end access and bi-directional signal operations;
- Micklefield Jn. layout improvements;

Significant interfaces

- Northern Hub.
- Leeds and Sheffield Capacity Improvements
- Trans Pennine Electrification
- Micklefield turnback
- Neville Hill depot operational requirements and improvements including stabling / train service maintenance
- Neville Hill S&C renewals
- Micklefield Jn and Peckfield S&C renewals in CP5

Key assumptions

- Disruptive track access will be available.
- Scope is subject to further development.
- No land purchase will be required.
- No Development Consent Order will be required.

Activities and milestones

It is proposed to commence development of this scheme with Micklefield Turnback and the programme is subject to confirmation.

London North West

	CP5 expenditure (£m in 2012/13 prices)
North West Train Lengthening	30
Walsall to Rugeley electrification	55
Chiltern Main Line Train Lengthening	13
Total	98

North West Train Lengthening

Operating route(s): LNW

Project reference code: NE024

Output: Capacity

CP5 output driver

Infrastructure interventions are required to help facilitate the operational plans developed with train operators to meet the HLOS capacity metrics and support forecast demand in CP5 for routes into Liverpool and Manchester.

Scope of works

- Platform lengthening at the stations identified :
 - 4x 24m car length at Mossley Down, Greenfield Down, Marsden, Slaithwaite, Mouldsworth, Delamere, Cuddington, Greenbank, Plumley Down, Ashley Down, Hathersage and Grindleford
 - 4 x 23m car length at Dove Holes, Chapel-en-le Frith, Middlewood, Woodsmoor, Humphrey Park, Glazebrook Down, New Lane, Bescar Lane, Moses Gate, Hall i'th'wood, Darwen, Ramsgreave & Wilpshire, Langho, Whalley and Clitheroe
 - 6 x 24m car length at Liverpool South Parkway Up and Down fast platforms, Widnes, Warrington Central and Newton-le-Willows
 - 3 x 23m car at Bamber Bridge Up
- Hadfield - Dinting – Glossop – Manchester rail capacity improvements – scope to be identified

Significant interfaces

- Rolling stock strategy
- Operational plans
- North West station renewals and maintenance programme

Key assumptions

- Cost estimates have been produced based on an initial list of platforms that have been identified as requiring extensions to facilitate train lengthening on the route.
- The additional rolling stock to support the operational plans will be provided outside of this project.
- Scope is subject to further development

Activities and milestones

Milestones	Date
GRIP 2 Complete - Feasibility complete	August 2012
GRIP 3 Complete - Single option selected	To be confirmed
GRIP 4 Complete – Single option scope defined	To be confirmed
GRIP 6 Complete – Project commissioned	To be confirmed

The implementation programme will be confirmed once GRIP 3 is complete.

Walsall to Rugeley Trent Valley electrification

Operating route(s): LNW

Project reference code: NW001

Output: Electrification

CP5 output driver

The Government's High Level Output Specification (July 2012) recognises that electrification of the route between Walsall and Rugeley Trent Valley has regional and strategic value, and will help to accommodate increased commuter demand into Birmingham during CP5.

Electrification will contribute to accommodating growth on the route by facilitating conversion to electric train operation. Electrification will provide the opportunity to reduce journey times, and improve connectivity between locations on the route and the wider region, including longer distance destinations.

Electrification of the route will provide an electrified alternative / diversionary route to the Wolverhampton – Stafford route.

Conversion to electric rolling stock will also offer the opportunity to accommodate peak growth into Birmingham on other routes by releasing the diesel train sets currently operating on the route.

Scope of works

The scope of the project is 27 kilometres of infill electrification works between Walsall Station and Rugeley Trent Valley. The scope includes installation of 25kV AC overhead electrification and associated power supplies and distribution.

Other works will include track lowering and bridge reconstructions. The electrification scheme will assess the cost of W10/W12 clearance, which is not currently in the scope of this project.

Significant interfaces

- Walsall to Rugeley Linespeed Improvements Scheme (planned completion December 2013) and Walsall - Rugeley Resignalling (planned completion 2013)
- DfT Rolling stock strategy

Key assumptions

- EMUs will be available to enable electric operation of passenger services. The project does not include provision of rolling stock or associated platform works to accommodate changes to rolling stock at the stations along the route.
- Clearance for the OLE at bridge/tunnel at Walsall station with the Saddlers Shopping Centre constructed above will be achieved by OLE design and track lowering arrangements without the need for re-construction.
- No new power supply points are required.
- The closure of Bloxwich Crossing is progressed by a separate project.

Activities and milestones

Milestones	Date
GRIP 3 Complete – Single Option Selected	September 2014
GRIP 4 Complete – Single Option Scoped Defined	To be confirmed
GRIP 6 Complete – Project Commissioned	March 2019

Chiltern Main Line Train Lengthening

Operating route(s): LNW

Project reference code: NW006

Output: Capacity

CP5 output driver

Infrastructure interventions are required to help facilitate the operational plans developed with train operators to meet the HLOS capacity metrics and support forecast demand in CP5. On the Chiltern Main Line, platform extensions are required to facilitate the proposal for train lengthening to 9-car operation at key stations in the morning peak, to deliver increased capacity into London Marylebone.

Scope of works

Platform extensions are required to accommodate the proposed 9-car operation at key stations on the Chiltern route. Based on the initial assessment of the proposed operational plan, platform extensions would be required at Beaconsfield, Bicester North, Haddenham and Thame Parkway, High Wycombe, and Princes Risborough. Further work is required to confirm the stations and detailed project scope.

Significant interfaces

Rolling stock strategy

Operational plans

London Marylebone capability improvements - potential infrastructure changes to improve reliability operational flexibility in the Marylebone throat area.

Key assumptions

Pre-Grip cost estimates have been produced based on an initial list of platforms that have been identified as requiring extensions to facilitate train lengthening on the route.

To enable platform extension at High Wycombe station would require demolition and infill of the existing pedestrian subway.

The additional rolling stock to support the operational plans will be provided outside of this project.

Scope is subject to further development

Activities and milestones

Milestones	Date
GRIP 2 Complete - Feasibility complete	August 2013
GRIP 3 Complete - Single option selected	December 2014
GRIP 4 Complete – Single option scope defined	CP5
GRIP 6 Complete – Project commissioned	CP5

The implementation programme will be confirmed once GRIP 3 is complete.

Wales

	CP5 expenditure (£m in 2012/13 prices)
Welsh Valley Lines Electrification	305
Total	305

Welsh Valley Lines Electrification

Operating route: Wales

Project reference code: DP016

Output: Overhead Line Electrification

CP5 output driver:

The scheme will enable the more efficient operation of passenger services on the Valley Lines network, replacing ageing diesel traction with a cascaded fleet of refurbished electric trains. The timetable will see additional services and longer trains to meet continued strong growth in demand which is forecast in the region. The scheme is an enabler of economic growth in south east Wales.

Scope of works:

Electrification of the Valley Lines passenger network which includes the following:

- The core scheme will involve provision of OLE at 25kV AC for the following passenger lines:
 - Rhymney
 - Coryton
 - Merthyr Tydfil
 - Aberdare
 - Treherbert
 - Cardiff Bay
 - Radyr via City Line
 - Radyr Branch Junction to Penarth Curve South Junction
 - Vale of Glamorgan Line to Bridgend
 - Penarth
 - Barry and Barry Island
 - Bridgend to Maesteg
 - Ebbw Vale (to Cardiff)
 - Cardiff to Bridgend (Great Western Main Line)
 - Cardiff Canton Depot, Rhymney and Treherbert Stabling Points
- As part of the Cardiff area signalling renewals scheme (CASR) and other planned enhancements, the following additional infrastructure will be provided and will be included in the cost estimates for electrification:
 - one through and one south facing bay at Cardiff Queen Street, giving a total of four through, and one bay, platform;
 - a new platform 8 at Cardiff Central;
 - a south-facing bay platform at Caerphilly;
 - a south-facing bay platform at Pontypridd;
 - a north-facing bay platform at Barry;
 - doubling of the Treforest East Curve (Radyr Branch Junction to Penarth Curve North Junction); and,
- The scope of the project has been estimated at 334 single track kilometres.

Significant interfaces

- Completion of Cardiff Area Resignalling Scheme;
- The GWML electrification project; and,
- Wales & Borders refranchise in 2018

Key assumptions

- It is assumed that CASR will be complete before Valley Lines electrification is fully commissioned.
- Electrification work is delivered using permitted development rights.
- The business case is centred on cost reductions from an electric fleet as well as growth in demand from customers. The rolling stock assumption from funders is that there will be cascade of 3 car class 313 trains or similar.
- Cardiff Valleys is delivered as part of a wider rolling programme of electrification and not as a stand alone project.
- An electrical control facility is provided and funded by the national SCADA project.

Activities and milestones

- GRIP 3 to be completed in CP4
- GRIP 6 to commence in CP5
- Final commissioning to be completed in early CP6 (indicative plan is December 2019)

Western

	CP5 expenditure (£m in 2012/13 prices)
Bristol Temple Meads station capacity (incl. Digby Wyatt Shed)	48
Dr Days Junction to Filton Abbey Wood capacity improvements	63
Oxford corridor capacity improvements	81
West of England Diesel Multiple Unit capability works	23
Thames Valley Electric Multiple Unit capability works	25
Western access to London Heathrow Airport	165
Thames Valley branch lines electrification	20
Acton (Great Western Main Line) to Willesden (West Coast Main Line) electrification	16
Total	440

Bristol Temple Meads Station Capacity (incl. Digby Wyatt Shed)

Operating route(s): Western

Project reference code: WW024

Output: Station capacity

CP5 output driver

The business objective for the Bristol Temple Meads station capacity review is to understand current and future capacity constraints. Demand is expected to increase following the introduction of the Intercity Express Programme (IEP) electric Super Express Train (SET) services in 2016, and specifically in 2017 when two new fast trains per hour are introduced from Bristol Temple Meads to London Paddington via Bristol Parkway. Increases in local service provision, as part of the Bristol Metro proposals, will also contribute to this growth.

Scope of works

- Provision on additional access and circulation at Bristol Temple Meads
- Reinstatement of platforms within the Digby Wyatt Shed capable of accommodating a 260m long 10-car SET.

Significant interfaces

- Electrification
- Intercity Express Programme
- Dr Day's Junction – Filton Abbey Wood capacity improvements
- Signalling renewals
- Track renewals
- The West of England Local Enterprise Partnership's Temple Quarter Enterprise Zone places an increased strategic importance on the station area
- Local transport network

Key assumptions

- Bristol Temple Meads is a combination of Grade 1 & 2 listed buildings; it is assumed the infrastructure changes required to meet the growth demand will be accepted by English Heritage, Local Conservation Officers and other key stakeholders following consultation
- Wider development for the station is being undertaken with external stakeholders and developed through an area Master Plan
- Removal of Bristol Panel Signalbox in the anticipated timeframe

Activities and milestones

- GRIP 3-4 during CP4 / CP5
- GRIP 5-8 during CP5

Dr Days Junction to Filton Abbey Wood capacity improvements

Operating route(s): Western

Project reference code: WW009

Output: Capacity

CP5 output driver

The scheme provides capacity for up to four additional train paths an hour in each direction between the two major stations in Bristol. As well as contributing to reducing end-end journey times it will provide the capability to keep train services operational when engineering works are planned.

Scope of works

The scope of work lies between Dr Day's Junction and Filton Abbey Wood and includes:

- Embankment works to accommodate the additional 2 track beds (as the existing 2 track railway has been slewed to the centre of the alignment over recent years)
- Replacement of the derelict 3-span steel viaduct at Stapleton Rd
- Provision of a new double junction at Horfield
- Enhanced signalling
- A new platform at Filton Abbey Wood station

Significant interfaces

- Electrification
- Intercity Express Programme
- Bristol Temple Meads Station Capacity (incl. Digby Wyatt Shed)
- Signalling renewals
- Track renewals

Key assumptions

- This scheme will align with the resignalling works

Activities and milestones

GRIP 4 Complete August 2013

GRIP 5 - 8 2017

Oxford corridor capacity improvements

Operating route(s): Western

Project reference code: WW007

Output: Capacity

CP5 output driver

The objective of the scheme is to improve capacity and capability on the Oxford Corridor (Didcot North Junction - Aynho Junction).

Scope of works

- Revised Oxford station platform arrangements
- Enhancement to the Botley Road bridge
- Bi-directional signalling between Didcot North and Aynho Junction
- Signalling enhancement to improve track capacity
- Improvements to line speeds

Significant interfaces

- Electrification
- Intercity Express Programme
- East West Rail
- Evergreen III
- Strategic Freight Network
- Signalling renewals
- Track renewals

Key assumptions

- This scheme will align with the resignalling works at Oxford to achieve the maximum synergy and cost benefit.

Activities and milestones

- GRIP 2 complete April 2013
- GRIP 3 complete December 2013
- GRIP 4 complete December 2014
- GRIP 5-8 – December 2016 – April 2017

West of England Diesel Multiple Unit capability works

Operating route(s): Western, Wales & Wessex

Project reference code: WW031

Output: Improved capability – Stations and Gauge

CP5 output driver

To provide infrastructure capability enhancements to enable operation of cascaded DMUs from the Thames Valley to the West Country. Network Rail believes that the constituent parts of the infrastructure capability works are as follows;

Scope of works

- Gauge clearance for the cascaded Class 165 and 166 DMU fleet; and
- A review of station operations at all stations where cascaded DMU trains are due to stop; this may result in platform extensions; selective door opening; revisions to permissive working for attaching; detaching; platform sharing arrangements and alterations to signal controls and signal locations to deal with changes to train operations

Network Rail has assumed that the cascaded Class 165 and 166 units will operate over the following parts of the Western, Wales and Wessex Routes:

- Core routes:
 - Cardiff - Bristol - Exeter – Penzance (including Weston-super-Mare)
 - Bristol to Portsmouth
 - Westbury to Weymouth
 - Bristol to Worcester (including Gloucester)
 - Bristol to Severn Beach
 - Swindon to Gloucester
 - Swindon to Westbury
- Diversionary routes
 - Bristol to Parkway via Avonmouth
 - Castle Cary to Exeter
 - Castle Cary to Exeter via Yeovil
 - Romsey to Fareham via Eastleigh

Significant interfaces

- Electrification
- Intercity Express Programme
- Signalling Renewals
- CP5 enhancement schemes (Greater Bristol Programme, Oxford Corridor capacity and Strategic Freight Network schemes)

Key assumptions

- All depot and depot access works are not part of this submission, these are funded by the Greater Western Franchisee;
- Train alterations required to meet station operation requirements (e.g. SDO) are not part of this submission;
- No infrastructure work is required to address stepping distances
- Capacity works for enhanced timetable operations are developed as separate schemes

Activities and milestones

GRIP 2: December 2013

GRIP 6: 2015

GRIP 6: Dec 2015 and June 2017

Further milestones will provided at the end of GRIP 2

Thames Valley Electric Multiple Unit capability works

Operating route(s): Western

Project reference code: WW032

Output: Improved capability – Stations and Gauge

CP5 output driver

To provide infrastructure capability enhancements to enable the operation of EMUs in the Thames Valley area – Paddington to Newbury, Oxford and associated branch lines. Network Rail believes that the constituent parts of these infrastructure capability works are as follows;

Scope of works

- Gauge clearance for the new or cascaded EMUs in the Thames Valley;
- A review of station operations at all stations where EMU trains are due to stop; this may result in changes such as ; platform extensions; selective door opening; revisions to permissive working for attaching, detaching; platform sharing arrangements and alterations to signal controls and signal locations to deal with changes to train operations

Network Rail has assumed that the EMUs will operate over the following parts of the Western Route:

- Core routes:
 - Paddington to Oxford
 - Slough to Windsor and Eton Central
 - Maidenhead to Marlow
 - Twyford to Henley
 - Reading to Newbury
 - Reading to Basingstoke
- Diversionary routes
 - Acton East to North Pole junction
 - Reading West Curve
- Ancillary movements
 - To and from Reading Train Care Depot

Scope of works

Gauge clearance works for EMUs with typical 20m and 23m length vehicles and updated operational arrangements at stations including platform extensions

Significant interfaces

- Electrification
- Intercity Express Programme
- Crossrail
- Signalling Renewal
- Oxford Corridor capacity
- Strategic Freight Network

Key assumptions

- All depot and depot access works are not part of this submission, these are funded by the Greater Western Franchisee;
- Any train alterations required to meet station operation requirements (e.g. SDO) are not part of this submission;
- No infrastructure work is required to address stepping distances
- Any required capacity works for any enhanced timetable operations are developed as separate schemes
- Pantograph design for 8 and 12 car operation at up to 110 mph will be developed between the TOC/ROSCO and the Network Rail Electrification Project

Activities and milestones

GRIP 2 Complete December 2013

GRIP 3 – 5 to be determined at the end of GRIP 2

GRIP 6 Site works commence mid 2015

GRIP 6 works will be completed in phases between Dec 2015 and June 2017

Western access to London Heathrow Airport

Operating route(s): Western

Project reference code: WW029

Output: A new rail link between Heathrow Terminal 5 and the Great Western Main Line.

CP5 Output driver

To improve access to Heathrow Airport for both travelling customers and airport workforce; and

To improve rail connectivity to the airport from the immediate vicinity which hosts high-value global industries dependent on the airport, the wider Thames valley, the West of England, the south west, south Wales and the West Midlands by providing interchange at Reading thereby avoiding the need to travel into London and back out. In the longer term provision for long distance services subject to business demand.

Scope of works

Following completion of the Network Rail funded GRIP 2 study in May 2012 and agreement with joint sponsors BAA and the project was submitted to the Department for Transport (DfT) for funding consideration.

Further development of the project was announced in both the DfT's Draft Aviation Policy Framework published 12 July 2012 and High Level Output Specification (HLOS), published 16 July 2012, as an "illustrative infrastructure enhancement requiring further business case work and conclusion of an agreement with the aviation industry".

Significant interfaces

- Crossrail
- Electrification
- Reading station area redevelopment
- Intercity Express Programme

Key assumptions

Development work will deliver a final option to deliver the required outputs within the funding available to enable construction work to commence circa 2017 for completion in early CP6 (2019-24).

Activities and milestones

GRIP3 estimated completion by July 2014;
GRIP4 by December 2015; and
GRIP5 by December 2017

Non railway-disruptive construction (tunnelling between T5 and GWML and construction of a new Up Relief Line) could start circa 2017, subject to successful IPC application (18 – 24 months). Disruptive railway construction (connecting the new rail link tunnel and the new relief formation) could take place during the early stages of CP6 (2019 – 2024). However, it is commercially desirable before 2020.

Thames Valley branch lines electrification

Operating route: Western

Project reference code: NW012

Output: Electrification

CP5 output driver

Following approval for the electrification of the Great Western Main Line (GWML), there is an opportunity to also electrify the three Thames Valley branch lines (listed below) enabling a significant switch to electrified services for commuting from the Berkshire, Buckinghamshire and Oxfordshire catchments. This project is likely to increase the efficiency of services that currently make use of main line with direct access to London Paddington. It also gives greater operational flexibility and reduces inefficient use of diesel services 'under the wires' with the potential for increased capacity for services.

Scope of works

The core works will involve electrifying overhead at 25kV AC on the following routes:

- Twyford to Henley-on-Thames
- Maidenhead to Bourne End and Marlow
- Slough to Windsor & Eton Central.

This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. rolling stock clearance, depots / stabling works or platform lengthening as a result of the operation of electric trains).

Significant interfaces

- The GWML electrification programme
- The Crossrail programme
- The Western/Thames Valley EMU programme

Activities and Milestones

The scheme is expected to be delivered by the end of CP5.

Acton (Great Western Main Line) to Willesden (West Coast Main Line) electrification

Operating route: Western / Anglia/ LNW South

Project reference code: NW013

Output: Electrification

CP5 output driver

Following approval for the electrification of the Great Western Main Line (GWML), the provision of a link between this newly electrified route and the West Coast Main Line at Willesden is a significant benefit to support the ability of freight operators to use electric traction and for operational flexibility of all rail services. The completion of such infill electrification linked with electrification of the GWML would enable cost savings to be achieved on some routes for freight operators with existing electric locomotives. The Network RUS: Electrification (2009) identified this route as an option to facilitate the efficient operation of freight services.

Scope of works

The core works will involve electrifying overhead at 25kV AC from Acton West to Acton Wells, Acton Canal Wharf Jct (for WCML) and the West London Line.

This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. rolling stock clearance, depots / stabling works or platform lengthening as a result of the operation of electric trains).

Significant interfaces

- The GWML electrification programme
- The Crossrail programme
- The Western/Thames Valley EMU programme

Activities and Milestones

The scheme is expected to be delivered by the end of CP5.

Scotland

CP5 enhancement programme

Scotland - Committed Projects

	CP5 expenditure (£m in 2012/13 prices)
EGIP Electrification (Springburn to Cumbernauld)	26
EGIP Electrification (Glasgow to Edinburgh via Falkirk High)	124
EGIP (Edinburgh Gateway Station)	31
EGIP Infrastructure works	308
Borders Railway	124
Total	613

EGIP - Electrification of Springburn to Cumbernauld

Operating route(s):

Dalmuir to Cumbernauld via Glasgow Queen St Low Level and Springburn (2 tph)
Glasgow Queen Street High Level to Falkirk Grahamston (hourly).

Project reference code: SC001a

Output:

The provision of more frequent and faster rail services between Scotland's two principal cities forms a key part of the Scottish Government's future transport strategy.

CP5 output driver

This project helps address capacity issues at Glasgow Queen St High Level. The extension of existing EMU services from Springburn to Cumbernauld facilitates a cascade of Cl158 DMU rolling stock to the new Borders Railway.

Scope of works:

- electrification of the routes from Cowlares West / Sighthill Junction to Cumbernauld
- electrification of Gartcosh Junction to Gartsherrie South Junction
- electrification of Garnqueen North Junction to Gartsherrie South Junction
- installation of additional S&C and a crossover at Springburn to improve operating flexibility for Cumbernauld service turnarounds
- platform lengthening at Cumbernauld for 6-car EMU operation.

The extent of the electrification works equates to circa 50stk's (single track kilometres) of new electrification, clearance works for the remaining 3 foul structures, parapet raising on 5 other bridges and immunisation of existing telecoms and S&T equipment.

Significant interfaces

Scotland CP5 projects (confirmed as part of asset renewals workbanks) have been reviewed and no significant interfaces have been identified. Disruptive access proposals in the 2014 Engineering Access Statement will be arranged to align with the scope and possession opportunities for track renewals and other work-types where practicable.

Key assumptions

OLE equipment will be new NR OLE Design Series 2 – suitable for 100mph running.

Activities and milestones

GRIP 4 for EGIP electrification (including the scope of Cumbernauld electrification) was completed at the end of February 2011.

GRIP 5-8 for advance structures clearance works on the Cumbernauld routes has been undertaken during 2012 (5 structures), and further works are scheduled for early 2013 (2 structures). A contract for 2013/14 clearance works at the final 3 structures is expected to be awarded in early 2013.

A contract for undertaking GRIP 5-8 for infrastructure works at Springburn and Cumbernauld is expected to be awarded in early 2013, leading into a delivery programme scheduled to commence in mid-2013 and complete by mid-2014.

EGIP - Edinburgh to Glasgow Electrification

Operating route(s):

Edinburgh to Glasgow Queen Street High Level (via Falkirk High)

Project reference code: SC001b

Output:

The provision of increased capacity and faster rail services between Scotland's two principal cities forms a key part of the Scottish Government's future transport strategy. This element of EGIP delivers electrification of the E&G route to achieve the acceleration of end to end services.

CP5 output driver

This will support an increase in passenger capacity across all routes between Edinburgh and Glasgow from the 6 or 7 services per hour with a fastest journey time of around 50 minutes operating in 2007, to 11 services per hour with a fastest journey time of between 42 and 43 minutes. Additional passenger capacity will be provided through the proposed introduction of 8-car EMU services on the main E&G route.

Scope of works

The project comprises the electrification of the following routes within the Central Belt of Scotland :

- Newbridge Junction to Glasgow Queen Street High Level via Falkirk High (including Eastfield depot)

The extent of the above works equates to approximately 150stk's (single track kilometres) of new electrification, including provision of a new feeder station at Greenhill, clearance works for circa 8 foul structures and, immunisation of existing telecoms and signalling equipment.

Significant interfaces

The following Scotland CP5 projects (confirmed as part of asset renewals workbanks) have been identified as relevant to EGIP, and works have been phased to combine scope and possession opportunities or de-conflict where scope or work-types are incompatible:

- Greenhill Upper Junction S&C renewals
- Winchburgh Junction S&C renewal
- Queen St Tunnel slab track and S&C renewals.

Key assumptions

OLE equipment will be new NR OLE Design Series 2 – suitable for 100mph running.

Activities and milestones

GRIP 4 for the original scope of EGIP electrification was completed at the end of February 2011.

Operating route(s):

Edinburgh to Dundee (via Inverkeithing)

Project reference code: SC001c

Output:

The provision of better integrated transport services for Scotland's two principal cities forms a key part of the Scottish Government's future transport strategy.

CP5 output driver

This project is now standalone from EGIP, but delivers a rail / tram interchange facility close to Edinburgh Airport. The new station will benefit Fife rail customers initially, but if a high speed diversionary route for the E&G is built in the future, Edinburgh Gateway would become accessible to a larger proportion of central Scotland rail users.

Scope of works

The following infrastructure projects have been developed to the end of GRIP 4:

- Edinburgh Gateway rail / tram interchange station facility at Gogar.

Track lowering has been undertaken in the vicinity of the new station in readiness for future electrification of the route.

Significant interfaces

There are no significant Scotland CP5 projects relevant to the Edinburgh Gateway works. However opportunities are being identified with Asset Track Renewals and Civils workbanks where disruptive access can be shared to achieve delivery efficiencies.

EGIP works to improve signalling headways between Haymarket West Junction and Inverkeithing will assist the timetabling of services scheduled to call at the new Edinburgh Gateway station.

The Gogar site for Edinburgh Gateway station is complicated by the delays to the Edinburgh Tram project. Engagement with the Tram project is ongoing to finalise the station and tram interchange design, confirm utility diversions required etc.

Key assumptions

A key assumption is that the project will be able to deliver the works to plan without powers granted through the new Transport & Works (Scotland) Act (TAWS) process.

Activities and milestones

The timescales for GRIP 5-8 for this project are dependant on the programme for completion of the Edinburgh Tram Project.

EGIP - Infrastructure Works

Operating route(s):

Edinburgh to Glasgow (via Falkirk High)

Project reference code: SC001d

Output:

The provision of increased capacity and faster rail services between Scotland's two principal cities forms a key part of the Scottish Government's future transport strategy. This element of EGIP delivers the additional network capacity required to operate these enhanced services.

CP5 output driver

This will support an increase in service levels across all routes between Edinburgh and Glasgow from the 6 or 7 services per hour with a fastest journey time of around 50 minutes operating in 2007, to 11 services per hour with a fastest journey time of between 42 and 43 minutes. Additional passenger capacity will be provided through the proposed introduction of 8-car EMU services on the main E&G route.

Scope of works

The following infrastructure projects are being developed to the end of GRIP Stage 4:

Project	Physical Outputs
Glasgow Queen Street High Level Station Capacity	Extended Platforms, Station Throat Re-Modelling and Signalling Headway Improvements
Platform Extensions at Croy, Falkirk High, Polmont and Linlithgow	Platforms lengthened to support 8-car EMU operation
Haymarket to Inverkeithing Signalling Headways	Signalling improvements to deliver reduced headways
Edinburgh Waverley Station Capacity	Works to support operation of 8-car EMU E&G services, which may include platform, S&C and signalling alterations, additional S&C in the Station Throat and an East of Edinburgh turnback facility.
East of Edinburgh EMU Depot	Creation of a maintenance depot for new EMU rolling stock at Millerhill, which may include Portobello Junction re-modelling.

Significant interfaces

The following Scotland CP5 projects (confirmed as part of asset renewals workbanks) have been identified as relevant to EGIP, and works will be phased to combine scope and possession opportunities or de-conflict where scope or work-types are incompatible:

- Greenhill Upper Junction S&C renewals
- Winchburgh Junction S&C renewals
- Queen St Tunnel slab track and S&C renewals.

Key assumptions

A key assumption is that the project will be able to deliver the majority of the works to plan without powers granted through the Transport & Works (Scotland) Act (TAWS) process.

Activities and milestones

GRIP 4 for the original scope of EGIP infrastructure projects was completed by the end of June 2012, though the revised scope of the programme will require that some aspects will have to be revisited e.g. Queen St station re-modelling for 8-car EMU operations.

The timescales for GRIP 5-8 for these projects will depend on final clarification of the new EGIP scope.

Borders Railway

Operating route(s):

New Railway South of Newcraighall

Project reference code: SC015

Output:

The Borders Railway comprises a new railway line linking Midlothian and Scottish Borders Local Authority areas to central Edinburgh and the national rail network.

CP5 output driver

Scope of works:

- provision of 30 miles of new single track railway with passing loops to create a rail route in the Scottish Borders connecting the Borders into the existing rail network at Newcraighall
- provision of 7 new stations at Shawfair, Eskbank, Newtongrange, Gorebridge, Stow, Galashiels and Tweedbank
- provision of 6 station car parks at Shawfair, Eskbank, Newtongrange, Gorebridge, Stow and Tweedbank
- a route capable of supporting a journey time of 44 minutes (plus one performance minute) between Tweedbank and a connection point at Newcraighall based on the rolling stock being cascaded (type 158s) and modelled using Railsys.

Significant interfaces

There are currently no identified significant interfaces with other Network Rail managed projects.

Key assumptions

The project will be delivered and managed by Network Rail. It will be financed by an addition to the RAB, subject to ORR approval. Transport Scotland will fund the repayments.

Activities and milestones

GRIP Stage 4 is planned to be complete, subject to agreement and regulatory approval, in spring 2013.

GRIP stage 5-8 programme dates have now been agreed with Transport Scotland and there are a series of delivery milestones culminating in a completion date of June 2015. There will then be a period of driver training prior to the commencement of passenger services.

Scotland - Funds to deliver specific outcomes

	CP5 expenditure (£m in 2011/12 prices)
Scottish Stations Fund	31
Scottish Strategic Rail Freight Investment Fund	31
Scottish Network Improvement Fund	62
Future Network Development Fund	10
Level Crossings Fund	10
Total	144

Scottish Stations Fund

Purpose

The purpose of the fund is to improve the public's access to railway services. To support this objective the Scottish Ministers would expect that this will fund, or support the funding of:

- improvements to station buildings and facilities
- improvements to passenger facilities at stations supporting long-distance services including the Caledonian sleeper services
- the development of new and improved car and cycle parking facilities
- new stations
- accessibility works.

Fund management

The fund is administered by the Head of Strategy and Planning (Scotland) and the Route Commercial Manager (Scotland). Authorisation of draw down and spend is as set out in Network Rail's internal regulations but schemes are also required to have been supported by the Scotland Route Strategy Planning Group and the Scotland Route Investment Review Group involving all relevant train operators and Transport Scotland; or as promoted by the Scottish Ministers.

Decisions on funding

The net cost of major works (i.e. the amount that will be drawn down from the Scottish Station Fund) must not exceed the following without prior approval from Transport Scotland:

- £100,000 if the benefit-cost ratio is less than 2 or not yet determined
- £1m if the benefit-cost ratio can be demonstrated to be 2 or greater.

A benefit-cost ratio must therefore be determined at the earliest opportunity.

An outline (qualitative) appraisal of the likely value to be delivered by the scheme should be carried out as early as possible in the development of the scheme. A more detailed (usually quantitative) appraisal should be completed prior to the commitment of detailed design. The appraisal must be clear, evidence based and in line with the fund principles, including the Scottish Ministers' priorities, and consider the financial impact on each affected industry partner. The appraisal is in accordance with the principles of the Scottish Transport Appraisal Guidance (STAG)

Role of the Office of Rail Regulation

The Office of Rail Regulation (ORR) does not intend to scrutinise all individual proposals for investment. However, they will assess a sample of schemes to ensure compliance with the general conditions and that the approach to delivery is efficient. As the ORR's acceptance criteria include efficient delivery, the efficiency rigour that is applied to the activity to which these funds relate should be consistent with the ORR's final determination for CP5.

Fund proposals

It is expected that the schemes will involve enhancements linked to renewals, improvements to existing stations and proposals for new stations. The promoter should identify funding partners, as proposals that are part-funded by third parties are likely to result in the greatest return. Stand-alone enhancement schemes are also possible.

In addition to the initiatives that can be delivered by this fund listed above, for new stations it is expected that promoters will follow the Scottish Transport Appraisal Guidance (STAG) process. In addition promoters should also consult Network Rail's Investment in Stations document prior to requesting investment from this Fund. A link to both documents is provided: [Scottish Transport Appraisal Guidance](#), [Investment in Stations](#)

Scottish Strategic Rail Freight Investment Fund

Purpose

Consistent with objectives of the Scottish Ministers to encourage growth in rail freight and reduce emissions, the Fund should support sustainable rail transport for freight, thereby reducing the supply chain's transport emissions and reducing road congestion. The fund will facilitate, or contribute towards, strategic infrastructure interventions on the Scottish network to enable rail freight to deliver against these objectives. This fund does not replace, nor will replicate, the grant elements of the Scottish Government Future Transport Fund, which aim to encourage a shift of freight to rail and water.

Fund management

The fund is administered by the Head of Strategy and Planning (Scotland). Authorisation of draw down and spend is as set out in Network Rail internal regulations but following recommendation from the Freight Working Group, schemes are required to have been supported by the Freight Joint Board (Scotland). This cross-industry group oversees the development of Rail Freight in Scotland and consists of representatives from Transport Scotland, Freight Operating Companies and Network Rail.

Decisions on funding

Where the Freight Joint Board for Scotland agrees to pursue a project initially, the net cost of major works (i.e. the amount that will be drawn down from the Strategic Rail Freight investment Fund) must not exceed the following without prior approval from Transport Scotland:

- £100,000 where the benefit-cost ratio is less than 2 or not yet determined
- £2.5m where the benefit-cost ratio (BCR) can be demonstrated to be 2 or greater.

A benefit-cost ratio must therefore be determined at the earliest opportunity.

The fund is not intended to support investments where the financial benefits to individual stakeholders are sufficient to warrant them funding the scheme directly.

An outline (qualitative) appraisal of the likely value to be delivered by the scheme should be carried out as early as possible in the development of the scheme. A more detailed (usually quantitative) appraisal should be completed prior to the commitment of detailed design. The appraisal must be clear, evidence based and in line with the fund principles, including the Scottish Ministers' priorities, and consider the financial impact on each affected industry partner. The appraisal is in accordance with the principles of the Scottish Transport Appraisal Guidance (STAG).

Role of the Office of Rail Regulation

The Office of Rail Regulation (ORR) does not intend to scrutinise all individual proposals for investment. However, they will assess a sample of schemes to ensure compliance with the general conditions and that the approach to delivery is efficient. As the ORR's acceptance criteria include efficient delivery, the efficiency rigour that is applied to the activity to which these funds relate should be consistent with the ORR's final determination for CP5.

Fund proposals

The fund can be used for improvement initiatives that encourage growth and productivity in rail freight, reduce emissions and road congestion.

The following projects are currently being considered as possible candidates for funding in Control Period 5:

Capacity and capability at Slateford Jn
Capacity and capability enhancement at Mossend Yard
Inverness Yard capacity and flexibility
Elgin to Inverness gauge improvement

Scottish Network Improvement Fund

Purpose

The purpose of this fund is to deliver, or support the delivery of, interventions on the Scottish network which support the development of the capacity and capability of general infrastructure and network communications systems in line with the strategic priorities of the Scottish Ministers, including improved journey times, improved connectivity and resilience. The fund should exploit opportunities available through current or planned works.

Fund management

The fund is administered by the Head of Strategy and Planning (Scotland). Authorisation of draw down and spend is in accordance with Network Rail internal regulations but schemes are required to have been supported by Network Rail's Scotland Route Strategy Planning Group and the Scotland Route Investment Review Group involving all relevant train operators and Transport Scotland.

Decisions on funding

The net cost of major works (i.e. the amount that will be drawn down from the Scottish Network Improvement Fund) must not exceed the following without prior approval from Transport Scotland:

- £0.5m of the total fund amount if the benefit-cost ratio is less than 2 or not yet determined
- £5m if the benefit-cost ratio can be demonstrated to be 2 or greater.

A benefit-cost ratio must therefore be determined at the earliest opportunity.

The fund is not intended to support investments where the financial benefits to individual stakeholders are sufficient to warrant them funding the scheme directly. Therefore where the benefits of a scheme:

- will accrue wholly to a single third party, it would generally be funded as a third party scheme
- are sufficient for Network Rail to justify funding the scheme, Network Rail would be expected to fund it themselves.

An outline (qualitative) appraisal of the likely value to be delivered by the scheme should be carried out as early as possible in the development of the scheme. A more detailed (usually quantitative) appraisal should be completed prior to the commitment of detailed design. The appraisal must be clear, evidence based and in line with the fund principles, including the Scottish Ministers' priorities, and consider the financial impact on each affected industry partner. The appraisal is in accordance with the principles of the Scottish Transport Appraisal Guidance (STAG).

Role of the Office of Rail Regulation

The Office of Rail Regulation (ORR) does not intend to scrutinise all individual proposals for investment. However, they will assess a sample of schemes to ensure compliance with the general conditions and that the approach to delivery is efficient. As the ORR's acceptance criteria include efficient delivery, the efficiency rigour that is applied to the activity to which these funds relate should be consistent with the ORR's final determination for CP5.

Fund proposals

It is expected that most schemes would take advantage of opportunities available through current or planned works as this is likely to provide the greatest value for money. However, stand-alone enhancement schemes are also possible, including those part funded by third parties.

Proposals being developed and potentially delivered through this fund will be added on a periodic basis.

Future Network Development Fund

Purpose

This will fund or support the development of proposals for strategic interventions to improve the capacity and capability of the Scottish network in Control Period 6 and beyond.

Fund management

The fund is administered by the Head of Strategy and Planning (Scotland). Authorisation of draw down and spend is in accordance with Network Rail internal regulations but schemes are required to have been agreed with Transport Scotland, supported by Network Rail's Scotland Route Strategy Planning Group and the Scotland Route Investment Review Group involving all relevant train operators.

Decisions on funding

The net cost of major works (i.e. the amount that will be drawn down from the Future Network Development Fund) must not exceed £200,000 without prior approval from Transport Scotland.

A business rationale must be presented to Transport Scotland at the earliest opportunity.

Appraisal

Future Network Development Fund schemes will be subject to the value for money test appropriate to the type of scheme under consideration. The appraisal must be clear, evidence based and in line with the fund principles, including the Scottish Ministers' priorities, and consider the financial impact on each affected industry partner.

Role of the Office of Rail Regulation

The Office of Rail Regulation (ORR) does not intend to scrutinise all individual proposals for investment. However, they will assess a sample of schemes to ensure compliance with the general conditions and that the approach to delivery is efficient. As the ORR's acceptance criteria include efficient delivery, the efficiency rigour that is applied to the activity to which these funds relate should be consistent with the ORR's final determination for CP5.

Fund proposals

It is expected that most schemes will have been identified in previous work such as the Strategic Transport Projects Review (STPR), Scotland Route Utilisation Strategy or similar documents but may also arise from discussions at Scotland Route Investment Review Group or as otherwise brought forward by Transport Scotland.

The following strategic projects are specified in the HLOS and may be considered for further development under this fund.

Passenger capacity at Glasgow Central, Glasgow Queen St, Edinburgh Waverley and Edinburgh Haymarket, including any requirements resulting from the introduction of High Speed 2 services
Train handling capability at Glasgow Central
Train handling capability at Edinburgh Waverley
Rail improvements between Aberdeen and the Central Belt
Further phases of electrification
Aberdeen to Inverness Corridor Improvements Phase 2
Highland Main Line Corridor Phase 3

Scotland: Level Crossing Fund

Purpose

In addition to the baseline funding requirement for level crossing safety in Scotland, this fund will support Network Rail, Local Authorities and other local stakeholders to work in partnership to facilitate the closure of level crossings in Scotland or to reduce risk at level crossings. Closing a level crossing to vehicular access greatly reduces the risk and the closure of low risk crossing may not always be the most effective way to holistically reduce the danger.

Fund management

The fund is administered by the Network Rail Route Safety Improvement Manager (Scotland). Authorisation of draw down and spend is in accordance with Network Rail internal regulations but schemes are required to have been supported by Network Rail's Scotland Route Strategy Planning Group and the Scotland Route Investment Review Group involving train operators.

Appraisal

The appraisal for Level Crossing safety is based on an 'as low as reasonably practical' (ALARP) study (using Network Rail's All Level Crossing Risk Model (ALCRM)).

Where base line (ALARP) level crossing safety funding or third party funding is not sufficient to facilitate closure of the level crossing consideration should be given to the benefits provided to the local community and the rail industry's reputation.

Role of the Office of Rail Regulation

The Office of Rail Regulation (ORR) does not intend to scrutinise all individual proposals for investment. However, they will assess a sample of schemes to ensure compliance with the general conditions and that the approach to delivery is efficient. As the ORR's acceptance criteria include efficient delivery, the efficiency rigour that is applied to the activity to which these funds relate should be consistent with the ORR's final determination for CP5.

Scotland - Other Scottish projects

	CP5 expenditure (£m in 2012/13 prices)
Aberdeen to Inverness improvements Phase 1	280
Highland main line journey time improvements Phase 2	121
Rolling Programme of Electrification	171
Motherwell re-signalling enhancements	11
Motherwell area stabling	10
Carstairs Junction Remodel	53
Edinburgh South Suburban Electrification	27
Total	673

The cost estimate for these projects is based on a high level (GRIP 0 or 1) estimate of potential scope. Discussions are ongoing with Transport Scotland on the required outputs for these projects during CP5. This will, in turn, enable the scope requirements to be refined and the cost estimate to be updated

Aberdeen to Inverness improvements Phase 1

Operating route(s): Scotland

Project reference code: SC002

Output:

Make progress during CP5 towards a longer term requirement to:

- provide an hourly service between Aberdeen and Inverness
- provide a half hourly service (other than after the evening peak) between Inverness and Elgin, including at a new station at Dalcross
- provide a half hourly service (other than after the evening peak) between Inverurie and Aberdeen, including a new station at Kintore
- enable journey time improvements to provide average end to end journey time of around 2 hours, calling at all stations
- retain freight capacity.

During CP5, the extent of progress is expected to include construction of new stations at Dalcross and Kintore, introduction of more frequent commuter services on the Inverness - Elgin and Aberdeen – Inverurie sections of the route and progress towards the longer term journey time aim.

Previous work on the project focussed on an incremental approach with development completed to GRIP 3 in June 2012 on the basis of the following prioritised sequence of outputs, as specified by Transport Scotland:

Phase 1 - Provide an hourly service between Aberdeen and Inverness.

Phase 2 - Provide a half hourly service between Inverness and Elgin, stopping at a new station at Dalcross.

Phase 3 - Provide a half hourly service between Inverurie and Aberdeen, stopping at a potential new station at Kintore.

Phase 4 - Enable journey time improvements to deliver a sub 2 hour typical end to end journey time.

The HLOS, published in June 2012, seeks an alternative prioritisation of the delivery sequence, with emphasis on the two new stations and increased frequency of commuter services as the early deliverables. This will require a re-work of the timetable development which will, in turn, dictate the infrastructure requirements for these initial phases.

CP5 output driver

The principal driver for the project is the Scottish Government's Strategic Transport Projects Review (STPR). The STPR defines the most appropriate strategic investments in Scotland's national transport network from 2012 to support the Scottish Government's purpose of promoting sustainable economic growth by planning the next 20 years of transport investment for Scotland's rail and trunk road networks.

This project is specified in the STPR (Project 19) with the stated aim of reducing journey times and increasing service frequency on the route.

Scope of works

The main elements of scope required to deliver the full project include:

- **Dalcross Station:** new station close to Inverness Airport
- **Kintore Station:** new station to the West of Aberdeen
- **dynamic loops:** New or extended existing loop provision at Dalcross, Nairn, Forres, Elgin, Huntly, Dyce and Inverurie

- **line speed improvements:** These will be at a number of sites, many of which will require track upgrade/renewal
- **level crossing upgrades:** To address the altered risk categorisation arising from faster and more frequent train services
- **signalling upgrades:** To enable more efficient operations, particularly at crossing locations.

The final extent of all of the above physical scope items will be determined by initial timetable development as, due to the single line nature of the route, the timetable will drive where and how much infrastructure is needed to cross trains travelling in opposite directions. It is also central to the identification of the line speeds and other infrastructure capabilities necessary to support the journey time reduction objective. Since completion of the original GRIP 3 report, development work has recommenced on the revised HLOS sequencing of output requirements and this will include early timetable development work before the necessary scope for the deliverables in CP5 can be confirmed. GRIP 3 completion for the revised output prioritisation sequence is expected by summer 2013.

Significant interfaces

The project does not interface with any other planned enhancement projects other than potential linkage to timetable changes in the Central Belt arising from EGIP and on the Highland Main Line. In both cases, these may affect connection timings onto the Aberdeen – Inverness line, on which the timetable is relatively inflexible due to its single line and passing loop configuration. Due to the HLOS changes mentioned above interfaces with planned renewals projects have not been explored at this time. Once more detail has emerged from the revised development work a clearer picture will emerge.

Key assumptions

For this stage the following project assumptions have been made:

- rolling stock to be used on the route will be Class 158 and 170 Diesel Multiple Units (DMUs)
- all trains on the route will call at all stations between their originating and terminating points, including Dalcross and Kintore when these are constructed
- the locations proposed for Dalcross and Kintore stations will not alter from that identified in the original GRIP 3 study
- agreement will be reached with relevant stakeholders for the closure of Dalcross Level Crossing prior to the construction of the new Dalcross station
- reasonable provision of freight capacity will be required but not during peak periods
- seasonal charter trains will continue to operate over the route
- no requirement to introduce longer trains/lengthen platforms other than specified
- that some temporary journey time extension may be necessary as the delivery of project interventions is staged.

It is also assumed that final agreement on project scope and costs will be reached with Transport Scotland once the revised GRIP 3 report, which addresses the altered prioritisation of staged implementation, is produced.

Activities and milestones

1. Pre 2012/13 – Development work for GRIP Stages 2 and 3 to Transport Scotland's original output specification.
2. 2012/13 – Completion of development works for GRIP Stage 3, then a revision of this work to address the HLOS requirement of a revised output specification with new priorities.

3. 2013/14 – Completion of revised GRIP 3 stage, agreement of scope to be taken to implementation, design development, consultation with various external stakeholders and approving bodies for delivery of the outputs stated above during CP5. This is likely to include working with Local Authorities, Transport Scotland and Developers to develop and agree funding packages for the new stations at Dalcross and Kintore.
4. 2014 / 2015 – Commencement of a variety of infrastructure intervention works across the route.
5. Milestones for subsequent stages to be agreed when scope and costs of CP5 works are agreed at the end of the revised GRIP 3 stage.

Highland Main Line journey time improvements (phase 2)

Operating route(s): Scotland

Project reference code: SC011

Output

As part of a longer term programme of improvements on the Highland Main Line, achieve during CP5:

- an hourly train service in each direction between Perth and Inverness extending to either Glasgow or Edinburgh with an average end-to-end journey time reduction of around 10 minutes in both directions, measured against the timetable in place at the time of the HLOS June 2012 statement or any improvements introduced between then and 31st March 2014 when CP4 ends
- more efficient freight operations that better respond to the demand from freight customers.

CP5 output driver

The principal driver for the project is the Scottish Government's Strategic Transport Projects Review (STPR). The STPR defines the most appropriate strategic investments in Scotland's national transport network from 2012 to support the Scottish Governments purpose of promoting sustainable economic growth by planning the next 20 years of transport investment for Scotland's rail and trunk road networks.

This project is specified in the STPR (Project 17) with the stated aim of improving rail network capacity between Inverness and Perth and reducing journey times.

Scope of works

The project will initially require timetable development to identify the infrastructure requirements necessary to deliver the enhanced service frequency and journey time improvements. This is likely to require new or extended double track sections and considerable track re-alignment and renewal to facilitate increased linespeeds. Strengthening works to structures and signalling system changes are also likely to be required, especially if the timetable requirements require additional loops, extension of existing loops and/or extension of existing double track sections. This project is currently predicted to continue through CP5 and into CP6 depending on availability of funding from Scottish Ministers.

Principal physical works are therefore likely to include:

- new or extended double track sections
- new or extended loops
- re-alignment of track
- renewal/upgrade of track to meet higher capability requirements.
- track formation treatment
- bridge strengthening
- signalling system alterations.

The scope and cost estimate for HML Phase 2 are indicative only at this stage. The project will require a detailed timetable study to determine the extent of infrastructure required to achieve the outputs specified for CP5. This timetable study will require to be based on the availability of paths from Glasgow and Edinburgh, such paths presently being subject to change from the revised EGIP timetable.

Significant interfaces

The project interfaces with the following planned renewals projects as follows:

- EGIP – to the extent that the timing of HML trains to/from Edinburgh Waverley and Glasgow Queen St will be determined by the EGIP timetable
- Aberdeen – Inverness Improvements Phase 1 – to the extent that the timetable on the HML will need to integrate with the Aberdeen – Inverness timetable to enable good service connections.

Key assumptions

For this stage of the project, the following assumptions have been made:

- that passenger rolling stock deployed on the route will consist of Class 158 and 170 units, HST units (with possible replacement by IEP units) and existing sleeper formations
- any gauging, platform extension or other work required by the IEP trains will be taken forward separately by the IEP project
- that the stopping pattern of trains is not fixed and can be flexed to optimise crossing of trains travelling in opposite directions with the proviso that all passenger services are expected to call at Pitlochry, Kingussie or Newtonmore and Aviemore
- that land acquisition, to the extent that this may be needed for additional infrastructure, can be achieved without the need for statutory powers.

It is also assumed that final agreement on project scope and costs will be reached with Transport Scotland once the project reaches the stage of GRIP 3 conclusion.

Activities and milestones

A programme for development of the HLOS outputs has still to be agreed with Transport Scotland. Based on a remit agreed with Transport Scotland prior to the publication of the HLOS, the following indicative milestones are anticipated:

1. 2012/13 – Development of Parts 1 and 2 of the GRIP Stage 2 study for Phase 2. Part 3 scope will be determined from the outputs of Parts 1 and 2 in conjunction with Transport Scotland.
2. 2013/14 – Completion of development works for GRIP Stage 2 including Part 3. There may be some potential to undertake some “quick win” infrastructure works. These “quick win” works would contribute to Transport Scotland’s aspirations for journey time improvements by the end of CP5.
3. 2013/14 and 2014/15 – development of infrastructure options to GRIP 3.
4. 2014/ 15 – Further development work producing a GRIP Stage 4 report that will provide a package of infrastructure works to deliver Transport Scotland’s HLOS outputs.
5. 2015/16 – Work ongoing at various locations along the route.
6. 2016/17 – Work ongoing at various locations along the route.
7. 2017/18 – Work ongoing at various locations along the route
8. 2018/19 – Completion of the Phase 2 infrastructure intervention work.

Rolling Programme of Electrification (Scotland)

Operating route(s): Scotland

Project reference code: SC004

Output:

Implement a rolling programme of electrification works which will cover around 100 single track kilometres per annum commencing from the completion of EGIP. It is proposed that this programme will include electrification of the following routes during CP5, although sequencing has still to be agreed:

- Cumbernauld – Greenhill, Lower Jn
- Greenhill Upper Jn - Greenhill Lower - Carmuir West Jn - Falkirk Grahamston and Polmont (possibly including Grangemouth Branch funded from the Scottish Strategic Rail Freight Investment Fund)
- Carmuir West – Stirling – Dunblane – Alloa including Larbert Jn to Carmuir East)
- Holytown Jn – Shotts – Midcalder Jn (the Shotts line)
- Rutherglen East Jn – Langloan Jn – Coatbridge Jn – Whifflet North Jn (the R&C line)

CP5 output driver

The principal driver for the project is the output of the Scottish Government's Strategic Transport Projects Review (STPR). The STPR defines the most appropriate strategic investments in Scotland's national transport network from 2012 to support the Scottish Government's purpose of promoting sustainable economic growth by planning the next 20 years of transport investment for Scotland's rail and trunk road networks.

This is specified in the STPR (Project 6) with the stated aim of reducing journey times, operating costs and environmentally harmful emissions.

Scope of works

The scope of the proposed works during CP5 is to complete the installation of a 25kV overhead electrification system on the nominated route sections detailed in the output section above.

The development work carried out to date has identified that significant engineering works will be required at a large number of structures to provide the necessary clearances for installation of overhead line equipment and early clearance of many of these structures may form part of an enabling work package prior to the full electrification installation.

The Cumbernauld - Greenhill to Polmont and Dunblane/Alloa routes have been developed to GRIP 4, originally as part of the EGIP project. A GRIP 3 study for the remaining routes was completed in September 2012.

Significant interfaces

There are significant interfaces for the Greenhill to Polmont and Dunblane/Alloa routes in respect of aligning the access requirements for construction with the need to protect diversionary routes during the core EGIP works. There are no specific interfaces with the other electrification projects apart from the need to integrate with the Motherwell North and Carstairs station remodelling projects and the opportunity to electrify the East Kilbride branch through a similar Alliancing project which successfully delivered electrification of the Paisley Canal branch.

Key assumptions

A number of specific assumptions have been made in development to date in respect of infrastructure, rolling stock, timetable, operations and performance and are detailed fully in the Project Requirements Specification and sponsor's remit.

A key assumption in developing the project is that the existing network layout will not be changed. In the study work done so far no increase in service frequencies on any of the sub-route sections has been considered. During Grip 3 it will be necessary to undertake timetable modelling to identify any conflicts and constraints.

Activities and milestones

It is anticipated that the majority of implementation will be from the middle to the end of CP5, possibly extending into early CP6. A detailed programme will be developed when agreement is reached with Transport Scotland on the extent of the proposed rolling electrification programme to be implemented in CP5.

Indicative programme milestones are:

1. Pre 2012 / 2013 – Development work for GRIP Stages 2 and 3 to Transport Scotland's original output specification.
2. 2012 / 2013 – Completion of development activities to GRIP Stage 3.
3. 2013 / 2014 – Continuation of detailed design, development and consultation with various external stakeholders and approving bodies for commencement of work to support the outputs stated above during CP5. This will include working with Local Authorities, Transport Scotland and various stakeholders.
4. 2014 / 2015 – Delivery of EGIP electrification ongoing so further work on Phase 2 remains to be agreed with Transport Scotland.
5. 2015 / 2016 – Delivery of EGIP electrification ongoing so further work on Phase 2 remains to be agreed with Transport Scotland.
6. 2016 / 2017 – Commencement of advance works on route sections still to be agreed with Transport Scotland. Land and property negotiations ongoing with land owners together with concluding the arrangements for the new Grid Supply Point at Currie necessary for the Shotts Line electrification.
7. 2017/2018 – OLE works on route sections still to be agreed with Transport Scotland.
8. 2018/2019 - OLE works on route sections still to be agreed with Transport Scotland.

Motherwell re-signalling enhancements

Operating route(s): Scotland

Project reference code: SC013

Output:

Increase capacity between Carfin and Holytown through the introduction of additional signalling. Provides flexibility, in addition to working towards 7 day railway through bi-directional working over the West Coast Main Line between Carstairs and Law Jn.

CP5 output driver

This signalling renewal element of this project is driven by the following:

- asset condition of Route Relay interlockings as determined by SICA.
- asset condition and potential worsening of existing wire degradation issues at a number of Relay Rooms as determined by SICA
- a requirement to renew telecoms assets, where appropriate, in synergy with signalling renewals.

Potential enhancements elements of this project are driven by:

- an HLOS requirement to enable more effective train operations in the Motherwell area and improve track maintenance opportunities
- a RUS requirement to enhance the network in the Motherwell North area, specifically the suburban commuter routes which are approaching capacity
- the desirability of capturing opportunities for synergy in delivering potential enhancement initiatives alongside core renewals.

Scope of works

The scope of the enhancement element of the project consists of:

- increased signalling capacity on the down Shotts Line between Carfin and Holytown Junction, and
- reduced capacity bi-directional signalling in the up direction over the down line from Law Junction to Carstairs and in the down direction over the up line from Carstairs to Shieldmuir South Junction.

Significant interfaces

Potential interfaces with other CP5 projects include:

- Motherwell Area Stabling
- Carstairs Junction re-modelling, and
- the rolling programme of electrification works.

Key assumptions

The key assumptions for the core renewal project which is linked to the enhancement component are listed below:

- the existing GEC Geographical Interlockings at Carmyle, Fauldhouse, Hamilton, Holytown, Uddingston, Whifflet Law, Lanark, and Wishaw shall be renewed with Westlock Interlockings, which ensures continuity with the current systems at WSSC when control is transferred from MSC
- the existing SSI controlled areas at Gartsherrie, Mossend (Burnhouse/South/Yard), Motherwell (North/South) and Newton (A/B) shall be re-controlled from WSSC via new Westlock Interlocking

- re-control of Haughhead Junction SSI
- GETS Modular Control System (MCS) shall be used as the control system, which is in line with the current technology in use at WSSC
- VDU in the form of TFT screens shall be provided as the indication system and operations will be controlled by tracker balls, or approved “Mouse”, and keyboards
- it is preferred that all complex signals (heads and structures), within the interlocking areas that are proposed for renewal, shall be renewed in their entirety
- no changes to the existing electrification system are anticipated as part of this project
- no changes are envisaged to the current configuration of existing rolling stock within the area of the project; however this should be confirmed through consultation with the TOC/FOC representative.

Activities and milestones

It is intended that GRIP Stage 3 and 4 will be completed by the end of CP4. It is anticipated that the majority of implementation will be from the start to the middle of CP5. Indicative milestone dates are provided below:

- end of GRIP stage 3 - Jan 2013
 - end of GRIP stage 4 – March 2014
 - Main Contract Award – November 2014
 - start on site –December 2014
 - Main Commissioning – December 2016
 - end of GRIP stage 6 – September 2017
 - end of GRIP stage 7 – February 2018
 - end of GRIP stage 8 – May 2019.
1. Pre 2012 / 2013 – Development work for signalling enhancements undertaken as part of the larger scheme renewals development.
 2. 2013 / 2014 – Continuation of development work for signalling enhancements along with the renewals elements of the scheme.
 3. 2014 / 2015 – Implementation works commence.
 4. 2015 / 2016 – Implementation works ongoing.
 5. 2016 / 2017 – Implementation works including signalling enhancements completed in this period.
 6. 2017 / 2018 – Renewals works continue in implementation.
 7. 2018 / 2019 - Completion and close-out of project activities.

Motherwell area stabling

Operating route(s): Scotland

Project reference code: SC012

Output:

- provide additional stabling at Motherwell for ScotRail services
- reduce the number of ECS movements between Yoker and Motherwell.

CP5 output driver

The train stabling arrangements in the Motherwell area involve use of a number of locations; the Derby & Weighs sidings, the Hamilton loop and Back of Shops sidings in the former Motherwell TMD. These locations are utilised on a regular basis for overnight stabling and cleaning of EMU and DMU fleets at Motherwell. The facilities at each of these stabling locations are very basic, and not commensurate with the quality of product that the rail industry is expected to deliver.

In addition, there is currently insufficient stabling capacity in the Motherwell area, and this requires daily ECS moves between Yoker and Motherwell.

Scope of works

The project will consider consolidation of all stabling and cleaning facilities at a reduced number of locations with a view to releasing some or all of the existing sites in current use for other purposes.

A GRIP 2 study was completed in June 2012 but this concluded that limited opportunities for cost effective enhancement of the initially preferred site at the former Motherwell TMD existed. It is therefore likely that the extent of scope deemed cost effective to take forward to implementation is modest and will be limited to further improvements to the 'Back of Shops' sidings location (including additional electrification) in the former TMD. It is anticipated that this will be implemented prior to the end of CP4.

A new study is to be commissioned to examine options for the redevelopment of the former Motherwell Bridge sidings as a stabling and servicing facility. A client remit for this study is in the course of agreement and it is anticipated that it will be taken to GRIP 2 level by the second half of 2013. Following review of this GRIP 2 report, a decision on scope to be developed further will be made with Transport Scotland.

The scope of potential enhancements at the Motherwell Bridge site will consider:

- track layout alterations to provide access from Motherwell Weighs
- EMU facilities
- carriage cleaning facilities, including walkways, water drainage and power
- CET facilities
- road access
- staff and store facilities.

Significant interfaces

There is a significant interface with the planned Motherwell North Signalling Renewal project currently being developed for delivery in CP5.

Key assumptions:

- to be determined once the client remit is agreed for the proposed GRIP 2 study.

Activities and milestones:

- develop a specification with costs for the minor works identified after consultation with Transport Scotland and First ScotRail in the “Back of Shops” sidings area by the end of March 2013
- further milestones to be agreed on conclusion of the GRIP 2 report for the Motherwell Bridge sidings location.

Carstairs junction remodel

Operating route(s): Scotland

Project reference code: SC007

Output: Journey time improvements

CP5 output driver

The project output drivers are:

- to increase speed over the three junctions thereby reducing journey times for both passenger and freight operators and increasing capability
- to simplify the junction layout reducing amount of infrastructure requiring maintenance in future years
- to improve the passenger experience on the WCML and the Cobbinshaw Line (Carstairs to Edinburgh) for passengers traveling between the WCML and Edinburgh as well as for Glasgow to Edinburgh services running via the Station Junction to East Junction Curve
- these are all consistent with HLOS requirements to seek cost effective enhancements to the network in synergy with planned renewals schemes and to reduce journey times.

Scope of works

The objective of the project is to re-model the junctions at Carstairs to achieve higher line speeds and an improved passenger experience. The project will examine options for simplification of the overall layout at Carstairs, whilst retaining current functionality and at the same time deliver speed improvements over the junction including the removal of the current 15 mph restriction at the Station Junction.

The project assumes that major track and signalling renewals will take place at Carstairs in CP5. This therefore provides the opportunity to achieve maximum synergies, both in terms of cost and access disruption efficiencies.

Significant interfaces

The major track (S&C) and signalling renewals planned in CP5 at Carstairs are significant interfaces. The prioritisation of the S&C renewals will be based on asset condition but funding for the renewals workbank in CP5 is still to be secured. It would not be cost effective to proceed with the enhancement option without the benefit of renewals funding.

Key assumptions

It is assumed that the project will not consider any options to move the existing station at Carstairs and that the current two platform face island platform arrangement will be retained.

Activities and milestones

Milestones to be developed following agreement with Transport Scotland on the extent of the project to be developed beyond GRIP 2.

Edinburgh South Suburban Electrification

Operating route(s): Scotland

- (1) Haymarket West Junction – Gorgie Junction (GGE).
- (2) Haymarket Central Junction – Gorgie Junction – Niddrie West Junction – Former Niddrie North Junction (SUB2).
- (3) Former Niddrie North Junction – Portobello Junction (SUB1).
- (4) Niddrie West Junction – Niddrie South Junction (MHY).
- (5) Craiglockhart Junction to Slateford Junction (CKT)

Project reference code: SC017

Output:

Electrification of the Edinburgh South Suburban line and associated connecting routes.

CP5 output driver

The principal drivers for the project are improving network resilience and capability in the Edinburgh area together with the provision of an electrified diversionary route for electric passenger services and a route for electric hauled freight services from West of Scotland terminals to the ECML avoiding Edinburgh Waverley station.

The project aligns with the priorities set out in the Scottish Government's Strategic Transport Projects Review which are:

- improving journey times and connections, to tackle congestion and the lack of integration and connections in transport that impact on the potential for continued economic growth
- reducing emissions, to tackle the issues of climate change, air quality and health improvement
- improving quality, accessibility and affordability, to give people a choice of public transport, where availability means better quality transport services and value for money or an alternative to the car.

The further electrification of the rail network in Scotland is one of the interventions targeted by the Scottish Government. Specific objectives identified in further electrification include:

- reduction in carbon emissions
- reduction in energy consumption of up to 20%
- improved accessibility by providing opportunities for new routes and through services
- more efficient use of rolling stock.

Scope of works

The scope of the GRIP Stage 2 study is to consider the infrastructure changes that would be necessary to install 25kV electrification on the nominated route sections. This will potentially lead to electrification of the following route sections:

- Haymarket West Junction – Gorgie Junction
- Haymarket Central Junction – Gorgie Junction – Niddrie West Junction – former Niddrie North Junction
- former Niddrie North Junction – Portobello Junction
- Niddrie West Junction – Niddrie South Junction
- Craiglockhart Junction to Slateford Junction.

The electrification of the Edinburgh South Suburban Line and connecting route sections is likely to require significant engineering works at a number of structures to provide the necessary clearances for installation of overhead line equipment.

Significant interfaces

There are no specific interfaces with other CP5 enhancement projects. During GRIP 2, a high level review will be undertaken however the following projects are potential interfaces with Edinburgh South Suburban Electrification.

- Shotts Line Electrification
- UB285/021 Cleland Viaduct: non-disruptive masonry repairs
- Motherwell Area Resignalling Phase 1
- Borders Railway Project
- Carstairs Junction remodelling
- Motherwell Area Resignalling Phase 2
- Inter-City Express Programme
- ECML Line of Route Capacity -
- EGIP Electrification core and secondary phases

Key assumptions

A number of assumptions have been made at this early stage of development:

- that the existing track layout will not change other than between Portobello Junction and the former Niddrie North Junction
- EGIP will undertake development work for the proposed infrastructure enhancements at Portobello Junction, Brunstane and the former Niddrie North Junction in conjunction with the new EMU maintenance and stabling facility to be constructed at Millerhill Yard
- that the signalling on the majority of the South Suburban Line will not change
- that the line will remain available for diversionary passenger services as it is today. The electrification project will be developed and implemented in a manner that would not preclude a passenger service to be re-instated at some time in the future. This approach will include sympathetic location of OLE structures at each of the former passenger station locations
- that the current freight utilisation will be sustained
- during GRIP 3 it will be necessary to undertake timetable modelling to identify any conflicts and constraints.

Activities and milestones:

- a programme will be produced for GRIP Stage 2 as part of the internal authority process during 2013
- a programme for future GRIP stages will be developed as part of the initial GRIP 2 work.