

Enhancements Delivery Plan

September 2018

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The Enhancements Delivery Plan sets out the outputs, scope and milestones for projects and ring fenced funds that Network Rail is committed to deliver in CP5. It is used both by the regulator, to hold us to account, and by our customers and funders, to give them visibility of our plans. Network Rail publishes an updated version of the EDP every quarter.

In January 2016 an update to the Enhancements Delivery Plan covering England and Wales was published in draft to support the Hendy review of Network Rail's enhancements programme for CP5. The review confirmed that Network Rail will continue to deliver a very significant enhancement programme during the period to 2019. Most of the originally planned projects will still be delivered in CP5 with significant benefits for passengers and freight users. We will work with our industry partners to deliver the planned benefits to the end user as soon as they can be achieved, so the benefits of other industry changes such as new franchises are delivered.

The Department for Transport has formally accepted the re-planning of the enhancements portfolio for CP5 which was proposed in the Hendy review. Further updates to the Enhancements Delivery Plan have been agreed between Network Rail and the Department through a formal change control process.

Each project entry includes a milestones table setting out the programme for the project's delivery. Each milestone is assigned a status; the statuses used have the following definitions:

- **Regulated Output** – a regulated milestone for which we are held to account by the Office of Rail and Road (ORR). For a project that is in GRIP stages 1 to 3 this is the GRIP 3 completion milestone. Otherwise it is the entry into service milestone when the infrastructure is available for use;
- **Indicator** – this is used for a milestone with a confirmed date which is not a Regulated Output. It is used for GRIP 4 / GRIP 5 milestones for projects which have completed GRIP 3;
- **Complete** – a past milestone completed on time;
- **Revised** – a milestone that has been changed not due to NR caused slippage;
- **Indicative** – a milestone which gives our best view of the likely date but which may be subject to re-planning and to which Network Rail has not committed. This is used for all milestones subsequent to GRIP 3 (including GRIP 6) when GRIP 3 has not been completed.

Until a project completes its development at the end of GRIP 3 there is likely to be some uncertainty around scope and timescales. Therefore projects which have not yet completed GRIP 3 are unlikely to be supported by a delivery programme and future milestones may be shown as "TBC", as well as having an "indicative" status.

Most projects have an **Output delivered** milestone with its status shown as 'not applicable'. This milestone is the point at which the customer benefit of a project is delivered. This often relies on other industry partners to provide the rolling stock or introduce a new timetable to contribute to the outputs.

This edition of the EDP updates the completion status of all milestones up until the end of August 2018. Updates to milestones due in September 2018 will be made in the December 2018 EDP update.

Crossrail

Details

Project reference code: CR001

HLOS driver: Committed projects

Operating route: Anglia, Kent and Western

Last updated: September 2018

CP5 output driver

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

The joint sponsors of the Crossrail project, the Department for Transport (DfT) and Transport for London (TfL), have 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 Reading 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; and
- 28 existing surface stations will be upgraded with many of these stations also receiving platform extensions.

Network Rail's obligation

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 7.0 on 9 May 2012, details in full Network Rail's obligation to deliver the ONW. It authorised the completion of design development for the ONW to the end of GRIP 4 and provided a process for agreeing an Overall Target Price (OTP) for GRIP 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.

These works support the full introduction of the Crossrail services in 2019, through a series of Key Dates obligations and Key Output obligations set out in the Network Rail Client Requirements (NRCR)

Scope of works

The scope of works Network Rail is responsible for, and that make up the ONW, is set out in the Network Rail Client Requirements and is as follows:

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
- 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
- New bay platforms at Maidenhead, West Ealing 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
- Design and provision of a new control centre facility at Romford
- Development of Enhanced TPWS

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
- Platforms will be lengthened and step-free access will be provided at a number of stations

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
- Resignalling of Heathrow Spur

Separately funded

- Upgrade of the traction power supply system

Interfaces and assumptions

There are multiple interfaces within Network Rail with:

- Intercity Express Programme (IEP), Great Western Electrification (GWEP), ERTMS, FTN and GSM-R which have key interfaces to support delivery outputs including the installation of Series 1 equipment, ETCS and SCADA, and installation of OLE between Maidenhead and Reading;
- HS2 especially the design and construction interface at Old Oak Common;
- Routes (Western, Anglia, Kent) including delivery outputs for Access for All at Burnham station;
- Enhancements, including Romford Control Centre which will house CRL staff;
- CP4 & CP5 renewals; key amongst these will be the Great Eastern rewiring which supports the Programmes delivery outputs on Anglia route;
- Maintenance, including Western asset resilience work which will affect delivery outputs for a resilient Crossrail timetable;
- Tunnel spoil removal; and
- Outside party works.

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 Public Performance Measure (PPM) remains the responsibility of CRL; and
- Interfacing projects are funded and delivered on time by other parties.

Activities and milestones (NR)

Activity	Output	Date	Status
Main works GRIP 6 start	Start on site	September 2012	Completed
Main works GRIP 6 complete	Assets commissioned	July 2018	Completed
Stage 0	New Concession to start running existing Great Eastern Trains between Shenfield and Liverpool Street	May 2015	Completed
Key Output 1	Infrastructure Capability to support the storage and operation of new Crossrail 8-car trains between Shenfield and Liverpool Street stations	February 2017	Completed
Stage 1 EIS Infrastructure Authorised	Progressive introduction of new Crossrail Rolling Stock (160m long trains) on existing suburban services between Shenfield and Liverpool Street by substitution	June 2017	Completed
Key Output 4	Infrastructure Capability from Heathrow Spur connection to Paddington (High Level), incl. new up/down lines providing access to Old Oak Common Depot	November 2017	Completed
Stage 2 EIS Infrastructure Authorised	On Network Works between Heathrow and Westbourne Park inclusive Substantially Complete (as defined in the PDA) with Crossrail 9 car Services running at a frequency of 4 trains per hour into Paddington (high level)	May 2018	Completed
Key Output 2	Infrastructure capability from Abbey Wood to the Central Core Area at Plumstead Portal, from Stratford to the Central Core Area at Pudding Mill Lane and from Old Oak Common to Westbourne Park	July 2018	Completed
Key Output 5a	Full infrastructure Capability in accordance with the ONFR from	September 2018	Regulated Output

Shenfield to the Central Core Area at Pudding Mill Lane

Stage 3 EIS Infrastructure Authorised	Crossrail Services running from Paddington (low level) to Custom House/Abbey Wood. To allow sufficient time for Trial Running & Trial operations within the Central Core Area, utilising the Turn Back at Abbey Wood	December 2018	Indicator
Stage 4 EIS Infrastructure Authorised	Through running of Crossrail services from Paddington Low Level to Shenfield and Custom House / Abbey Wood. To allow sufficient time for Trial operations and Trial Running	May 2019	Indicator
Key Output 5b	Full infrastructure capability from Shenfield to the Central Core Area at Pudding Mill Lane. To allow sufficient time for Trial Operations and Trial Running	September 2019	Regulated Output
Stage 5 EIS Infrastructure Authorised	Full Crossrail service from Reading and Heathrow through the central section to Shenfield and Custom House / Abbey Wood.	December 2019	Indicator

Details

Project reference code: CR004

HLOS driver: Committed Project

Operating route: South East Route (lead), LNE & EM, Anglia

Last updated: March 2016

CP5 output driver

The DfT Thameslink Programme aims to provide a step change in capacity on an extended Thameslink network thus providing new journey opportunities, congestion relief and capacity for future growth in passenger demand on National Rail and London Underground.

Network Rail's obligation

Network Rail is contracted to provide the enhanced infrastructure through a Protocol signed in 2008. Network Rail's obligation is delivery of the infrastructure capability to enable a number of pre-defined incrementally enhanced timetables to be introduced on a progressively wider Thameslink network. This culminates in the provision of infrastructure to provide 24 train paths per hour between St Pancras and Blackfriars stations in a final timetable change in December 2018.

Scope of works

The Thameslink Programme has phased delivery over three key outputs:

- Key Output 0 allowed for a consistent train service to run throughout the Thameslink Programme construction periods. The work was completed in March 2009. It allowed for up to 15 trains per hour to run between St Pancras International (low level) and Blackfriars stations
- Key Output 1 provided an improved train service capacity of up to 16 train paths per hour between St Pancras International (low level) and Blackfriars stations and the ability to run longer 12 car trains. The lengthening works were completed in December 2011 and the capacity improvement was commissioned in April 2012.
- Key Output 2 provides for the completed Thameslink service giving a further improved 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 infrastructure to support up to 18 Thameslink trains per hour through the London Bridge corridor, extra stabling, connections to train care depots, the extension of services onto the East Coast via Canal Tunnels and the radical improvement of passenger facilities at London Bridge station by the complete rebuild of the station.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Ongoing coordination of key resources and possessions with other major programmes in the south east such as Crossrail.
- Intercity Express programme & East Coast infrastructure capability and power supply upgrades along the south end of the ECML (mutual dependency)
- Enabling enhancement works supporting the construction phase timetables and wider post-Thameslink timetable in the south east including platform extensions in Kent & Sussex, DC power supply enhancements in Kent & Sussex, turnbacks and Redhill additional platform.
- Midland Main Line Electrification (revised operating regime)

The following critical assumptions on internal factors are being made:

- The works continue to be delivered in the tightly planned sequence of possessions and blockades. If this sequence is broken it will have a significant impact on the schedule.
- Sufficient resource is available within the organisation to effectively manage the programme of business and operational changes

The following critical assumptions on external factors are being made:

- There is a need to closely coordinate activities with Govia Thameslink Railway relating to systems interfaces and changes to operational arrangements (pre-defined Configuration States).
- The DfT managed Thameslink Rolling Stock Project delivers the new fleet of 115 Class 700 trains and testing, commissioning and roll-out progresses in accordance with the agreed industry plans.
- DfT continue to manage system integration risks (through their system integration team)
- The train service specification which GTR is contracted to deliver by December 2018 can be adapted into a robust and reliable timetable across the wider south east rail network. The timetable needs to integrate with other franchised, open access and freight services and be underpinned by high performing infrastructure across the South East.

Activities and remaining milestones (NR)

Remaining Milestone	Description	Date	Status
Hornsey Traincare Depot	Completion of Hornsey depot connection, power supply and distribution	31 July 2016	Complete
KO2 Interim Milestone	Conventional infrastructure to provide 20 train paths per hour between St Pancras and Blackfriars stations	2 January 2018	Complete
EIS – Infrastructure Authorised KO2 Final Milestone	High capacity infrastructure to provide 24 train paths per hour between St Pancras and Blackfriars stations	9 December 2018	Regulated Output & Protocol

North of England Programmes (LNW)

Details

Project reference code: CR005 (including LNW001 & LNW002)

HLOS Driver: Committed Projects

Operating route(s): LNW & LNE

Last updated: September 2018

CP5 Output Driver

The North of England Programme (NoEP) incorporates the outputs from the Northern Hub and North West Electrification.

This project supports the achievement of the capacity metric in the government's 2012 HLOS relating to the numbers of arriving passengers to be accommodated at Manchester Stations in the morning three-hour peak and one-hour high-peak.

The specific outputs of these programmes are designed to enhance the capability of the rail network across the North of England in LNW Route to provide:

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

The programme also delivers conditional outputs which provide additional capacity to accommodate more services, improvements to linespeeds to reduce journey times and electrify specific routes within the region.

These conditional outputs are currently being revisited with our stakeholders to make sure that they reflect the new franchise arrangements.

Network Rail's Obligation

Network Rail commits to delivering the combined interventions as defined in the NoEP Output Document (October 2015) so that the infrastructure required to enable the operation of a proposed Indicative Train Service Specification or ITSS (IPG December 2014) is available in time for an agreed timetable change date. In addition, Network Rail commits to facilitating the introduction of electric train operation on passenger and freight services across the North West by the dates agreed. In the case of each

agreed 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.

Scope of Works

The combined programme consists of the following interventions:

Intervention	Description
Phase1 & 2 Electrification of Liverpool to Wigan, Liverpool to Manchester (Victoria and Piccadilly)	25kV AC Electrification and associated power supplies/distribution. Also includes signalling immunisation, track lowering and bridge reconstructions.
Phase 3 Blackpool line upgrade	25kV AC Electrification, resignalling, track renewals/remodelling, track lowering and bridge reconstructions
Phase 4 Preston to Manchester (Victoria and Piccadilly) and Preston JTI	25kV AC Electrification and infrastructure improvements to give journey time savings. Also includes signalling, immunisation, track lowering, Farnworth tunnel reborings, remodelling at Bolton and bridge reconstructions.
Phase 5 Manchester Victoria to Salybridge.	25kV AC overhead electrification between Manchester Victoria and the Bromley Street (Manchester) area, new grid supply point at Salybridge, associated power cable from Salybridge to Ordsall Lane for Phases 4 and 5 NWEF and infrastructure improvements to give journey time savings.
Package A Ordsall Chord; Manchester Victoria capacity; Core Manchester performance	New railway line in west Manchester providing a direct route between Manchester Victoria and Manchester Piccadilly; Layout alterations to the West of Victoria station to provide capacity and flexibility; Castlefield corridor and Ordsall Lane Junction capacity and performance improvements
Package B Manchester Airport station	Additional platform to accommodate extra services from Manchester city centre in CP5
Package C Manchester Oxford Road station	Additional platforms and remodelling to provide capacity to accommodate longer, more frequent trains
Manchester Piccadilly station	Provision of two additional through platforms (15 & 16) Subject to TWAO.

Intervention	Description
Huyton - Roby and Chat Moss capacity	Four tracking at this location to increase capacity and provide an overtaking facility, and headway improvements to provide additional capacity between Liverpool to Manchester on the Chat Moss route. Split into two phases- Phase 1 completed.
Rochdale capacity and Calder Valley JTI	Provision of a turnback facility at Rochdale station towards Manchester and infrastructure improvements between Manchester and Bradford to provide journey time savings split into Calder Valley West and Calder Valley East.
Hope Valley capacity and JTI	Doubling of the single line between Dore West & Dore Station Junction and provision of freight recessing facilities, a passing loop at Bamford, with Infrastructure improvements between Dore and Stockport to provide journey time savings. Subject to TWAO.
Liverpool Lime St	Remodelling of station to give additional platform capacity, also includes resignalling and track renewals.
Blackburn LMD	Provision of a Light Maintenance Depot at Blackburn with capacity for servicing and stabling 26 DMU's. The depot comprises arrival and departure roads, fuelling, washplant and CET and staff accommodation and car parking. The provision of this facility is also a key enabler for the NWEF Phase 3 blockade.

More detail on the scope of works associated with the North of England Programme is outlined the NoEP Outputs Document (July15 Version 2.02)

Following the DfT announcement on 9th December 2015 regarding the new Northern and TransPennine Express franchises, Network Rail will work with the successful

bidders to explore the options for implementation, blockade and authorisation strategies, with the objective of an effective entry into service date.

Significant Interfaces

- North West platform lengthening
- Rolling Stock Gauge Clearance
- East of Leeds capacity scheme
- Huddersfield capacity scheme
- West Coast power supply upgrade phase 3B
- Manchester Victoria redevelopment
- Strategic Freight Network
- National SCADA renewal
- Manchester Rail Operating Centre
- DfT rolling stock strategy
- CP5 renewals plan
- HS2

Key assumptions

- The timeline for obtaining consents allows delivery to the milestones set out in the table below.
- No ancillary works (e.g. rolling stock clearance, depots / stabling works or platform lengthening) created by the introduction of new rolling stock are delivered by the programme¹
- There is sufficient supply chain capacity to undertake the volume of works.
- Sufficient engineering access is made available and timing of works on adjacent routes allows delivery of the interventions.

¹ The ancillary works are delivered by a separate funding scheme and have a separate delivery plan entry.

Activities and milestones (NR)

Intervention	Baseline Dates / Status					
	GRIP 3 Completion		GRIP 6 Completion		EIS *	
Huyton & Roby Phase 1 & Chat Moss Capacity ~	Dec '12	Completed	Aug '14	Completed	Aug '14	Completed
Phase 2A – Edge Hill to Earlestown ^	Sep '11	Completed	Mar '15	Completed	Mar '15	Completed
Phase 2B – Huyton to Wigan ^	Sep '11	Completed	Mar '15	Completed	Mar '15	Completed
Phase 2C – Ordsall Lane – Manchester Victoria ^	Sep '11	Completed	Apr '15	Completed	Apr '15	Completed
Huyton & Roby Phase 2	Dec '12	Completed	10 Dec '17	Completed	10 Dec '17	Completed
Rochdale & Calder Valley West ~	Dec '12	Completed	11 Dec '16	Completed	11 Dec '16	Completed
Calder Valley East ~	Dec '12	Completed	30 Jun '19	Indicator	9 Dec 18²	Regulated Output
Phase 3 – Blackpool to Preston ^	26 Feb '16	Completed	CP5 ⁴	Indicative	CP5⁴	Regulated Output
Ordsall Chord (Package A) ³	Sep '13	Completed	10 Dec '17	Completed	10 Dec '17	Completed
Manchester Airport (Package B)	Jun '13	Completed	Mar '15	Completed	13 Dec '15	Completed
Phase 4 – Manchester – Preston ^ ~	31 Mar '16	Completed	Dec '18	Indicative	Dec '18	Regulated Output
Phase 5 – Manchester Victoria to Stalybridge ^ ~	31 Mar '16	Completed	Mar '19	Indicative	Mar '19	Regulated Output
Liverpool Lime Street	Jul '14	Completed	9 Dec '18	Indicator	9 Dec '18	Regulated Output
Manchester Oxford Road and Piccadilly (Package C)	Subject to TWAO	Regulated Output	Subject to TWAO [#]	Indicative	Subject to TWAO [#]	Indicative
Hope Valley Capacity ~	Jun '16	Completed	Subject to TWAO [#]	Indicative	Subject to TWAO [#]	Indicative

EIS * = Entry into Service

Regulated Milestones = **BOLD**

^ Electrification Scheme

~ JTI Improvement included

[#]Schemes subject to a Transport and Works Act Order

²Currently under review

³Includes Ordsall Chord, Manchester Victoria Capacity and Core Manchester Performance

⁴CP5: not later than December 2018, but update to follow detailed work with new franchise holders

⁵Subject to ongoing change control

NOTE: Electrification of the route between Guide Bridge and Stalybridge will now be considered as an option as part of the TRU programme (see LNE001a).

The new Northern and TransPennine Express franchises include ambitious commitments to transform rail services in the north of England between now and the end of 2019, with extra services, new trains and a massive increase in capacity to accommodate more passengers while reducing crowding. Network Rail will work with the successful franchise bidders to deliver the outputs of the North of England Programmes and to seek opportunities for further passenger benefits to be delivered as infrastructure schemes are completed during CP6.

Mobile Maintenance System

Details
Project reference code: CR006
HLOS driver: Network availability
Operating route: Anglia, LNE & EM, South East and Wessex
Last updated: March 2017

CP5 output driver

Delivering bespoke maintenance trains that support a new way of working for maintenance personnel enabling delivery of core maintenance and campaign works in a more efficient manner leading to improved utilisation of track access. This will enable improvements in network availability

This system has the potential to deliver significant safety, capability and quality benefits. The system provides a platform from which greater work quantities can be delivered without increasing track access times.

This project was funded as a CP4 7 day railway scheme and delivery has been rolled over into CP5.

Network Rail's obligation

To deliver a total of eight (8) Mobile Maintenance Systems (MMS) to LNE&EM, Anglia, South East and Wessex Routes to enable more efficient delivery of maintenance and campaign works.

Scope of works

The project will deliver eight mobile maintenance systems across LNE&EM, Anglia, South East and Wessex.

The Project includes:

- Design, build and delivery of the trains to the routes;
- System certification; and
- Compatibility testing and acceptance

The project also includes organisation change and consultation to put in place the teams to manage and work on the MMS.

Additional work streams will deliver various enabling activities including:

- Safe systems of work;
- Stabling and materials handling facilities;
- System maintenance and operational servicing arrangements;
- Train drivers; and
- Developing system specific planning process and procedures

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- None

The following critical assumptions on internal factors are being made:

- That the MMS is able to operate under signal protection to maximise the efficiencies, enabling more train paths and to realise the all potential benefits.
- A vehicle isolation solution when working in 3rd rail areas will be developed as part of the project.

The following critical assumptions on external factors are being made:

- System manufacture lead-time for first system is 18 months from order placement with subsequent trains delivered at 7 to 8 weeks frequency thereafter

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 6 start	Manufacturer starts train design work	November 2013	Complete
EIS – equipment authorised	Final train delivered and entered into operational service	December 2016	Complete

FTN/GSM-R inclusion of freight-only branch lines

Details

Project reference code: CR009

HLOS driver: CP4 completion - GSM-R system coverage and operation

Operating route(s): Freight branches nationally (nominally all routes)

Last updated: January 2016

CP5 output driver

The national implementation of GSM-R will improve national safety and performance metrics. This is a CP4 scheme being completed in CP5.

Network Rail's obligation

With the expiration of the National Radio Network (NRN) license, we have worked with our freight partners to deliver an FTN/GSM-R system and associated infrastructure as a replacement.

Scope of works

The project accommodates all remaining (i.e. as yet without GSM-R system coverage) single-ended freight-only branch lines which are:

- North of a line drawn between the Severn Estuary and the Wash
- Operational and within Network Rail controlled infrastructure boundaries (NRCI); into the FTN/GSM-R Programme scope

The operational license for NRN north of the line drawn between the Severn Estuary and the Wash expires in December 2015. Trackside GSM-R base transceiver equipment is being installed as required, together with fibre-optic connections to the Fixed Telecoms Network (FTN), thus providing (as a minimum) a level and quality of driver-signaller communication equivalent to the existing NRN service.

Significant interfaces

The key interface is with the main FTN/GSM-R delivery programme.

Key assumptions

- All new infrastructure will be constructed and installed on land owned by Network Rail
- Planning approval is required for all GSM-R sites under the 'Permitted Development Rights' process
- The delivery rate of the substantive FTN/GSM-R programme shall be maintained
- The scope assumes that design rules applied elsewhere for the provision of radio coverage using GSM-R technology are also appropriate for freight-only branch lines: any viable relaxation of the design rules will be identified on a site-by-site basis during the project development phase and managed as programme efficiency
- Where branch lines are part-privately owned, radio coverage to minimum operational standards will be extended only as far as the NRCI boundary.

Activities and milestones

Note: the main FTN/GSM-R Programme is substantially complete, with the only significant element remaining being the construction of the GSM-R coverage solution in the Mersey tunnels. The Freight Branches Project (this project) is also substantially complete with only a small number of line-side GSM-R sites requiring completion of construction and commissioning. The majority of lines are therefore already at a point of infrastructure readiness and either have been submitted, or will shortly be submitted, to the ORR for authorisation to bring GSM-R into operational service over them.

Milestone	Description	Date	Status
GRIP 6 completion	Infrastructure ready for use	May 2014	Complete

Note this project is funded through renewals and is included for completeness only

East West Rail

Description

Reinstatement of the rail line between Oxford/Aylesbury and Milton Keynes/Bedford, enabling direct rail services.

New services provided to a number of stations, providing up to 3 local passenger services each way per hour and two train paths per hour for freight/inter-regional services. Generate and support economic growth along the line of route by encouraging residential and commercial growth.

EDP Reference Codes

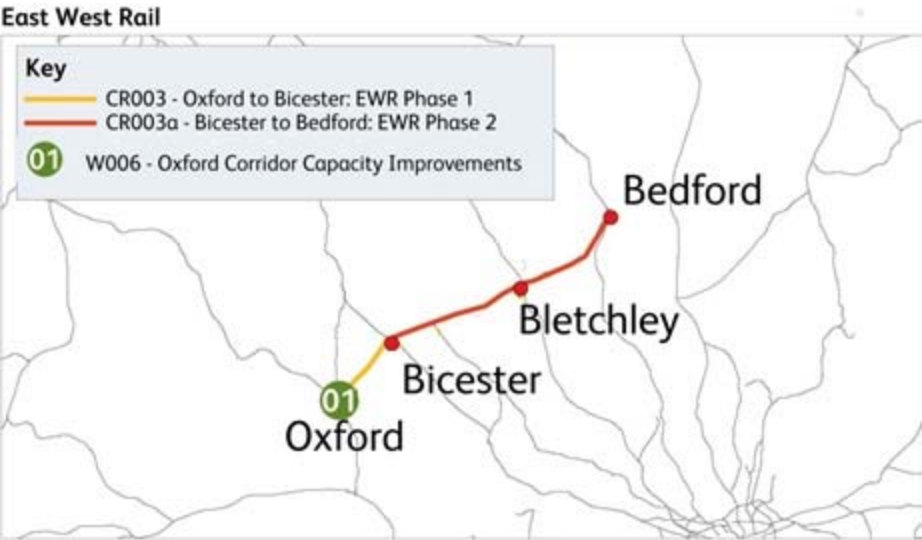
- CR003 - East West Rail Phase 1
- CR003a - East West Rail Phase 2

Significant Interfaces

- Oxford Corridor
- High Speed 2
- Thames Valley resignalling

Announcements

Date	Announcement
None	



East West Rail Phase 1

Details

Project reference code: CR003

HLOS driver: Committed projects

Operating routes: LNW and Western

Last updated: March 2016

CP5 output driver

The objective of this project is to provide the capacity and capability for direct rail services between London Marylebone and Oxford via Bicester, to enable the outputs required under Chiltern Railways' "Evergreen 3 Phase 2" Project. Capacity will be provided for two passenger train paths per hour in each direction on the Bicester-Oxford route, in addition to existing irregular freight flows. Other outputs are described in the Contribution Agreement between Network Rail and Chiltern Railways.

When Phase 2 of the project is complete, it will also deliver incremental capacity for an additional four passenger and three freight paths per hour on the Oxford – Bicester section for the later introduction of direct services between Oxford and Milton Keynes/Bedford (see CR003a East West Rail Phase 2).

Network Rail's obligation

Network Rail's obligation is to construct the infrastructure required to deliver the CP5 industry outputs described above. The project is currently in GRIP stage 6.

Scope of works

The incremental outputs required for East West Rail between Oxford and Bicester, and the works planned under Chiltern Railway's "Evergreen 3 Phase 2" project, are being delivered as a combined project in order to secure efficiencies and economies. The works include the following:

- Installing a new chord line to provide rail access between the Chiltern Main Line and the Bicester-Oxford branch;
- Doubling the former single-track line between Bicester and Oxford North junction, with a maximum 100mph line speed replacing the previous 40 mph limit;
- Rebuilding existing stations at Bicester Town (now renamed "Bicester Village") and Islip, and building a new station named Oxford Parkway to serve North Oxford and the surrounding area;
- Closure of all but one of the level crossings between Bicester and Oxford North junction;

- New and enhanced overline structures constructed to W10 or W12 + electrification loading gauge, subject to gauging strategy and physical constraints;
- Capacity enhancement works between Wolvercote Tunnel, Oxford North Junction and Oxford station, including bringing into use two new bay platforms at Oxford.

Interfaces and assumptions

Significant interfacing schemes and their impact are:

- Thames Valley resignalling: control of the Oxford area was originally planned to be transferred to the new Thames Valley Signalling Control Centre in 2016. The replanning of this scheme has led to changes to the scope of work in the Oxford area, and the phasing of some deliverables;
- East West Rail Phase 2 (CR003a): Phase 1 will deliver some elements of Phase 2 scope in the Oxford area to resolve issues arising from replanning of Thames Valley Resignalling, and to achieve efficiencies;
- Oxford corridor capacity improvements: the East west Rail Phase 1 Oxford works are a component part of this programme, with outputs, funding and delivery arrangements integrated.

The following critical assumptions on internal factors are being made:

- Any further replanning of interfacing projects will have minimal impact on delivery of East West Rail Phase 1.

The following critical assumptions on external factors are being made:

- Further delays in discharging planning conditions through local planning authorities, which have impacted the programme to date, are expected and will be mitigated as far as possible through continuing dialogue.

Activities and milestones (NR)

Milestone	Description	Date	Status
Oxford GRIP 3 completion	Single option selection	September 2014	Completed
GRIP 4 completion	Single option scope defined	December 2013	Completed
Oxford GRIP 4 completion	Single option scope defined	January 2015	Completed
GRIP 6 start	Start on site	May 2013	Completed
Oxford GRIP 6 start	Start on site	September 2015	Completed
Oxford Parkway GRIP 6 completion	Infrastructure ready for use	September 2015	Completed
EIS Testing	Entry into service for testing and driver training	September 2015	Completed
EIS Infrastructure authorised	Infrastructure authorised for passenger use	October 2015	Completed
Oxford Parkway Output delivered	First Timetabled public use of infrastructure	October 2015	Completed
Oxford GRIP 6 completion	Infrastructure ready for use	December 2016	Completed

East West Rail Phase 2

Details

Project reference code: CR003a

HLOS driver: Committed projects

Operating route: East Midlands, LNW and Western

Last updated: December 2017

CP5 output driver

This is a committed project in the Government's 2012 HLOS. Its objective is to support economic growth along the line of route, particularly around Milton Keynes and North Buckinghamshire, by providing the capacity for direct rail services between Oxford / Aylesbury and Milton Keynes / Bedford. The new services are also intended to encourage residential and commercial growth in the area.

This project will deliver capacity for two new passenger services per hour between Oxford and Milton Keynes, an hourly service from Oxford to Bedford; and an additional service per hour between Milton Keynes and Aylesbury.

Network Rail's obligation

Network Rail's obligation in CP5 is to complete:

- GRIP 3 single option selection;
- GRIP 4 single option development;
- development and implementation of a joint delivery strategy with HS2 Ltd in the Claydon area;
- development of options for delivery strategy to the end of CP6.

Scope of works

These outputs are to be reviewed during further project development and are subject to a single scope option being selected.

- Upgrading the existing Bicester Village to Bletchley freight line as a double track 100mph multi-functional railway capable of accommodating three passenger services each way per hour.
- Upgrading the existing Aylesbury to Claydon Junction freight single-line to be capable of accommodating one passenger service per hour.
- Retention of existing freight capacity and identification of opportunities to enhance capability.
- Minor upgrading of the existing Bletchley to Bedford passenger railway to accommodate one additional fast passenger service each way per hour
- New station at Winslow
- New high-level platforms and track remodelling at Bletchley

- New overline structures to be constructed to W12 + electrification loading gauge

The Department for Transport (DfT) has identified the East West Rail route as having future potential to deliver further enhancements to network capacity and flexibility.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- East West Rail Phase 1 (Bicester to Oxford): originally promoted and developed by Chiltern Railways to allow the introduction of a new London Marylebone to Oxford via High Wycombe service.
- Thames Valley resignalling: control of the Oxford area to be transferred to the new Thames Valley Signalling Control Centre, enabling East West Rail Phase 2 infrastructure to be commissioned required for services from Milton Keynes and Bedford.
- Oxford corridor capacity improvements: includes additional capacity between Didcot and Wolvercote Junction (north of Oxford) to accommodate growth in freight traffic and East West Rail phase 2 services from Milton Keynes and Bedford.
- Thameslink: capacity enhancements planned on the Thameslink network are likely to have a major impact on the Bedford station area.
- High Speed 2: this crosses the East West Rail line of route at Steeple Claydon, where an infrastructure maintenance depot is planned. This is planned to be rail-served via the East West Rail route both during construction of HS2 and subsequently after opening of the high speed line. HS2 and Network Rail are working jointly to progress design work in their area of interface.
- East West Rail Central Section: Network Rail will seek to work with the industry to determine a longer term view and develop EWR service changes to increment in a strategic and efficient way.
- Current scope does not provide provision for depots, stabling or rolling stock clearance.

The following critical assumptions on internal factors are being made:

- Sufficient WCML capacity can be identified to allow train services to/from Milton Keynes.
- Sufficient capacity at Oxford can be identified to allow train services to/from Oxford.
- Development and implementation of a joint delivery strategy with HS2 Ltd in the Claydon area.

The following critical assumptions on external factors are being made:

- DfT rolling stock strategy: planned diesel fleet cascade policies are likely to impact on East West Rail scope and programme decisions.
- TWAO submission and authorisation form part of the critical path for the project.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion for design work independent of HS2 interface	December 2016	Completed
GRIP3 AIP completion	Full single option selection and AIP completion	July 2017	Completed
GRIP 4 completion	Single option scope defined	December 2019	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP6*	Indicative
Output delivered - Enhanced connectivity	First timetabled public use of the infrastructure	CP6*	n/a

**We are currently working with stakeholders to confirm the Entry-Into-Service dates for this project and we plan to confirm these in the June 2018 update to the enhancements delivery plan.*

Oxford to Bletchley Electrification

Details

Project reference code: CR003b

HLOS driver: Electric Spine

Operating route: LNW(S)

Last updated: June 2017

CP5 output driver

This project is part of a wider electrification strategy to improve regional and national connectivity and links to ports and airports for both passengers and freight to support economic development. This strategy would increase the extent of the electrified network to create a 'critical mass' that facilitates the operation of electric, rather than diesel, trains.

The project would contribute to delivering:

- Improved rail industry efficiency and value for money
- Increased train carrying capacity and new through journey opportunities
- A reduction in the environmental footprint of rail
 - An improved train service without increasing the demand for scarce diesel multiple units

This project was formerly part of the Electric Spine Development Programme, which was requested in the CP5 High Level Output Statement (HLOS). The project was originally intended for delivery in parallel timescales to East West Rail Phase 2 until an instruction was received from the DfT in Autumn 2016 to remove any development work from the scope of the project, beyond GRIP 3 completion.

Network Rail's obligation

In CP5 develop an efficient solution which allows electric trains to operate between Oxford and Bletchley (initially 2tph plus any electrically hauled freight – determined by long term forecasts and dependent on rolling stock availability). This will require the project to complete GRIP3 single option selection.

Scope of works

To conclude GRIP 3 (Option Selection) to define the potential future interventions, which are anticipated to be as follows;

- To provide 25kv AC overhead electrification and associated power supplies / distribution, including running lines and crossovers, plus freight facilities (subject to business case).
- Between Bicester and Bletchley the railway is being completely reconstructed by the East West Rail Phase 2 project, which will make appropriate passive provision for future electrification to a definition agreed with the DfT.
- Electrical distribution design is based on the Central Traction Power Supply Study, but will need to be reviewed if the project is restarted at a later date.
- The design and development work of the project will define the best value outputs taking into account rolling stock availability, schedule risks and efficient delivery in the context of other enhancement projects.

Interfaces and assumptions

Current interfacing schemes, relevant to the design work undertaken are:

- W001a GW Electrification – development work has proposed shared feeding arrangements and physical interface at Oxford
- CR003(a) East West Rail phases 1 and 2 – upgrade / reinstatement of the railway along the line of route, including passive provision for electrification
- W006 Oxford station area / corridor – finalise track and signalling layout at Oxford
- F006 Strategic Freight Network – gauge clearance to Aristotle Lane Bridge

Activities and milestones (NR)

As per an instruction from the DfT, the project will now complete GRIP3 work only within CP5.

Milestone	Description	Date	Status
GRIP 3 AIP completion	Option selection and AIP	December 2016	Complete
GRIP3 AIP completion	Single option selection and AIP completion	July 2017	Complete

Electric Spine Development Programme

Description
Except for the work to deliver specific infrastructure required to facilitate a new hourly service to Kenilworth station this programme in its entirety is now planned for CP6. It is proposed that the following schemes, originally considered for development as part of the Electric Spine Development Programme, will not be developed in CP5 but will be considered as part of the enhancement programme in CP6: <ul style="list-style-type: none">• DC to AC conversion Southampton to Basingstoke• Electrification (25kv AC overhead) of the route between Bletchley and Bedford
Creating, over a number of control periods, a high-capability 25kV electrified passenger and freight route from the South Coast via Oxford and the Midlands to South Yorkshire.
Improves regional and national connectivity and links to ports and airports for both passengers and freight to support economic development.

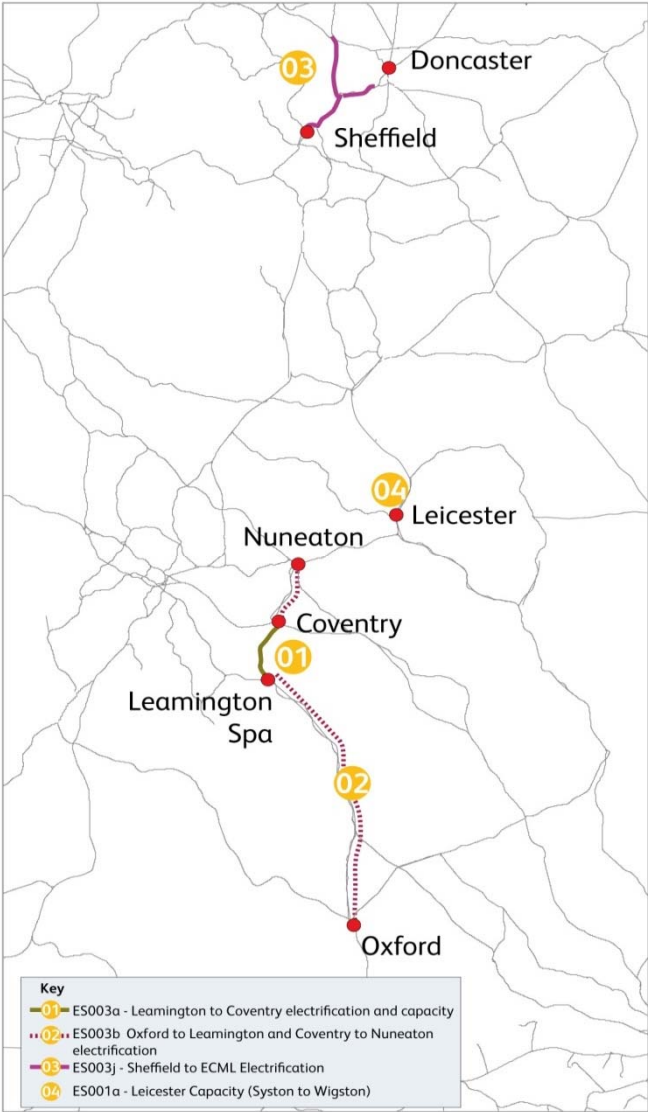
- EDP Reference Codes**
- ES003a – Leamington Spa to Coventry electrification and capacity
 - ES003b – Oxford to Leamington and Coventry to Nuneaton electrification
 - ES003j – Sheffield – ECML Electrification
 - ES001A – Leicester Capacity (Syston to Wigston)

- Significant Interfaces**
- East West Rail
 - Great Western Electrification
 - Midland Main Line Route Upgrade

Announcements

Date	Announcement
None	

Electric Spine



Leamington Spa to Coventry Electrification and Capacity

Details
Project reference code: ES003a
HLOS driver: Electric Spine
Operating route: London North Western (LNW)
Last updated: January 2016

CP5 output driver

The work to deliver specific infrastructure required to facilitate a new hourly service to Kenilworth station is now described under a separate entry ES003m. Remaining work on this project is now planned to start in CP6.

The High Level Output Specification (HLOS) for CP5 required the development of a north-south rail electrified corridor that will incrementally allow the transfer of both passenger and freight services from diesel to electric traction.

The outputs of this project between Leamington Spa and Coventry are to enable an increased number of train services to operate. This route section will form part of a 25kv electrified passenger and freight network from the south coast Solent area through the Thames Valley and linking the West and East Midlands to South Yorkshire.

In addition to the benefits listed above the project will contribute to improving rail industry efficiency and value for money, improving connectivity and reducing the environmental footprint of rail.

Network Rail's obligation

During CP6 and CP7 the project shall develop and deliver a solution, for the capacity enhancements and electrification required for future growth on the route between Leamington Spa and Coventry.

Scope of works

- Developing a solution to capacity interventions and electrification required between Leamington Spa and Coventry

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Oxford to Nuneaton - It is expected that the electrification and capacity enhancement of the route between Leamington Spa and Coventry will imminently become part of the Oxford-Nuneaton Corridor project through formal change control.

The following critical assumptions on internal factors are being made:

- Economies of scale are realised by transferring the scope of this project to the Oxford-Nuneaton Electrification project

The following critical assumptions on external factors are being made:

- That any TWA Order required can be achieved within an 18 month timeframe, in line with indicative project requirements

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP Completion	Single option selection and AIP completion	CP6	Regulated Output
GRIP 6 Completion	Infrastructure ready for use	TBC	Indicative

Oxford to Leamington and Coventry to Nuneaton Electrification

Details
Project reference code: ES003b
HLOS driver: Electric Spine
Operating route: LNW/Western
Last updated: March 2016

CP5 output driver

Work on this project is now planned to start in CP6.

The Government’s 2012 HLOS requires the development of a north-south electrified corridor that will incrementally allow the transfer of both passenger and freight services from diesel to electric traction. The route between Oxford and Nuneaton, via Coventry is a significant element of this, linking the electrification of the GWML and the already electrified WCML. Electrification of this route may act as an enabler for further electrification schemes in the future.

In addition to the benefits listed above the project will contribute to improving rail industry efficiency and value for money, improving connectivity and opening up new journey possibilities and reducing the environmental footprint of rail.

Network Rail’s obligation

In CP6, the project shall develop a solution, by completing single-option selection (GRIP 3), to the provision of an electrified railway between Oxford-Leamington and Coventry-Nuneaton.

It is expected that the electrification of the route between Leamington Spa and Coventry, together with the capacity enhancement between Milverton Junction and Kenilworth South junction, currently part of the Coventry-Leamington project, will imminently become part of this project’s scope to be developed and delivered in CP6.A formal change control will be undertaken at the earliest opportunity.

Scope of works

- The project is to develop options for the electrification of the route and complete single-option selection in CP6. This shall include:
- Developing a solution to structure interventions along the route to provide the required clearance
 - Developing a solution to the traction power supply requirements along the route.
 - Developing the design of the electrification system to be implemented.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Coventry to Leamington Capacity – the project assumes that capacity interventions associated with the proposed new station at Kenilworth, in the Leamington Spa and Milverton areas, will be delivered in advance of electrification.
- Oxford to Bletchley electrification
- GWML Electrification
- There is no interface between this project and the Coventry to Nuneaton Rail upgrade programme

The following critical assumptions on external factors are being made:

- That an efficient traction power supply solution can be identified and delivered in line with project requirements.
- That funding for delivery of the project will be available in CP6.
- That the rolling stock to be used on the route, once electrified, is identified early enough to be integrated into project design solutions.
- That any TWA Order required can be achieved in line with indicative project requirements.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection and AIP completion	CP6	Regulated Output
EIS Infrastructure authorised	Infrastructure authorised for passenger use	TBC	Indicative

Sheffield – ECML Electrification

Details

Project reference code: ES003J

HLOS driver: Electric Spine

Operating route: LNE/EM

Last updated: January 2016

CP5 output driver

Work on this project is now planned to start in CP6.

The High Level Output Specification (HLOS) for CP5 requires the development of a north-south electrified corridor that will incrementally allow the transfer of both passenger and freight services from diesel to electric traction. The electrification of the route between Sheffield and the East Coast Main Line (Doncaster and Wakefield) is a component part of this output, linking the electrification of the Midland Main Line (MML) and the already electrified East Coast Main Line (ECML).

In addition to the benefits listed above the project will contribute to improving rail industry efficiency and value for money, improving connectivity and opening up new journey possibilities and reducing the environmental footprint of rail.

Network Rail's obligation

In CP6, the project will develop a solution to the provision of an electrified railway between Sheffield and the ECML at both Doncaster and South Kirkby Junction, by completing single-option selection (GRIP 3).

Scope of works

The project is to develop options for the electrification of the route and complete single-option selection in CP6. This will include:

- Developing solutions for structure interventions along the route to provide the required clearance for electrification
- Developing a solution to the traction power supply requirements along the route.
- Developing the design of the electrification system to be implemented.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Midland Main Line Electrification. The project assumes that any traction power supply requirements that jointly support both MMLE and this project will be developed and implemented by MMLE.
- Midland Main Line Electrification and Sheffield Station Re-modelling. The project assumes that an integrated electrification design will be developed at Sheffield station electrification between the three projects.
- ECML Power Supply Upgrade – The project assumes that any traction power supply requirements that jointly support both this and ECML Upgrade will be developed and implemented by ECML Power Supply Upgrade project.
- Tram-Train – it is assumed that this project will have no impact on the design and implementation of Sheffield – ECML Electrification project.

The following critical assumptions on external factors are being made:

- That an efficient traction power supply solution can be identified and delivered in line with project requirements;
- That funding for delivery of the project will be available in CP6;
- That the rolling stock to be used on the route, once electrified, is identified early enough to be integrated into project design solutions.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection	CP6	Regulated Output
EIS Infrastructure authorised	Infrastructure authorised for passenger use	TBC	Indicative

Leicester Capacity (Syston to Wigston)

Details

Project reference code: ES001A

HLOS driver: Electric Spine

Operating route: East Midlands

Last updated: January 2016

CP5 output driver

Work on this project is now planned to start in CP6.

The High Level Output Specification (HLOS) for CP5 required the industry to develop and deliver a number of strategic capacity enhancement schemes as part of the Electric Spine Development Programme.

This capacity scheme will deliver one of these strategic capacity enhancement schemes to support the expected passenger and freight service increases within the Leicester corridor (Syston – Wigston) both on the Midland Main Line and the Felixstowe – Nuneaton corridors. This growth results from a general increase in demand on both corridors including additional long distance high speed passenger services, growth in aggregates and intermodal freight flows. The project will also improve journey times and reduce operational costs for passenger and freight services on this corridor.

Network Rail's obligation

An initial increase in passenger and freight service demand is expected through the Leicester corridor. This project will develop solutions necessary to meet the output driver: to enable an increase in capacity to support forecast growth (freight and passenger). Further capacity enhancement works may be required beyond CP6 to support longer term forecast freight and passenger growth through to 2043.

Scope of works

- Currently the project is in the process of closing out GRIP Stage 2. The remit is to provide capacity to meet growth forecasts to 2023 and to build towards 2033 and 2043 forecast levels.
- Given changes to the delivery timescale for capacity enhancement works on other key routes, notably the F2N corridor a limited refresh of GRIP 2 will be undertaken in early 2016 against revised traffic forecasts to ensure the proposed outputs in CP6 remain aligned with forecast demand.
- Currently it is assumed the works will deliver grade separation at Wigston, up and down slow lines between Leicester and Wigston, a new slow line

platform at Leicester and up and down slow lines between Humberstone Road and Syston to aid improved capacity/train regulation in the Syston area.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Midland Main Line electrification (ES001) - potential impact on infrastructure design and the overall efficient delivery of works within the Leicester corridor
- MML Long Distance High Speed Train Services (EM001) - potential impact on infrastructure design at Leicester station
- Development of additional capacity on the Felixstowe – Nuneaton corridor

The following critical assumptions on internal factors are being made:

- All electrification works will be delivered by the Midland Main line electrification project (see ES001 Milestones) although it may ultimately prove more appropriate or efficient for the Leicester Capacity scheme to deliver certain electrification enabling works.
- The project will be delivered in conjunction with the planned CP6 Signalling Renewals scheme at Leicester.

The following critical assumptions on external factors are being made:

- Passenger rolling stock will be 12 car class 377 or class 350 trains or their derivatives and 10 car class 222 trains. Freight trains will be diesel hauled class 6 up to 2600 tonnes trailing load as a maximum

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 2 completion	Pre-feasibility	CP6	Indicative
GRIP 3 AIP completion	Single option selection and AIP completion	CP6	Regulated output
GRIP 6 start on site	Commencement of site works	TBC	Indicative
EIS infrastructure authorised	Infrastructure authorised for passenger and freight services	TBC	Indicative

Ely North Junction Capacity Improvement

Details
Project reference code: A001
HLOS driver: Airport and port access
Operating route: Anglia
Last updated: January 2016

CP5 output driver

All work on this project is now planned for CP6.

The track arrangement at Ely North Junction has been identified as one of a number of constraints to increasing passenger services in the Ely area. This project will develop a scheme which improves capacity in the area by developing an operationally flexible junction that can deliver multiple train moves simultaneously. This is an enabling project to allow for a future uplift in trains across the junction, once other (currently unfunded) works are completed.

Owing to the level crossings assessment work undertaken, the project objectives have been redefined to encompass the wider capacity constraints. This forms the basis for the amended project plan.

Network Rail's obligation

CP6: to develop a range of feasible options to address the constraints at Ely North Junction along with the level crossings.

Scope of works

- Develop a range of feasible options that address Network Rail's CP5 obligation which focus upon:
 - Changes to the arrangement of the railway and associated infrastructure between Ely station and the surrounding area
 - The required infrastructure to address the constraints in the project area
 - Impact upon the local area
- Consideration of the engineering access requirements for delivery of the project in CP6.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Re-control of signalling to Romford ROC
- Felixstowe to Nuneaton Programme - Ely North Junction must be open to allow for engineering trains during construction
- All Anglia enhancement and renewals projects - due to Ely North Junction's proximity to Whitemoor Yard, Ely North Junction would need to remain open or an alternative route found for the passage of engineering trains
- Development activity of the Kings Lynn 8-Car project

The following critical assumptions on internal factors are being made:

- Resource availability
- Route availability during construction of changes as a result of this project.

The following critical assumptions on external factors are being made:

- The scheme is affordable
- Changes can be made to the railway layout in the Queen Adelaide area
- Planning will be approved
- Additional land likely to be required will be available
- Development processes involved are likely to have long lead times due to significant changes to the scope of the project.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	AIP completion	CP6*	Regulated Output
EIS Infrastructure Authorised	Infrastructure authorised for passenger use	CP6*	Indicative

* Due to the revised objectives for this project, the programme and the re-definition of this project is under review. Network Rail is working with its customers and Department for Transport to achieve an agreed programme of delivery.

Anglia Traction Power Supply Upgrade

Details

Project reference code: A002

HLOS driver: Capacity enabler

Operating route: Anglia

Last updated: March 2017

CP5 output driver

This project supports the achievement of the capacity metric in the government's 2012 HLOS relating to the numbers of arriving passengers to be accommodated at London Liverpool Street in the morning three-hour peak and one-hour high-peak.

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 to provide additional power to support the capacity increases into London Liverpool Street. It will also consider the implications associated with future service increases and rolling stock changes in CP6 (funding outside PR13).

This project will provide the required power capability to accommodate the service increases indicated in A003 and A004, along with incremental train lengthening on some services that are currently 'short formed'.

Network Rail's obligations

Network Rail's obligations are to deliver the traction power supply upgrades necessary to enable the following service changes, compared to the May 2015 timetable:

West Anglia Inner

- 2 additional AM peak services from Angel Road to Stratford
- Replacement rolling stock for LOROL-operated West Anglia Inner services

West Anglia Outer

- AM peak hour service from King's Lynn to Cambridge consisting of one 4-car Class 317 or Class 379 train, plus two 8-car Class 377 trains
- AM contra-peak hour service from Cambridge to King's Lynn consisting of one 4-car Class 377 train and one 8-car Class 377 train

Great Eastern Main Line

- 2 additional AM peak services on the core route between Shenfield and London Liverpool Street (assumed to originate from Chelmsford within this work)

- Crossrail services (12tph Shenfield to Pudding Mill Lane portal and 4tph Gidea Park to London Liverpool Street)

Scope of works

The following is a summary of the scope of works required to deliver the output and obligations described above.

West Anglia Inner

- Increase the Firm Service Capacity at Northumberland Park to 18MVA
- Upgrade life-expired switchgear at Northumberland Park

West Anglia Outer

- Increase the Conditional Service Capacity at Ugley to 12MVA *
- Increase the Firm Service Capacity at Milton to 16MVA *
- Increase the Firm Service Capacity at King's Lynn to 3MVA *

(* This scope requires works only on adjacent UKPN infrastructure)

Great Eastern Main Line

- Provide a new 400kV bulk supply point and AT-ready feeder station at Bulls Lodge (near Boreham)
- Remove the existing 132kV bulk supply point and feeder station at Springfield
- Minor upgrades to overhead line equipment for up to 3km either side of the existing neutral section at Springfield

Interfaces and assumptions

There are significant CP5 schemes linked to this project.

The following critical assumptions on internal factors are being made:

- AT feeding between Springfield and Colchester will not be required for the CP5 timetable specification

The following critical assumptions on external factors are being made:

- 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 London 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).
- If additional traction power is required to support the proposed new station at Cambridge North (Chesterton) it will be funded and delivered by other projects

Activities and milestones (NR)

West Anglia Inner

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	July 2014	Complete
GRIP 4 completion	Single option scope defined	February 2016	Complete
GRIP 6 start	Start on site	June 2016	Complete
EIS – Infrastructure authorised	Additional power available for use by electric train operators	September 2016	Complete

West Anglia Outer

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	April 2015	Complete
GRIP 4 completion	Single option scope defined	November 2016	Complete
GRIP 6 start	Start on site	April 2017	Complete
EIS – Infrastructure authorised	Additional power available for use by electric train operators	November 2018	Regulated Output

Great Eastern Main Line

Milestone	Description	Date	Status
GRIP 4 completion	Single option scope defined	June 2016	Complete
GRIP 6 start	Start on site	November 2016	Complete
EIS – Infrastructure authorised	Additional power available for use by electric train operators	March 2019	Regulated Output

West Anglia Main Line Capacity Increase

Details

Project reference code: A003

HLOS driver: City capacity – London Liverpool Street (terminating)

Operating route: Anglia

Last updated: March 2018

CP5 output driver

The project will relieve overcrowding and supports the achievement of the capacity metric in the Government's 2012 HLOS on the West Anglia Main Line. The project shall deliver a scheme targeted at implementing the southern part of recommendation C2b in the July 2011 London and South East RUS. This scheme is intended to address the medium term demand arising from industrial and residential developments in the vicinity of Tottenham Hale, Northumberland Park and the new Meridian Water development with a view to achieving an additional two trains per hour between Stratford and Meridian Water stations.

Network Rail's obligation

Network Rail's obligation is to deliver a solution to allow for an additional two trains per hour to operate from Tottenham Hale to Stratford compared to the December 2014 Timetable in which two trains per hour currently operate.

Network Rail will also deliver infrastructure to allow these services to be extended beyond Tottenham Hale to a new station at Meridian Water (funded by external stakeholders).

Scope of works

- Additional track between Coppermill Junction and a new station at Meridian Water with associated signalling and overhead line modifications.
- New platforms and step free access bridges at Tottenham Hale and Northumberland Park.
- Closure of Northumberland Park level crossing
- A new station at Meridian Water
- Passive provision for future capacity improvements between Tottenham Hale and Meridian Water.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Gospel Oak to Barking electrification project - currently the West Anglia and Gospel Oak to Barking routes cannot be closed at the same time due to the need to allow for diversionary access from each.
- Emerging proposals for Crossrail 2, which suggest the northern part of the route may be via the Lea Valley. Crossrail 2 is basing early feasibility designs on the assumption that this A003 project is delivered to current design.
- The Transport for London project delivering station enhancements at Tottenham Hale. These station enhancements are fully integrated with delivery of changes at Tottenham Hale by this project.
- The Crossrail programme is carrying out a large amount of works planned within the Anglia route area and as a result access and resource levels are constrained.

The following critical assumptions are being made:

- There will be sufficient rolling stock available to operate additional services.
- That no additional stabling facilities will be required for the rolling stock to operate the revised service.
- All works can be accommodated within the current operational rail boundary.
- All works can be delivered through one programme to maximise efficiency
- Sufficient engineering possessions will be granted for construction of this project and that no enabling works will need to be completed to diversionary routes.
- All reasonable critical plant and materials will be made available by Route Services to suit programme requirements. Additionally it is assumed that critical resources will be available to support delivery of the scheme.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection and AIP completion	30 January 2016	Complete
GRIP 4 completion	Single option scope defined	30 May 2016	Complete
GRIP 6 start	Start on site (main works)	24 September 2016	Complete
GRIP 6 completion	Infrastructure construction completion between Lea Bridge and Northumberland Park	31 December 2018	Indicative
GRIP 6 completion	Infrastructure ready for use (Meridian Water station)	16 April 2019	Indicative
EIS – Infrastructure authorised	Infrastructure Entry into Service	19 May 2019	Regulated Output

Great Eastern Main Line Capacity Improvement (Bow Junction)

Details
Project reference code: A004
HLOS driver: City capacity – London Liverpool Street (terminating)
Operating route: Anglia
Last updated: March 2018

This project will no longer be delivered in CP5 as the proposed passenger capacity outputs have been achieved through the introduction of new rolling stock.

CP5 output driver

The project will relieve overcrowding and supports the achievement of the capacity metric in the Government’s 2012 HLOS on core main line services between Shenfield and London Liverpool Street. Additional peak capacity into London is achieved through enabling 2 additional morning peak main line services per hour (totalling 24 main line trains per hour in the high peak). These additional services are assumed to operate between Southend Victoria and London Liverpool Street.

Network Rail’s obligation

In CP5 Network Rail’s obligation is to develop the solution required at Bow Junction to enable the 2 additional main line peak services between Southend Victoria and London Liverpool Street compared to the December 2014 timetable, to total 24 trains per hour in the high peak.

In CP6 Network Rail’s obligation, subject to further funding being agreed, is to deliver the changes required to Bow Junction to enable the 2 additional main line peak services between Southend Victoria and London Liverpool Street compared to the December 2014 timetable.

Scope of works

- Remodel Bow Junction and verify that all other elements of the infrastructure are capable of supporting a reliable and robust train service on the introduction of an additional 2 trains per hour. The project enables more efficient use of the capacity released on the Electric Lines into London Liverpool Street following diversion of most peak suburban services through the Crossrail tunnel in 2019.
- Undertake timetabling, rolling stock utilisation and performance studies to validate additional services can be accommodated with acceptable impact on reliability.

- Track (S&C and Plain Line) and OLE realignment, Signalling structure modification and interlocking upgrades to ensure capacity is available.

Kings Lynn – Cambridge 8-car

Details

Project reference code: A006

HLOS driver: Capacity

Operating route: Anglia

Last updated: December 2017

CP5 output driver

The project will relieve overcrowding in the Peak Hour between Kings Lynn and Cambridge. These services are currently 8-car or 12-car between Cambridge and London Kings Cross but due to constraints on the Kings Lynn Line are only 4-car in length north of Cambridge. There is Peak crowding on these services particularly between Ely and Cambridge.

Network Rail's obligation

Network Rail's obligation is to develop a solution to enable 8-car operation of Peak services between Kings Lynn and Cambridge (and onto London Kings Cross).

Scope of works

This project will develop a scheme that allows for 8-car operation at all stations on the Kings Lynn Branch Line, which includes investigation of;

- Infrastructure capable of 8 – car operations at Waterbeach, Littleport and Watlington via: SDO, Platform Extension or Platform Relocation
- Closure of 1 Barrow Crossing and provision of alternative access at Littleport;
- Options for additional siding facilities for 2 x 4-car units at Kings Lynn
- Delivery programme
- Traction power modelling

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes which will also deliver works in the area are:

- Anglia PSU A002 – West Anglia Outer power supply changes;

The following critical assumptions on internal factors are being made:

- The works can be contained within the current property boundary and be undertaken using Network Rail's Permitted Development Rights, excluding the siding at Kings Lynn;
- Other CP5 enhancements in the Anglia Route area are underway and as a result access and resource levels are constrained;
- Peak services which require lengthening are assumed to arrive/depart London between 0700-1000 and 1600-1900.

The following critical assumptions on external factors are being made:

- Funding is made available to develop this scheme;
- There will be sufficient Rolling Stock made available to increase train length upon delivery of the project;
- It is assumed for the purposes of modelling and development that the Rolling Stock will be of type Class 379;
- Funders will need to decide if this scheme progresses once GRIP 5-8 cost and programme are understood.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 2 completion	Pre-feasibility	October 2016	Complete
GRIP 3 AIP completion	Completion of AIP	February 2018	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	TBC*	Indicative
Output delivered	First timetabled public use of the infrastructure	TBC*	n/a

*Dependent on the outcome of the GRIP 4 stage and whether funding is agreed for implementation of the scheme.

Midland Main Line Programme – Key Outputs 1 & 1a

Details

Project reference code: N/A

HLOS driver: Electric Spine, Capacity Metric, PJIF, Depots and Stabling

Operating route: EM/LNE

Last updated: September 2017

CP5 output driver

This Enhancements Programme is part of a rail industry programme that aims to transform travel to and from London on the Midland Mainline during CP5 and CP6 and improve the links between the core centres of population and economic activity in the East Midlands and South Yorkshire.

The industry wide programme benefits include:

- Reduced journey times for passenger and freight trains
- Increased capacity of the infrastructure leading to more train paths being available
- Greater capacity on trains to cater for the projected increase in passenger numbers travelling on the route
- Greater capability on the route to handle longer passenger trains
- Improved gauge capability for large box container trains (W12)
- Reduced railway industry costs
- Reduced carbon emissions through the creation of an electrified route from London St Pancras to Corby and the replacement of the existing diesel passenger fleet with electric stock and/or bi-modal stock.

The High Level Output Specification (HLOS) sets out the Government's strategy for CP5. This programme delivers a key part of this strategy.

Key Outputs

The MML Programme has a phased delivery over two key output dates

Key Output 1 – August 2020 for Entry into Service Infrastructure Authorised:

- Provision of 25kv electrification from the existing limits at Bedford to Kettering and Corby; providing traction power for 2 electric passenger train services.
- Enabling of improved journey times through the delivery of key infrastructure schemes;

- Additional capacity for a 6th Long Distance High Speed service to serve between St Pancras and Kettering / Corby; and 3 freight paths per hour between Bedford and Kettering.
- The capability of the network will be enhanced through the extension of platforms at key stations south of Leicester.
- New stabling facilities will also be provided at Kettering.

Key Output 1a – CP6* (see activities and milestones for *):

- Enable 6 Long Distance High Speed Services to use electric traction from Market Harborough/Kettering to London;
- Increase the permissible speed for electric trains on the existing fast line infrastructure south of Bedford;
- Provide traction power for 6 Long Distance High Speed services on the existing infrastructure south of Bedford;
- Enabling of improved journey times through the delivery of key infrastructure schemes; and
- Additionally the capability of the network will be enhanced through the extension of platforms at key stations north of Leicester.

The current programme consists of the following projects; refer to the individual project descriptions below for detailed delivery plans, interfaces and assumptions.

Summary of MML Programme Works

Midland Main Line Programme	Key Output (KO)	EDP Number
London to Corby Electrification & Capacity Upgrade <i>Inc. Depot & Stabling Fund works at Kettering</i>	KO1	EM001
Kettering to Corby Capacity	KO1	EM001
Derby Station Area Remodelling	KO1	EM001
Passenger Journey Improvement Fund <ul style="list-style-type: none"> Market Harborough Linespeed Leicester South Linespeed Derby to Sheffield Linespeed – Phase 1 	KO1	F007 These projects are being developed under this EDP number, to be transferred to this MML Programme EDP entry post-GRIP4.
Midland Main Line Bi-mode enabling	KO1a	EM001
Long Distance High Speed Train Lengthening – Phase 2	KO1a	EM001
Passenger Journey Improvement Fund <ul style="list-style-type: none"> Derby to Sheffield Linespeed – Phase 2 	KO1a	F007 This project is being developed under this EDP number, to be transferred to this MML Programme EDP entry post - GRIP4.

Network Rail's obligations

To deliver the infrastructure works listed above to the agreed timescales to enable the Key Outputs to be met by the industry and:

- To provide Overhead Line Electrification (OLE) at 25kV AC, for the following sections of the route, so that Electric Trains can run from the following dates:
 - Bedford to Kettering and Corby – August 2020.
- To provide gauge of the sections of route listed below to W6a, W7, W8, W9, W10 & W12 between Bedford and Corby where not already cleared.
- To develop solutions to provide traction power and other associated asset capability to allow 6 long distance high speed services to use electric traction between Market Harborough/Kettering and London in CP6.
- To provide speed capability to the OLE system between London St Pancras to Bedford South Junction, to allow electric rolling stock to operate at the published permanent speed restriction
- Carry out the infrastructure works required to enable an increase in capacity to a maximum of five train paths per hour in each direction between Kettering and Corby.
- To develop solutions to allow six passenger services and three freight services per hour in each direction between Bedford and Kettering by May 2020.
- To provide infrastructure to allow segregation of services through the station platforms at Derby Station and an increase in the line speed to 40mph for through services. The new track layout to the west of the station will remove the existing constraint at London Road Junction and facilitate parallel movements into and out of the station for trains arriving or heading out to the west and south.
- To develop solutions to improve the passenger journey on the Midland Main Line by increasing the line speed at Market Harborough, Leicester South (London Road Junction) and between Derby Station and Sheffield
- To improve infrastructure capability to enable the introduction of longer trains (up to 240m) on the MML on selected services in order to accommodate the forecast levels of passenger growth specified in the 2012 HLOS and to reduce crowding on MML Long Distance High Speed (LDHS) services between London St. Pancras and Nottingham and Sheffield.

Interfaces and assumptions

There are significant CP5 and CP6 schemes linked to this programme. Other key interfacing schemes and their potential impact are:

- Syston to Stoke gauge enhancement - potential impact on cost
- Leicester Capacity - potential impact on infrastructure design and staging of works
- Sheffield station area remodelling - potential impact on cost
- Northern Hub Programme - Dore Junction doubling – potential impact on infrastructure design
- East West Rail (Bedford area) - potential impact on infrastructure design
- Sheffield to East Coast Electrification - potential impact on infrastructure design and staging of works
- Future schemes as identified through the long term planning process - potential impact on infrastructure design and staging of works
- High Speed 2 – Eastern Leg – potential impact on infrastructure design and staging of works

The following critical assumptions on internal factors are being made:

- Integrated renewals work and other funds that contribute towards an output will continue to do so
- The existing published and agreed gauge for the route sections require no further work to maintain this capability
- Resources are available to complete the works and the key works in interfacing projects

The following critical assumptions on external factors are being made:

- The Key Outputs are dependent on rolling stock availability. Other than London to Corby Electrification & Capacity Upgrade (Kettering stabling and Long Distance High Speed services platform lengthening works) and Long Distance High Speed services platform lengthening works - phase 2, this Programme does not include, and is not funded for, associated ancillary works necessary to enable the introduction and operation of electric trains, other electric traction and any other new traction/vehicles introduced during the life of the programme. These excluded works include:
 - Vehicle change
 - Depots / stabling works
 - Platform lengthening and associated facilities
 - Route availability for rolling stock above RA5
 - Traction changeover

These works will need to be aligned to the Programme to deliver bi-modal train operation.

- The Programme's outputs are not required to deliver any capacity enhancements north of Kettering North Junction, with the exception of any benefits gained from Derby Area Station Remodelling project
- The Programme does not include for any additional OLE or gauge clearance works south of Bedford Station (slow lines) or south from Ford End Road bridge (Fast Lines) at Bedford, other than adjustments to existing Fast Line OLE south of Bedford to raise permissible electric traction speed.
- The Programme does not include any interim stages (requiring Entry into Service for driver training) other than those listed in the individual schemes.

Activities and milestones (NR)

Key Output	Activity		Date	Status
Key Output 1	Kettering to Corby Capacity	Grip 3 completion	January 2014	Completed
Key Output 1 / 2	Midland Main Line Electrification	Grip 3 completion	June 2014	Completed
Key Output 1	Derby Remodelling	Grip 3 completion	February 2015	Completed
Key Output 1	LDHSS – Phase 1	Grip 3 completion	July 2015	Completed
Key Output 1	Bedford to Kettering Capacity	Grip 3 completion	July 2016	Completed
Key Output 1	Market Harborough LSSI	Grip 3 completion	July 2017	Completed
Key Output 1	Leicester South LSI	Grip 3 completion	July 2017	Completed
Key Output 1	Derby North JTI	Grip 3 completion	September 2018	Indicative
Key Output 1	Kettering to Corby Capacity	EIS Infrastructure authorised - Infrastructure authorised for passenger and freight use	February 2018	Completed
		5 train paths per hour Kettering – Corby - Infrastructure available for passenger & freight services*	February 2018	Completed
	London to Corby Electrification & Capacity Upgrade (*)	GRIP 3 completion (**)	September 2017	Completed
		Platform Lengthening - EIS Infrastructure authorised for passenger use.		Regulated output
		Kettering Stabling Facility - EIS Infrastructure authorised	May 2020	Indicator
		EIS Infrastructure authorised - Infrastructure authorised for passenger use – prioritised electrified route		Regulated output
		EIS Infrastructure authorised - Infrastructure authorised for passenger use – full electrified route	August 2020	Regulated output
		- Provision of 25kv OLE Prioritised Route/ Additional Capacity/ Stabling Facility/Platform Lengthening - Infrastructure available for passenger &/or freight services	December 2020	Indicator
		- First timetabled public use of the infrastructure (6 passenger and 3 freight paths per hour Bedford – Kettering possible)	December 2020	Indicator
	Derby Remodelling	EIS Infrastructure authorised - Infrastructure authorised for passenger use	October 2018	Regulated output
		Output delivered (JTI) - First timetabled public use of the infrastructure	December 2018	Indicator
Key Output 1a	Midland Main Line Bi-mode enabling (Kettering to Nottingham & Sheffield)	GRIP 3 completion – Single option selection (and AIP completion)	CP5*	Indicative
		EIS Infrastructure authorised –Infrastructure authorised for passenger/freight use	CP6 *	Indicative
	Long Distance High Speed Services train lengthening	GRIP 3 completion - Single option selection (and AIP completion)	June 2020	Regulated output
		EIS Infrastructure authorised - Infrastructure authorised for passenger/freight use	March 2023	Indicator
		Increased capability - Infrastructure available for passenger services	March 2023	Indicator

(*)MML Programme is currently assessing the impact of a new client Instruction. Agreement with the client (DfT) and the ORR to provide holding milestones in the September EDP update. A more detailed set of milestones are to be developed and published in future Enhancement Delivery Plan update.

PJIF - Market Harborough LSSI, Leicester LSI and Derby North JTI are not included in the MML programme at this point as they are being developed to GRIP4 as part of the separate EDP PJIF entry. It is anticipated that, post this milestone, these projects will be delivered as part of the MML programme and become part of this EDP entry.

Midland Main Line Programme – Key Outputs 1 & 1a Project Descriptions

London to Corby Electrification & Capacity Upgrade

The scope of works is to:

- Installation of an additional slow line between Sharnbrook Junction and Kettering South Junction along with all associated signalling, telecoms, earthworks and structures works, to provide a four track section to allow 6 passenger services and 3 freight services per hour in each direction.
- Install OLE infrastructure between Bedford South Junction (fast lines) and Bedford Station (slow lines) to Corby.
- Provide connections to the National Grid and other associated works (e.g. substation and distribution)
- Provide W6a/7 to W12 gauge clearance between Bedford South Junction to Corby.
- Provision of new infrastructure to a maximum line speed of 90 mph (noting existing infrastructure will remain at its published PSR);
- Provision of axle weight clearances between Sharnbrook Junction and Kettering South Junction of RA10 at 60mph and RA8 at 90mph (up to permissible line speed) on the new slow line.
- Provide the means to call 240m trains at the following stations: Bedford, Wellingborough, Kettering, Corby and Market Harborough
- Provision of an electric stabling facility at Kettering

The following works are excluded from the scope:

- This project does not address station capacity and depot capacity, other than the platform accommodation of the lengthened trains and electric stabling at Kettering.
- Excluded are any improvements to Route Availability above RA5 for loco hauled stock or gauging requirements for any of the suggested rolling stock types.

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- MML Programme – Capacity (Kettering to Corby) (ES003H) - potential impact on infrastructure design through adjustment of multi-discipline designs during detailed design phase.
- East West Rail (Bedford area) - potential impact on infrastructure design
- Level Crossing Safety Enhancement programmes – Various - potential impact on infrastructure design at affected stations
- Thameslink Programme – potential impact on infrastructure design.

The following critical assumptions on internal factors are being made:

- Integrated renewals work that contribute funding towards an output will remain within the work bank
- The existing published and agreed gauge for the route sections require no further work to maintain this capability
- Signalling design and testing resources are available to complete the works and the key works in interfacing projects
- Market Harborough PJIF project will align design and deliver the Key Output 1 requirements of platform lengthening by the proposed location of the realigned platforms.

The following critical assumptions on external factors are being made:

- All critical assumptions on rolling stock can be found in the MMLP rolling stock assumptions document.
- The EIS Infrastructure authorised date is dependent on rolling stock availability to enable ORR authorisation and TSI Technical File completion.
- 3rd party owned power and telecommunication lines that are required to be moved due to new electrification equipment will be funded by the owning parties.
- Bulk power supply sources (grid point connections) can be provided to the required timescales
- For platform lengthening, structural strengthening/alteration and major junction remodelling or re-signalling will not be required.

Kettering to Corby Capacity

The scope of works includes:

- Works necessary to deliver an increase in capacity to a maximum of five train paths per hour in each direction between Kettering and Corby, from December 2019:
 - Installation of an additional track between Kettering and Corby to 'double track' the existing single line section along with all associated signalling, telecoms, earthworks and structures works;
 - Increase in line speed (new and existing line) up to 90mph;
- Provision of W6a/7 gauge clearance (new line based on existing structure clearance) on the Kettering to Corby route;
- Provision of axle weight clearances between Kettering and Corby of RA10 at 60mph and RA8 at 90mph;
- Reduced signalling headways between Corby and Manton.

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- MML Programme – London to Corby Electrification & Capacity Upgrade - potential impact on infrastructure design at Kettering and Corby

The following critical assumptions on internal factors are being made:

- All electrification works and W12 gauge clearance on this corridor will be delivered by the London to Corby Electrification & Capacity Upgrade project.

The following critical assumptions on external factors are being made:

- Passenger rolling stock will be 10 car class 222s and HSTs (220m), freight rolling stock will be diesel hauled class 6 with up to 2600 tonnes trailing load. The London to Corby Electrification & Capacity Upgrade project will include an assumption for passenger rolling stock and will carry out the infrastructure works associated with this rolling stock.

Derby Area Station Re-Modelling

CP5 output driver

The project output is to contribute to the Government's 2012 HLOS metric for journey improvement by providing a layout in the Derby geographical area that enables reduced journey times and improves performance by increasing line speed and segregating services through Derby Station.

This project is aligned to planned signalling and track renewals in the station area.

Network Rail's obligation

Network Rail's obligation is to provide infrastructure to allow segregation of services through the station platforms and an increase in the linespeed to 40mph for through services. The new track layout to the west of the station will remove the existing constraint at London Road Junction and facilitate parallel movements into and out of the station for trains arriving or heading out to the west and south.

In addition to the obligation above the remodelled station is anticipated to provide the additional benefits listed below:

- Track line speeds designed for optimum performance of electric traction.
- Facility for freight regulation (loops) in the station area on the primary freight route (West to North) with 40 mph switches and crossings
- Improved performance and reliability of signalling assets with the renewal of 1960's signalling equipment
- Improved performance and reliability of track through removal of bespoke assets and replacement with standardised components, with the inclusion of condition monitoring technology
- A simplified layout that can accommodate overhead electrification in an efficient manner, with suitably immunised assets
- Maintained ability for the existing diesel rolling stock to utilise Etches Park

The scope of works consists of:

- Signalling and track remodelling in the station area
- Construction of a new station platform and necessary alterations to the station footbridge
- Alterations to existing station platforms in order to facilitate track layout
- Renewal of simplified level crossing at Spondon, after removal of disused assets at Spondon Sidings
- Alterations to Etches Park depot entrance and Chaddesden Sidings

There are significant CP5 signalling and track renewals in the Derby Area linked to this project. Other interfacing schemes and potential impacts are:

- Midland Main Line electrification - potential for shared construction access
- Re-control of signalling between Derby and Stretton – aligned with this project to minimise disruption to train operations.
- Journey time improvement between Derby and Sheffield - potential for shared construction access

The following critical assumptions on internal factors are being made:

- Other projects that require significant track access in the Derby area will be aligned and can be delivered without material impact on the remodelling programme and consents required

The following critical assumptions on external factors are being made:

- The implementation strategy and required track access will be agreed with stakeholders in accordance with the programme
- There is no requirement for this project to increase current capacity
- The current capability (gauge) and capacity of the infrastructure shall not be reduced by the remodelling.
- Any works associated with the potential to stable and/or maintain an electric fleet at Etches Park and Chaddesden Sidings are not included in the scope of this project.

Midland Main Line Bi-mode Enabling

The scope of works is to:

- Provide connections to the National Grid and other associated works (e.g. substation and distribution)
- Make appropriate adjustment of Fast Line OLE between London St Pancras to Bedford South Junction
- Make appropriate adjustments to the existing infrastructure south of Bedford to provide traction power supplies and associated asset works
- Provide infrastructure which is capable of high speed traction change over
- Deliver, if required, and other bi-mode enabling works that emerge through project development.

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- MML Programme – London to Corby Electrification & Capacity Upgrade potential impact on infrastructure design through adjustment of multi-discipline designs during detailed design phase.
- East West Rail (Bedford area) – potential impact on infrastructure design
- Thameslink Programme – potential impact on infrastructure design

The following critical assumptions on internal factors are being made:

- Integrated renewals work that contribute funding towards an output will remain within the work bank
- The existing published and agreed gauge for the route sections require no further work to maintain this capability
- Signalling design and testing resources are available to complete the works and the key works in interfacing projects

The following critical assumptions on external factors are being made:

- All critical assumptions on rolling stock can be found in the MMLP rolling stock assumptions document.
- The EIS Infrastructure authorised date is dependent on rolling stock availability to enable ORR authorisation and TSI Technical File completion.
- 3rd party owned power and telecommunication lines that are required to be moved due to new electrification equipment will be funded by the owning parties.

- Bulk power supply sources (grid point connections) can be provided to the required timescales
- This project does not include, and is not funded for, associated ancillary works necessary to enable the introduction and operation of electric trains and other electric traction (e.g. vehicle change, depots / stabling works, platform lengthening and associated facilities or route availability for rolling stock above RA5) which will need to be aligned to the programme to deliver electric train operation.

Long Distance High Speed Train Lengthening

The scope of works is to:

- Provide the means to call 240m trains at Long Eaton, Loughborough, East Midlands Parkway, Beeston, Chesterfield and Sheffield. Options considered may vary at each platform/station, including one or a combination of:
 - Operation control measures at platforms
 - Platform extensions
 - New footbridges
 - Minor signalling changes

The following works are excluded from the scope:

- This project does not include associated ancillary works necessary to enable the introduction and operation of electric trains (e.g. rolling stock clearance, depots or stabling works as a result of the operation of electric trains).
- This project does not address station capacity and depot capacity, other than the platform accommodation of the lengthened trains.
- Excluded are any improvements to Route Availability above RA5 for loco hauled stock or gauging requirements for any of the suggested rolling stock types. Platform canopy alterations are excluded from the scope and AFC.

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- MML Electrification (ES001) - potential impact on infrastructure design and delivery timescales at all stations, e.g. holistic design for full length of operational platform and integration of possessions. .
- Sheffield station area remodelling - potential impact on infrastructure design and delivery timescales, e.g. if elements of scope are transferred to this project.

The following critical assumptions on internal factors are being made:

- The aspiration for the Route is W6a/W7/W12 gauge clearance
- Any platform extensions delivered by this project will not inhibit these gauge clearance aspirations
- There are the necessary resources, particularly signalling, to complete the works

The following critical assumptions on external factors are being made:

- 12 x 20m vehicles or 8 x 26m vehicles with multiple pantographs and Selective Door Operation (SDO) are assumed to be in operation.
- For platform lengthening, structural strengthening/alteration and major junction remodelling or re-signalling will not be required.

Market Harborough Line Speed Improvement (PJIF funded)

Details

Project reference code: ES003k

HLOS driver: Passenger Journey Improvements

Operating route: LNE/EM

Last updated: September 2017

CP5 output driver

The driver for the project is to increase the line speed through Market Harborough in order to support a journey time improvement between London and Sheffield.

Network Rail's obligation

Network Rail's obligation is to develop solutions to increase the line speed between Kettering and Wigston South Junction timing points in order to enable a reduction in Sectional Running Time (SRT); subject to developing a value for money option and securing funding Network Rail will then deliver the line speed improvement. (SRT is subject to industry agreement.)

Scope of works

The following works are anticipated:

- Realignment of the track through the Market Harborough Station area.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Midland Main Line electrification (ES001) - potential impact on infrastructure design
- Little Bowden level crossing closure – potential impact on the ability to increase the line speed
- Kettering to Cory K2C – potential impact due to the 'sharing' of schedule 4 costs
- London to Corby Electrification Capacity Upgrade – Market Harborough Line Speed improvement will design and deliver the KO1 requirements of platform lengthening at Market Harborough by March 19.

The following critical assumptions on internal factors are being made:

- Line speed increases at Market Harborough are not impacted by level crossing closures – these works are being carried out by other CP5 projects.
- Rolling stock modelled will include Class 222 and Class 395

- Interventions required to increase at Market Harborough can be implemented prior to March 2019.

The following critical assumptions on external factors are being made:

- Market Harborough 3rd Party funding contribution will be sufficient to enable the project to proceed at end of GRIP 3.
- Full funding will be secured by November 2017

Activities and milestones (NR)

Market Harborough LSI

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP complete	July 2017	Completed
GRIP 6 LSI Infrastructure authorised	LSI infrastructure authorised for passenger and freight use	March 2019*	Indicative
Output delivered (JT1)	First timetabled public use of the infrastructure	December 2019	n/a

*Subject to ongoing change control

St Pancras to Sheffield linespeed improvements

Details

Project reference code: EM002

HLOS driver: CP4 HLOS scheme

Operating route: EM/LNE

Last updated: January 2016

CP5 output driver

This project will complete a CP4 scheme to deliver a potential journey time reduction of 8 minutes for class 222 trains travelling between London St Pancras and Sheffield via Derby (in both directions).

Network Rail's obligation

Our obligation is to complete the scheme, commenced in CP4, by delivering infrastructure works in order to reduce Sectional Running Time for the class 222 trains by the remaining seconds required to meet the requirements of the Output Driver.

Works that deliver approximately 7 seconds reduction on the Up line only remain to be delivered.

Scope of works

The scope of works is to:

- In conjunction with Sileby Junction (switches and crossing) renewal, raise the permanent speed restriction of the Up Line through the junction;
- Close a footpath crossing at Spondon and divert the right of way to existing infrastructure allowing a raising of the linespeed over this location.

Interfaces and assumptions

Significant CP5 schemes linked to this project and that have a potential impact are:

- MML Programme – Derby Remodelling (ES002) - potential impact on signalling design for the linespeed at Spondon
- Level Crossing Safety Enhancement programmes – potential impact on infrastructure design and timing of delivery of works at Spondon
- Renewal of Silbey Junction – potential impact on timing of delivery of the speed increase caused by delays to the renewal project.

The following critical assumptions on internal factors are being made:

- Integrated renewals work proceeds as planned and is not adjusted in the CP5 workbank
- Signalling design and testing resources are available to complete the works and the key works in interfacing projects

The following critical assumptions on external factors are being made:

- Statutory process will be required to be obtained for the closure and diversion of the footpath crossing, the raising of the linespeed at the location (Spondon) is dependent on this legal process including the third party approval of this closure.

Activities and milestones (NR)

Milestone	Description	Date	Status
EIS Infrastructure authorised (Final works)	Infrastructure authorised for passenger/freight use	December 2016	Completed
GRIP 6 completion	Infrastructure works complete	June 2017	Completed

Kenilworth Station Infrastructure Interventions

Details
Project reference code: ES003m
HLOS driver: Electric Spine
Operating route: London North Western (LNW)
Last updated: June 2017

CP5 output driver

A new station at Kenilworth has been promoted and specified by Warwickshire County Council with funding contributions secured through the New Stations Fund.

The outputs of this project are to provide the specific infrastructure to facilitate a new, hourly passenger service to the proposed new station at Kenilworth.

The project will contribute to improving connectivity between Leamington Spa, Kenilworth and Coventry.

Network Rail’s obligation

In CP5, the project shall provide specific infrastructure to facilitate a new, hourly passenger service to the proposed new station at Kenilworth.

Scope of works

Provision of the infrastructure to support a new, hourly passenger service for Kenilworth station. This shall include signalling alterations, a new crossover at Milverton, and track slewing of the existing single line.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Kenilworth Station Project: Any changes to the scope or delivery of the Kenilworth Station project would impact on the Kenilworth Station Infrastructure Interventions project.

The following critical assumptions on internal factors are being made:

- There is an assumption that signalling resource will be available to undertake the signalling alterations required for this project

The following critical assumptions on external factors are being made:

- There is an assumption that funding will remain available for the Third party funded Kenilworth Station project

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP Completion	Single option selection and AIP completion	April 2016	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	December 2017	Completed

Kent Traction Power Supply Upgrade

Details

Project reference code: K001

HLOS driver: Capacity enabler

Operating route: Kent

Last updated: January 2016

CP5 output driver

The main output driver for this scheme is the operational support of the CP5 (December 2018) train service on the Kent routes. The project will provide the power to facilitate 12 car operation on remaining routes, as per the operating plan, and consistent with the post 2018 timetable specification.

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. Completion of the Thameslink project is a key requirement set out in the Government's 2012 HLOS.

Network Rail's obligation

Network Rail's obligation is to provide sufficient traction power supply capacity to reliably operate the December 2018 timetable (as defined in DTT2011 of 9/11/2011).

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:

- Gravesend to Gillingham: traction power supply upgrade to 12 car 465/466 operation;
- Outer Kent resilience: Grove Hill and High Brooms substation upgrades (conversion to 33kV) – required for operational resilience, later delivery does not restrict introduction of the December 2018 timetable.

Significant interfaces

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

- DfT's procurement programme for new and cascaded rolling stock – will determine the quantum of trains and their power draw characteristics
- The completed CP4 platform lengthening programme – longer trains will require more power but cannot be operated without longer platforms
- The CP4 traction power upgrades on the Kent routes – the output of these upgrades determines the baseline for this intervention
- Thameslink Key Output 2 infrastructure – will determine the infrastructure which will require feeding with power
- Development work on the December 2018 timetable – will determine the future quantum of trains and associated power supply requirement
- The journey time reduction programme – faster trains will have a higher power draw
- East Kent re-signalling – need to ensure an efficient alignment of possessions

Key assumptions

- Train lengthening programmes will absorb all other costs associated with track / signalling / structures / stations and other railways systems, except those identified by the GRIP 3 Feasibility Study.
- 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 three 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 Orpington via Chislehurst.
- There will be sufficient EPDG resource to produce designs and sufficient market resource to deliver to set milestones.
- FOCs power supply interference issues can be resolved permitting the approval of related Network Change.
- Any changes to the renewals CP5 workbank will not affect the scope of works.

Activities and milestones

Gravesend – Gillingham 12 car

Milestone	Description	Date	Status
GRIP 4 completion	Single option scope defined	April 2014	Complete
GRIP 6 start	Start on site	September 2014	Complete
GRIP 6 partial completion	Electrical capacity ready for use in normal conditions	December 2015	Complete
GRIP 6 completion	Infrastructure ready for use without interim restrictions	June 2016	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP5	n/a

Outer Kent resilience

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	September 2015	Complete
GRIP 4 completion	Single option scope defined	June 2016	Complete
GRIP 6 start	Start on site	February 2017	Complete
GRIP 6 completion	Infrastructure ready for use	March 2019	Regulated Output

Route 1 – Power Supply Enhancements

Details

Project reference code: K002

HLOS driver: CP4 completion - capacity enabler

Operating routes: Kent

Last updated: January 2016

Output driver

This project is required in order to provide the necessary infrastructure to facilitate the operational plan assumed with train operators to deliver the CP4 HLOS capacity metrics. 12 car formation of existing Class 465 units are to be operated on the following routes between London Charing Cross, Cannon Street, London Bridge and:

- Dartford via Greenwich, Bexleyheath and Sidcup (3 routes);
- Hayes (in Kent);
- Sevenoaks (via Grove Park); and
- Gravesend via Dartford.

This route scope excludes the traction power supply enhancements required for Class 465 12 car operations to Gillingham from Gravesend. The enhancements to support this are described in K001, with completion required to align with the Phase 3 scope.

Network Rail's obligation

Network Rail's obligation is to provide sufficient traction power supply capacity to reliably operate the December 2018 timetable (as defined in DTT2011 of 9/11/2011) and its phased implementation.

Scope of works

Three phases of scope changes are proposed for E&P distribution – Dartford loop, Hayes branch, Dartford to Gravesend, Kent main line to Sevenoaks.

Phase 1

Limited 12 car operations in CP4 of up to a maximum of the 6 x 12 car Class 465 diagrams in the morning peak period. This is the assumed operational plan as provided by Southeastern to Network Rail on 16 September 2011. This equates to circa 25 x 12 car trains in both directions in the morning weekday peak period from 07:00 to 09:59.

Traction power modelling and design analysis has been completed for the Phase 1 enhanced train service. This has highlighted constraints in the existing network. The scope of works proposed to address forecast infrastructure deficiencies are noted in the table below:

Phase 1	Outline description of scope
DC switchgear changes	22 changes to existing DC circuit breakers and new switchgear including route settings changes to enable the operation of 12 car formations of existing Class 465 trains on these routes
Track paralleling huts (TPH) / substation changes	2 new track paralleling huts and 1 conversion of track paralleling hut to sub-stations.
Electric track equipment (ETE)	Additional strengthening to circa 50 electrical sections on all routes including selected track feeder changes

Phase 2

Flexibility is required prior to the commencement of the Thameslink London Bridge high level construction works to enable timetable and train lengthening during which no extra vehicles will be available. The high level principles of the timetable were known, but as at April 2012 the operational plan was under development.

Phase 2	Outline description of scope
DC switchgear changes	Phase 2 scope as identified by desk top studies which enables the phase 2 obligation to provide the flexibility required prior to the commencement of the Thameslink London Bridge high level construction works to enable timetable and train lengthening during which no extra vehicles will be available.
TPH / substation changes	
ETE	

Phase 3

Enabling 12 car operations when the Kent and Sussex timetable is recast when Thameslink is implemented. This is the operational plan which relates to the CP4 HLOS capacity metric. The requirements are defined in the 2018 Development Timetable 2011 (DTT2011 of 09.11.11) for the morning weekday peak period.

Phase 3	Outline description of scope
DC switchgear changes	3 locations changed
TPH / substation changes	9 track paralleling huts converted to substations
HV feeders	4 HV feeder sizes enlarged
ETE	Additional strengthening to 30 electrical sections on all routes including selected track feeder changes

Significant interfaces

- Thameslink Programme (Key Output 2) – will determine the infrastructure requiring feeding with power
- New Cross Grid enhancement – coordination required to ensure that this and other enhancements supply sufficient power for the region
- Crossrail interface at Abbey Wood – coordination of feeding arrangements
- DC energy efficiency project.
- National SCADA project.
- Train lengthening projects which will potentially increase power draw
- Traction power supply renewals on which this enhancement will be overlaid.

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.
- It is assumed that the new Thameslink rolling stock will operate on the following routes in the Phase 3 morning peak period timetable:
 - 2 trains per hour in 12 car formation on the Bexleyheath route to Dartford; and
 - 2 trains per hour in 12 car formation on the Orpington route via Grove Park.
- No specific requirement to reduce journey times or improve rolling stock performance.
- The technology used will be based on current industry standards providing lowest life cycle cost with no provision for low loss materials, or other developments.

- Costs associated with train entry into service requirements such as safety case and system compatibility are not included.
- 12 Class 465 rolling stock traction power requirements consist of 3 x existing 4 car Class 465 units.
- Class 395 rolling stock dc maximum current draw for 12 car formation is 4kA.
- No special requirements for depots (new or old) or stabling of trains, including both temporary and permanent have been included as the information is not currently available and is also subject to separate funding to be agreed with the DfT.
- This project will be required to modify and/or enhance elements of the SCADA system.
- Current Rules of the Route (Engineering Access Statement) will remain unchanged.

Activities and milestones

Activity	Output	Date	Status
Phase 2: flexibility to operate timetable during London Bridge high level construction work – project completion	Infrastructure ready for use	Dec 2014	Complete
Phase 3: Enable 2018 timetable recast	Infrastructure ready for use	June 2016	Complete

East Kent Resignalling Phase 2 Enhancements

Details

Project reference code: K003

HLOS driver: City capacity – London Bridge (Kent routes)

Operating route: Kent

Last updated: January 2016

CP5 output driver

The project will enhance capability and supports the achievement of the capacity metric in the Government's 2012 HLOS on the routes between Kent and London Bridge by facilitating the future timetable (December 2018) through the Medway towns. It will allow improved integration of the railway with other forms of public transport, closer to the heart of Rochester city centre and provide a direct link to the area of disused dockland which Medway Council plan to develop.

Network Rail's obligation

Network Rail's obligation is to deliver the following:

- 12 car operation through the Medway Towns from May 2016
- New Rochester station open from December 2015
- Increased train capacity by 2tph Rochester and Gillingham from December 2018

Scope of works

- Relocate Rochester station to Corporation Street
- Platform extensions to accommodate 12 car Class 465s at the following stations:
 - Strood
 - Rochester (delivered as part of new three platform station)
- Turnback facilities at Rainham including a new 12 car bay platform and associated station infrastructure changes
- Two additional signal sections to reduce headways 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.

Interfaces and assumptions

The following critical assumptions on internal factors are being made:

- 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
- Scope of works excludes any traction power supply upgrade.

The following critical assumptions on external factors are being made:

- The benefits provided by the delivery of the project provide a base for an improved December 2018 timetable which has yet to be defined.
- Additional TOC operator costs for the use and management of new infrastructure are not included in cost or business case for the scheme.

Activities and milestones (NR)

Milestone	Description	Date	Status
EIS Infrastructure Authorised	Station ready for use	February 2016	Complete

New Cross Grid

Details

Project reference code: K004

HLOS driver: Capacity enabler

Operating route: South East (Kent)

Last updated: June 2017

CP5 output driver

The project will provide increased traction power supply capacity for DC electric services in South London, North Kent and Sussex. It is required to provide additional base capacity in the area for future train service increases.

The project is a strategic upgrade and is part renewal funded in its replacement of existing obsolete 66kV equipment and connections.

Network Rail's obligation

To provide base traction power supply capacity for increased DC electric train services into London in line with predicted future growth.

Scope of works

- Short term remedial repairs to a number of transformers in the area, to enable them to remain in reliable service until 2018 when the new supplies are commissioned
- New 275kV/33kV 140MVA connection (with n-1 redundancy) at National Grid New Cross site
- Two new cabled transmission connections from New Cross Grid to new NR 33kV switching station
- Two new cabled transmission connections to existing NR substation at South Bermondsey
- New 33kV feeder from new switching station to existing NR substation at Brockley
- Decommission and remove 3 x 66/33kV transformers at Lewisham, South Bermondsey and Nunhead NR substation

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes which have a potential impact on the project's outputs and delivery are:

- Thameslink programme.
- DC Regenerative braking project
- Traction Power Supply Upgrades.
- National SCADA project.

- Traction power supply renewals (at particular sites)

The following critical assumptions on internal factors are being made:

- Current Rules of the Route (Engineering Access Statement) will remain unchanged
- Renewals are undertaken as advised where interfaced with this Project

The following critical assumptions on external factors are being made:

- 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
- There is no specific requirement to reduce journey times or improve rolling stock performance.
- The technology used will be based on current industry standards providing lowest life cycle cost with no provision for low loss materials, or other developments.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	May 2008	Complete
GRIP 4 completion	System configuration	December 2012	Complete
GRIP 5 completion	Cable routes and equipment layout	July 2018	Indicator
Completion of National Grid works	Works by others, required before Network Rail works	April 2017	Complete
Completion NR Works	NR installation and connections complete	March 2019	Indicator
GRIP 6 completion and EIS	Commission into service new traction supplies from New Cross Grid End of main project delivery phase	September 2018*	Regulated Output
GRIP 7	Completion of 66kV decommissioning Removal of redundant infrastructure	April 2019	Indicative

*Subject to ongoing change control

Package 4: Gravesend Train Lengthening

Details

Project reference code: K005

HLOS driver: CP4 completion - capacity

Operating route: Kent

Last updated: January 2016

Output driver

To facilitate the operational plan assumed with train operators to deliver the CP4 HLOS capacity metric by supporting 12 car operations on specific services between Gillingham and Gravesend.

Network Rail's obligation

Network Rail's obligation is to deliver platform works at Gravesend to support 12 car Class 465 operations.

Scope of works

Platform lengthening of 2 platforms and creation of a new island platform to support 12 car Class 465 operations.

Significant interfaces

- Construction works for Key Output 2 of the Thameslink Programme – these will potentially reduce capacity through London Bridge for much of the later part of CP4 and would therefore require longer trains to be in place in mitigation during this period.
- A scheme by Southeastern to modify Class 465 vehicles such that both sets of passenger doors on the rear vehicle on 12 car formations do not open at Charing Cross.
- Key assumptions
- Southeastern's franchise agreement will be modified to include a requirement to meet the CP4 HLOS peak capacity metrics, with additional rolling stock provided as necessary.
- 12 car operation in the suburban area will utilise 3 x 4 car Class 465 units, with reconfigured vehicle interiors if necessary. The scheme will also be designed to allow for the operation of 12 car Class 375, 376 or 377 sets.
- 12 car Class 465 trains will be able to be accommodated at London Charing Cross with infrastructure works to platforms 1, 2 and 3. This limitation is reflected in our assumptions regarding the overall contribution of the Kent train lengthening package to the peak capacity metric.

- 2 car Class 466 vehicles will be banned from operation in 12-car formations, since the additional platform length required cannot realistically be provided at critical sites.
- Any main line trains (those operating east of Swanley and south of Sevenoaks) to be lengthened will be operated by SDO equipped rolling stock (Class 375 or 377) so longer platforms are not required.
- Splitting and joining is required at Dartford and Orpington, to enable 12 car sets to meet high peak requirements, whilst allowing shorter trains to run off peak. Splitting and joining capability at other locations will be provided to the extent necessary to deliver the capacity metric.
- Derogations from standards will be required to deliver certain items in the above listed scope; we assume that stakeholder support will be forthcoming where necessary.
- Thameslink KO2: interface with Thameslink project as KO2 currently envisages some services on the Sydenham slow line routes become Thameslink operated from 2018.

Activities and milestones

Milestone	Description	Date	Status
EIS Infrastructure Authorised	Infrastructure ready for use	May 2014	Complete

Transpennine Route Upgrade

Description
Working with Rail North and the successful bidders for the Northern and Transpennine franchises passengers will benefit from a significant improvement in train services. These changes facilitate the growth of the Northern economy through;
Connecting businesses across the north of England
Getting people to work in the major cities
Connecting to international markets through Manchester Airport
Passengers themselves will benefit from;
Longer environmentally friendly electric trains with more capacity
Faster services on the Transpennine route
More frequent services between Manchester and Leeds
These benefits will be delivered over CP5 and CP6. At the end of CP6 the target is;
Manchester Victoria to Leeds in 40 minutes
Manchester Victoria to York in 62 minutes

EDP Reference Codes

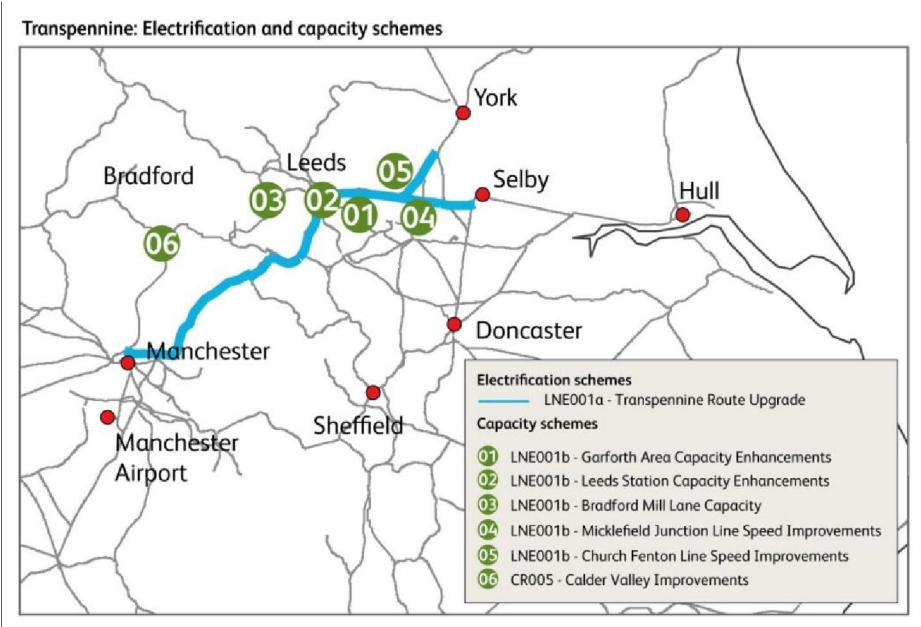
- LNE001a – Transpennine Route Upgrade
- LNE001b – Transpennine Route Upgrade Intermediate Interventions

Significant Interfaces

- North of England Programme (including Northern Hub)
- IEP East Coast Programme

Announcements

Date	Announcement
30/09/2015	Secretary of State and Sir Peter Hendy announcement regarding resumption of paused electrification schemes



Transpennine Route Upgrade

Details

Project reference code: LNE001a

HLOS driver: Journey Time Improvements/Capacity

Operating route: LNE/LNW

Last updated: March 2018

Output driver

The Secretary of State for Transport has determined a high level set of outcomes for the Transpennine route comprising: provision of capacity for 6 fast or semi-fast inter-regional trains per hour, a reduction by up to 15 minutes of journey time between Manchester and York, and capability for longer local and inter-regional train services.

Network Rail will work with the DfT and Transport for the North to develop plans for the Transpennine line between Stalybridge and Leeds and on to York and Selby and will focus on delivering key capacity and journey time passenger benefits between Manchester Victoria, Leeds and York. These benefits will support economic growth as part of the Northern Powerhouse, facilitate commuter travel into the major urban areas of the North of England and be supported by a value for money DfT business case.

The outputs of the Route Upgrade programme, in conjunction with North of England Programmes LNW (CR005), will enhance the capability of the rail network across the North of England, providing infrastructure capability to support:

- Improvements in journey times of up to 15 minutes between Manchester Victoria to York via Leeds;
- Increased capacity through faster and more frequent services with increased direct links between Northern cities;
- Passenger capacity metrics for Leeds, Manchester and Liverpool as defined in Appendix A Table 2 of the High Level Output Statement; and
- Performance at a level necessary to support the agreed national performance target of 92.5% PPM

Network Rail's obligation

In December 2017 Network Rail submitted the Single Development Option to the DfT with four scenarios providing a range of benefits, programme and costs to meet the aforementioned output obligations to support business case development and subsequent investment decisions by the DfT.

Scope of works

The scope is to develop, subject to a value for money business case and the necessary joint (DfT and Network Rail) investment decisions, a route wide solution that will provide the expected capacity and journey time improvements. This includes the development of the following:

- Signalling headway and infrastructure enhancements between Manchester Victoria, Leeds and York to provide additional capacity to move towards the Indicative Service Specification (version 1.1) level of service at the specified performance level
- Line speed improvements between Manchester Victoria, Leeds and York to support journey times on inter-regional services that move towards;
 - Manchester Victoria to Leeds of 40 minutes with 1 stop
 - Manchester Victoria to York of 62 minutes with 2 stops
- Traffic management solutions for the Transpennine Route to provide improvements in performance and operational resilience
- Consideration of options for a fully or partial electrified route to enable the operation of electric traction and/or bi-mode stock between the following points:
 - Stalybridge to Leeds;
 - Leeds to York; and
 - Leeds to Selby; and which will include
 - A new traction power feeder station east of Leeds to support the electrified route.

For any the electrification options, the project's western boundary meets the extent of North of England Programmes LNW (CR005) at Stalybridge. (Subject to agreement through change control, the DfT are seeking to instruct Network Rail to consider options to enable the operation of electric traction and/or bi-mode stock between Guide Bridge and Stalybridge, and Manchester Victoria and Stalybridge, in addition to the routes listed above.)

Interfaces and assumptions

There are significant CP5 schemes linked to this project, which will be considered during the development of design solutions and programmes of works, including:

- North of England Programmes LNW (CR005)
- Transpennine Route Intermediate Interventions (LNE001b)
- National SCADA renewal
- GSM-R and FTN
- Huddersfield to Bradford Resignalling and Recontrol
- East Coast Connectivity projects (F003)

- LNE Power Supply Upgrade (LNE003)
- Neville Hill depot operational requirements and improvements including stabling / train service maintenance
- Neville Hill S&C renewals
- Mickelfield Junction and Peckfield S&C renewals
- New station at Low Moor
- Gauge Clearance for new rolling stock
- EMC Clearance for new rolling stock
- Depots and Stabling emerging from Northern/Transpennine Franchises
- Platform Extensions emerging from Northern/Transpennine Franchises (previously South and West Yorkshire train lengthening)

Other interfacing schemes, which will be considered during the development of design solutions and programmes of works, are:

- High Speed 2
- Northern Powerhouse Rail
- Leeds Station Master Plan.
- Selby to Hull Electrification
- Huddersfield Station Underpass Extension

The following critical assumptions on internal factors are being made:

- Delivery of key element of the North of England Programme (CR005) is achieved in advance of TRU
- New electrical control facilities will be provided and funded by the national SCADA project
- Sufficient engineering access is made available and timing of works on adjacent routes allows delivery of the interventions
- GSM-R and FTN programmes will have completed work along the full line of route
- Stations will be able to accommodate additional passenger flows
- Enhancement work at Bradford Mill Lane will be completed with the planned signalling renewal in CP5
- Enhancement work on Calder Valley including Huddersfield to Bradford Resignalling will be completed with the planned signalling renewal in CP5
- Any traction power supply options for the Transpennine Route Upgrade will be developed in conjunction with traction power supply options for LNE003 ECML Traction Power Supply Upgrade

The following critical assumptions on external factors are being made:

- Journey time aspirations are based on acceleration/deceleration characteristics of a Class 802 vehicle
- Indicative Train Service Specification v1.1 (dated December 2017), as endorsed by Programme Delivery Group, will be used to inform development of value for money options for capacity improvements
- DfT and Rail North will support securing the necessary access from the affected operators to allow delivery of the interventions
- DfT and Rail North will support the necessary changes to franchise commitments in order to achieve the intended outcomes
- National Grid and Distribution Network Operators can provide the necessary power supply points to the timescales required to deliver the programme
- Development Consent Order and/or Transport & Works Act Orders are secured as necessary to the timescales required to deliver the programme.
- All individual planning, heritage or regulatory consents will be secured to the timescales required to deliver the programme
- All Third party land access, including relevant traffic orders and highway consents will be secured to the timescales required to deliver the programme
- The technology required for Digital Train Control will be available to achieve the programme timescales
- Future changes to Technical Specification for Interoperability will not impact on the scope and deliverability of the programme

Activities and milestones (NR)

Milestone	Description	Date	Status
Single Development Option	Single Development Option to enable DfT to make investment decisions about scope to be designed	31 December 2017	Completed
Programme Definition stagegate	GRIP for Programmes Definition stagegate completed	31 March 2019	Indicator
EIS Infrastructure authorised	Infrastructure authorised for passenger use	Subject to final investment decision	Indicative

TRU – Intermediate Interventions

Details

Project reference code: LNE001b

HLOS driver: Journey Time Improvements/City Capacity/Electrification

Operating route: LNE

Last updated: December 2017

CP5 output driver

The Intermediate Interventions programme will enhance the capability of the rail network at specific locations across the Transpennine route and provide infrastructure capability to support the expected outcomes of the Transpennine Route Upgrade programme (LNE001a). The Intermediate Interventions programme will also support the delivery of the DfT's infrastructure assumptions within the Northern and Transpennine franchise commitments.

The completion of this programme, in conjunction with the Transpennine Route Upgrade (LNE001a), will support economic growth as part of the Northern Powerhouse and facilitate commuter travel into the major urban areas of the North of England.

Network Rail's obligation

Network Rail's obligation is to develop a solution and design a programme of works that will enable the intermediate interventions to be delivered in advance of the expected outputs for Transpennine Route Upgrade programme (LNE001a). Network Rail will lead industry stakeholders to determine the constraints of meeting the expected outputs and develop options to overcome these constraints where necessary for industry stakeholders to agree.

Scope of works

The scope is to develop, the intermediate interventions that will support the achievement by Transpennine Route Upgrade of the expected outputs previously described, and will include the development of the following:

- **Bradford Mill Lane Capacity** – infrastructure improvements to provide parallel moves at Bradford Interchange to/from Leeds and Halifax. This supports delivery of the Leeds capacity metrics and the delivery of capacity

improvements on the Calder Valley route in conjunction with North of England Programmes LNW (CR005). The full benefit of increased capacity on the Calder Valley route is dependent on the delivery of both the Calder Valley journey time improvements, as part North of England Programmes LNW (CR005), and the capacity enhancements at Leeds station as part of this programme.

- **Leeds Station Capacity Enhancements** - Additional capacity at Leeds Station to support the operation of longer trains and additional services on a number of routes. The project will be delivered in the following phased strategy:
 - **Phase 1** - Recontrol of the signalling control system to the York Rail Operating Centre (ROC)
 - **Phase 2** - The relocking of 8No. existing signalling interlockings to provide additional signalling capacity
 - **Phase 3** - A new 8-car platform (platform 0) and longer train standages on platforms 6. Track remodelling to the West end of the station to provide greater operational flexibility. Associated resignalling
 - **Phase 4** - Development phase to be undertaken as part of Transpennine Route Upgrade
- **Micklefield Junction Line Speed Improvement** – Infrastructure improvements at Micklefield Junction to support: journey time improvements on inter-regional services, improvements in junction capacity and junction performance as well as the operation of longer trains on inter-regional services. The project will be delivered in the following phased strategy:
 - **Phase 1** - New S&C at Micklefield Junction and track realignment, to include incremental line speed improvement
 - **Phase 2** - Realignment, extension construction and commissioning of Platform 2
 - **Phase 3** - Platform 1 extension construction and signaling commissioning
 - **Phase 4** - Peckfield Level Crossing diversion and Platform 1 commissioning

Interfaces and assumptions

There are significant CP5 schemes linked to this project, which will be considered during the development of design solutions and programmes of works, including:

- North of England Programmes LNW (CR005)
- Transpennine Route Upgrade (LNE001a)

- National SCADA renewal
- GSM-R and FTN
- East Coast Connectivity funded projects (F003)
- LNE Power Supply Upgrade
- Leeds Station Southern Entrance
- Neville Hill depot operational requirements and improvements including stabling / train service maintenance
- Neville Hill S&C renewals
- Micklefield Junction and Peckfield S&C renewals
- Granting of consents for Peckfield Level Crossing
- Proposal for new station at Low Moor
- Depots and Stabling emerging from Northern/Transpennine Franchises
- Platform Extensions emerging from Northern/Transpennine Franchises (previously South and West Yorkshire train lengthening)

Other interfacing schemes, which will be considered during the development of design solutions and programmes of works, are:

- HS2
- Northern Powerhouse Rail
- Leeds Station Master Plan
- Selby to Hull Electrification

The following critical assumptions on internal factors are being made:

- Delivery of North of England Programme (CR005) is achieved during CP5
- New electrical control facilities will be provided and funded by the national SCADA project
- Sufficient engineering access is made available and timing of works on adjacent routes allows delivery of the interventions
- GSM-R and FTN programmes will have completed work along the full line of route
- Stations will be able to accommodate additional passenger flows
- Enhancement work at Bradford Mill Lane will be completed with the planned signalling renewal in CP5
- The Intermediate Interventions will not require any permanent land acquisition

The following critical assumptions on external factors are being made:

- Journey time aspirations are based on the acceleration/deceleration characteristics of a Class 395 vehicle
- Indicative Service Specification v0.4 (Dated 14 October 2015), as endorsed by North of England Tri-lateral Programme Board, will be used to inform development of value for money options for capacity improvements
- DfT and Rail North will support securing the necessary access from the affected operators to allow delivery of the interventions

- DfT and Rail North will support the necessary changes to franchise commitments in order to achieve the intended outcomes
- Development Consent Order and/or Transport & Works Act Orders will not be required
- All individual planning, heritage or regulatory consents will be secured to the timescales required to deliver the programme
- All Third party land access, including relevant traffic orders and highway consents will be secured to the timescales required to deliver the programme
- Future changes to Technical Specification for Interoperability will not impact on the scope and deliverability of the programme, nor will it change the assessment that the Intermediate Interventions are not interoperable

Activities and milestones (NR)

Leeds Station Capacity			
Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	31 May 2017	Complete
GRIP 4 completion	Phase 1 Recontrol Single option scope defined	30 July 2018	Complete
GRIP 6 start	Phase 1 Recontrol Start on site	4 April 2019	Indicative
Phase 1 EIS	Phase 1 Recontrol Entry into Service	31 December 2019	Indicative
Phase 2 EIS	Entry into Service signalling relocking	31 December 2020*	Indicative
Phase 3 EIS	Entry into Service Platforms 0-6 infrastructure	31 December 2021*	Indicative
Phase 4 Development	Development phase to be undertaken as part of TRU	31 December 2018	Indicative
EIS All Phases	Infrastructure authorised for passenger use	tbc	Indicative

*These are target dates not yet supported by a programme and subject to change. The achievement of these dates will also be subject to the agreement of appropriate engineering access to enable delivery.

Micklefield			
Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	31 May 2017	Complete
Phase 1 commissioning	Install new S&C and commission incremental line speed improvement	31 May 2017	Complete
Phase 2 commissioning	Platform 2 realignment and extension	31 March 2017	Complete
Phase 3 completion	Signalling commissioning and Platform 1 extension construction	31 March 2019*	Indicative
Phase 4 commissioning	Peckfield Level Crossing diversion implementation and Platform 1 commissioning	TBC	Indicative
EiS All Phases	Infrastructure authorised for passenger use	TBC*	Regulated Output
Output delivered	First timetabled public use of the infrastructure	TBC	n/a

*these are target dates not yet supported by a programme and subject to change. EIS for all phases will be subject to the granting of consents for Peckfield Level Crossing diversion.

Deliver: Bradford Mill Lane Capacity Improvements			
Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	31 August 2015	Complete
GRIP 4 completion	Single option scope defined	31 March 2017	Complete
GRIP 6 start	Start on site	30 June 2017	Complete
EIS testing	Entry into Service for testing and driver training	30 November 2018	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	10 December 2018	Regulated Output
Output delivered	First timetabled public use of the infrastructure	10 December 2018	n/a

Yorkshire Train Lengthening

Details

Project reference code: LNE001c

HLOS driver: City capacity – Leeds

Operating route: LNE

Last updated: March 2016

CP5 output driver

This project delivers infrastructure interventions required to help facilitate the operational plans developed by train operators to meet the CP5 HLOS capacity metrics.

Network Rail's obligation

Network Rail will work with the new franchise holders (for the Northern and TransPennine Express franchises) to develop options and then deliver a scope to support the operators' operational plans to deliver the CP5 HLOS capacity metrics for Leeds.

Scope of works

The scope of the development work will be determined by the rolling stock strategy for services in the North East and the operational plans of the relevant new franchise holders.

Significant Interfaces

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Refranchising process for Northern and TPE franchises
- Transpennine Route Upgrade
- TRU Intermediate Interventions
- North West Train Lengthening

The project's scope is subject to confirmation of rolling stock strategy and the operational plans of the new franchise holders.

Key Assumptions

- Northern and TPE franchises are awarded by end 2015
- The scope necessary to support the operators operational plans to deliver the HLOS capacity metrics can be accommodated within the available funding and are deliverable by the operators' required timescales
- This project does not include gauge clearance at stations as part of route clearance works for new or cascaded rolling stock

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	CP5	Regulated Output
EIS Infrastructure authorised	Infrastructure authorised for passenger use	TBC	Indicative

* Milestone dates are subject to rolling stock strategy and operational plans of the new franchisees, and confirmation of development and delivery strategy by the franchisees.

East Coast Main Line Enhancements Programme

Details

Fund reference code: EC001

HLOS driver: East Coast Connectivity

Operating route: LNE

Last updated: September 2018

As part of the process to bring more coherency to investment on the East Coast Main Line (ECML), DfT have brought the East Coast Connectivity Fund projects, the Intercity Express Programme (IEP) enabling projects on the ECML and some additional ECML HLOS projects together into one overarching programme. Titled the East Coast Main Line Enhancements Programme, this approach was approved by the East Coast Programme Board on 26 Apr 2017 and by the DfT's Board Investment and Commercial Committee on 22 May 2017.

CP5 Output Driver

The Government's 2012 HLOS included an East Coast Connectivity Fund with the objective of improving capacity and reduction in journey times on the East Coast Main Line, including suitable efficient capacity for the crossing flows of passenger and freight traffic at Peterborough. A further key output included in the Government's 2012 HLOS was the implementation of the IEP on the Great Western and East Coast Main Lines. The programme is driven by a strategic priority to increase capacity, improve passenger experience and accelerate journey times between key cities.

Key Outputs

DfT have agreed these outputs to be derived from infrastructure enhancements for the ECML Enhancement Programme:

- An increase in capacity from 6 to 8 Long Distance High Speed services (LDHS) between London King's Cross and Doncaster and from 5 to 6 LDHS paths between Doncaster and Newcastle per hour;
- Maintaining 2 freight tph, using diversionary routes as far as practicable;
- A reduction in journey times for the fastest LDHS services to 4 hours from London to/from Edinburgh and 2 hours to/from London to Leeds.

DfT noted these outputs are to be treated as **conditional** as trade-offs may still be needed to be made as further work is completed by NR to develop the timetable.

Network Rail's obligation

Network Rail's obligation is to:

- To work with the industry to develop plans and to deliver works on the ECML to deliver the outputs specified above
- To deliver the infrastructure upgrades on the ECML to enable IEP (Class 800/801) train operation as agreed with the DfT in the Infrastructure Output Specification (IOS). IEP is proposed to operate over the ECML core and diversionary routes as defined in the East Coast IEP Network Master Availability and Reliability Network Agreement.
- To deliver upgraded traction power supply capability between Wood Green and Bawtry to support introduction of Intercity Express Programme and Thameslink Programme requirements and enable the introduction of new rolling stock on the ECML.
- Finally, for traction power north of Bawtry, to develop to GRIP 3 an upgrade of traction power supplies for full implementation in CP6.

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 project in CP5 for likely delivery in late CP5 and CP6 following completion of the works between Wood Green and Bawtry (formerly LNE002b) in 2017. This includes discussion with and studies by National Grid and Distribution Network Operators.

Governance

The East Coast Programme Board oversees the prioritisation of schemes and allocation of funding for scheme development and delivery, subject to approval by the Portfolio Board. The East Coast Programme Board is a cross-industry group consisting of representatives from DfT, Transport Scotland, Network Rail, Freight Operating Companies, Train Operating Companies, RDG, and the ORR (as observers).

Scope of Works

Whilst the final scope will be subject to the DfT's Full Business Case (FBC) gaining formal approval, the Programme includes the following:

- The enhancement projects originally part of the East Coast Connectivity Fund
- IEP funded ECML infrastructure enhancements
- King's Cross Remodelling
- Power Supply Upgrade Phases 1 and 2 (PSU1 and PSU2)
- Stevenage Turnback
- Depots and Stabling Works (third party paid for)
- Note that at the request of the DfT and the TOC, Gordon Hill Turnback is no longer being currently pursued
- Note that Digital Railway is separate programme although it will interface with the East Coast Main Line Enhancements Programme.

More specifically, projects whose benefits primarily lead to the increase in capacity:

- King's Cross Remodelling – station throat enhancements (contribution to a primarily renewal funded remodelling project);
- Werrington Grade Separation – grade separated access to the GN/GE line;
- Huntingdon-Woodwalton Four Tracking – an additional fourth line reinstated between Huntingdon and Woodwalton;
- Peterborough Down Slow – upgrade the Down Slow line between Fletton and Peterborough;
- 400kV National Grid feeding supply transformer, now completed;
- Upgrade of the existing classic overhead line feeding system between Wood Green and Bawtry, now effectively completed with solely further resilience work outstanding;
- New/upgraded feeding supply transformers, now completed;
- Upgrade of existing classic overhead traction power feeding system between Bawtry and Edinburgh, between Doncaster and Leeds and on the Hertford Loop;
- Platform extensions at Edinburgh Waverley Platforms 5 and 6 will be delivered through the EGIP project with a funding contribution to EGIP;
- A turnback solution at Stevenage;
- Note the original East Coast Connectivity Fund also included a package of enhancements at Doncaster Station (additional platform and bi-di signalling) which have now been completed.

Projects whose benefits primarily lead to a reduction in journey times:

- Gauge clearance on the ECML core and diversionary routes including provision of a test route;
- Platform extensions at Stevenage, Northallerton and Durham, now completed;

- Alterations to overhead line booster overlaps and neutral sections.

Interfaces and assumptions

A Programme approach has been adopted for integrated delivery of ECML enhancement schemes, which includes:

- Creating, managing and reporting on an integrated programme that demonstrates safe delivery of key outputs;
- Efficiently integrating resource and access requirements;
- Managing engineering and systems integration across the programme in compliance with progressive assurance processes and system engineering strategies.

The following critical assumptions on external factors are being made:

- This programme is not responsible for introducing new timetables.
- The projects when combined with new rolling stock will enable a restructuring of the timetable which is anticipated to result in reductions in journey times between London and key ECML cities.
- 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 (SDO) operation has been agreed with the DfT, ORR and train operators.
- Any new operating instructions at stations (e.g. for SDO) are not within the scope of this project.
- 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 the programme scope (part of Train Service Provider contract requirements).
- All assembly plant and assembly plant access works are excluded from the programme scope (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 two pantograph operations without any modification to OLE infrastructure.
- Existing signalling arrangements can support IEP splitting and joining requirements.
- No infrastructure work is required to address platform stepping distances or bridge resonance effects.

- National Grid can meet their committed timescales specified in their feasibility study.
- Upgrade of traction power supplies between Bawtry and York will be delivered taking into account the TransPennine Route Upgrade (TRU) programme
- 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).
- No planning permissions or land purchase will be required for PSU 1 or 2
- GRIP 3 options will be developed in conjunction with traction power supply requirements for the TRU programme.
- Access (possessions and/or isolations) will be available as required.
- Re-planning of the Stevenage scheme for CP6 may have an impact on GTR's rolling stock plans for operations on the Hertford Loop. Any costs associated with any rolling stock implications are not budgeted for as part of this project.
- No other infrastructure interventions are required at Stevenage station.
- Innovative technical solution or construction approach (e.g. modular) will not be required at Stevenage.
- 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.

Activities and Milestones

Projects whose benefits primarily lead to the increase in capacity

Milestone	Description	Date	Status
GRIP 4 Completion	Single option scope identified – ECML Power Supply Upgrade 1	August 2014	Complete
GRIP 6 Start	Start on Site – IEP Gauging	June 2015	Complete
Gauge Clearance Low traffic testing	Werrington to Darlington – IEP Gauging	September 2015	Complete
GRIP 3 completion	AIP completion – Gordon Hill Turnback	February 2016	Complete
EIS Infrastructure authorised Corey's Mill to Welwyn (Thameslink Requirement)	Infrastructure authorised for passenger use – ECML Power Supply upgrade 1	March 2016	Complete
GRIP 3 AIP Completion	AIP completion – Fletton to Peterborough Upgrade project	November 2016	Complete
GRIP 6 Start	Start on Site – OLE	December 2016	Complete
TWA order application	Submission of TWAO for Werrington Grade Separation and Huntington to Woodwalton Four Tracking proposals	December 2016	Complete
EIS infrastructure authorised	Infrastructure authorised for passenger use – Doncaster Station Area Enhancement	May 2017	Complete
GRIP 3 AIP Completion	AIP Completion – Northallerton to Newcastle Freight loops	August 2017	Complete

Projects whose benefits primarily lead to reduced journey times			
Milestone	Description	Date	Status
EIS Infrastructure authorised	Infrastructure authorised for passenger use – Stations	August 2017	Complete
Gauge Clearance Normal traffic testing	Kings Cross to Inverness/Aberdeen – IEP Gauging	April 2018	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use - IEP Gauging	April 2018	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use – OLE Boosters	August 2018	Complete
Milestone	Description	Date	Status
GRIP 6 Completion	Infrastructure ready for use – National Grid 400kV feeder stations	August 2017	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use – ECML PSU 1; Wood Green to Bawtry	August 2017	Complete
First Thameslink trains	Thameslink Trains in passenger service – ECML PSU 1	December 2017	Complete
GRIP 3 completion	AIP Completion – ECML Traction power supply upgrade	January 2018	Complete
GRIP 3 completion	Stevenage turnback	June 2018	Complete
TWA order application	Determination for TWAO for Werrington Grade separation	August 2018	Complete
GRIP 3 AIP completion	AIP Completion – Werrington Grade Separation project	September 2018	Complete

GRIP 3 AIP completion	AIP Completion – Huntington to Woodwalton four tracking project	September 2018	Complete
Output Delivered	IEP trains in timetable service - OLE, IEP Gauging and Stations	September 2018	n/a
Output Delivered	First IEP Trains in timetable Service – ECML PSU 1	September 2018	n/a
Output Delivered	First timetabled public use of infrastructure	December 2018	n/a

Milestone	Description	Date	Status
EIS Infrastructure authorised	Infrastructure authorised for passenger use – Fletton to Peterborough upgrade project	March 2019	Regulated Output
EIS Infrastructure authorised	Infrastructure authorised for passenger use – Werrington Grade separation project	December 2020	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use – Huntington to Woodwalton four tracking	TBC	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use – ECML Traction power supply upgrade	CP6	Indicative
GRIP 6 Start	Start on site – Stevenage turnback	TBC	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use – Stevenage Turnback	TBC	Indicative

Stafford Area Improvement Scheme

Details

Project reference code: LNW003

HLOS driver: Committed Projects

Operating route: LNW

Last updated: January 2016

CP5 output driver

This project supports the achievement of the capacity metric in the Government's 2012 HLOS. 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 and Norton Bridge. Current levels of infrastructure performance at these locations also impacts on overall performance of the route.

Network Rail's obligation

The project's remit is to deliver infrastructure 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. The project will deliver the capability in the Stafford area for:

- Two additional, off peak, fast line paths from London to the North West in each direction;
- One additional path per hour on the Birmingham-Manchester axis (each direction) and;
- One additional freight path per hour through Stafford, again in each direction.

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 with 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 at Trent Valley Junction and on the slow lines between Doxey Junction and Crewe Basford Hall.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- West Coast Power Supply Upgrade (LNW004) is a critical enabler for this project
- Access interface with High Output track renewals programme

The following critical assumptions on internal factors are being made:

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

The following critical assumptions on external factors are being made:

- All necessary external authorities and consents are in place
- The infrastructure options are being developed in such a way so as to not prejudice the development of HS2
- The required network access to enable successful delivery will be agreed, Discussions are on-going with operators to assess methodology and mitigate risk
- The third party utilities diversionary works required in the Norton Bridge area can be integrated with the project programme

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 4 completion	Single option scope definition	April 2014	Complete
GRIP 6 start Stafford Resignalling	Start on site	February 2014	Complete
GRIP 6 start Norton Bridge	Start on site	October 2014	Complete
GRIP 6 completion Stafford Resignalling	Infrastructure ready for use	December 2015	Complete
GRIP 6 completion Norton Bridge	Infrastructure ready for use	August 2017	Complete
EIS – Infrastructure Authorised	Infrastructure authorised for passenger use	December 2017	Complete

West Coast Power Supply Upgrade

Details

Project reference code: LNW004

HLOS driver: Capacity Enabler

Operating route: LNW

Last updated: March 2017

CP5 output driver

Phase 3 of the WCPSU project is remitted to upgrade sections of the WCML to a 12kA autotransformer (AT) system. The project supports the North-West Electrification Scheme, specifically the implementation of Liverpool-Manchester EMU services in December 2014 and Preston-Blackpool in December 2015 2017. WCPSU is a critical enabler for the Preston – Manchester (Phase 4) EIS in December 2017 following changes to the NWEF Phase 5 programme.

Network Rail's obligation

The scope of the overall programme is to deliver an upgraded traction power supply system to support the Delivery of NWEF Phase 4 EIS in December 2017 following changes to NWEF phase 5 and provide increased resilience. 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 remainder of the route and is to be completed during CP4 and CP5.

Scope of work

The project will renew and upgrade the remainder of the 25kV power supply equipment on the WCML between North Wembley and Whitmore (Phase 3A) and between Weaver 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) and between Whitmore and Weaver are no longer required.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- The scheme is a critical enabler for the North West electrification programme
- The scheme was a critical enabler for the Stafford area improvements scheme (now completed)
- LNW route 25kV traction switchgear renewal – interface scope agreed with Asset Manager
- Renewal of 25kV traction sole user assets at Rugby and Stafford - interface scope agreed with Asset Manager.

The following critical assumptions on internal factors are being made:

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

The following critical assumptions on external factors are being made:

- National Grid undertake required changes for 12kA feed in line with programme.
- There are no further external requests for additional scope.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 6 start	Start on site	June 2013	Complete
Completion of first commissioning area	Weaver to Springs Branch	November 2014	Complete
Completion of second commissioning area	Oxenholme to Carnforth / Oxenholme to Great Strickland	December 2017	Complete
Completion of third commissioning area	Springs Branch to Euxton	December 2017	Complete
EIS infrastructure authorised	Infrastructure authorised for passenger use	December 2017	Complete

Birmingham New Street Gateway

Details

Project reference code: LNW005

HLOS driver: Committed projects

Operating route: LNW

Last updated: January 2016

CP5 output driver

The high level objectives for the project have been agreed by the key funders, Advantage West Midlands, Birmingham City Council, DfT, Centro and Network Rail. These include to:

- Increase passenger capacity to meet forecast growth;
- Improve passenger facilities and environment, including access to/from/within the station for all users;
- Improve pedestrian access routes to/from/across the city;
- Transform the appearance of the station as a major civic amenity and its environs to improve perceptions and stimulate confidence through creating an appropriate gateway to the region;
- Stimulate re-development in and around the City centre.

Network Rail's obligation

Network Rail's obligation is to design and build the infrastructure to meet the key funders' objectives, whilst keeping the station operational for passengers and with minimal disruption to train movements.

Scope of works

Platform level

- The work generally comprises the removal of all platform accommodation, ramped areas to the West and enclosures. Passenger movements both for access and escape are enhanced by the introduction of new and additional standard escalators, lifts and staircases to platforms.
- New train dispatch rooms are to be constructed to accommodate platform level staff.

Concourse level

- The works comprise the enlargement of the existing concourse to cater for increased passenger demand, with associated requirements for additional dwell space, customer information systems and other facilities. The additional space is created by extending the concourse into the area formerly occupied by the lowest two NCP car park levels.

- Existing staircases and escalators are removed and replaced with new vertical circulation cores down to platform level. New entrances to the concourse are created on the northern, southern and eastern elevations.
- A new control room is constructed.
- Additional retail is provided on the eastern side in the form of a new two storey extension. The concourse areas provide amenity facilities such as toilets and a multi faith prayer room.
- Rail specific accommodation is provided within the concourse area for the ticket office and Centro travel centre, Network Rail reception and a First Class Lounge.
- Public Information Systems are provided including a new departure board located on one side of the atrium.
- Works to the North West entrance include lifts, stairs and escalators to the Grand Central retail level.

Off station works

TOC back of house accommodation is relocated to new accommodation, within the five minutes' walk time provided for in the TOC franchises.

External works

- The creation of a new North West entrance to the shopping centre includes some external works.
- The new walkway adjacent to the Odeon site provides connection routes to the northern and eastern elevations, Moor St. station, and the city generally.
- New taxi drop off and pick up areas are created.
- Within the station site a new walkway provides a route from the northern station entrance to the southern station entrance and on to the southern part of the city.
- A new short term parking facility is created utilising part of the former NCP lower level car park. At the concourse level a through route provides drop off / pick up facilities
- Part of the existing Navigation Street footbridge has been replaced by a new enhanced section, extending to Hill Street and providing a new entrance/exit to the station. In addition the footbridge now connects to both platforms 1 and 12 (these were not previously accessible from the footbridge).
- A major new retail facility (John Lewis) has been constructed as part of the project, located on the southern side of the station adjacent to Hill Street/Station Street.
- The former NCP multi-storey car park has been demolished due to its condition, and rebuilt in the same location.

Interfaces and assumptions

Key interfacing projects are:

- Ladywood House redevelopment - an independent commercial development adjacent to the station.
- Centro project extending the existing Metro line from Snow Hill to Stephenson Street, adjacent to New Street station

The following critical assumptions on internal factors are being made:

- Platform improvement works will continue until October 2016 recognising limitations imposed by restrictions on platform closures.
- Navigation Street footbridge internal refurbishment to be complete by June 2016, with the external cladding anticipated to be complete in early CP6

The following critical assumptions on external factors are being made:

- City-centre development and regeneration will be stimulated as a consequence of delivering this project, satisfying external funders' objectives.

Activities and milestones (NR)

Milestone	Output	Date	Status
EIS - Infrastructure Authorised (phase 2)	Main concourse open for use by passengers	September 2015	Complete
GRIP 6 completion (platforms)	Complete platform improvement works	October 2016	Complete

Walsall to Rugeley Trent Valley Electrification

Details

Project reference code: LNW006

HLOS driver: Other electrification projects

Operating route: LNW

Last updated: December 2017

CP5 output driver

This project is providing the infrastructure to enable the running of electric rolling stock between Walsall and Rugeley Trent Valley.

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 Birmingham-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.

Network Rail's obligation

Network Rail's obligation is to deliver the electrified infrastructure to enable commencement of electric passenger and freight services between Walsall station and Rugeley Trent Valley.

Scope of works

- Route clearance including track lowering and bridge/tunnel reconstructions
- 27 kilometres of electrification works between Walsall Station and Rugeley Trent Valley
- Installation of 25kV AC overhead electrification and associated power supplies and distribution
- Electrical control system including telecoms and SCADA

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Walsall to Rugeley journey time improvement (will allow a half-hourly service to operate from May 2018 (initially with DMUs) in line with franchise requirements)
- DfT rolling stock strategy (provides electric trains for the route and enables release of diesel units for use elsewhere).

The following critical assumptions on internal factors are being made:

- Platform works to accommodate changes to rolling stock at the stations along the route are being undertaken by the Journey Time Improvement scheme.
- Electric trains for the route will require depot and stabling facilities to be provided, not part of this project
- Closure of Bloxwich Level Crossing (facilitates electrification and linespeed design)

The following critical assumptions on external factors are being made:

- EMUs will be available to enable electric operation of passenger services

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	September 2014	Complete
GRIP 4 completion	Single option scope defined	March 2015	Complete
GRIP 6 start	Start on site	June 2015	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	December 2018	Regulated output
Output delivered	Full EMU-worked half-hourly passenger service	December 2018	n/a

Chiltern Main Line Train Lengthening

Details

Project reference code: LNW007

HLOS driver: City capacity – London Marylebone

Operating route: LNW

Last updated: June 2016

CP5 output driver

The project will relieve overcrowding and supports the achievement of the capacity metric in the Government's 2012 HLOS on the Chiltern Main Line by accommodating an additional 1,000 passengers during the morning 3 hour peak into London Marylebone.

Network Rail's obligation

Network Rail's obligation is to deliver the following infrastructure:

- Platform extensions at five key stations on the Chiltern route to accommodate the proposed 9 car operations;
- Enhanced Driver Only Operation (DOO) equipment at five stations to enable the safe dispatch of 9 car train formations operating south of Banbury;
- Additional train despatch signalling control equipment necessary on two platforms at Marylebone station.

Scope of works

- Mainline platform lengthening to accommodate 9 car trainsets at Bicester North, Haddenham and Thame Parkway, Princes Risborough, High Wycombe and Beaconsfield stations
- Installation and commissioning of new DOO systems on the lengthened platforms
- New walking route and access gate at West Ruislip
- Extension of Wembley turnback siding to accommodate 9 car trainsets
- Installation and commissioning of a new TRTS dispatch system on platforms 5 and 6 at London Marylebone

Interfaces and assumptions

This project has significant CP5 interfaces with:

- Rolling stock strategy and cascade of vehicles from other operators (determined by the DfT) to enable the lengthening of trainsets
- Operational plans for the 9 car trainsets to be managed by Chiltern Railways

The following critical assumptions on internal factors are being made:

- In-filling of the existing subway at High Wycombe station is possible and an alternative structure between the platforms is proposed.

The following critical assumptions on external factors are being made:

- The additional rolling stock and depot / stabling enhancements to support the operational plans to accomplish the HLOS capacity metric is not included in this project.

Activities and milestones (NR)

Platform lengthening (except High Wycombe DOWN platform)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	March 2014	Complete
GRIP 4 completion	Single option scope definition	April 2014	Complete
GRIP 6 start	Start on site	May 2014	Complete
GRIP 6 completion	Infrastructure ready for use	September 2014	Complete

High Wycombe DOWN Platform lengthening, siding enhancement works and additional signalling control equipment on two platforms at Marylebone station.

Milestone	Description	Date	Status
GRIP 2 completion	Feasibility complete	December 2013	Complete
GRIP 3 completion	Single option selection	December 2014	Complete
GRIP 4 completion	Single option scope definition	March 2015	Complete
GRIP 6 start	Start on site	June 2015	Complete
GRIP 6 completion	Infrastructure ready for use	August 2015	Complete

The GRIP 6 completion is linked to planned timetable change commencing 7th September 2015.

High Wycombe permanent footbridge installation

Milestone	Description	Date	Status
EIS Infrastructure authorised	Infrastructure authorised for passenger use	April 2016	Complete

North West Train Lengthening

Details

Project reference code: LNW008

HLOS driver: City capacity – Liverpool - Manchester

Operating route: LNW

Last updated: September 2016

CP5 output driver

This project delivers infrastructure interventions required to help facilitate the operational plans developed by train operators to meet the CP5 HLOS capacity metrics.

Network Rail's obligation

Network Rail will work with the new franchise holders (for the Northern and TransPennine Express franchises) to develop options and then deliver a scope to support the operators' operational plans to deliver the CP5 HLOS capacity metrics for Manchester and Liverpool (excluding Merseyrail).

Scope of works

Final scope and single option selection will be determined by the rolling stock strategy for services in the North West and the operational plans of the relevant new franchise holders.

Significant Interfaces

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Refranchising process for Northern and TPE franchises.
- North West Electrification Programme
- North West station renewals and maintenance programme
- Yorkshire train lengthening

The project's scope is subject to confirmation of rolling stock strategy and the operational plans of the new franchise holders

Key Assumptions

- Northern and TPE franchises are awarded by end 2015
- The scope necessary to support the operators operational plans to deliver the HLOS capacity metrics can be accommodated within the available funding
- This project does not include gauge clearance at stations as part of route clearance works for new or cascaded rolling stock

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 2 Completion	Feasibility Complete	August 2012	Complete
GRIP 3 completion	Single option selection	CP5	Indicative
GRIP 4 completion	Outline Design	tbc	Indicative
GRIP 6 start	Start on site	tbc	Indicative
GRIP 6 completion	Infrastructure ready for use	tbc	Indicative

Bromsgrove Electrification

Details

Project reference code: LNW009

HLOS driver: CP4 completion - electrification

Operating route: LNW

Last updated: September 2017

CP5 output driver

This project is providing infrastructure to support an increase in capacity by extending a service of three trains per hour which currently terminate and turn round at Longbridge to Bromsgrove. The additional services offer a significantly enhanced frequency for passengers in Bromsgrove and improvements in connectivity between Bromsgrove and the intermediate locations e.g. Birmingham University.

This project supports the achievement of the capacity metric in the Government's 2012 HLOS.

Network Rail's obligation

Network Rail's obligation is to deliver the electrified infrastructure to enable commencement of electric passenger services to/from Bromsgrove into the Birmingham Cross-City network.

Scope of works

- Route clearance including reconstruction of four overbridges between Barnt Green and Bromsgrove to provide sufficient clearance for electrification
- Significant track remodelling around the new Bromsgrove Station area
- 9 kilometres of electrification works between Barnt Green Junction and Bromsgrove Station
- Installation of 25kV AC overhead electrification and associated power supplies and distribution
- Electrical control system including telecoms and SCADA

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Bromsgrove new station (opening April 2017)
- Bromsgrove Corridor Resignalling (commissioning November 2016)
- DfT rolling stock strategy (provides electric trains for the route)
- Worcestershire Parkway Station (later scheme with timetable dependencies)

The following critical assumptions on internal factors are being made:

- 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.
- Economies of scale are realised by sharing electrification project resource with other local projects
- The provision of electrification-immune signalling will be provided by the Bromsgrove Corridor Resignalling project in timescales consistent with this project

The following critical assumptions on external factors are being made:

- EMUs are assumed to be made available to enable electric operation of passenger services. The extension of the Cross City line will only require a minimal increase in rolling stock. Currently the service is operated by Class 323s operated by London Midland
- The station relocation needs to happen before electrification to enable the extension of the Cross City Line services. The station relocation is separately funded and constitutes a replacement of the existing two platform station, with longer platforms and with the additional facilities to turn back trains. The additional track work to operate the Bromsgrove turnback will be provided under this project.

Activities and milestones (NR)

Milestone	Description	Date	Status
Station re-location	Completion of station relocation in interim layout	April 2016	Completed
GRIP 6 start	Start on site	August 2015	Completed
EIS infrastructure authorised	Infrastructure authorised for passenger use	August 2018	Completed
Output delivered - Timetabled operation	First timetabled public use of the infrastructure	August 2018	n/a

Redditch Branch Enhancement

Details

Project reference code: LNW010

HLOS driver: CP4 completion - capacity

Operating route: LNW

Last updated: January 2016

CP5 output driver

This project has provided the infrastructure to support the primary output of increased capacity in the form of an additional train path per hour (creating a standard 20 minute interval), from the current two trains to three trains an hour between Barnt Green and Redditch on the south end of the Birmingham Cross-City line.

This was a CP4 project completed in CP5.

Network Rail's obligation

Network Rail's obligation has been to provide the track, civils, signalling, station and electrification infrastructure upgrades to enable the reliable operation of a 20-minute interval service in each direction between Redditch and Barnt Green.

Scope of works

The scope of works consisted of:

- Provision of a two mile passing loop between Alvechurch and Redditch:
- Civils works to widen cuttings and embankments:
- New switches and crossings and new second track
- Additional platform face at Alvechurch station, with new footbridge and lifts
- Signalling and overhead electrification to new layout
- Removal of the footpath level crossing at Alvechurch to improve line speed and safety

Interfaces and assumptions

The outputs of the project have been delivered and there are no outstanding interfaces or assumptions.

Activities and milestones (NR)

Milestone	Description	Date	Status
EIS infrastructure authorised	Infrastructure authorised for passenger use	August 2014	Complete*

*Handback was achieved for start of service on Monday 01 September 2014. The 3tph timetable was introduced on schedule at the start of the December 2014 timetable.

Banbury Light Maintenance Depot

Details

Project reference code: LNW011

HLOS driver: City capacity – London Marylebone

Operating route: LNW

Last updated: March 2017

CP5 output driver

This project delivers a new stabling and light maintenance depot at Banbury on the Birmingham-Marylebone route. This supports Chiltern Railways in meeting their extra capacity obligation as specified in the Government's July 2012 High Level Output Specification (HLOS - Regulated Output).

Network Rail's obligation

The project will be delivered in phases. Phase 1A involves the construction of a mainline connection with Departure/ Reception lines and four new sidings to provide stabling facilities for Chiltern Railways (38 vehicles) required as a consequence of the re-modelling of the Banbury station area - a separately-authorised project (commissioned Aug-16) which removed existing stabling capacity at Banbury.

Phase 1A+ will deliver additional operational functionality (e.g. fuelling and CET systems plus a south-end headshunt) essential to Chiltern's operation.

Scope of works

The scope of works for Phase 1A and 1A+ is defined within a baselined Detailed Route Requirements Document endorsed by NR, DfT and Chiltern Railways. The key items of scope are as follows:

Phase 1A	Phase 1A+
Sidings 1-4	South-end headshunt
5 car fuelling with canopies	CET & fuelling facilities
3 car wash apron	Permanent foul water outfall
1 car underframe wash pit	Statutory services Building
Fuel point welfare building	Firefighting system
Underframe wash building	Depot Protection system
Access Road and service yard	Permanent Services
Walking routes within sidings	
Depot signalling system	
Service gantry	
Drainage to temporary outfall	

Interfaces and assumptions

There are other CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- The completion of Banbury Remodelling (EEPH08) requires replacement stabling facilities at Banbury LMD (Phase 1A).
- The HLOS objective, to relieve overcrowding and support the achievement of the capacity metric in the Government's 2012 HLOS on the Chiltern Main Line, relates to the Chiltern Main Line Train Lengthening project (LNW007), which assumes the provision of the LMD at Banbury to support increases to the Chiltern fleet.
- East West Rail (Phase 1) introduced further vehicles into the Chiltern Fleet for which Banbury LMD provides additional stabling/maintenance facilities.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP complete	November 2015	Complete
GRIP 6 EIS Infrastructure authorised	Completion of Phase 1A. Entry into Service (EiS) for Sidings 1, 2, 3, 4.	May 2017	Complete
GRIP 6 EIS Infrastructure authorised	Completion of Phase 1A+. Full EiS for scope as per DRRD.	December 2017	Complete

Sussex Traction Power Supply Upgrade

Details

Project reference code: S001

HLOS driver: Capacity enabler

Operating route: Sussex

Last updated: January 2016

CP5 output driver

The main output driver for this scheme is the operational support for the changes to train services on the Sussex routes facilitated by S002 and the Tattenham / Caterham train lengthening project completed in CP4.

Network Rail's obligation

The principal objective of this scheme is to develop options to deliver power supply capability in CP5 consistent with the asset policy, to provide for the additional traffic resulting from implementation of the capacity strategy proposed for the route in addition to the (committed) Thameslink Programme.

The purpose of the Sussex Power Supply Enhancement scheme is "To provide DTT [December timetable] 2011 power requirements as defined and agreed with the route/stakeholders across the entire South East - "Sussex" route through E&P assets to support the CP5 timetable." A current December 2018 timetable has been provided by Govia Thameslink Railway (GTR). Timetable and service proposals have been shared and agreed as correct with train operators and interfacing projects. The full power asset have been analysed against the DTT 2011. A main output driver for this scheme is to provide N-1 (full power available with parts of the system in an outage condition) functionality and the operational support for the changes to train services on the Sussex routes including those facilitated by Redhill additional platform 0 enhancements that are underway and the Tattenham / Caterham train lengthening project completed in CP4, including Wimbledon Loop ETE enhancements and West Coast Way substation arrangements.

Scope of works

- The scope of work required to support the CP5 train service alterations has been developed as part of the Route Asset Strategy process.
- The full power asset has been analysed against the future timetable so that the Direct Current (DC), Electrical Track Equipment (ETE) and High Voltage (HV) network are understood.
- The locations of specific interventions are subject to completion of detailed design in GRIP 5.

Interfaces

This project has key interfaces with the following CP5 programmes of work, which also contribute to the delivery of the additional capacity:

- Thameslink Key Output 2 infrastructure – will determine the infrastructure which will require feeding with power
- Development work on the December 2018 timetable – will determine the future quantum of trains and associated power supply requirement
- Journey time reduction programme – faster trains have a higher power draw
- DfT's procurement programme for new and cascaded rolling stock – will determine the quantum of trains and their power draw characteristics
- the completed CP4 platform lengthening programme – longer trains will require more power but cannot be operated without longer platforms
- the CP4 traction power upgrades on the Wessex, Sussex and Kent routes – the output of these upgrades determines the baseline for this intervention
- Victoria 2B and Lewis/Newhaven signalling schemes- need to ensure an efficient alignment of possessions

Key assumptions

- Train lengthening programmes will absorb all other costs associated with track / signalling / structures / stations and other railways systems, except those identified by the GRIP 3 Feasibility Study.
- The Thameslink scheme will progress according to its December 2010 timelines and provide the identified capability for any additional cascaded rolling stock.
- There will be sufficient EPDG resource to produce designs and sufficient market resource to deliver to set milestones.
- FOCs power supply interference issues can be resolved permitting the approval of related Network Change.
- Any changes to the renewals CP5 workbank will not affect the scope of works for Sussex Traction Power Supply Upgrade.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection and AIP completion	September 2015	Complete
GRIP 4 completion	Single option scope defined	May 2016	Complete
GRIP 6 start	Start on site	March 2017	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	December 2018	Regulated Output

Redhill Additional Platform

Details

Project reference code: S002

HLOS driver: City capacity – London Victoria (Southern)

Operating route: Sussex

Last updated: January 2016

CP5 output driver

The project will contribute to the delivery of the capacity metric in the Government's 2012 HLOS by providing improved operational resilience and platform capacity at Redhill.

Network Rail's obligation

This project will provide the infrastructure to support improved operational resilience and platform capacity at Redhill.

The project will also support a number of local operational changes which are proposed by Govia Thameslink Railway (GTR) and Great Western Railway (GWR) in CP5 in the Redhill area including:

- Changes to splitting and joining arrangements at Redhill to support the final KO2 Thameslink Timetable
- An increase in the number of trains operating to and from the Reigate/ North Downs line.
- Scope of works
- Provision of an additional 12-car 270m platform at Redhill.
- Provision of a canopy (90m), waiting shelter, stairs and lift connection to the existing subway and ticket hall
- Alterations to track & signalling assets required for parallel move functionality
- The existing interlocking will be replaced with a new Computer Based Interlocking system
- Rationalisation of the track layout (S&C) at the London end of Redhill Station;

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes which will also deliver works at Redhill station are:

- Redhill Station car park redevelopment scheme by Solum Regeneration;
- Southern proposal for access improvements between ticket office and subway.

The following critical assumptions on internal factors are being made:

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

The following critical assumptions on external factors are being made:

- The scheme is sufficient to support the Thameslink KO2 timetable. It is understood that the capability provided by this project is an assumption in the Thameslink KO2 timetable. The KO2 timetable is currently under development and is planned for introduction in December 2018. The evolution of this timetable will need to continue to be monitored. The original scheme was based on the DTT 2011 iteration. Work is currently underway to revalidate the scheme against the franchisee's (GTR) latest bid timetable.
- The scheme is sufficient to support franchise commitments. A new directly awarded franchise agreement with GWR commenced in September 2015. Within the new GWR franchise new commitments are set out in relation to North Downs services which differ from GWR's previous commitments for service improvements on the route. These changes are being reviewed including their impact on Redhill. It is probable the new layout at Redhill will be capable of handling the revised commitments – but there may of course be other locations on line of route that need improvements to facilitate a consistent 3tph service on the North Downs.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	June 2014	Completed
GRIP 6 start	Start on site	March 2016	Completed
Entry into Service – Infrastructure Authorised	Infrastructure authorised for passenger use	December 2018	Regulated output

Uckfield Train Lengthening

Details

Project reference code: S003

HLOS driver: City capacity – London Bridge (Sussex routes)

Operating route: South East

Last updated: January 2016

CP5 output driver

The key output is to contribute to the capacity metric in the Government's 2012 HLOS through the provision of extra capacity between East Croydon and London Bridge, and on the Uckfield Line by enabling 10-car trains to operate.

Network Rail's obligation

In the absence of a suitable location on the route to allow train joining, Network Rail's obligation is to implement a scheme allowing 10 car Class 170/171 (23m) stock to serve up to eight station locations between Edenbridge Town and Uckfield, including work to extend 12 platform faces and relocate three signals.

Scope of works

The following platforms will be lengthened by the project:

- Edenbridge Town (platforms 1 & 2)
- Hever (platforms 1 & 2)
- Cowden (platform 1)
- Ashurst (platforms 1 & 2)
- Eridge (platforms 1)
- Crowborough (platforms 1 & 2)
- Buxted (platform 1)
- Uckfield (platforms 1)

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

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Eridge Station has a footbridge replacement scheme planned for 2015/16 implementation in the RAM (Buildings) business plan and this may include lift installation. There is an opportunity for efficiencies for the contractor to deliver both projects, during the same possessions.

The following critical assumptions on external factors are being made:

- Options reliant upon use of Selective Door Opening (SDO) are unlikely to be feasible at every station 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.
- Those 10 car trains will be no longer than 236m (e.g. Class 171 2x4 car and 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 will be 243m long.
- It is assumed the project will not result in large numbers of additional passengers using the Uckfield Line over and above established growth projections and provision of additional passenger facilities at these locations will not be required as part of this scheme.
- Works at all locations can be contained within current property boundaries and ownership.
- The works can be undertaken using Network Rail's Permitted Development Rights.
- The refurbished Class 170/171 rolling stock will be available in July 2016.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	November 2014	Complete
GRIP 6 start	Start on site	August 2015	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	July 2016	Complete
Output delivered - 10 car trains operational	First timetabled public use of the infrastructure	25 July 2016	Complete

London Victoria Station Capacity Improvements

Details

Project reference code: S004

HLOS driver: Station capacity – London Victoria (Southeastern and Southern)

Operating route: South East

Last updated: January 2016

CP5 output driver

Delivery of this project is now planned for CP6.

The project will contribute to the capacity metric in the Government's 2012 HLOS by increasing passenger capacity at London Victoria station. The available concourse space will be increased significantly and the gate line 'walkways' capacity will be increased by around 60%.

Network Rail's obligation

Unacceptable crowding (measured as Fruin - level of service F) is currently experienced at London Victoria in the high peaks. As an outcome of this enhancement, Network Rail will reduce overcrowding to Fruin - level of service D as a minimum up until 2023. The only exception to this is the dedicated Gatwick Express gate line which will not see an increase in walkway capacity.

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 – this is achieved by removing an access ramp up to the next level to allow the platform widening this specific location. An existing lift will also be reconfigured in replacement of the ramp access.
- Reconstruct fire exits: provide new fire escape stairs in the Left Luggage building.
- Remove retail units and other structures next to the escalators on Sussex concourse.
- Construct a Gatwick Express ticket office on the platform 9-12 gateline on the Sussex side concourse.
- Relocate the gateline and Customer Information Screens (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 glazed screens and seating, and displace the adjacent retail units.

- Install overhead direction indicators above all gate line walk ways.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Victoria Station Masterplan – this project will introduce congestion relief proposals which must be aligned with these works
- London Underground Victoria Station Upgrade (VSU) project. This scheme started construction in 2007 and will continue until final completion 2018. It will impact passenger flows until its completion.

The following critical assumptions on internal factors are being made:

- A technical solution can be found that alleviates pedestrian congestion at the station.
- The existing assets to be relocated are in good condition.

The following critical assumptions on external factors are being made:

- VSU – Phased opening of elements of the London Underground scheme will happen during the delivery of this scheme. It is assumed that the impact on passenger flows can be managed by the Station Management.
- 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.
- Vacant possession of all retail units is achieved.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	April 2015	Complete
GRIP 6 start	Start on site	CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP6	Regulated output

Balcombe to Copyhold Bi-directional Signalling Upgrade

Details
Project reference code: S005
HLOS driver: Network availability
Operating route: Sussex
Last updated: January 2016

CP5 output driver

This project provides infrastructure to enable improved engineering access, and reduced disruption when access is taken, on the Brighton Mainline between Haywards Heath and Three Bridges through the provision of an improved bi-directional signalling functionality. This functionality will allow significantly enhanced flexibility for engineering access. In addition, the flexibility can be used during perturbation to improve service recovery.

Network Rail's obligation

Network Rail's obligation is to deliver infrastructure to enable improved engineering access, and reduced disruption when access is taken, on the Brighton Mainline between Haywards Heath and Three Bridges through the provision of an improved bi-directional signalling functionality.

Scope of works

The scheme is developed to deliver the following scope of:

- Installation of all necessary signalling infrastructure to provide additional bi-directional signalling sections on the Balcombe Tunnel Junction to Copyhold Junction track section;
- Upgrade of track circuits;
- Installation of dual detection in the form of axle counters in Balcombe Tunnel; and
- New 650v signalling power supply.

Significant interfaces

- Thameslink Three Bridges depot works and signalling immunisation.
- Haywards Heath S&C renewals.
- ETE cables and rebated sleepers installation at Ouse Valley substation.
- Balcombe station embankment stabilisation work.
- Safer faster isolations CP5 rollout.

Key assumptions

None

Activities and milestones

Milestone	Description	Date	Status
EIS Infrastructure Authorised	Infrastructure ready for use	April 2015	Complete

Great Western Capacity Enhancement Programme and Electrification

Description
The core works will involve electrifying the lines to provide electric traction power from London Paddington to Swansea, and a number of branches, capacity projects at Reading, Oxford, Bristol Parkway and Bristol Temple Meads, and works to facilitate the introduction of new and cascaded fleets of electric trains, and the cascade of diesel rolling stock.
Significant passenger capacity enhancement through the operation of longer services (various length diesel services, lengthened to a mixture of 8 and 12 carriage electric services), and additional services. Reduced journey times including from Bristol to London Paddington.

EDP Reference Codes

- W001a – Great Western Electrification
- W001b – Cardiff to Swansea electrification
- W001c – Reading independent feeder (Bramley)
- W002a – IEP Western Capability
- W002b – IEP Western Capacity
- W003a – Thames Valley Branches
- W003b – Southcote Junction to Basingstoke electrification
- W004 – Thames Valley EMU Capability Works
- W006 - Oxford Corridor Capacity Improvements
- W007 – Dr Days to Filton Abbey Wood capacity improvements
- W008 – Bristol Temple Meads passenger capacity
- W009 – West of England DMU capability works
- W010 – Swindon to Kemble Redoubling
- W011 – Access to Assets
- W012 – Westerleigh to Barnt Green
- W013 – North Cotswolds Platform Lengthening
- W014 –West of England Platform Lengthening
- W015 – Bristol East Junction Enhanced Renewal and Remodelling
- CR002 – Reading Station Area Redevelopment
- CR007 – Acton to Willesden electrification (WCML)

Significant Interfaces

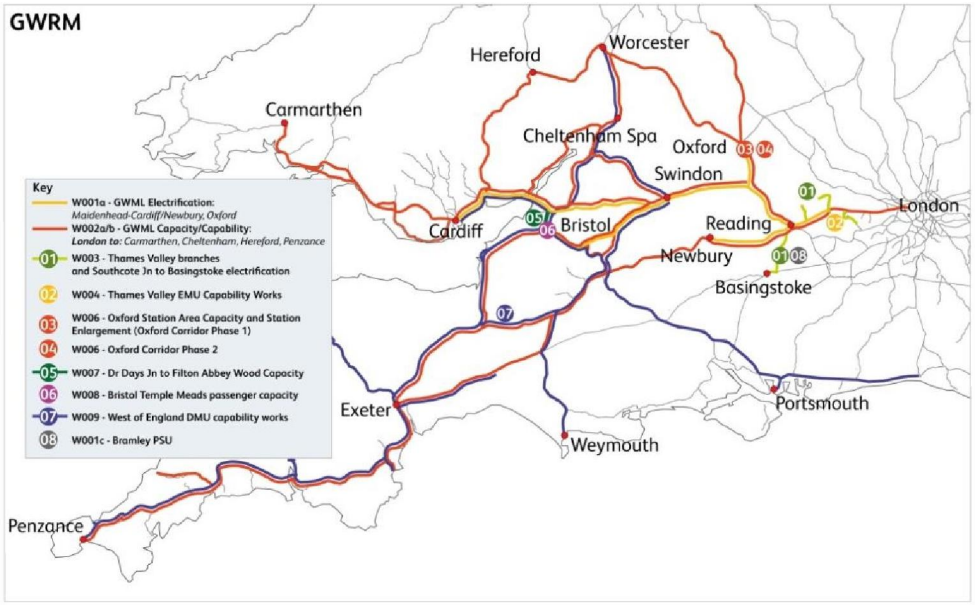
- East West Rail
- Electric Spine
- Crossrail

Assumptions

- Funding for all depot and stabling works on this programme is provided from the Depot & Stabling Fund, F010
- This programme provides infrastructure to enable the introduction of the following rolling stock onto Western Route:
 - Hitachi Super Express Trains Class 800 and Class 801
 - EMU Class 387
 - EMU Class 365

Announcements

Date	Announcement
None	



Great Western Electrification

Details

Project reference code: W001a

HLOS driver: Committed project

Operating route: Western, Wales

Last updated: September 2018

CP5 output driver

The electrification of the GWML facilitates the introduction of electric train operation delivering significant journey time improvements on key intercity routes and high seating capacity trains on suburban services, contributing to the delivery of the HLOS capacity metric for London Paddington.

Network Rail's obligation

Network Rail's obligation is to extend the electrification of the Great Western Main Line (GWML) from Maidenhead (the furthest extent of the Crossrail infrastructure works) to Cardiff and to deliver the scope of works described below.

Scope of works

The scope of the project includes the extension of electrification on the route sections as listed below, including power and distribution works and clearance works for electrification:

- Maidenhead to Didcot
- Didcot to Wootton Bassett Junction
- Reading to Newbury
- Didcot to Oxford
- Wootton Bassett Junction to Bristol Parkway
- Bristol Parkway to Cardiff
- Wootton Bassett Junction to Bristol Temple Meads
- Filton Bank

Interfaces and assumptions

The delivery of GW Electrification forms part of the Integrated Great Western Route Modernisation Programme (GWRM).

Significant interfacing schemes to this programme which will be delivered on or adjacent to the GWML are:

- Crossrail
- HS2
- Intercity Express Programme (IEP) (W002a, W002b), including co-ordination with the IEP Depot provision at Stoke Gifford
- Reading Station Area Redevelopment
- GW Mainline W10/12 gauge enhancement
- Dr Days Junction to Filton Abbey Wood capacity Improvements (W007)
- Bristol East Junction remodelling
- Oxford Corridor capacity improvements, including stabling requirements (W006)
- Oxford to Bletchley electrification (CR003b)
- South Wales mainline electrification (Cardiff to Swansea) (W001b)
- Thames Valley Branches (W003a)
- Southcote Junction to Basingstoke Electrification (W003b)
- Reading Independent Feeder (W001c)
- National SCADA Programme

The following critical assumptions on internal factors are being made:

- HOPS will be used wherever possible to maximise efficiency
- Signalling renewals projects will be completed ahead of electrification
- Bristol East Junction will be remodelled ahead of electrification
- Oxford remodelling will be completed ahead of electrification

The following critical assumptions on external factors are being made

- Distribution Network Operator (DNO) cable diversions will be funded separately and works will be delivered by the DNOs in time for the Entry Into Service dates shown below.
- Bi-mode IEP trains will be introduced in Autumn 2017
- The enhanced IEP timetable will start in January 2019
- Access will be granted to meet the Master Control Schedule (MCS)
- Planning and other required Consents will be obtained as required

Activities and milestones (NR)

This programme of works is to be delivered in phases, as listed on the following pages:

Maidenhead to Didcot

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	July 2014	Completed
GRIP 6 start	Start on site	October 2014	Completed
EIS testing (for IEP)	Entry into Service for IEP testing (Tilehurst –Didcot)	September 2016	Completed
EIS testing (complete route section)	Completion of infrastructure T&C / Route section available for driver training (if required)	November 2017	Completed
EIS Infrastructure authorised	Infrastructure authorised for passenger use	December 2017	Completed
Output delivered - First Electric Train	First timetabled public use of the infrastructure	January 2018	n/a

Didcot to Wootton Bassett Junction

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	July 2014	Completed
GRIP 6 start	Start on site	May 2014	Completed
EIS testing	Completion of infrastructure T&C / Route section available for driver training (if required)	June 2018	Completed
EIS Infrastructure authorised	Infrastructure authorised for passenger use	December 2018	Regulated output
Output delivered - First Electric Train	First timetabled public use of the infrastructure	January 2019	n/a

Wootton Bassett Junction to Bristol Parkway

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	July 2014	Completed
GRIP 6 start	Start on site	November 2014	Completed
EIS testing	Completion of infrastructure T&C / Route section available for driver training (if required)	October 2018	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	December 2018	Regulated output
Output delivered - First Electric Train	First timetabled public use of the infrastructure	January 2019	n/a

Reading to Newbury

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	July 2014	Completed
GRIP 6 start	Start on site	December 2014	Completed
EIS testing	Completion of infrastructure T&C / Route section available for driver training (if required)	October 2018	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	December 2018	Regulated output
Output delivered - First Electric Train	First timetabled public use of the infrastructure	January 2019	n/a

Didcot to Oxford

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	July 2014	Completed
GRIP 6 start	Start on site	December 2014	Completed
EIS testing	Completion of infrastructure T&C / Route section available for driver training (if required)	CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP6	Regulated Output
Output delivered - First Electric Train	First timetabled public use of the infrastructure	CP6	n/a

Bristol Parkway to Cardiff

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	April 2016	Completed
GRIP 6 start	Start on site	June 2015	Completed
EIS testing	Completion of infrastructure T&C / Route section available for driver training (if required)	July 2019	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	November 2019**	Regulated Output
Output delivered - First Electric Train	First timetabled public use of the infrastructure	January 2020	n/a

*Subject to access being agreed

*Includes an increase in scope of work to Brickyard Sidings at Cardiff Central to accommodate class 387 Electric Multiple Unit operation

Wootton Bassett Junction to Bristol Temple Meads

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	April 2016	Completed
GRIP 6 start	Start on site	April 2016	Completed
EIS testing (WBJ to Chippenham, ex. Station)	Completion of infrastructure T&C / Route section available for driver training (if required)	March 2019	Indicative
EiS Infrastructure Authorised (WBJ to Chippenham, ex. Station)	Infrastructure authorised for passenger use	March 2019	Indicative
EIS testing (Chippenham to Thingley, inc. Chipp Station)	Completion of infrastructure T&C / Route section available for driver training (if required)	CP6	Indicative
EiS Infrastructure Authorised (Chippenham to Thingley, inc. Chipp Station)	Infrastructure authorised for passenger use	CP6	Indicative
EIS testing (Thingley to BTM)	Completion of infrastructure T&C / Route section available for driver training (if required)	CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP6	Regulated Output
Output delivered - First Electric Train	First timetabled public use of the infrastructure	CP6	n/a

Filton Bank

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	April 2016	Completed
GRIP 6 start	Start on site	October 2016	Completed

EIS testing	Completion of infrastructure T&C / Route section available for driver training (if required)	CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP6	Regulated Output
Output delivered - First Electric Train	First timetabled public use of the infrastructure	CP6	n/a

South Wales Main Line Electrification

Details

Project reference code: W001b

HLOS driver: Other electrification projects

Operating route: Wales

Last updated: September 2017

Following development work the client has decided not to progress the scheme further.

CP5 output driver

The electrification of the GWML, including the South Wales Main Line, facilitates the introduction of electric train operation delivering significant journey time improvements on key intercity routes and high seating capacity trains on long distance and suburban services contributing to the delivery of the HLOS capacity metric for London Paddington.

Network Rail's obligation

To develop solutions to extend the electrification of the Great Western Main Line (GWML) from Cardiff (excl.) to Swansea (incl.), ELR: SWM2 171m 55ch (Leckwith Loop North Junction) to Swansea Station 216m 07ch.

Network Rail's obligation in CP5 is to complete GRIP Stage 3 and some enabling works. Following development work the client has decided not to progress the scheme further.

Scope of works

GRIP 3 development will:

- Include assessment of wiring the Landore Triangle incorporating the Single Swansea Avoiding Line (214m 62ch to 215m 14ch), and Swansea Loop (215m 14ch to 215m 46ch);
- Identify the preferred OLE system solution to deliver 25kV Overhead Electric supply using numerate whole life costing approach to justify the solution;
- Co-ordinate design, programme and delivery with the current Great Western Electrification project so as to extend the service from Cardiff Central as a logical progress of the wider electrification of the Great Western Main Line.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Great Western Electrification (W001a): W001b should follow in a logical and efficient development / delivery process.
- Welsh Valleys Electrification (WL001): interfaces at Bridgend in particular to be acknowledged and allowance made for future development of this project.
- The Intercity Express Programme (IEP): in particular the requirements to deliver co-ordination of the IEP Depot provision at Maliphant Sidings.

The following critical assumptions on internal factors are being made:

- HOPS will be used wherever possible to maximise efficiency
- Cardiff Area Signalling Renewal (CASR) works are fully conversant with requirements for immunisation of signalling, and to include within W001b areas out of CASR scope.
- Port Talbot West Signalling Renewal: as above.
- Port Talbot East Signalling Immunisation: as above.
- GWML W10/12 gauge enhancement: the project will ensure that requirements of gauging are incorporated. Where there may be conflict (only on the basis of whole life cost or availability of capital within the programme), reasonable resolution will be sought.

The following critical assumptions on external factors are being made

- Distribution Network Operator (DNO) cable diversions will be funded separately and works will be delivered by the DNOs in time for the Entry Into Service dates shown below
- The enhanced IEP timetable will start in December 2018
- Access will be granted to meet the dates currently assumed in the Master Control Schedule (MCS)
- Planning and other required Consents will be obtained as required

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	April 2016	Complete

Reading Independent Feeder (Bramley)

Details
Project reference code: W001c
HLOS driver: Other electrification projects
Operating route: Western, Wessex
Last updated: January 2016

CP5 output driver

This project contributes to the electrification of the Great Western Main Line (GWML) which facilitates the introduction of electric train operation delivering significant journey time improvements on key intercity routes and high seating capacity trains on suburban services contributing to the delivery of the HLOS capacity metric for London Paddington.

Network Rail's obligation

Network Rail's obligation is to complete a GRIP Stage 3 option study for traction power resilience, and to implement the preferred option from that study (implementation assumed to start CP5, complete CP6). The current working assumption is that the feed could be taken from either an existing grid supply at Didcot or a new supply point at Bramley.

Scope of works

With the introduction of electrification to the GWML, a level of redundancy is required to ensure that the network has the resilience to withstand a power failure to adjacent equipment and facilitate an efficient maintenance regime.

- This proposal will develop options for an independent power feed to Reading depot and OLE system that:
- Provides resilience to the GWML in the event of an isolation of the Didcot – Reading section of the route;
 - Provides redundancy, such that maintenance can be carried out on the main line without isolating Reading depot;
 - Provide additional capacity for future electrification schemes, e.g. Southcote Junction to Basingstoke.

Interfaces and assumptions

The delivery of Reading Independent Feeder forms part of the Integrated Great Western Route Modernisation Programme (GWRM).

Significant interfacing schemes to this programme, which will be delivered on or adjacent to the GWML are:

- Great Western Electrification (W001a)
- Crossrail (CR001)
- Intercity Express Programme (IEP) (W002a, W002b)
- Thames Valley EMU capability works (W004)
- Reading Station Area Redevelopment (CR002)
- Southcote Junction to Basingstoke Electrification (part of W003)
- National SCADA Programme
- Electric Spine

The following critical assumptions on internal factors are being made:

- Resource will be available from within the Great Western Modernisation Programme to deliver this project

The following critical assumptions on external factors are being made:

- Electrification of Southcote Junction to Basingstoke will not be carried out ahead of this project
- National Grid have a 5 year lead time to deliver a new grid supply point
- Access will be granted to meet the programme
- Planning and other required Consents will be obtained as required
- A suitable mitigation plan can be put in place for the period between electrification of the GWML and the commissioning of the Reading Independent Feeder

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	April 2017	Complete
EIS Infrastructure authorised	Independent Power Feed	CP6	Regulated Output

Intercity Express Programme: Western Capability

Details

Project reference code: W002a

HLOS driver: Committed projects

Operating route: Western, Wales & Wessex

Last updated: March 2017

CP5 output driver

To contribute to the delivery of the Government's 2012 HLOS by providing infrastructure capability enhancements to enable the delivery of the Intercity Express Programme.

Network Rail's obligation

To provide infrastructure capability enhancements as outlined in the client (DfT) remit "Infrastructure Output Specification" (IOS5) to enable the operation of the Hitachi Super Express Trains on the defined IEP network as set out in the Master Availability & Reliability Agreement (MARA) dated July 2012. The scope of enhancements is described in the section below.

Scope of works

The constituent parts of the infrastructure capability works are as follows:

- Gauge clearance for the new Hitachi Super Express Trains on specific routes across GWML;
- A review of station operations at all stations where new Hitachi Super Express Trains are due to stop; this may result in the following changes:
 - Platform extensions (see locations in table to right);
 - Revisions to permissive working (attaching/detaching/platform sharing) arrangements; and
 - Alterations to signal controls and signal locations to deal with changes to train operations;
- Infrastructure changes; platform alterations, signal relocations and electrification at Paddington to allow electric trains to access all platforms along with the Royal Oak sidings
- Enhancements to overhead line equipment between Paddington and Stockley Bridge Junction;
- Train / infrastructure interface between the Hitachi Super Express Trains design and the Network Rail infrastructure:
 - Bridge resonance;
 - Acceleration curve;
 - Platform stepping distances studies; and
 - Traction power changes;

- Assisting Hitachi Rail Europe Ltd in the Train/Infrastructure Compatibility process through the provision of train testing routes;
- Installation of Eurobalise devices to enable the use of automatic selective door opening (ASDO) and power change over (APCO) by CI.80X trains on the Western; and
- Depot enabling works; various works at London, Bristol and Swansea to meet the depot lease obligations with Hitachi Rail Europe Ltd

The Hitachi Super Express Trains are proposed to operate over the following parts of the network.

Core routes

- London to Cardiff/Swansea/Carmarthen.
- London to Bristol/Weston Super Mare/Taunton.
- London to Gloucester/Cheltenham.
- London to Oxford/Worcester/Hereford.
- London to Exeter/Paignton/Plymouth/Penzance via Westbury.

Diversions routes

- Westbury to Bath Spa.
- Gloucester to Severn Tunnel Junction.
- Cardiff to Bridgend via Barry.
- Castle Cary to Exeter via Yeovil.
- Reading to Waterloo.

Deliverables related to IEP capacity schemes are shown on W002b.

Operational length	No of platforms to be extended	Stations and platforms to be extended
9 Car	2	<ul style="list-style-type: none"> • Didcot Parkway - Platforms 4 & 5
10 Car	13	<p>Phase 1</p> <ul style="list-style-type: none"> • Bristol Temple Meads – Platforms 13 & 15 • Cheltenham Spa - Platforms 1 & 2 • Didcot Parkway - Platform 3 • Swindon – Platform 1 <p>Phase 2</p> <ul style="list-style-type: none"> • Bath Spa – Platform 1 • Chippenham – Platforms 1 & 2 • Neath – Platform 2 • Swansea - Platform 4 • Westbury – Platforms 2 & 3

Interfaces and assumptions

There are significant CP5 projects linked to this project. Other interfacing projects and their potential impact are:

- CR001 Crossrail (including electrification between Stockley and Maidenhead) - 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.
- W004 Thames Valley EMU capability works - development of capability works to allow cascaded EMUs from Thameslink to operate in the Thames Valley area. Some stations and gauging works are common to IEP and will be developed as a common project.
- W009 West of England DMU capability works - development of capability works to allow cascaded DMUs from the Thames Valley to operate on the GWR "West" routes. Some stations and gauging works are common to IEP and will be developed as a common project.
- Hitachi Train Care facilities - the IEP project will work with the Train Service Provider to develop the proposed Hitachi Super Express Trains train care facilities in London, Bristol and Swansea.
- Western Mainline signalling renewals at Oxford, Swindon, Bristol and Cardiff.

The following critical assumptions on internal factors are being made:

- W001 Great Western Electrification is delivered to enable train / Infrastructure interface and compatibility testing.
- W004 Thames Valley electric multiple unit capability works is completed on time
- W009 West of England diesel multiple unit capability works is completed on time
- CR001 Crossrail electrification and stations enhancement works are delivered in advance of the planned introduction of Hitachi Super Express Trains into passenger service in June 2017.

The following critical assumptions on external factors are being made:

- Agility/Hitachi achieve full vehicle compatibility by early 2017
- GWR (Franchisee) completes their driver training programme and obtains the relevant Vehicle Change and revised track access rights to introduce the trains into passenger service from June 2017 onwards.
- 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 depot and depot access works are not part of this submission; these are funded by Hitachi Rail Europe Ltd as part of Train Service Provider contract requirements.
- Any train alterations required to meet station operation requirements (e.g. SDO) are not part of this submission (part of Train Service Provider contract requirements).
- Great Western Mainline IEP works specifically exclude works covering traction power:
 - GWML electrification provides power and OLE between Maidenhead and Newbury, Oxford, Bristol, Cardiff and Swansea;
 - Network Rail Crossrail provides OLE between Stockley Bridge Junction and Maidenhead; and
 - Crossrail Ltd provides power between Paddington and Maidenhead.
- Pantograph design for the Hitachi Super Express trains will allow 2-pantograph operation at 125 mph without any modification to OLE infrastructure.
- Pantographs can be raised and lowered at linespeed without any modification to OLE infrastructure. Discussions continue between Network Rail, DfT, Hitachi and the TOCs to confirm this.
- Physical Platform Stepping Distance works are excluded from this project
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Route wide capability works

Milestone	Description	Date	Status
GRIP 3 Complete - provision of 125mph OLE Acton to Stockley	Single Option Selection	May 2015	Complete
GRIP 6 complete – gauge capability works (Hitachi test routes)	Completion of gauge capability works on the London to Bristol Parkway route	December 2015	Complete
GRIP 6 complete – gauge capability works (mainline routes)	Completion of capability on the core main line routes (London to Bristol, Plymouth, Swansea, Worcester, Hereford)	December 2016	Complete
GRIP 6 complete – Phase 1 stations capability works (mainline routes)	Completion of works at stations to allow Hitachi train to call	December 2017	Complete
Output delivered	First timetabled public use of bi-mode train	October 2017	n/a
GRIP 6 complete – capability works (remaining works)	Completion of remaining capability works on the GWML	June 2018	Indicative
GRIP 6 complete – provision of 125mph OLE Acton to Stockley resilience	Completion of works necessary for resilient operation at 125mph	May 2018	Complete
GRIP 6 complete – Phase 2 stations capability works	Completion of works at stations to allow Hitachi train to call	TBC	Indicative

Train / Infrastructure interface work streams

Milestone	Description	Date	Status
GRIP 3 complete – technical capability works	Single option selection	March 2014	Complete
GRIP 6 complete	All interface works completed	December 2016	Complete

Intercity Express Programme: Specific GWML Capacity Schemes

Details

Project reference code: W002b

HLOS driver: Committed projects

Operating route: Western

Last updated: September 2018

CP5 output driver

The output of the project is to contribute to the delivery of the Government's 2012 HLOS by providing infrastructure capacity enhancements to enable the delivery of the Intercity Express Programme.

Network Rail's obligation

Network Rail's obligation is to provide infrastructure capacity enhancements as outlined in the client (DfT) remit "Infrastructure Output Specification" (IOS5) to enable the operation of an enhanced passenger timetable from December 2018. The proposed enhanced timetable is planned to operate over the following parts of the Great Western Mainline:

- London to Oxford/Worcester/Hereford;
- London to Gloucester/Cheltenham;
- London to Bristol/Weston-Super-Mare;
- London to Newbury/Westbury/Exeter/Paignton; and
- London to Cardiff/Swansea/Carmarthen.

At Bristol Parkway station deliver infrastructure to enable:

- 2 new London to Bristol Temple Meads via Parkway services each hour in each direction from December 2018
- Improved operational flexibility, over the base May 2016 layout, sufficient to allow ECS moves to and from the new Hitachi Train care facility at Stoke Gifford
- Parallel moves from Bristol Parkway towards Filton (from platform 1) and South Wales (from platform 2)

At Worcester:

- Deliver infrastructure to enable an hourly service to operate to and from London Paddington and Worcester Foregate St Station (City Centre) without the need to run to Malvern to turnback
- These schemes are baselined against the outputs currently delivered by the December 2014 timetable

Scope of works

At Bristol Parkway station deliver the following infrastructure:

- An additional platform face, signalling and track works
- Additional bi-directional signalling between Filton Abbey Wood and Bristol Parkway
- Additional bi-directional signalling between Patchway and Bristol Parkway
- Additional bi-directional signalling between Patchway and Severn Tunnel Junction
- Provision of direct access to Stoke Gifford Yard in the up direction

At Worcester (Henwick)

- Additional signalling and provision of a turnback siding capable of holding a 260m long train

Interfaces and assumptions

There are significant CP5 projects linked to this project including:

- W001 Great Western Electrification – the new Hitachi Super Express Trains will make use of the electrification of the Great Western Main Line between Maidenhead, Oxford, Bristol and Swansea.
- W002a IEP: Western Capability works across the Great Western Main Line
- W007 Dr Days Junction to Filton Abbey Wood capacity improvements
- CR001 Crossrail (including electrification between Stockley and Maidenhead) - 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.
- Hitachi Train Care facilities - the IEP project will work with the Train Service Provider to develop the proposed traincare facilities for the new Hitachi Super Express Trains in London, Bristol and Swansea.
- Agility Trains Ltd Train Delivery Programme
- Western Mainline signalling renewals at Oxford, Swindon, Bristol and Cardiff.

The following critical assumptions on internal factors are being made:

- W001a Great Western Electrification is delivered to Bristol Parkway and Stoke Gifford in advance of the December 2018 timetable
- W002a IEP: Western Capability is completed on time
- W004 Thames Valley electric multiple unit capability works are completed on time
- W007 Dr Days Junction to Filton Abbey Wood capacity improvements are completed in advance of the December 2018 timetable
- W009 West of England diesel multiple unit capability works is completed on time
- CR001 Crossrail electrification is delivered in advance of the December 2018 timetable

The following critical assumptions on external factors are being made:

- Agility/Hitachi achieve full vehicle compatibility by early 2017
- GWR (franchisee) complete their driver training programme and obtain the relevant additional track access rights for the enhanced December 2018 timetable
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
Bristol Parkway 4th platform - GRIP 3 complete	Single option selection	August 2014	Complete
Henwick turnback facility – GRIP 3 complete	Single option selection	June 2014	Complete
Bristol Parkway 4th platform - EIS – Infrastructure authorised	Infrastructure ready for use for driver training/testing	December 2019*	Regulated Output
Henwick turnback facility – EIS – Infrastructure authorised	Infrastructure ready for use	December 2017	Complete

*Subject to acceptance of full business case

Thames Valley Branch Lines Electrification

Details

Project reference code: W003a

HLOS driver: Other electrification projects

Operating route: Western, Wessex

Last updated: December 2016

CP5 output driver

Following approval for the electrification of the Great Western Main Line (GWML), there is an opportunity to also electrify the two Thames Valley branch lines (listed below) enabling a significant switch to electrified services for commuting in the Thames Valley from the Berkshire and Oxfordshire catchments.

The projects will facilitate replacement of diesel trains for cascade to the West, providing additional capacity for both the Thames Valley and the West of England.

Network Rail's Obligation

- Deliver a 25kv AC electrification solution for the Twyford to Henley-on-Thames, Slough to Windsor and Eton Central to enable electric traction to operate.
- For the avoidance of doubt, electrification of Maidenhead to Bourne End and Marlow branch lines is not included, but Network Rail will support Great Western Railway and other stakeholders to develop their capacity improvements proposals for this section

Scope of works

- Develop 25kv AC electrification solution (including gauging and structures clearance) for:
 - Twyford to Henley-on-Thames
 - 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).

Interfaces and Assumptions

There are significant CP5 projects linked to this project including:

- GWML electrification (W001a) –the branches will be powered from the GWML electrification system
- W003b, Southcote – Basingstoke electrification – also enables use of EMUs in the Thames Valley and cascade of diesel rolling stock further West
- Western Route track and bridge renewals programme
- W004, Thames Valley EMU capability works – platform lengthening and gauge clearance works need to be integrated with OLE design

The following critical assumptions on internal factors are being made:

- An electrical control facility is provided and funded by the national SCADA project
- Bulk traction power supply will be provided by Great Western Electrification project

The following critical assumptions on external factors are being made:

- OLE masts and overhead line equipment will be contained wholly within Network Rail's land ownership.
- OLE masts and overhead equipment may be installed wholly within Network Rail's permitted development rights by virtue of Part 11 or Part 17A of the Town and Country Planning (General Permitted Development) Order 1995.
- Distribution Network Operator (DNO) cable diversions will be funded separately and works will be delivered by the DNOs in time for the Entry into Service dates shown below.
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Thames Valley Branch Lines

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	June 2016	Completed
GRIP 6 start	Start on site	CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP6	Regulated Output
Output delivered	First timetabled public use of the infrastructure	CP6	n/a

Southcote Junction to Basingstoke Electrification

Details

Project reference code: W003b

HLOS driver: Other electrification projects

Operating route: Western, Wessex

Last updated: December 2017

CP5 output driver

Following approval for the electrification of the Great Western Main Line (GWML), there is an opportunity to also electrify the Southcote to Basingstoke line enabling a significant switch to electrified services for commuting in the Thames Valley from the Berkshire and Hampshire catchments.

The project will facilitate replacement of diesel trains for cascade to the West, providing additional capacity for both the Thames Valley and the West of England.

Southcote to Basingstoke is also an important step towards enabling 'Cross Country' passenger services and freight operating electrically in the future.

Network Rail's Obligation

- Develop to GRIP Stage 2, 25kV AC electrification solution between Southcote Junction and Basingstoke.

Scope of works

- Develop a 25kv OLE electrification solution for Southcote Junction to Basingstoke enabling more efficient operation of passenger services on the route through electric traction.

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).

Interfaces and Assumptions

There are significant CP5 projects linked to this project including:

- W001a, GWML electrification – the branches will be powered from the GWML electrification system
- W003a Thames Valley Branches electrification – also facilitates use of EMUs in the Thames Valley and cascade of diesel rolling stock to the West
- Western Route track and bridge renewals programme
- W004, Thames Valley EMU capability works – platform lengthening and gauge clearance works need to be integrated with OLE design

- ES003, Electric Spine Development Programme – multiple elements necessary to realise the benefits of introducing electric freight traction
- Reading Borough Council proposals for a new station at Reading Green Park.

The following critical assumptions on internal factors are being made:

- An electrical control facility is provided and funded by the national Supervisory Control and Data Acquisition (SCADA) project
- Bulk traction power supply will be provided, which is subject to the development of the Reading Independent Feeder (Bramley) proposal (W001c)

The following critical assumptions on external factors are being made:

- OLE masts and overhead line equipment will be contained wholly within Network Rail's land ownership.
- OLE masts and overhead equipment may be installed wholly within Network Rail's permitted development rights by virtue of Part 11 or Part 17A of the Town and Country Planning (General Permitted Development) Order 1995.
- Distribution Network Operator (DNO) cable diversions will be funded separately and works will be delivered by the DNOs in time for the Entry Into Service dates shown below.
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 2	Pre-feasibility	December 2017	Complete
GRIP 3 AIP completion	Single option selection and AIP completion	CP6	Indicative
GRIP 4 completion	Single option scope defined	Assumed CP6	Indicative
GRIP 6 start	Start on site	Assumed CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	Assumed CP6	Indicative
Output delivered	First timetabled public use of the infrastructure	Assumed CP6	n/a

Thames Valley Electric Multiple Unit Capability Works

Details

Project reference code: W004

HLOS driver: Other electrification projects

Operating route: Western

Last updated: March 2018

CP5 output driver

The scheme contributes to the delivery of the HLOS capacity metrics for London Paddington and the HLOS Reliability metric for England and Wales.

Network Rail's obligation

Network Rail's obligation is to provide infrastructure capability enhancements to enable the operation of class 387 EMUs in the Thames Valley area – Paddington to Oxford, Reading to Newbury, Reading to Basingstoke, Slough to Windsor and Twyford to Henley.

Scope of works

Network Rail will be undertaking the following infrastructure capability works:

- Gauge clearance for the new and cascaded class 387 EMUs in the Thames Valley;
- Revised stopping location boards at all station platforms;
- Platform extension works;
- Amendments to signalling at 3 stations to allow for the revised train lengths to operate;
- Enhancements to station lighting where necessary to cater for extended train lengths and Driver Controlled Operations (DCO)

Platforms to be extended are as follows:

Operational length	No of platforms to be extended	Stations and platforms to be extended
4 car	6	Appleford – Platform 1 and 2. Aldermaston – Platform 2. Bramley – Platforms 1 and 2 Mortimer – Platform 1
8 car	24	Tilehurst – Platforms 1, 2, 3 and 4 Pangbourne – Platforms 1 and 2. Goring and Streatley – Platforms 1, 2, 3, 4 Cholsey – Platforms 1, 2, 3 and 4. Culham – Platforms 1 and 2. Radley – Platforms 1 and 2. Reading West – Platform 2. Theale – Platforms 1 and 2. Thatcham – Platforms 1 and 2. Iver – Platforms 4 (resurfacing)
12 car	13	Slough – Platforms 2, 3, 4 and 5. Maidenhead – Platforms 1, 2, 3, 4 and 5. Twyford – Platforms 1, 2 and 3. Didcot - Platform 3 – funded by IEP but still delivers 12 car EMU capability

DfT and the franchisee have confirmed that EMU operations will utilise class 365 and 387 EMUs operating up to 12-car in length over the following core and diversionary route sections, on which the scope above will be implemented:

Core routes

- Paddington to Oxford
- Slough to Windsor and Eton Central
- Twyford to Henley
- Reading to Newbury
- Reading to Basingstoke

Note:

- 4 and 8 car train sets are planned to operate on the Relief Line suburban Services
- 8 and 12 car train sets are planned to operate on the Main Line peak and off Peak services as well as the Main Line semi fast peak hour services
- 12 car trains may also operate on the Relief Lines at times of planned and unplanned perturbation
- 4 car services will operate on the branch lines

Diversiory routes

- Acton East to North Pole junction
- Reading West Curve
- Foxhall curve

Ancillary movements

- To and from Reading Train Care Depot
- To and from Oxford up and down carriage sidings
- To and from the proposed West Ealing sidings
- To and from the proposed Didcot sidings
- To and from London North Pole depot

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- W001a Great Western Electrification – the Class 365 and 387 EMUs will make use of the electrification on the Great Western Main Line between Maidenhead, Oxford and Newbury
- W002a Intercity Express Programme – for gauging works and the extension to platform 14 at Paddington
- W003 Thames Valley Branch Lines Electrification - the Class 365 and 387 EMUs will make use of the electrification on the Thames Valley branch lines
- W006 Oxford Corridor Capacity – for provision of station capability
- CR001 Crossrail – for platform extensions and enhancements at Acton Main Line, Ealing Broadway, West Ealing, Southall, Hayes, West Drayton, Langley and Taplow Note: works to platforms at Slough and Maidenhead are jointly funded by CR001 and W004.
- CR001 Crossrail - for provision of OLE between Stockley Bridge Junction and Maidenhead

The following critical assumptions on internal factors are being made:

- W001 Great Western Electrification is delivered to enable train / infrastructure interface, compatibility testing and passenger service operations
- W003 Thames Valley Branch Lines Electrification; Dates within CP5 are yet to be committed and EMUs cannot operate on these lines until these works are completed
- CR001 Crossrail electrification and stations enhancement works are delivered in a phased programme that allows the planned introduction of class 387 EMUs into passenger service from May 2016

The following critical assumptions on external factors are being made:

- GWR (franchisee) completes their driver training programme and obtains the relevant Vehicle Change and revised track access rights to introduce the trains into passenger service from May 2016 onwards
- Any train alterations required to meet station operation requirements (e.g. SDO & DOO) are not part of this submission
- Any infrastructure alterations required to meet station operation requirements (e.g. SDO Balises) are not part of this submission
- Works to address stepping distances are only required at specified stations;
 - Culham Platform 1, Midgham Platform 1, Theale Platform 1 and Tilehurst Platform 4
- Any required capacity works for any enhanced timetable operations are developed as separate schemes
- Pantograph design for 8 and 12 car operations at up to 110 mph will be developed between the TOC/ROSCO and the Network Rail electrification project
- SDO balises are excluded from the scope of this project
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	April 2015	Complete
GRIP 6 start	Start on site (in phases)	November 2015	Complete
EIS testing	Entry into Service for testing and driver training (in phases)	August 2016	Complete
EIS Infrastructure authorised (Paddington to Didcot)	Infrastructure authorised for passenger use	December 2017	Complete
EIS Infrastructure authorised (Reading to Newbury)	Infrastructure authorised for passenger use	December 2018	Regulated output
EIS Infrastructure authorised (Didcot to Oxford)	Infrastructure authorised for passenger use	Assumed CP6	Indicative
EIS Infrastructure authorised (Reading to Basingstoke)	Infrastructure authorised for passenger use	Assumed CP6	Indicative
Output delivered (Paddington to Didcot)	First timetabled public use of the infrastructure	January 2018	n/a
Output delivered (Reading to Newbury)	First timetabled public use of the infrastructure	January 2019	n/a
Output delivered (Didcot to Oxford)	First timetabled public use of the infrastructure	Assumed CP6	n/a
Output delivered (Reading to Basingstoke)	First timetabled public use of the infrastructure	Assumed CP6	n/a

Western Rail Link to Heathrow

Details

Project reference code: W005

HLOS driver: Airport and port access

Operating route: Western

Last updated: March 2018

CP5 output driver

To improve access to Heathrow Airport for both business, leisure travellers and airport workforce, by improving rail connectivity to the airport from the immediate vicinity, the M4 corridor, the wider Thames Valley, the West of England, the South West, South Wales and the West Midlands.

Network Rail's obligation

The project should develop options to provide a westerly rail route to achieve optimum journey times between Reading and London Heathrow Airport, calling at Slough and Maidenhead or Twyford, at a maximum frequency of 4 trains per hour.

Scope of works

Following completion of the Network Rail GRIP 2 study in May 2012 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 (July 2012) and the High Level Output Specification (July 2012), which stated that delivery of enhancement works "will be subject to a satisfactory business case and the agreement of acceptable terms with the Heathrow aviation industry".

Significant Interfaces

There are significant CP5 projects linked to this project including:

- CR001, Crossrail, delivering the electrification and station alternations along the Great Western Mainline (GWML) from Heathrow Airport Junction to Maidenhead (inclusive). This is reflected in the assumed electrification infrastructure that Western Rail Link to Heathrow (WRLtH) will connect into.
- W001, Great Western Main Line electrification, delivering the electrification of the GWML from Maidenhead (exclusive) to Reading and further west. This will be delivered pre WRLtH construction and allows electric traction to travel west of Maidenhead.
- F011, Western route European Train Control System (ETCS); this enhanced signalling system is planned to be operational between Paddington and Heathrow Airport Terminal 4 and 5. This will be extended along the GWML

from Heathrow Airport Junction towards Bristol. Progress of this project will affect the signalling arrangements that WRLtH will connect into.

- F008, High Speed 2, requiring the Heathrow Express depot to move from Old Oak Common by December 2018. If the site identified for the replacement depot, at Langley, proceeds, design and construction coordination will become a key project activity.
- The Project will work with local landowners to avoid, where practical, frustrating future aspirations.

Key assumptions

Development work aligned to public and statutory consultation will produce a final option to deliver the required outputs within the funding available to enable application through a Development Consent Order.

- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Network Change will not be unreasonably withheld

Activities and milestones

Milestone	Description	Date	Status
GRIP 4 AIP completion	Single option development and AIP completion	Early CP6	Regulated Output
GRIP 6 start	Start on site	TBC	Indicative
GRIP 6 completion	Infrastructure ready for use	TBC	Indicative

Oxford Corridor Capacity Improvements

Details

Project reference code: W006

HLOS driver: Freight and Passenger Carrying Capacity. Station expansion at Oxford.

Operating route: Western

Last updated: September 2017

CP5 output driver

This project contributes to the delivery of capacity and capability metrics in the Government's 2012 HLOS, relating to journey time improvements on the Oxford Corridor (Didcot North Junction - Aynho Junction).

Network Rail's obligation

Network Rail's obligation is to:

- Deliver infrastructure to support East West Rail (EWR) Services from Oxford to London Marylebone (2 TPH) in September 2016 (Phase 0)
- Deliver infrastructure to support Strategic Freight Network 775m freight trains
- Deliver infrastructure to support EMU service introduction between Oxford Station and London Paddington
- Deliver sidings infrastructure to support EMU and IEP introduction
- Deliver infrastructure to support IEP timetable
- Develop infrastructure solutions to support capacity improvements for additional EWR Phase 2 services from Oxford to Bedford/Milton Keynes (2TPH)
- Develop infrastructure solutions to support increased frequency Freight (2TPH) and Cross Country services (1TPH)
- Develop Transport and Works Order (TWAO) for Oxford Phase 2

Scope of works

The project's scope of works consists of:

- Improvements to line speeds
- Track and signalling enhancement to improve capacity, flexibility, maintenance and availability
- Revised Oxford station platform arrangements to support EWR services and future passenger capacity growth

Interfaces and assumptions

There are significant CP5 scheme interdependencies with this project including:

- Oxford area re-signalling to be delivered concurrently with Oxford Corridor Phase 1 for efficient delivery

- Hinksey Flood Resilience: Oxford Corridor Phase 1 works to be planned alongside Hinksey flood resilience project for efficient delivery
- Western route track and bridge renewals programme. To be delivered concurrently with Oxford Corridor Phase 1 for efficient delivery
- W001, Great Western Main Line electrification, Oxford Corridor Phase 1 track re-modelling, signalling and civils are required ahead of electrification from Didcot to Oxford
- W002a, W002b, Intercity Express Programme (IEP). Oxford Corridor Phase 1 will deliver stabling and turnback provision for IEP introduction. Electrification following Phase 1 works will support the efficient operation of new trains
- W004, Thames Valley Electric Multiple Unit Capability Works. Oxford Corridor Phase 1 will deliver stabling provision for EMU introduction. Electrification to follow Phase 1 track and signalling works
- W009, Bristol and West Country DMU introduction: Introduction of EMU service will allow current DMUs to be cascaded to Bristol and the West Country
- CR003, East West Rail (Phases 1 and 2). Oxford Corridor program will deliver the required station capacity and operational flexibility to support the introduction of EWR services
- F006, Strategic Freight Network, (capacity improvements between Didcot and Oxford). Phase 1 will deliver track layout and signalling capability to support freight capacity improvements
- Oxford Station Masterplan (external funding to be confirmed). To be delivered concurrently with Oxford Corridor Phase 2 for efficient delivery

The following critical assumptions on internal factors are being made:

- Project dates are based on receiving funding authority for Oxford Corridor Phase 1 in May 2016
- Project authority and funding for all interfacing projects are available at the required time: Depots and Stabling (F010), Renewals, East West Rail (CR003), Strategic Freight Network (F006)
- Oxford Corridor Phase 1 track, signalling and civils scope is delivered as a pre-requisite to subsequent electrification from Didcot to Oxford
- Resources and access are available as planned to deliver the updated programme

The following critical assumptions on external factors are being made:

- Oxford Corridor Phase 1 Consents are not unreasonably delayed
- Oxford Corridor Phase 2 TWAO is not unreasonably delayed
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion (Phase 1)	Single option selection and AIP completion	April 2015	Complete
GRIP 3 AIP completion (Phase 2)	Single option selection and AIP completion	CP5	Regulated Output
GRIP 4 completion (Phase 1)	Single option scope defined	August 2016	Complete
GRIP 4 completion (Phase 2)	Single option scope defined	CP5	Indicative
GRIP 6 start (Phase 1)	Start on site	September 2016	Complete
GRIP 6 Start (Phase 2)	Start on site	CP6	Indicative
EIS – Infrastructure authorised (Phase 0)	Infrastructure Ready for Use	September 2016	Complete
EIS – Infrastructure authorised (Phase 1)	Infrastructure Ready for Use	August 2018	Complete
EIS – Infrastructure authorised (Phase 2)	Infrastructure Ready for Use	CP6	Indicative

Note

Phase 0: enables Chiltern Rail services to commence from London Marylebone to Oxford from September 2016 as part of the East West Rail project, through existing bay platform enhancement.

Phase 1: includes reconfiguration to the track layout and sidings to provide additional operational capacity, capability and flexibility through the station. This further compliments the subsequent electrification of the railway south of Oxford.

Phase 2: provides additional through platform capacity and line speed improvements to enable an enhanced timetable to operate electric trains and provides additional East West Rail services from Milton Keynes or Bedford. This also supports Oxford Councils' aspirations to improve the highway through the Botley Road Bridge, and is proposed to be delivered concurrently with Oxford Corridor Phase 2 for efficient delivery.

Dr Days to Filton Abbey Wood Capacity Improvements (Filton 4-tracking)

Details

Project reference code: W007

HLOS driver: City capacity – Bristol

Operating route: Western

Last updated: January 2016

CP5 output driver

The project will contribute to reducing end-to-end journey times for cross-country and Bristol – London Paddington services and support the HLOS capacity metrics for both Bristol and London Paddington. It will also provide the capability to keep train services operational when engineering works and asset maintenance are planned.

Network Rail's obligation

Network Rail's obligation is to provide the infrastructure capable of operating 4 additional trains an hour (each way) between Bristol Parkway and Bristol Temple Meads. This enhanced capability will support the enhanced Intercity Express Programme (IEP) timetable (2 additional hourly services between Bristol and London Paddington) as well as the required empty stock moves to and from Stoke Gifford Depot.

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 two track
- Replacement of the derelict 3-span steel viaduct at Stapleton Road
- Provision of a new double junction at Horfield
- Enhanced signalling; and
- A new platform at Filton Abbey Wood station.

Interfaces and assumptions

There are significant CP5 schemes linked to this project.

- Bristol Area Signalling Renewals and Enhancements (BASRE)
- Bristol East Junction Renewal
- W001, Great Western Main Line electrification, including electrification of the new four-track railway (which will follow commissioning of this project)
- W002a & b, Intercity Express Programme (IEP)
- W008 Bristol Temple Meads Passenger Capacity
- W009 West of England DMU capability works
- West of England Partnership funded MetroWest

The following critical assumptions on internal factors are being made:

- The changes to the wider programme delivery of GWRM can be accommodated by the limited resources in critical areas (such as signalling design, testing and commissioning)
- That the enhancement at Bristol Parkway (4th platform) and Patchway exit proceed as planned

The following critical assumptions on external factors are being made:

- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	November 2013	Complete
GRIP 6 start	Start on site	September 2015	Complete
EIS Infrastructure Authorised	Infrastructure ready for use (not electrified)	December 2018	Regulated Output
Output delivered	First timetabled public use of the infrastructure	December 2018	n/a

Bristol Temple Meads Passenger Capacity

Details

Project reference code: W008

HLOS driver: City capacity – Bristol

Operating route: Western

Last updated: January 2016

CP5 output driver

The objective for the Bristol Temple Meads station capacity project is to understand and provide for future capacity constraints. Demand is expected to increase following the introduction of the Intercity Express Programme (IEP) new Hitachi Super Express Train services, when two additional fast train services per hour are introduced from Bristol Temple Meads to London Paddington via Bristol Parkway.

Network Rail's obligation

- To enhance capacity and safe pedestrian flow to accommodate the passenger growth forecast for 2018 to circa. 2025.
- To deliver a solution that takes full cognisance of the proposed Masterplan redevelopment.
- In the longer term to reinstate two platforms in Midland Shed to accommodate 260m long 10 car IEP trains (it should be noted that it is proposed to re-plan this element of the works to align with the Masterplan; the activities and milestones shown therefore do not relate to this specific scope)

Scope of works

The works consist of the provision of additional capacity, access and circulation at Bristol Temple Meads that will provide a foundation for future proposed developments at Bristol Temple Meads Station – most notably the Bristol Temple Meads station Masterplan.

Interfaces and assumptions

The most significant assumption with this Project is the replanning of the provision of additional platforms to align with the Bristol Temple Meads station Masterplan. The rationale for this is that the new platforms are not required until CP6 or beyond.

There are significant CP5 projects linked to this project including:

- Bristol Temple Meads Masterplan (to be externally funded);
- W002a, W002b, IEP;
- W007, Dr Day's Junction to Filton Abbey Wood capacity improvements;

- The West of England Local Enterprise Partnership's Temple Quarter Enterprise Zone places an increased strategic importance on the station area; and
- Local transport network and 'MetroWest'.

The following critical assumptions on external factors are being made:

- 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 Historic England, Local Conservation Officers and other key stakeholders following consultation.
- Wider development for the station will be funded and is being undertaken with external stakeholders and developed through an area Master Plan.
- Access will be granted to meet the programme.
- Planning, Consents, Licences and Agreements will be obtained as required.
- Station Change will not be unreasonably withheld or delayed.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completed	March 2017	Complete
GRIP 4 completion	Single option scope defined	December 2017	Complete
GRIP 6 start	Start on site	June 2018	Indicative
EIS infrastructure approved	Infrastructure authorised for passenger use	October 2018	Regulated Output
Output delivered	First timetabled public use of the infrastructure	CP6	n/a

West of England DMU Capability

Details

Project reference code: W009

HLOS driver: City capacity – Bristol

Operating route: Western, Wales & Wessex

Last updated: March 2018

CP5 output driver

To contribute to the delivery of the Government's 2012 HLOS capacity metrics for Bristol and the England and Wales HLOS Reliability metric.

Network Rail's obligation

Network Rail's obligation is to develop solutions for infrastructure capability enhancements to enable the operation of cascaded DMUs from the Thames Valley on the West Country routes described in the Scope of Works below.

Scope of works

The constituent parts of the infrastructure capability works being developed are as follows:

- A phased programme of 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 arrangements
 - Revisions to permissive working for attaching; detaching and platform sharing arrangements; and
 - Alterations to signal controls and signal locations to deal with changes to train operations.

DfT, Network Rail and GWR have determined that the phased approach to gauge clearance will be developed for the cascade of Class 165 and 166 units over the following routes:

Group 1 – Greater Bristol Area

- Bristol Temple Meads (BTM) to Severn Beach
- Avonmouth to Bristol Parkway plus the Filton chords
- Routes to and from Bristol St Phillips Marsh depot

Group 2 – Bristol Suburban Area

- BTM to Taunton (including Weston-super-Mare)

Group 3 – South Wales

- BTM to Cardiff Central

Group 4 – Wider Bristol Travel to Work Area

- BTM to Worcester Foregate Street (including Gloucester)
- Westbury to Southampton (including diversionary routes)
- Castle Cary to Weymouth
- Swindon to Standish Junction
- Swindon to Westbury
- Castle Cary to Cogload Jn
- Frome Loop and Hawkerdige Curve - Westbury

Group 5 – Wessex Route

- Southampton to Portsmouth

Group 6 – South East Route

- Portsmouth to Brighton

Group 7 – West of England

- Exeter St Davids to Plymouth
- Exeter St Davids to Barnstaple
- Exeter St Davids to Exmouth
- Newton Abbot to Paignton
- Routes to and from Laira depot

Group 8 – West of Plymouth

- Plymouth to Penzance
- Gunnislake branch
- St Ives branch

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- W007 Bristol Dr Days Junction to Filton Abbey Wood Capacity Improvements
 - Provision of additional infrastructure to allow the operation of the enhanced December 2018 timetable.

The following critical assumptions on internal factors are being made:

- W001 Great Western Electrification is delivered to enable the DMU cascades to take place
- W004 Thames Valley electric multiple unit capability works is completed on time to allow the DMU cascade to take place

The following critical assumptions on external factors are being made:

- Any train alterations required to meet station operation requirements (e.g. SDO & DOO) are not part of this submission.
- Works to address stepping distances are only required at specified stations; Freshford Platform 2 and Stonehouse platform 2.
- Any required capacity works for any enhanced timetable operations are developed as separate schemes.
- GWR (franchisee) and the ROSCO complete their vehicle modifications to the kinematic envelope and door controls prior to the DMU Cascade.
- GWR (franchisee) completes its driver training programme and obtains the relevant Vehicle Change and revised track access rights to introduce the trains into passenger service from January 2017 onwards.
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Operational length	No of platforms to be extended	Stations and platforms to be extended
1 car (23m vehicle)	2	Dilton Marsh – Platforms 1 and 2.
3 car (23m vehicle)	1	Melksham - Platform 1
5 car (23m vehicle)	7	Bradford on Avon – Platform 2 Freshford – Platforms 1 and 2 Lawrence Hill - Platform 2 Stapleton Road – Platform 1 Trowbridge – Platform 1 Warminster – Platform 2
6 car (26m vehicle)	3	Kemble – Platform 1 Stonehouse – Platforms 1 and 2

Activities and milestones (NR)

Route wide capability works

Milestone	Description	Date	Status
GRIP 3 AIP completion (Stations)	Single option selection and AIP completion	June 2016	Complete
EIS testing	Start of Entry into Service for driver training	April 2017	Complete
EIS – Infrastructure Authorised (Gauging)	Phased Infrastructure works authorised for passenger use starts	April 2017	Complete
EIS – Infrastructure Authorised (stations)	Stations infrastructure authorised for passenger use concludes	May 2018*	Regulated Output
EIS – Infrastructure Authorise (Gauging)	Gauging Infrastructure authorised for passenger use concludes	December 2018	Regulated Output
Output delivered	Timetabled public use of the infrastructure	December 2018	n/a
EIS Infrastructure authorised (West of Plymouth)	Infrastructure authorised for passenger use	CP6	Indicative

*Remaining scope to be completed by August 2018 ahead of passenger services commencing December 2018

Swindon to Kemble Redoubling

Details

Project reference code: W010

HLOS driver: Investment Framework

Operating route: Western

Last updated: January 2016

CP5 output driver

To complete the project as remitted in CP4 under the Investment Framework process. This enhancement will provide capacity for four train paths per hour (in each direction) between Cheltenham Spa and Swindon. The linespeed remains unchanged.

The delivery of this project is a core enabler for the wider Great Western Route Modernisation (GWRM) programme to provide a robust diversionary route to south Wales when the main route via Bristol Parkway is closed.

Network Rail's obligation

Network Rail's obligation is to deliver infrastructure capable of operating 4 trains an hour (each way) between Swindon and Gloucester.

Scope of works

The scope of works is to re-double the railway between Swindon Loco Junction (78m 20ch) and Kemble (90m 74ch), which predominately consists of slewing works to the existing single line and the relaying of a new second track, associated signalling and other discipline works.

Additional intermediate infill signalling is to be provided between Kemble and St Mary's crossing, and between this crossing and Standish Junction. This new signalling is to include associated cable routes, telecoms and signalling power supplies. Consideration shall be given to possible implementation of modular signalling elements.

Interfaces and assumptions

Significant interfacing schemes to this programme included:

- Swindon A Signalling Renewal
- GWRM (which includes the installation of the OLE)

In addition to the enhancement the project will deliver two core renewal elements of work:

- Embankment renewal at Purton and Minety; and
- Renewal (and relocation) of 2 crossovers at Swindon.

Funding for these renewal elements of works was not part of this project budget; however, aligning with this programme was the most efficient delivery route.

Activities and milestones (NR)

Milestone	Description	Date	Status
Entry Into Service	Infrastructure commissioned	August 2014	Complete

Western Route: Access to Assets

Details

Project reference code: W011

HLOS driver: Crossrail Performance Delivery

Operating route: Western

Last updated: March 2017

CP5 output driver

To deliver sustainable maintenance access and asset reliability improvements on the operational railway between Paddington and Reading following commencement of the 2019 Crossrail High Frequency Timetable, in support of the Public Performance Measure.

In addition to the benefits listed above the project will enable improved maintenance to be undertaken on the asset base between Paddington and Reading leading to improved asset reliability, Composite Reliability Index, and Composite Sustainability Index and reduced Mean Time Between Service Affecting Failures (MTBSAF) for the asset base.

Network Rail's obligation

Network Rail's obligation is to develop and deliver a package of interventions that improve maintenance access, operability and asset reliability on the railway between Paddington and Reading to enable the 2019 Crossrail Timetable to be delivered.

Scope of works

- Provision of additional and enhanced Maintenance Access Points to enable staff, and on-track plant and machinery to have improved access to the railway to reduce travel time to worksites, failures and key asset locations
- Development of Reliability Based Maintenance (Inspection and Planned) on all asset groups
- Enhancement of existing MK3b Overhead Line Equipment for high intensity Super Express Trains and Electric Multiple Unit pan pass volumes
- Provision of Reversible Feed 650v power and signalling supply infrastructure
- Development of split end detection to key S&C assets
- Reliability and PPM improvement interventions to S&C and Train Detection Asset Groups
- Development of other interventions in support of the output

Interfaces and assumptions

There are significant CP5 projects linked to this project. These interfacing projects, which could have a potential impact, are:

- Crossrail On Network Works
- Great Western Electrification
- HS2 Old Oak Common Station
- Intercity Express Programme
- Thames Valley EMU Deployment
- Langley Heathrow Express Depot (HS2 related)
- Western Rail Link to Heathrow (WRLtH)

The following critical assumptions on internal factors are being made:

- Sufficient resources can be deployed by Western Route to develop and deliver the interventions identified in sufficient time to complete implementation by the end of 2018
- No programme slippage occurs in the delivery of the Crossrail On-Network Programme.

The following critical assumptions on external factors are being made:

- The major Crossrail timetable change remains at 2019

Further enhancement projects announced for the Paddington – Reading corridor above those currently identified are not accounted for in current costs and milestones

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion Various	Single option selection	Various All current projects in A2A programme will complete GRIP 3 by 30th October 2017	Complete
GRIP 4 completion Various	Single option scope defined	Various All current projects in A2A programme will complete GRIP 4 by 31 st December 2017	Complete
GRIP 6 start Various	Start on site	Various All current projects in A2A programme will start GRIP 6 by 01/01/18 and complete by 31/03/19	Complete
EIS testing Various	Entry into Service for testing and driver training	Various however all current A2A projects are required to be tested and ready for use by 31/03/19	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	Various however all current A2A projects are required to be tested and ready for use by 31/03/19	Regulated Output
Output delivered	First timetabled public use of the infrastructure	Various however all current A2A projects are required to be tested and ready for use by 31/03/19	n/a

Reading Area Station Redevelopment

Details

Project reference code: CR002

HLOS driver: Committed projects

Operating route: Western

Last updated: January 2016

CP5 output driver

Located at the crossroads between the west and London and between the north and south, Reading station is the major bottleneck on the Great Western Main Line (GWML) restricting capacity and constraining performance. Funded through the CP4 and CP5 periodic reviews, the programme of work delivers a major capacity, capability and performance enhancement across the Reading station area and its approaches.

Network Rail's obligation

Deliver infrastructure works to:

- Provide a station to accommodate medium and long term growth requirements
- Improve reliability to 92%
- Provide additional train paths
- Reduce conflicting moves
- Enable longer trains (IEP)
- Enable electrification of GWML

Scope of works

The constituent parts of the project are:

- A new Thames Valley signalling centre replacing the existing Reading signal box (completed and operational);
- Four new platforms on the north side of the station and a new transfer deck (completed and operational);
- Widening of Platform 7 (completed and operational);
- A new south side platform and platform extensions for Waterloo line services (completed and operational);
- 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 (completed, and operational);
- A 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 trains and modern equivalent depot facilities (completed and operational);
- Grade separation by provision of elevated main lines to the west of the station facilitating improvements to Cow Lane Bridge by January 2015;

- Provision of a new grade-separated feeder line from Oxford Road Junction to the north side of the station by April 2015;
- Grade separation of the Reading West Curve from Oxford Road Junction – Reading West Junction;
- Extensive track layout reconfiguration and re-signalling throughout the area;
- Provision for Crossrail services; and
- A Transport and Works Order Act, which was successfully enacted on 28 October 2009, thereby securing the lands needed to undertake the project.

Interfaces and assumptions

There are significant CP5 projects linked to this project including:

- Asset renewals and enhancements programmes for signalling, telecoms and track.
- GWML route enhancement projects.
- CR001, Crossrail
- W001, Great Western Main Line electrification
- W002a, W002b, Intercity Express programme (IEP)
- W004, Thames Valley EMU capability works

The following critical assumptions on internal factors are being made:

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

The following critical assumptions on external factors are being made:

- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
EIS - Infrastructure authorised: Station upgrade works	Infrastructure authorised for passenger use	June 2014	Complete
EIS - Infrastructure authorised: Reading West Junction grade separation	Infrastructure authorised for passenger use	January 2015	Complete
EIS - Infrastructure authorised: West Country grade separation	Infrastructure authorised for passenger use	April 2015	Complete
EIS - Infrastructure authorised: Recoveries & speed restriction removals	Infrastructure authorised for passenger use	September 2015	Complete

Acton (GWML) to Willesden (WCML) Electrification

Details

Project reference code: CR007

HLOS driver: Other electrification projects

Operating route: Anglia, LNW & Western

Last updated: June 2016

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 (WCML) 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.

The project provides capability for electric passenger and freight train operation between the Great Western Main Line and the West Coast Main Line for timetabled and diverted services.

Network Rail's obligation

Develop to Governance of Railway Investment Projects stage 3 (GRIP 3) an overhead electrification system at 25kV AC from Acton West to Acton Wells, Acton Canal Wharf (for WCML) and the West London Line in order to provide the capability for 25kV AC electric trains to operate.

Scope of works

- Develop 25kV AC Overhead Line Equipment (OLE) solution for Acton West to Acton Wells via the Goods and Poplar Lines
- Develop 25kV AC OLE solution for Acton Wells to Acton Canal Wharf Junction via the Cricklewood lines and onto the Up/Down Acton branch to interface with existing West Coast overhead line equipment at Willesden No. 7 junction.
- Develop 25 kV AC OLE solution from Acton Wells Junction to the West London Line is the Up/Down and through South West sidings.
- Develop solutions for associated structures clearance to facilitate OLE installation
- Develop options for additional 25kV AC installation of Acton Freight Yard, South West Sidings & the European Metal Siding.

Interfaces and assumptions

There are significant CP5 projects linked to this project including:

- W001a, GWML electrification programme – Electric Multiple Units (EMU) Stock delivery
- CR001, Crossrail
- W004, Thames Valley EMU Capability Works

The following critical assumptions on internal factors are being made:

- An electrical control facility is provided and funded by the national Supervisory Control and Data Acquisition (SCADA) project.

The following critical assumptions on external factors are being made:

- OLE mast and overhead line equipment will be contained wholly within Network Rail's land ownership.
- OLE mast and overhead equipment may be installed under Network Rail's permitted development rights by virtue of Part 11 or Part 17A of the Town and County Planning (General Permitted Development) Order 1995.
- Distribution Network Operator (DNO) cable diversions will be funded separately and works will be delivered by the DNOs in time for the Entry into Service dates shown below.
- Access will be available for interfacing works with GWML and WCML.
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	May 2016	Completed
GRIP 4 completion	Single option scope defined	Assumed CP6	Indicative
GRIP 6 start	Start on site	Assumed CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	Assumed CP6	Regulated Output
Output delivered	First timetabled public use of the infrastructure	Assumed CP6	n/a

Westerleigh Junction to Barnt Green Linespeed Improvement

Details

Project reference code: W012

HLOS driver: CP4 completion – linespeed improvements

Operating route: Western

Last updated: March 2016

CP5 output driver

This enhancement will provide a linespeed increase of 100mph for the majority of the route, resulting in increased performance robustness contributing to the HLOS reliability metric.

Network Rail's obligation

To review the remaining linespeed increases works and determine if any further scope is necessary to deliver the outcome.

Scope of works (remaining)

Testing and commissioning for the linespeed increases below:

- Up and Down Lines; Robinswood to Tuffley
- Up and Down Lines; Charfield to Yate

Two earlier phases were completed in Control Period 4.

Interfaces and assumptions

There are significant CP5 projects linked to this project including:

- Bristol Area Signalling Renewal (BASRE).

The following critical assumptions on internal factors are being made:

- The planned track renewals upon which this project depends are completed in CP5
- This work is dependent upon planned track renewals occurring on programme.
- The condition of the existing track (not part of the planned enhancement) will be capable of the enhanced linespeed without further intervention. Such intervention is not part of any current planned works
- Critical assumption is that if the project is to complete its original scope this can be achieved without any impact on Bristol Area Signalling Renewal (BASRE).

The following critical assumptions on external factors are being made:

- The wider industry will support the recommended option that Network Rail is developing
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
EIS Infrastructure Authorised	Infrastructure authorised for passenger use	December 2018	Indicative
Output delivered	First timetabled public use of the infrastructure	CP6	n/a

North Cotswolds Line Platform Extensions

Details

Project reference code: W013

HLOS driver: Committed Projects

Operating route: Western

Last updated: March 2018

CP5 output driver

The output of the project is to contribute to the delivery of the Government's 2012 HLOS by providing infrastructure capacity enhancements to enable the delivery of the Intercity Express Programme.

Network Rail's obligation

To provide infrastructure capability enhancements as outlined in the client (DfT) remit to enable the operation of the Hitachi Super Express Trains on the North Cotswolds Line.

Scope of works

Network Rail will be undertaking the following infrastructure capability works:

- Platform extension works;
- Revised stopping location boards at all station platforms;
- Enhancements to station lighting where necessary to cater for extended train lengths and Driver Controlled Operations (DCO)

Operational length	No of platforms to be extended	Stations and platforms to be extended
6 car (26m Vehicle)	1	Kingham up platform
7 car (26m Vehicle)	10	Hanborough (Single) Charlbury up and down platforms Moreton In Marsh up and down platforms Honeybourne up and down platforms Evesham up and down platforms Pershore (single)

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- W002a IEP: Western Capability works across the Great Western Main Line (gauging)
- Hitachi Rail Europe shore supply works

The following critical assumptions on internal factors are being made:

- W002a IEP: Western Capability (gauging) is completed on time

The following critical assumptions on external factors are being made:

- Any train alterations required to meet station operation requirements (e.g. SDO) are not part of this submission (part of Train Service Provider contract requirements).
- GWR (franchisee) complete their driver training programme and obtain the relevant track access rights.
- Any required capacity works for any enhanced timetable operations are developed as separate schemes.
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP complete	November 2017	Completed
GRIP 6 EIS Infrastructure authorised	Infrastructure authorised for passenger and freight use	March 2019	Regulated Output
Output delivered (JTI)	First timetabled public use of the infrastructure	March 2019	n/a

West of England Platform Extensions

Details

Project reference code: W014

HLOS driver: Capacity Enabler

Operating route: Western

Last updated: March 2018

CP5 output driver

To contribute to the delivery of the Government's 2012 HLOS capacity metrics for Bristol and the England and Wales HLOS Reliability metric.

Network Rail's obligation

Network Rail's obligation is to develop to Governance of Railway Investment Projects stage 3 (GRIP 3) platform extension works necessary to allow four carriage, Class 150 trains and nine/ten carriage, Class 800/802, peak summer trains to operate on the Barnstaple, Exmouth and Paignton routes in the Devon and Cornwall area.

Scope of works

Electrification of the Great Western Main Line (GWML) will enable the introduction of Class 387 Electric Multiple Units (EMUs) to operate in the London-Thames Valley area. This will enable a series of rolling stock fleet movements with Class 16x Diesel Multiple Units (DMU) cascaded to the Bristol area and Class 150 DMUs cascaded to Exeter area.

Network Rail will undertake the following infrastructure capability works: platform extension works, revised stopping location boards at all station platforms and enhancements to station facilities (lighting, customer information, security and station furniture).

At the same time, Cl. 80x Hitachi trains are being introduced on high speed services between London, Exeter, Plymouth, Penzance and Paignton. These trains will be operated in 5-, 9- or 10-carriage configurations and are longer than the HSTs that they replace.

The scope of works required for Class 150 trains cascaded to the Exeter area include:

- Eggesford – 4-car Cl.150 train to be platformed
- Exeter St James Park – 4-car Cl.150 train to be platformed
- Lymington Commando – 4-car Cl.150 train to be platformed

The scope of works for nine/ten carriage, Class 800/802, peak summer trains in Devon/Cornwall include:

- Truro – all doors on a nine carriage Cl.80X train to be platformed
- Torre – six carriages of a 10-car, Cl.80X train to be platformed
- Totnes – seven carriages of a 10-car Cl.80X train to be platformed
- Devonport – all doors on a five carriage Cl.80X train to be platformed

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- W002a Intercity Express Programme: Western Capability – dependency on gauge clearance works for Cl.80X trains
- W009 West of England Diesel Multiple Unit Capability Works – dependency on gauge clearance and station works for Cl.16X trains to enable cascade of Cl.150 to Exeter area.
- IFDfT007 Cornwall Capacity Enabling Scheme - Cornwall re-signalling will need to take cognisance of revised platform lengths and stopping arrangements.

The following critical assumptions on internal factors are being made:

- W001a Great Western Electrification is delivered to Cardiff in advance of the December 2018 timetable
- W002a IEP: Western Capability is completed on time
- W004 Thames Valley electric multiple unit capability works are completed on time
- W009 West of England diesel multiple unit capability works is completed on time
- CR001 Crossrail electrification is delivered in advance of the December 2017 timetable

The following critical assumptions on external factors are being made:

- Agility/Hitachi achieve full vehicle compatibility by early 2017
- Any train alterations required to meet station operation requirements (e.g. SDO) are not part of this submission (part of Train Service Provider contract requirements).

- GWR (franchisee) complete their driver training programme and obtain the relevant track access rights.
- Any required capacity works for any enhanced timetable operations are developed as separate schemes.
- Access will be granted to meet the programme
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP complete	April 2018	Complete
GRIP 6 EIS Infrastructure authorised – Cl.150 platforms	Infrastructure authorised for passenger use	TBC	Indicative
GRIP 6 EIS Infrastructure authorised – Cl.80X platforms	Infrastructure authorised for passenger use	TBC	Indicative

Bristol East Junction Enhanced Renewal and Remodelling

Details

Project reference code: W015

HLOS driver: City capacity – Bristol

Operating route: Western

Last updated: March 2017

CP5 output driver

To deliver improvements to the existing junction layout east of Bristol Temple Meads to meet current and future forecast demand, specifically the enhanced train service specifications for both the long distance and local cross-Bristol services in both directions across the greater Bristol area.

Network Rail's obligation

The limited operational flexibility of the junction is seen as a constraint to growth and it is recognised that layout improvements, to allow all lines to reach all platforms at Bristol Temple Meads, will be required. This project will deliver an enhanced renewal providing the optimum layout which can accommodate the growth in services and provide improved operability, maintainability, reliability and accessibility. The project will also be delivered ahead of electrification in CP6 to avoid the long term commercial, maintenance and renewal risks arising from the electrification of the existing non-standard junction layout.

Scope of works

- Reduction of existing 58 point ends to 47 point ends
- Minor civils; waterproofing of Avon Street and structure deck replacement
- HV cable diversion – runs under two tracks on the up side
- Junction lighting – for safer maintenance activities
- Inclusion of a new transformer due to increased power usage
- Demolition of lineside buildings
- All associated signalling works inclusive of a data change (79 SEUs)
- Minor telecoms works
- Signalling gantry renewal (electrification scope)

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Bristol Area Signalling Renewals and Enhancements (BASRE)
- Dr Days to Filton Abbey Wood Capacity Scheme
- Great Western Main Line electrification (GWML)
- Bristol Temple Platform Capacity Scheme
- MetroWest

The following critical assumptions on internal factors are being made:

- Bristol Area Signalling Renewal is a core interface to this project, particularly the phase to re-signal Bristol Temple Meads station which needs to precede this project.
- A staging area at Bristol East Depot is available

The following critical assumptions on external factors are being made:

- 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 Historic England, Local Conservation Officers and other key stakeholders following consultation
- Access will be granted to meet the programme
- Network Change will not be unreasonably withheld or delayed
- Funding is available in CP6

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 6 start	Start on site	CP6	Indicative
GRIP 6 completion	Infrastructure ready for use	CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP6	Regulated Output

Welsh Valley Lines Electrification

Details

Project reference code: WL001

HLOS driver: Other electrification projects

Operating route: Wales

Last updated: January 2016

DfT is putting in place a revised funding mechanism for their contribution to the development of this project in CP5.

CP5 output driver

The driver for this scheme, as stated in the HLOS, is improved connectivity and improved capacity on the Valley Lines network.

A new timetable will be introduced to meet continued growth in demand for rail in the region. The project will deliver the scope of work as described below and will enable faster journey times, more efficient rolling stock and support economic growth.

Network Rail's obligation

Network Rail has delivered its previous obligation to complete development of options for electrification to GRIP stage 2 – this was achieved in early 2014.

The primary funder – the Welsh Government – is now reviewing the scope and future direction of the scheme and all Network Rail development work is on hold. Network Rail's future obligations will be determined when the review is completed.

Scope of works

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

- Rhymney;
- Coryton;
- Merthyr Tydfil;
- Aberdare;
- Treherbert;
- Cardiff Bay;
- Radyr via City Line;
- Vale of Glamorgan Line to Bridgend;
- Penarth;
- Barry and Barry Island;
- Bridgend to Maesteg;
- Ebbw Vale (to Cardiff) and;

- Cardiff Canton depot reception lines, Rhymney and Treherbert stabling points.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. These are:

- Completion of the Cardiff Area Signalling Renewal scheme – this project provides the increased capacity for the new timetable.
- Electrification of the Great Western Main Line to Bridgend and Swansea – this project facilitates electric train operation to Maesteg.

Other interfacing schemes and activities are:

- Valleys Signalling Re-lock & Recontrol.
- Port Talbot West Resignalling.
- Maesteg & Ebbw Vale frequency enhancement schemes.
- Wales & Borders refranchise in 2018.

The following critical assumptions on internal factors are being made:

- This scheme (i.e. WL001) will fund the signal immunisation element of the separate Valleys Signalling Relock and Recontrol scheme or, otherwise, this scheme will need to return at a later time to undertake the work separately which will be less efficient.
- Great Western Electrification will deliver electrification between Cardiff and Bridgend.

The following critical assumptions on external factors are being made:

- The Wales & Borders franchise renewal will specify electric rolling stock on this network.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	TBC	Regulated Output
GRIP 4 completion	Single option scope defined	TBC	Indicative
GRIP 6 start	Start on site	TBC	Indicative
EIS testing	Entry into Service for testing and driver training	TBC	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	TBC	Indicative
Output delivered - Improved connectivity & capacity	First timetabled public use of the infrastructure	TBC	n/a

Barry – Cardiff Queen Street Corridor

Details

Project reference code: WL002

HLOS driver: CP4 completion - capacity

Operating route: Wales

Last updated: September 2016

CP5 output driver

This project facilitates the ability to increase South Wales Valley Line services through the central Cardiff corridor (defined as Cardiff Queen Street North Junction to Cardiff Central), from 12 trains per hour to 16 trains per hour by January 2017. The completion of Phase 2 in November 2014 has already provided the ability to increase capacity to 14 trains per hour.

The project will provide an additional through platform and associated track at Cardiff Central station which will be brought into use in January 2017.

Network Rail's obligation

Networks Rail's obligation is as defined below to facilitate 16 trains per hour over the central Cardiff corridor.

Scope of works

The scope of works consists of:

- The provision of an additional through platform at Cardiff Queen Street station to accommodate the increased level of south Wales valley lines services;
- The provision of an additional bay platform at Cardiff Queen Street station for independent operation of Cardiff Bay services, freeing up capacity to accommodate the increased level of south Wales valley lines services;
- New/revised station building and access works to service the new platforms at Cardiff Queen Street station;
- the provision of an additional through platform at Cardiff Central station to accommodate the increased level of south Wales valley lines services;
- New/revised station building and access works to service the new platform at Cardiff Central station;
- Bi-directional signalling for those platforms;
- Doubling of the single line Treforest curve to accommodate the increased level of south Wales valley lines services;
- Linespeed increase for the City Line (Radyr to Ninian Park) to deliver services faster to and from the central Cardiff corridor to maximise capacity;
- Installation of a Cardiff East crossover from platform 4 to the Up Barry line to accommodate the increased level of south Wales valley lines services; and

- Cogan junction remodelling to accommodate the revised specification for south Wales valley lines services towards the Vale of Glamorgan.

Interfaces and assumptions

There is one significant CP5 schemes linked to this project:

- Cardiff Area Signalling Renewal (CASR) - the Network Rail renewal of the Cardiff area signalling system is providing enhanced operational capacity and capability required by this project

The following interfacing schemes have been completed or substantially completed:

- The provision of Tir Phil loop and new station (funded by WG).
- Rhymney Valley turn back (at Caerphilly) (funded by WG).
- Barry Town platform 3 re-instatement (funded by WG).

The following critical assumptions on internal factors are being made:

- The remaining phases of Cardiff Area Signalling Renewal (CASR) will be delivered by the re-baselined dates shown below

Activities and milestones (NR)

Milestone	Description	Date	Status
Phase 2 – Valley Lines	Cardiff Queen Street station access enhancement completion	November 2014	Complete
Phase 3 – Barry Lines	Cardiff – Barry lines signalling and construction of Barry new platform and Treforest curve	May 2015	Complete
Phase 4 – Cardiff East	Major signalling commissioning and permanent way remodelling Cardiff East	June 2015	Complete
Phase 5 – Cardiff Central	Major signalling commissioning and permanent way Cardiff Central including commissioning of the West of Cardiff. Leckwith – Llanharan	January 2017	Complete
Phase 6 – Cardiff platform 8 works	Cardiff Central platform 8 works and Southern entrance	January 2017	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	January 2017	Complete
Phase 7 – recoveries	Permanent way and signalling recoveries	October 2017	Complete

Wessex Capacity Improvement Programme

Description

The Wessex Capacity Improvement Programme is a focused initiative to boost peak time capacity into Waterloo Station.

- Reopening the former Waterloo International Terminal to be used regularly by 10-car commuter services.
- Lengthening Platforms 1-4 to allow 10-car services to run on suburban routes for the first time ever during the peak commuter hours

In addition works will be undertaken to provide improvements to key stations to support the additional passenger growth.

EDP Reference Codes

- WX001 – Waterloo
- WX003 – Reading, Ascot to London Waterloo train lengthening
- WX004 – Wessex Traction Power Supply Upgrade

Significant Interfaces

- WX002 – South London HV traction power upgrade

Announcements

Date	Announcement
None	



Waterloo

Details

Project reference code: WX001

HLOS driver: Capacity Enabler

Operating route: Wessex

Last updated: December 2017

CP5 output driver

The overall remit of the Wessex Capacity Programme comprises of 4 key outputs at Waterloo station which support the achievement of the capacity metric in the Government's 2012 HLOS, which indicates that it is necessary to provide capacity to accommodate an additional demand in the three hour morning peak.

Network Rail's obligation

Network Rail's obligation is to deliver infrastructure to provide a capability for the following:

- The provision of 10 car suburban services
- The provision of additional peak hour Windsor line services into the former Waterloo International Station to a maximum of 18 trains per hour
- The use of Waterloo International Station as a high frequency station operating as part of the main Waterloo Station
- Easing passenger congestion at Vauxhall

Scope of works

The provision of infrastructure to support 10 car suburban services consists of

- Lengthening platforms 1-4
- Shortening platforms 5-6
- Narrowing the country end of platforms 7-8
- Associated track signalling and power at Waterloo.

The provision of infrastructure to support additional peak Windsor line services into the former Waterloo International Station comprises of:

- Delivery of passenger facilities and associated railway engineering works
- Provision of new pedestrian and circulation routes
- All the required facilities to allow the use of Waterloo International Station as a high frequency station operating as part of the main Waterloo Station, including infrastructure works at Queenstown Road

In addition the above works there are also works planned to ease passenger congestion at Vauxhall Station in CP5 and at a number of key stations in CP6. This

would provide an improved passenger circulation and management of dwell times at these key locations.

Interfaces and assumptions

There are significant CP5 schemes linked to this project:

- The Department for Transport's procurement programme in conjunction with South West Trains for new and cascaded rolling stock and franchise change
- Depots Stabling and Ancillary Fund (DSAWF) – supports the introduction of the proposed timetable
- Reading 10 car WX003 – possession interface
- Reading PSU WX004 – possession interface
- Crossrail 2 – design interface
- Feltham re-signalling – possession interface
- Waterloo throat track renewals – possession interface
- Commercial development of Waterloo International and other sites in the vicinity of the station – construction interface
- Traffic Management Systems and C-DAS projects – required to deliver the CP5 output

The following critical assumptions on internal factors are being made:

- The chosen CP5 solution can be delivered without an unacceptable level of disruption to the train service
- Any land that may be required can be acquired
- Any impact of future demand growth on the on-wards London transport network can be managed outside of this project
- It is assumed that there is alignment in the new South Western Trains Franchise specification (for example in respect of TT development for Dec 2017 and into 2018, and in respect of stopping pattern at Queenstown road) and the deliverables of the Wessex Capacity project, and support towards achieving this alignment by all parties: SSWT, DfT and future franchise operator

Works to be delivered in CP5

- Waterloo International – new track and station layout
- Waterloo Platforms 1-4 – new track layout and associated signalling
- Windsor Outlying – new S&C at Queenstown Road, increased capacity to facilitate 10-car suburban services and an additional Windsor line service
- Waterloo Station – new staircases from platforms to subway, new roof connecting to Waterloo International
- Development works at Clapham Junction
- Vauxhall – new staircase from platform to subway, relocation of existing lift

Works to be delivered in CP6

- Power required to deliver further frequency on the Windsor lines- up to a maximum of 20 trains per hour
- Surbiton station congestion relief
- Clapham Junction station
- Wimbledon station
- Queenstown Road – station reopened platform 1 and additional S&C
- Waterloo station improvements

Activities and milestones (NR)

Overall programme

Milestone	Description	Date	Status
GRIP 2 completion	Feasibility complete	June 2014	Completed
GRIP 3 completion	Single option selection	September 2015	Completed

Suburban 10 car railway

Milestone	Description	Date	Status
GRIP 3 completion	Single Option Selection	June 2015	Completed
GRIP 4 completion	Single Option scope defined	December 2015	Completed
EIS testing	Entry into service for testing and driver training	August 2017	Completed
EIS infrastructure authorised	Infrastructure authorise for passenger use	December 2017	Completed
Output delivered - First 10 car train	First timetabled public use of the infrastructure	December 2017	n/a

Windsor line additional peak hour services

Milestone	Description	Date	Status
GRIP 3 completion	Single Option Selection	September 2015	Completed
GRIP 4 completion	Single Option scope defined	January 2016	Completed
EIS testing	Entry into service for testing and driver training	December 2018	Indicator
EIS infrastructure authorised	Infrastructure authorise for passenger use	December 2018	Regulated output
Output delivered - First additional peak hour services	First timetabled public use of the infrastructure	December 2018	n/a

Mainline capacity enabling works (Woking area)

Milestone	Description	Date	Status
GRIP 3 completion	Single Option Selection	March 2019	Indicator

Works to be completed in CP6

Milestone	Description	Date	Status
GRIP 5 completion	Detailed design	March 2021 ¹	Indicator

¹ The detail design on Clapham Junction and Wimbledon will be developed to align with future aspirations including the impact of Crossrail 2

South London HV Grid (Wimbledon) upgrade

Details

Project reference code: WX002

HLOS driver: Capacity Enabler

Operating route: Wessex

Last updated: June 2017

CP5 output driver

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 and South East Routes in CP6 and beyond.

The Wimbledon supply point, 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 that are expected in CP6 and beyond necessitates the strengthening of the connection at Wimbledon Grid in CP6.

The CP5 output driver is the potential requirement (depending on the single option selected at the end of GRIP 3 Phase 2) to enter into a connection agreement with National Grid up to five years in advance of implementation (GRIP 3 Phase 1 has been completed and indicates that no works are required at the Wimbledon site to operate the planned CP5 train service).

Network Rail's obligation

Working in conjunction with National Grid, develop phase 2 of the scheme to enhance Network Rail's connection to Wimbledon Grid through GRIP 3 – 5. Network Rail and National Grid, working on behalf of Network Rail, would then deliver infrastructure enhancements at the Wimbledon Grid supply point, and potentially adjacent Network Rail infrastructure, in CP6. The exact scope of works that would be required on Network Rail's adjacent infrastructure, if any, is not yet known.

Modelling has indicated that the Grid connection enhancement is not required until CP6, which enables the works to be undertaken in conjunction with infrastructure enhancements that National Grid are carrying out on site in early CP6.

Scope of works

- In CP5, develop the scheme to enhance Network Rail's connection to Wimbledon Grid through GRIP 3 – 5 (phase 2);
- Subject to the option selected, a connection agreement with National Grid may be required up to five years in advance of implementation;
- Funding of the full scheme will need to be confirmed in CP5 prior to entering into a connection agreement with National Grid, even though delivery will take place in CP6. The current uncertainty of scope means the spend profile across control periods will be refined as GRIP 3 (phase 2) is completed.
- CP5 spend will include development costs, contractual payments to National Grid and, depending on the option selected, advance purchase of long lead electrical equipment.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Wessex Capacity Programme – will deliver power supply upgrades to support the CP5 train service, forms part of this scheme's baseline;
- Wessex Traction Power Supply Upgrade – will deliver power supply upgrades to support the CP5 train service, forms part of this scheme's baseline;
- Sussex Power Supply Upgrade – will deliver power supply upgrades to support the CP5 train service, forms part of this scheme's baseline;
- National Grid's scheme to enhance Wimbledon Grid – will be undertaken in conjunction with the upgrade to Network Rail's connection;
- Any train lengthening or train service increase schemes in the inner Wessex and South East areas in CP6.

The following critical assumptions on internal factors are being made:

- The Wessex Capacity Programme will deliver all power upgrades in CP5 that are required to operate the service level proposed on Wessex at the end of CP5
- New Cross Grid and HV feeder alterations will be completed in CP5
- Network Rail will be able to enter into contract with National Grid that will mean committing spend beyond CP5.

The following critical assumptions on external factors are being made:

- The enhancement scheme being undertaken at Wimbledon Grid by National Grid will be undertaken prior to any train service increases as a result of Woking Grade Separation.
- Any works undertaken at the site by National Grid on behalf of Network Rail will require a connection agreement.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion (phase 1)	October 2015	Complete
GRIP 3 AIP completion	Single option selection and AIP completion (phase 2)	January 2019	Regulated Output
GRIP 4 completion	Single option scope defined	July 2019	Indicative
GRIP 6 start	Start on site	tbc	Indicative
EIS Infrastructure Authorised	Infrastructure authorised for passenger use	tbc	Indicative
Output delivered	Increased connection in use	tbc	n/a

Reading, Ascot to London Waterloo Train Lengthening

Details

Project reference code: WX003

HLOS driver: City capacity – London Waterloo

Operating route: Wessex

Last updated: March 2018

CP5 output driver

The project supports the delivery of the HLOS capacity metric for London Waterloo which indicates that it is necessary to provide capacity to accommodate an additional demand of 9,700 passengers in the three hour morning peak.

Network Rail's obligation

The project will provide infrastructure to enable the operation of 10 car services on the Reading to London Waterloo and Aldershot via Ascot to London Waterloo routes. This will relieve overcrowding, particularly between Virginia Waterloo and London Waterloo in the morning peak.

Scope of works

The scheme includes all infrastructure interventions required to permit the operation of 10 car trains, with the exception of works to the traction power supply system, which are being delivered under Delivery Plan entry WX004. Platforms will be extended to accommodate 10 car trains at the following stations:

- Ascot – platforms 1, 2 and 3
- Bracknell – platforms 1 and 2
- Camberley – platforms 1 and 2 (to 6 car length only)
- Chertsey – platforms 1 and 2
- Egham – platforms 1 and 2
- Feltham – platforms 1 and 2
- Martins Heron – platforms 1 and 2
- Sunningdale – platforms 1 and 2
- Virginia Water – platforms 1 and 2
- Wokingham – platform 1 only

Automatic Selective Door Opening (ASDO) has been assessed as suitable at the remaining stations. The scope also includes all necessary signal moves, conductor rail transpositions, platform lighting, PA systems and customer information systems.

At Ascot, the platform extensions will be constructed over the barrow crossing at the London end of the platforms, necessitating its closure. A fully accessible 2 span footbridge with 3 lifts will be installed to maintain accessibility at the station.

Feltham station is constrained at the London end by a road bridge and at the Country end by Feltham West level crossing. The project is working closely with key stakeholders with a view to closing Feltham West level crossing and extending the platforms to the Country end, avoiding the need to demolish and rebuild the road bridge.

Interfaces and Assumptions

The project has major interfaces with:

- Wessex traction power supply upgrade project (WX004) which is carrying out work in the same area over the same timescales;
- Feltham re-signalling project where design changes could have an impact on the platform and signalling designs, along with overlapping signalling source records, which may impact delivery timescales;
- Wessex capacity programme (WX001/WX001a) which has overlap with signalling source records and potentially possession requirements, which may impact delivery timescales;
- DfT / Stagecoach South West Trains rolling stock procurement and cascade programme which may impact when the infrastructure needs to be available and its design;
- CP5 renewals workbank, which may take place in the same locations at the same time or may lead to design alterations being required;
- Maintenance work may result in lost possessions and design changes; and
- Wessex ASDO (WX006) which is carrying out work along the same line of route.
- Depots Stabling and Ancillary Fund (DSAWF) – supports the introduction of the proposed timetable

The delivery of the significant capital investment on the Wessex Route in CP5 is complex - an Integrated Programme Office has been set up to manage the interfaces between projects.

The following critical assumptions on external factors are being made:

- The Feltham Resignalling project will liaise with this project to ensure signalling takes account of the proposed platform lengths and the combined works are delivered efficiently;
- Planning consent at Feltham Station can be achieved in line with programme;
- Third party delivered highway works in Feltham can be delivered in line with programme; and
- Land acquisition and access can be agreed where required.

Activities and milestones

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	June 2015	Complete
GRIP 4 completion	Single option scope defined	February 2016	Complete
GRIP 6 start	Start on site	April 2016	Complete
EIS – Infrastructure Authorised	Infrastructure authorised for passenger use	May 2017	Complete
Output delivered - New timetable	Benefits realised	14 May 2017	n/a
EIS- Infrastructure Authorised at Feltham	Platform extension delivered at Feltham	December 2019	Regulated Output

Wessex Traction Power Supply Upgrade

Details

Project reference code: WX004

HLOS driver: City capacity – London Waterloo

Operating route: Wessex

Last updated: January 2016

CP5 output driver

The project supports the delivery of the HLOS capacity metric for London Waterloo which indicates that it is necessary to provide capacity to accommodate an additional demand of 9,700 passengers in the three hour morning peak.

Network Rail's obligation

Network Rail's obligation is to provide traction power supply infrastructure to enable the operation of 10 car services on the Reading to London Waterloo and Aldershot via Ascot to London Waterloo routes. This will relieve overcrowding, particularly between Virginia Waterloo and London Waterloo in the morning peak.

Scope of works

The scope of works can be split into three categories:

- DC Enhancements:
 - Conversion of Track Paralleling Huts to Substations at Sunningdale, Buckhurst, Emmbrook and Whitmoor; and
 - Upgrading existing substations at Ash Vale and Winnersh.
- HV Enhancements:
 - Upgrade of seven HV feeder cables; and
 - Increase fixed service capacity at Byfleet and Camberley Grids.
- Electrical Track Equipment (ETE) Enhancements:
 - DC track feeder cable doubling on four route sections; and
 - ETE cable doubling (complete on three sections, partial on one section).

Interfaces and assumptions

The project has major interfaces with:

- Reading, Ascot to London Waterloo Train Lengthening (WX003) which is carrying out work in the same area over the same timescales, so possessions may interface;
- Feltham re-signalling project where design changes could have an impact on cable route designs;

- Wessex capacity programme (WX001/WX001a) which has overlap with signalling source records and potentially possession requirements, which may impact delivery timescales;
- DfT / Stagecoach South West Trains rolling stock procurement and cascade programme which may impact when the infrastructure needs to be available and it's design;
- CP5 renewals workbank, which may take place in the same locations at the same time or may lead to design alterations being required;
- Maintenance work may result in lost possessions and design changes;
- Wessex ASDO (WX006) which is carrying out work along the same line of route and may impact on possession availability;
- South London HV Project (WX002) as the modelling carried out on it has assumed this project will be complete;

The delivery of the significant capital investment on the Wessex Route in CP5 is complex - an Integrated Programme Office has been set up to manage the interfaces between projects.

The following critical assumptions on external factors are being made:

- That it is possible to agree access and planning consent at sites where this is required, in line with the programme

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	September 2014	Complete
GRIP 4 completion	Single option scope defined	February 2015	Complete
GRIP 6 start	Start on site	June 2015	Complete
EIS – Infrastructure Authorised	Infrastructure authorised for passenger use	May 2017	Complete
Output delivered - New timetable	Benefits realised	14 May 2017	n/a

Package 7, 10 Car South Western Railway

Details

Project reference code: WX005

HLOS driver: CP4 completion - capacity

Operating route: Wessex

Last updated: January 2016

CP5 output driver

The project will relieve over-crowding and supports the achievement of the capacity metric in the Government's 2012 HLOS by undertaking the remaining works needed to allow 10 car operation on suburban services on the Wessex route.

Network Rail's obligation

Network Rail's obligation is to undertake platform extension works necessary to allow 10 car operation on suburban services on the Wessex route.

Scope of works

The scope of works delivered in CP5 included:

Route	Platforms and sidings to be lengthened
Raynes Park to Dorking	Raynes Park
	Ewell West
Hampton Court Branch	Berrylands
Kingston Loop and Shepperton Branch	Earlsfield (platforms 2 & 3)
	Kingston (platform 3)
	Strawberry Hill (platforms 1 & 2)
Guildford via Cobham	Effingham Junction (platforms 1 & 2) and Effingham Junction sidings

Interfaces and assumptions

Delivery of the final output of 10 car operation on most peak services is now dependent on the completion of works to Platforms 1 to 4 to be completed by the Wessex Capacity programme WX001.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	N/A	N/A
GRIP 4 completion	Single option scope defined	February 2011	Complete
GRIP 6 start	Start on site	March 2012	Complete
EIS testing	Entry into Service for testing and driver training	January 2015	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	January 2015	Complete
Output delivered	First timetabled public use of the infrastructure	April 2015	n/a

Details

Project reference code: WX006

HLOS driver: CP4 Completion - Capacity

Operating route: Wessex

Last updated: January 2016

CP5 output driver

The output driver of the project is the CP4 HLOS capacity metric for London Waterloo station. Works delivered by this project will allow operation of a 10 car suburban rail service.

Network Rail's obligation

Network Rail will install electronic beacons at 168 stations on the Wessex route, and ensure that they are operational across the network in order to allow the Desiro fleet to operate using Automatic Selective Door Opening (ASDO). The beacons are attached to the sleepers and contain all the data required to enable the train to operate Automatic Selective Door Opening.

Scope of works

There are some locations on the Windsor suburban routes where the cost of extending platforms to allow 10 car trains to call would be prohibitive or offer poor value for money. They include:

- Datchet
- Sunnymeads
- Isleworth
- Addlestone
- Hounslow
- Syon Lane
- Virginia Water (platform 3)
- Wraysbury.

Increasing the use of manual selective door opening (SDO) is discouraged and so, in agreement with Stagecoach South West Trains (SSWT), an automatic SDO system (ASDO) is to be introduced.

Operation of the system will require the installation of radio frequency identification tags (RFID) in each platform used by South West Trains at 168 stations across the Wessex route.

SSWT is responsible for the approval of the ASDO system, the fitment of train borne equipment and specification of trackside equipment (RFID). Network Rail will procure, install and maintain the trackside equipment.

The scope of works required to deliver the outputs is:

- Procurement and installation of the trackside equipment (beacons) required to operate the ASDO system; and
- The fitment of train borne equipment and specification of trackside equipment (beacons).

Interfaces and assumptions

The ASDO system has been commissioned; although 81 beacons on the Windsor lines still need to be replaced due to issues identified with the equipment installed. This will largely be carried out in line blockages, so there are unlikely to be any significant interface issues.

Activities and milestones (NR)

Milestone	Description	Date	Status
EIS - Infrastructure Authorised	Infrastructure authorised for passenger use	October 2015	Complete
ASDO system ready for use	First timetabled public use of the infrastructure	October 2015	Complete

DC Regeneration

Details

Project reference code: WX007

HLOS driver: Committed project

Operating route: Wessex

Last updated: March 2017

CP5 output driver

The output is to complete the CP4 scheme that enables DC regenerative braking to be introduced on all DC electrified routes in Wessex, Sussex and Kent. The project results in a reduction of electric current for traction (EC4T) consumption with consequent reductions in energy costs to TOCs and FOCs and therefore improvement in industry energy efficiency.

The project will also increase the nominal system voltage to 750V across the three routes, which marginally increases the available traction supply capacity.

Network Rail's obligation

Network Rail is required to carry out the infrastructure interventions necessary to permit the operation of DC regenerative braking on the Wessex, Sussex and Kent routes.

Scope of works

DC regenerative braking is now in use within Wessex, Sussex and Kent routes and no further work is required to meet this obligation.

Segregation of 660V DC traction supplies to the LUL Waterloo & City line from Network Rail Infrastructure will be completed to enable the increase of Network Rail system voltage without risk to LUL rolling stock and systems.

The project will also modify circuit breakers and raise traction supply outputs on all inner London routes to 750V DC nominal in Wessex, Sussex and Kent. This will be completed in two parts:

- Phase 1 – all inner London traction supply outputs other than the areas surrounding the LUL District line interfaces at Richmond and Wimbledon was completed by March 2014; and
- Phase 2– the remaining inner London traction supply outputs will be increased once the LUL rolling stock change programme has completed in December 2016.

Interfaces and assumptions

The majority of works were completed in Control Period 4, with only phase 2 works outstanding.

The following critical assumptions on external factors are being made:

- That Stagecoach South West Trains Ltd (SWT) rolling stock regenerative braking software upgrades are complete in line with the introduction of S Stock trains by LUL on the District Line and the completion of phase 2 works.
- Funding for the SWT software upgrades (through a capped funding agreement with Network Rail) is sufficient and no further funding will be required.
- The LUL delivered rolling stock change will be complete by December 2016.

Activities and milestones (NR)

Milestone	Description	Date	Status
EIS – Infrastructure Authorised – phase 1	Infrastructure ready for use	March 2014	Complete
GRIP 6 start – phase 2	Start on site	July 2017	Complete
EIS - Infrastructure Authorised – phase 2	Infrastructure authorised for passenger use	January 2018	Complete

Route 3 – Power Supply Enhancements

Details
Project reference code: WX008
HLOS driver: CP4 completion – capacity enabler
Operating route: Wessex
Last updated: January 2016

CP5 output driver

The project will contribute to the CP4 HLOS capacity metrics by providing the necessary infrastructure to facilitate 10 car train operation on both the Wessex Main Suburban and Windsor Lines.

Network Rail's obligation

Network Rail's obligation is to deliver the necessary infrastructure upgrades to the traction power supply system to enable 10 car train operations.

Scope of works

Traction power modelling and design analysis was completed which highlighted constraints in the existing network. The scope provides infrastructure which maintains the resilience of the traction power system when the longer trains are operating and one key component of the adjacent traction power system is not available for use during planned or unplanned outages (known as n-1). Changes defined in this project also support the operation of 10 car trains on the Sussex route.

Description of work	
E&P Distribution – Windsor & Eton Riverside Branch	
HV cable upgrade	Connections of HV feeding upgraded at Wraybury in accordance with asset policy.
Equipment changes	Enlarge DC switchgear panel at Datchet and enlarge HV AC switchgear panel at Wraysbury.
Electric Track Equipment	Changes as required to support modelled train operations. Where required the impedance bonds are also changed to Type 3 from Type 0 and 1.

Description of work	
E&P Distribution – Hounslow loop	
HV cable upgrade	Upgrade of 33kV feeders between Barnes, Chiswick and Brentford.
Equipment changes	Track paralleling huts (TPH) converted to sub-stations at Chiswick and Isleworth.
Electric Track Equipment	Changes as required to support revised modelled train operations. Where required the impedance bonds are also changed to Type 3 from Type 0 and 1
E&P Distribution – Hounslow to Staines	
HV cable upgrade	Upgrade of 33kV feeders on parts of the route from Barnes to Twickenham including a parallel feeder between Earlsfield and Barnes.
Equipment changes	Track paralleling huts (TPH) or switching station converted to sub-station at Ashford and Feltham; additional transformer at Richmond and Twickenham with consequential changes to HV AC switchgear panel and extension of HV AC switchgear at Earlsfield for the new feeder connection; new feeder connection at Barnes.
Electric Track Equipment	Changes as required to support revised modelled train operations. Where required the impedance bonds are also changed to Type 3 from Type 0 and 1.
E&P Distribution – Weybridge via Chertsey	
HV cable upgrade	Upgrade of 33kV feeders on parts of the route from Byfleet grid to Woking, Weybridge and Virginia Water including additional parallel feeders where required to comply with asset policy.
Equipment changes	Additional transformer at Weybridge; track paralleling hut (TPH) converted to sub-stations at Addlestone and Virginia Water; new connections into Byfleet sub-station.
Electric Track Equipment	Changes as required to support revised modelled train operations. Where required the impedance bonds are also changed to Type 3 from Type 0 and 1.

Description of work

E&P Distribution – Hampton Court Junction to Guildford via Cobham and main line routes

Equipment changes	Switching station converted to sub-station at Fulwell; Epsom switching station and Woking sub-station has additional transformer; track paralleling hut (TPH) converted to sub-station at Kingston; enlarge DC switchgear panel at Chessington South, Hampton Court Junction, Upper Haliford, Tolworth and New Haw; additional transformer and consequential HV AC switchgear changes at Pirbright and Guildford.
Electric Track Equipment	Changes as required to support revised modelled train operations. Where required the impedance bonds are also changed to Type 3 from Type 0 and 1.

Interfaces and assumptions

As this project has been completed there are no ongoing interfaces.

The following critical assumptions on internal factors have been made:

- Rolling stock configurations are as agreed and detailed in the Southern DC traction power supply Sponsor's remit.
- There is no specific requirement to improve journey times or rolling stock performance.
- Current Rules of the Route will remain unchanged.

The following critical assumptions on external factors are being made:

- 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.
- Rolling stock and the new configurations will be operating on existing power levels

Activities and milestones (NR)

Milestone	Description	Date	Status
EIS Infrastructure authorised	Infrastructure authorised for passenger use	July 2014	Complete
Output delivered	First timetabled public use of the infrastructure	December 2014	Complete

All key outputs have now been delivered, with only minor residual works and closeout of the project remaining for completion.

Level Crossing Risk Reduction Fund

Details
Fund reference code: F001
HLOS driver: Safety improvement
Operating route: All
Last updated: January 2016

The CP5 fund value is £96m in 12/13 prices.

Objective of the Fund

The objective of the LCRRF is to meet the requirement 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.

Network Rail’s obligations

Network Rail’s obligation is to achieve the maximum possible reduction in risk of accidents at level crossings. The enabling fund will be termed the Level Crossings Risk Reduction Fund (LCRRF).

Governance

The Head of Passenger and Public Safety Strategy is the fund holder for the LCRRF. Expenditure against the fund will be governed by the Level Crossing Programme Board (LCPB), a Network Rail body working alongside, and informed by the strategic direction of, the cross industry Level Crossings Strategy Group (LCSG).

Level Crossing Programme Board will fund risk reduction activities at level crossings in accordance with Network Rail’s strategy for level crossings risk reduction & safety enhancement during CP5.

Investment will prioritise the permanent closure of high risk level crossings. To ensure Network Rail maximises risk reduction in line with its obligations, Level Crossing Programme Board’s investment decisions will be informed by a “hurdle rate” calculation of forecast reduction in Fatalities and Weighted Injuries (FWI) per unit of investment. While opportunities for closure deliverable within CP5 take priority, the LCRRF will also be available for deploying technology to achieve risk reduction above basic legal requirements, such as through wayside horn and Miniature Stop Light equipment.

Other funding sources may be matched to the LCRRF to enable risk reduction at high priority level crossings in line with the hurdle rate.

Interfaces and assumptions

There are significant CP5 schemes interfacing with the Level Crossing Risk Reduction Fund. Schemes and their potential impact include:

- Great Western Route Modernisation (match funding source and delivery of benefits)
- Kent Re-Signalling Phase 2 (match funding source and delivery of benefits)
- East - West Rail Phase 2 (match funding source and delivery of benefits)
- North of England Programmes (Contractor resourcing conflict)

The following critical assumptions on internal factors are being made:

- Feasibility studies will reveal that some crossings are unsuitable for closure. Opportunities to substitute unsuitable crossings for others offering equal or greater benefit will be limited. Therefore, the total benefit forecast for realisation through the LCRRF is expected to diminish with progress.
- Additional funding sources will be identified to match with the LCRRF.

The following critical assumptions on external factors are being made:

- Land purchase negotiations will be resolved favourably within programme timescales.
- Rights of Way Officer resources are sufficient to consider Network Rail’s proposals within programme timescales.
- Formal objections to Network Rail’s individual level crossing proposals will be resolved within CP5. Objections will result in extended programme timescales and/or changes in scope, and may require hearing at Public Enquiry.

Stations – National Stations Improvements Programme (NSIP)

Details
Fund reference code: F002a
HLOS driver: Station improvement
Operating route: All except Scotland
Last updated: January 2016

The CP5 fund value has been revised from £110m (including rollover of £7m) to £73.5m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6.

Objective of the Fund

The objective of the NSIP programme, is to achieve a noticeable improvement to the passenger perception of stations by focusing on high footfall, low passenger satisfaction stations, with a wider aim to develop a more effective, coordinated approach for the planning and delivery of activities at stations by all stakeholders, thereby improving efficiency and value for money in station investments. Over 450 stations benefitted from investment in CP4 and the CP5 programme is an extension to this. Currently, around 200 station projects are in development, design or delivery as part of the programme.

Network Rail's obligations

Network Rail's obligation is to be the Secretariat and administrator of the fund, whilst also co-chairing the NSIP Board with a train operator representative. The train operator owning group representative is determined by the relevant owning group and will work with the industry via LDG's (Local Delivery Groups) and stakeholders to identify the best use of the NSIP funds and deliver the identified station works.

Governance

Network Rail's Director, Maintenance and Operational Services is the budget holder for NSIP.

The NSIP Board (a cross-industry body consisting of train operating owning group representatives, Department for Transport, Office of Rail and Road and Network Rail senior management) reports on a periodic basis and provides an overview of the delivery of the NSIP programme. The Board additionally offers 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.

NSIP investment at stations is proposed by a Local Delivery Group (LDG) and the NSIP Board agrees funding allocation to projects meeting the agreed criteria.

Priorities for investment are informed by the Secretary of State's desire to see an improvement in passenger satisfaction, alongside development of strategic priorities as measured by Passenger Focus's National Passenger Survey (NPS).

Although no specific target has been set, NPS data will be utilised where practicable to assess the benefit of investment on a 'before and after' basis at specific stations undergoing enhancement. Progress against satisfaction will be measured and presented to the NSIP Board; this information will be collated by the LDGs responsible for implementing station improvement projects.

Stations – Access for All (AFA)

Details

Fund reference code: F002b

HLOS driver: Station improvement

Operating route: All

Last updated: January 2016

The CP5 fund value has been revised from £135m (including £32m rollover) to £87.1m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6.

See also the separate entry titled 'Stations – Access for All (AfA) CP5 Additional Schemes' (CashDfT005) for the work funded by the additional funds that have been allocated following the 2014 Autumn Statement.

Objective of the Fund

To increase accessibility at stations across the network, building on the significant work carried out to date which has delivered 142 schemes.

Network Rail's obligations

Our obligation is to manage the programme and deliver efficiently the schemes that are authorised by DfT to draw down from the fund.

For each station in scope, to achieve an unobstructed and obstacle free 'accessible route' within Network Rail controlled infrastructure, from at least one station entrance (usually the main one) and all drop-off points associated with that entrance, to each platform and between platforms served by passenger trains.

An accessible route is defined as:

- Meeting all applicable areas of 'Accessible Train and Station Design for Disabled People Code of Practice' technical standards, except where dispensations have been agreed;
- A distance, ideally not exceeding 400m, from station entrance (or drop off point if further) to the appropriate point of entry/exit of trains at platforms; and
- A route for a manually self-propelled wheelchair user to negotiate.

Governance

Network Rail's Director, Maintenance and Operational Services (DMOS) is the budget holder for the fund.

AfA measures are proposed by Local Delivery Groups (LDG) and in Scotland by Transport Scotland in conjunction with Network Rail, based on existing award allocation criteria with the Transport Minister providing final approval for the schemes to be taken forward. There may be instances where the Transport Minister is required to specify AfA measures.

The AfA Programme Board (consisting of Network Rail (Chair), DfT, TS and ORR) provides governance of the fund, including taking an overview of the delivery of the programme and the Secretary of State's wish for the industry to improve the passenger experience at stations including better passenger information, and to provide easier access for older or disabled passengers and passengers with small children.

The programme is aligned with other station investment programmes, such as renewals and the National Stations Improvement Programme, which will, wherever possible, deliver efficient project management and contracting resource required to deliver the schemes.

CP6 Development Fund

Details
Fund reference code: F004
HLOS driver: Ring Fenced Fund
Operating route: All, except Scotland
Last updated: January 2016

The CP5 fund value has been revised from £57m to £31.9m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6.

Objective of the Fund

The fund will be used to:

- Support the Long Term Planning Process (LTPP) in developing an evidence base for an industry submission for infrastructure investment in Control Period 6; and
- Further develop schemes that are likely to be required and funded for delivery, primarily during CP6.

Network Rail's Obligations

Network Rail's obligation is to administer the fund and to deliver the development of schemes that are authorised to draw down from this fund.

Governance

The Director Policy and Programmes is the fund holder for the CP6 Development Fund and will approve the use of funds. Authorisation will be made at the appropriate investment panel as set out in Network Rail's Investment Regulations.

Approval and authority for works to support the development of the LTPP is likely to be required for a study rather than for individual schemes.

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, as well as assessing efficient delivery.

Rail Industry Planning Group (RIPG) will be used to hold the fund holder to account for the use of funds.

Schemes should be considered likely to be required and funded for delivery during CP6 as part of the next periodic review.

Schemes must not be otherwise funded in CP5 through the PR13 settlement.

Funding should generally only 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.

The costs of the option development work stream required for the Route Studies and other strategies as part of the LTPP are eligible for funding from the CP6 Development Fund. These costs will mainly be for Infrastructure Projects (management, estimating, risk, engineering feasibility) and Asset Management (engineering feasibility). Note that funding for these studies will still be subject to the governance arrangements explained above.

The fund will be used to authorise development funding for proposals where funding is required to estimate costs before the appraisal can be completed. This is true of funding for option development to support the LTPP. In this case, the proposal must be reasonably likely to demonstrate a value for money case for investment.

Funds will be made available to progress schemes through to the next GRIP stage(s) that are shown to be feasible candidates for funding through the CP6 periodic review process. In this case, the proposal must be subject to a value for money (VfM) assessment including an economic case.

Network Rail Discretionary Fund (NRDF)

Details
Fund reference code: F005
HLOS driver: Ring Fenced Fund
Operating route: All except Scotland
Last updated: January 2016

The CP5 fund value has been revised from £103m to £59.2m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6. This means there is only a small remaining provision for investment in CP5 beyond that already spent.

Objective of the Fund

The fund is a mechanism for funding small schemes for which funding is not available elsewhere and that 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.

Network Rail's Obligations

Network Rail's obligation is to work with stakeholders to identify the best use of available funds and (usually) to deliver the schemes that are funded through NRDF. There are a large number of schemes ongoing across the network, most of which are schemes initiated in the latter years of CP4.

Governance

The Director Policy and Programmes is the fund holder for NRDF and will approve the use of funds. Authorisation will be made at the appropriate investment panel as set out in Network Rail's Investment Regulations.

Schemes will usually have been supported at the appropriate Route Strategy Planning Group (Network Rail's internal cross-functional group where local investment opportunities are reviewed), or equivalent group, 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).

Rail Industry Planning Group (RIPG) will hold the fund holder to account for the use of funds.

Expenditure must be classifiable as capex, as set out in IR01.

The fund can be used for initiatives that demonstrate at least a medium value for money economic case. The sponsor will be required to demonstrate the following:

- The funds will not be used to deliver outputs already funded to deliver regulated performance targets through the CP5 periodic review;
- The scheme is not eligible for funding from elsewhere;
- The funds will not be used to deliver outputs already funded through the franchise agreement between the DfT and an incumbent operator; and
- A better value for money operational solution has not been identified that delivers the same or similar outputs.

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; 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.

Funding will not be available for investments where the benefits to individual stakeholders are sufficient to warrant them funding the scheme directly. For example, where the benefits of a scheme:

- Will accrue primarily to a third party and that party would see a reasonable financial return, it would generally be funded as a third party scheme; or
- Will accrue primarily to Network Rail and Network Rail would see a reasonable financial return, it would generally be funded by Network Rail.

It is expected that eligible schemes will exploit opportunities incremental to asset renewals or other works.

All schemes taken forward for implementation are subject to a value for money (VfM) assessment including the economic case. A VfM assessment will be developed that is compliant with the DfT's WEBTAG guidance and will include the other four cases required by the guidance (strategic, commercial, financial and management).

Strategic Freight Network (SFN) Fund

Details

Fund reference code: F006

HLOS driver: Ring Fenced Fund

Operating route: All except Scotland

Last updated: January 2016

The CP5 fund value has been revised from £253m to £235.9m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6.

Objective of the Fund

The objective of the fund is to enhance the strategic freight network to facilitate growth of the freight market, deliver significant environmental, operational and economic efficiencies including reduction of delays to freight trains, and to reduce conflict between freight and passenger traffic.

Network Rail's obligation

Network Rail's obligation is to work with stakeholders to identify the best use of available funds and to deliver schemes that are selected by the Strategic Freight Network Steering Group (SFNSG) and funded through the CP5 SFN fund.

Funding for the strategic freight network can take the form of project development funding, research and development activities, as well as capital investment.

Governance

The Director Policy and Programmes is the budget holder for the SFN Fund.

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 SFNSG. This is a cross-industry group that oversees the development of the strategic freight network.

The role of SFNSG is to:

- Have strategic oversight of development of the strategic freight network including projects that are not directly funded through the SFN fund;
- Identify schemes which meet one or more of the nine core objectives of the strategic freight network;
- Determine prioritisation of schemes, having regard to the above objectives and to the DfT's five case approach to business cases, which includes the economic case and value for money considerations;

- Determine prioritisation of schemes where a change on any given project within the strategic freight network programme significantly affects other projects in the strategic freight network programme; and
- Monitor scheme progress in respect of planned timescales, scope and budget; and, where necessary, recommend corrective measures.

Schemes 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 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.

Interfaces and assumptions

The following critical assumptions on external factors are being made:

- Final selection of schemes for CP5 delivery is dependent on approval of the SFNSG. Therefore the scope of works, activities and milestones are subject to change dependant on SFNSG strategy;
- Strategic freight network schemes are delivered on a number of different strategic routes. Some of these schemes are dependent upon the completion of other enhancement programmes detailed in this document

Passenger Journey Improvement Fund (PJIF)

Details
Fund reference code: F007
HLOS driver: Ring Fenced Funds
Operating route: Various
Last updated: January 2016

The CP5 fund value has been revised from £206m to £106m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6.

Objective of the Fund

Network Rail has an obligation to work with the industry to develop and deliver works to improve the passenger journey experience. It is anticipated that this fund will be used to deliver a step change improvement in journey times on key corridors in conjunction with other major capacity and capability improvements with the intention of delivering significant enhanced franchise and economic value.

Network Rail's Obligations

Network Rail's obligation is to work with stakeholders to identify the best use of available funds and (usually) to deliver the schemes that are funded through PJIF.

Governance

The Director Policy and Programmes is the fund holder for PJIF and will approve the use of funds. Authorisation will be made at the appropriate investment panel as set out in Network Rail's Investment Regulations.

The fund holder will agree the allocation of funds with the DfT. In determining the use of the fund the expected impact on franchise value will be a key factor in the allocation process.

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), or equivalent, 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).

Rail Industry Planning Group (RIPG) will hold the fund holder to account on the use of funds.

Expenditure is classifiable as capex, as set out in IR01.

Funding will not be available for 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 primarily to a third party and that party would see a reasonable financial return, it would generally be funded as a third party scheme; or
- Will accrue primarily to Network Rail and Network Rail would see a reasonable financial return, it would generally be funded by Network Rail.

All schemes taken forward for implementation are subject to a value for money (VfM) assessment including the economic case, compliant with the DfT's WEBTAG guidance, and including the other four cases required by the guidance (strategic, commercial, financial and management).

High Speed 2

Details
Fund reference code: F008
HLOS driver: High Speed 2
Operating route: National (London North West, London North East, Wales & Western, Anglia, Scotland)
Last updated: January 2016

The CP5 fund value remains at £36m but DfT is putting in place a revised funding mechanism for this fund.

CP5 output driver

High Speed Two (HS2) is the Government’s project to deliver additional rail capacity to relieve the West Coast Main Line and boost economic growth, particularly in the north of England. It is a project of national importance that will affect passengers in England and Scotland, both during construction and when it is completed. HS2 Ltd is the company that has been established by the Department for Transport (DfT) to develop and deliver the new line to achieve this capacity.

As industry experts, the objective of Network Rail’s involvement in HS2 is to ensure the impact of the new line on the existing network is managed; that disruption is minimised and the opportunities and benefits are maximised.

Objectives of the fund

The objective of this fund is to enable Network Rail to work jointly with HS2 Ltd and the DfT in order to:

- Protect Network Rail’s interests, particularly in managing the risks and changes associated with the proposed High Speed 2 (HS2) line at the interfaces and with the wider network;
- Help Network Rail to prepare for the changes associated with the new high speed railway and protect Network Rail’s ORR commitments and obligations in respect of safety, train performance, financial performance, asset management and customer satisfaction;
- Facilitate industry engagement and the associated industry processes for regulated change;
- Identify opportunities for network and commercial development as a result of the new railway line;
- Provide input to the DfT’s strategy for High Speed Rail in Britain

Network Rail’s obligation

Network Rail under the Tripartite Cooperation Memorandum have committed to work in an

alliance with the DfT and HS2 Ltd (as a ‘Tripartite’ arrangement) to deliver the HS2 project. Our obligation is to work within that agreement and in particular lead the work at the interfaces and the integration of the HS2 railway line with the existing NR network.

These objectives will be achieved by:

- Working with DfT, HS2 Ltd and other stakeholders to help develop HS2 as a single national railway network, focussing particularly on effective integration of the new line with the wider network, seeking to maximise the benefits from the investment in new infrastructure.
- Development and implementation of the necessary works at the interfaces of the new line with the existing network, including making recommendations for improvements and taking forward development and implementation of the On-Network Works (on Network Rail infrastructure) where appropriate. These elements of works will be funded by Third Parties (including DfT and HS2 Ltd) through separate development and implementation agreements.
- Working with DfT and HS2 Ltd on the development of a route from the West Midlands to Crewe with a hybrid Bill for Phase 2A with significant interfaces at Crewe.
- Working with DfT and HS2 Ltd on the development of a route to Manchester and the North and West Midlands to Leeds and beyond and a hybrid Bill for Phase 2B with significant interfaces in the East Midlands, Sheffield and Leeds.
- Support the development of the future timetable with the wider industry;
- Provide technical advice for the hybrid Bill and Select Committee process for HS2 Ltd on proposed construction and operational activities through review of the parliamentary designs and documents;
- Protection of existing railway assets (to be funded by a separate Framework Asset Protection Agreement) and input to asset management/maintenance considerations for the new assets;
- Facilitation of access by HS2 Ltd and their consultants to the existing network for survey and design purposes (to be funded by Third Parties).
- In a joint team with the Route teams, work with the ORR to manage, review and agree changes resulting from the effect of the HS2 works on Network Rail’s regulatory commitments in respect of safety, train performance, financial performance, asset management and customer satisfaction.

The above are Network Rail’s CP5 scope of works to achieve the objective of the fund. This scope will be reviewed, updated and added to for CP6 and beyond at the relevant time.

Governance

The Head of High Speed Rail Development is the fund budget holder and will approve the use of funds; authorisation will be made at the appropriate investment panel as set out in Network Rail’s Investment Regulations.

Innovation Fund

Details

Fund reference code: F009a

HLOS driver: Ring Fenced Funds

Last updated: January 2016

The CP5 fund value has been revised from £52m to £18.9m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6. This means there is only a small remaining provision for investment in CP5 beyond that already spent.

Objective of the fund

The objectives of the fund are to:

- Support delivery of the Rail Technical Strategy (RTS), to the extent that the projects selected meet the criteria agreed with ORR in the separate governance note, optimising the performance and efficiency of the whole railway including reduced costs and increased revenues through better exploitation of the railway system
- Increase the commercial attractiveness and competitiveness of the rail market to encourage an increasing level of innovation, and increasing level of investment in innovation, by all parts of the rail industry and other connected industry sectors
- Enhance the capacity of the GB rail network and increase rail's modal share for freight and passengers
- Boost GDP and economic growth by enhancing the capability of the transport system and supporting UK companies where appropriate
- Develop the capability to use innovation to sustain and improve performance, efficiency and economic value over the longer term, delivering against industry objectives.
- Address market failure
- Enable the industry to reach a self-funding position for innovation development in the long term
- Enable and accelerate the introduction of innovation

Network Rail's obligation

Network Rail's obligation is to administer the fund to support industry to develop, demonstrate and introduce new technologies and innovation including technical, business model, operational, process and supply chain innovation to improve the performance and economic value of the railway and railway industry.

The Innovation Fund is complementary to the Strategic Research and Development (R&D) Fund and will be governed through the same industry and Network Rail groups

to achieve an efficient integrated R&D programme that will deliver co-ordinated improvements to the whole railway system. The Innovation Fund explicitly includes wide reaching goals for innovation to enable economic growth and increase rail's share of freight and passenger transport.

The two funds are delivered through a single annual plan to achieve an efficient integrated R&D programme that will deliver co-ordinated improvements to the whole railway system with the following scope:

- Innovation that could benefit the GB railway system and industry
- Innovation that supports delivery of the RTS, to the extent that the projects selected meet the criteria agreed with ORR in the separate governance note
- Supports short, medium and long term innovations to include technical, business model, operational, process and supply chain innovation
- Accessible to all parts of industry and open to proposals from any organisation/consortium
- Policy implications will be considered when identifying projects for funding
- Projects will typically be co-funded with the extent and nature of co-funding appropriate for the risks and maturity of individual projects
- The Innovation fund will not fund projects that would ordinarily be funded by individual industry organisations

Governance

The Group Safety, Technical & Engineering Director is the fund holder for the Innovation Fund. Network Rail is accountable for expenditure on the fund. Expenditure against this fund will be driven by and governed by the Technical Strategy Leadership Group (TSLG), which is a cross industry body working under the strategic direction of the Rail Delivery Group (RDG) and facilitated by RSSB.

TSLG will produce an overall plan for activity and expenditure, and annually a plan for each year of the control period. When these plans are endorsed by both the Network Rail Technology and Innovation Board and the RDG (T&O) Steering Group, Network Rail will transfer sufficient funds to RSSB to enable the efficient functioning of the Future Railway Team and the entering into of commitments for innovation activity to deliver the plan.

To ensure the plans are complementary, the TSLG plan will be endorsed by the Network Rail R&T board, and the Network Rail plan for the Strategic R&D Fund will be endorsed by TSLG. The combined plans for these programmes will be endorsed by the RDG T&O Steering group.

Management and delivery of the TSLG plan will be overseen by the Core Group of TSLG which is established and set up under governance arrangements approved by the RSSB Board and RDG.

RSSB (Future Railway Team) will be responsible for managing delivery in accordance with the delegated authorities for this activity and will report – through the Core Group and TSLG to Network Rail and RDG both expenditure and progress with the delivery of the plan.

TSLG will agree any material changes to the plan with the fund holder. Further details of these arrangements are set out in an investment governance note which can be found on the Network Rail website.

[Governance of Innovation and Strategic R&D Funds Letter](#)

Strategic Research and Development Fund

Details

Fund reference code: F009b

HLOS driver: Ring Fenced Funds

Last updated: January 2016

The CP5 fund value has been revised from £50m to £13.5m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6. This means there is only a small remaining provision for investment in CP5 beyond that already spent.

Objective of the Fund

The objectives of the fund are to:

- Support delivery of the Network Rail Technical Strategy and Rail Technical Strategy, optimising the performance and efficiency of the whole railway including safety, cost, enhanced capacity, customer experience and sustainability
- Develop the capability to use innovation to sustain and improve performance and efficiency over the longer term, delivering against Network Rail business and industry objectives
- Address market failure in innovation
- Increase the commercial attractiveness and competitiveness of the rail market to encourage an increasing level of innovation, and increasing level of investment in innovation, by third parties
- Enable and accelerate the introduction of technology and innovation

Network Rail's obligation

Network Rail's obligation is to administer the fund to support the research, development and demonstration of new technologies and innovation, working closely with industry, to improve the performance and economic value of the railway.

The Strategic R&D Fund is complementary to the Innovation Fund and will be governed through the same Network Rail and industry groups.

The two funds are delivered through a single annual plan to achieve an efficient integrated R&D programme that will deliver co-ordinated improvements to the whole railway system with the following scope:

- Innovation that supports delivery of the NRTS and RTS
- The Strategic R&D fund supports short, medium and long term research and development and innovation with the primary focus on technology-based innovation
- For the avoidance of doubt, the Strategic R&D fund is additional to, and does not replace, funding for projects that would ordinarily receive contributions from Network Rail or other individual industry organisations. This is typically likely to arise because:
 - Sufficient benefits are not available within CP5 to create a business case;
 - The business case delivers whole industry benefits rather than benefit to Network Rail's business independently; or
 - The project involves a level of risk of not leading to an implementable solution that would mean the project would not be undertaken as business as usual.

Governance

The Group Safety, Technical & Engineering Director is the fund holder for the Strategic R&D fund. Internal governance and direction for the fund will be achieved through a Research and Technology Board within Network Rail. Financial authorisation for R&D Fund projects will be via delegated authority endorsed by the Research and Technology Board. Industry will review proposed investments through the Technical Strategy Leadership Group (TSLG), a cross industry body working under the strategic direction of the RDG and facilitated by RSSB. The accountability for individual projects will fall to Network Rail or industry governance boards on a case by case basis with appropriate reporting and accountability to funders.

Portfolio management will be applied to the treatment of risk and to return on investment and to achieve a balanced delivery of Network Rail and industry outcomes. Co-funding for the portfolio will at least match the level of investment from the Strategic R&D fund. The co-funding of individual projects will be considered on a case by case basis as part of the process for investment scrutiny and approval.

Further details of these arrangements are set out in an investment governance note which can be found on the Network Rail website.

[Governance of Innovation and Strategic R&D Funds Letter](#)

Depots and Stabling Fund (D&SF)

Details
Fund reference code: F010
HLOS driver: Ring Fenced Fund
Operating route: All except Scotland
Last updated: January 2016

The CP5 fund value has been revised from £312m to £414.9m in 12/13 prices.

Objective of the Fund

The objective of the fund is to deliver depots, stabling and ancillary works to support delivery of outputs by committed projects. The fund's prime objective is to enhance depots and stabling facilities for HLOS capacity metric schemes, the CP5 electrification programme and for associated gauge and electric compatibility works.

It should be noted that the fund also contains a provision to support the new Northern franchise.

Network Rail's Obligations

Our obligation is to work with stakeholders to identify the best use of available funds and (usually) to deliver the schemes that are funded through D&SF. There are a large number of schemes ongoing across the network. In most cases Network Rail will deliver the infrastructure upgrades to depots and stabling facilities for HLOS capacity metric schemes, the CP5 electrification programme and for associated gauge and electric compatibility works.

Governance

The Director Policy and Programmes is the budget holder for the D&SF although schemes are selected through agreement with DfT. Authorisation of draw down and spend is as set out in Network Rail's Investment Regulations.

The governance arrangements reflect the ORR's determination that Network Rail should not be wholly accountable for the delivery of depots given that depot location, scope and specification of works are all dependent on decisions made by the funders, TOCs and ROSCOs.

Rail Industry Planning Group (RIPG) will be used to inform wider stakeholders on the use of the fund.

Schemes may be developed and delivered by Network Rail or third parties.

Candidate schemes will be assessed against the objectives of the D&SF and will be expected to include one or more of the following:

- Enhancement of depots and stabling for CP5 capacity metric schemes;
- Enhancement of depots and stabling for the CP5 electrification programme;
- Ancillary works such as gauge and electric compatibility works associated with the above.

The allocation of funding should be for schemes which have a good economic case, usually as an enabler to operation of a committed investment in CP5. Priority will be given to schemes with the strongest business case and which unlock the benefits of committed infrastructure schemes. DfT strategies on franchising and rolling stock will inform Network Rail decisions on how best to allocate and prioritise the use of the fund. Therefore DfT will sense check the strategic fit of proposed investments with the rolling stock strategy and franchising strategy before confirming their support for specific proposals. DfT will also check the overall business case by adding the proposed depots and stabling cost to the associated programme cost and evaluating the impact on the overall business case.

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

ETCS Cab Fitment Fund

Details
Fund reference code: F011
HLOS driver: Ring Fenced Fund
Last updated: January 2016

The CP5 fund value has been revised from £194m to £133.5m in 12/13 prices, with the remainder of the original CP5 fund value now planned for CP6.

Objective of the fund

- To facilitate the inclusion of migration to ETCS operation as a requirement in new franchises through funding and supporting the development of First-in-Class design solutions;
- To engage with Freight Operators and Open Access passenger operators to fund and co-ordinate the retro-fitment of ETCS on-board equipment to their fleets and the consequential changes to their business to support operation with ETCS; and
- To ensure sufficient ETCS-equipped engineering vehicles and on-track machines are available to assure the continued maintenance of the routes equipped with ETCS.

Note, this work supports DfT’s franchise commitments as well as enabling the UK to be compliant with the Railway Interoperability Regulations (2011).

Network Rail’s obligation

Our obligation is to work with all train operators and our stakeholders to ensure there are appropriate plans in place for them to introduce ETCS on-board equipment to their fleets so that there are no barriers or interruption to operating services on ETCS equipped infrastructure.

Governance

ERTMS Programme Board oversees the ERTMS programme activities including the ETCS cab fitment projects and consists of representatives from DfT, Freight Operating Companies, Train Operating Companies, RSSB, ATOC, Network Rail and ORR (as observers).

ETCS Infrastructure

Details
Fund reference code: F011
HLOS driver: Committed Project
Operating routes: London North Eastern & Great Western Main Line
Last updated: January 2016

In light of the revisions to the ETCS Cab Fitment Fund described in the preceding entry, the implications on the ETCS infrastructure plans will be evaluated over the coming months through the governance arrangements described on the preceding entry.

CP5 output driver

Design and develop an ETCS line side infrastructure system that is compliant with legislation and an enabler for the achievement of the Digital Railway, which will deliver industry benefits including improved safety, performance and capacity in forthcoming control periods.

Network Rail’s obligation

Our obligation is to work with all stakeholders to develop, co-ordinate and synchronise projects in order to commission Level 2 ETCS train control systems on the East Coast Main Line (ECML) and Great Western Main Line (GWML) whilst ensuring the optimum industry efficiency and benefit is achieved.

ETCS level 2 systems will:

- Reduce the cost of signalling renewals (when installed with no lineside signals);
- Reduce the cost of signalling maintenance (when installed with no lineside signals);
- Improve safety through continuous automatic train protection (ATP);
- Provide the opportunity for enhanced operational capability and increased capacity (when installed with no lineside signals); and
- Afford regulatory compliance to Railway Interoperability Regulations (2011).

New Stations Fund

Details

Fund reference code: F012

HLOS driver: New Stations

Operating route: Various

Last updated: January 2016

The CP5 fund value is £19.7m in 12/13 prices.

Objective of the Fund

The fund was agreed outside of HLOS in CP4. Its objective is to enable a funding contribution to be made to the provision of new stations promoted by third parties in England and Wales. This funding has been distributed through a competition to ensure that all promoters of New Stations which meet the conditions have had an equal opportunity of securing a funding contribution.

Network Rail's obligation

Network Rail's obligation is to administer the New Stations Fund and monitor the delivery of those schemes that are authorised to draw down from this fund. As part of the process of updating the CP5 Delivery Plan we will regularly provide a list of schemes authorised to draw down from the fund as we progress through the control period.

It should be noted that in the Summer 2015 budget statement mention was made of a further tranche of this funding. Network Rail has been advised that further information on this will be known following the outcome of the 2015 Autumn Spending review.

Governance

The Director Policy and Programmes is the fund holder for the New Stations Fund. Authorisation of draw down and spend is as set out in Network Rail's Investment Regulations. Schemes were selected by the New Stations Fund Awards Panel which comprised Network Rail, the Department for Transport, ATOC and the Campaign for Better Transport. Qualifying schemes met conditions set out in the New Stations Fund guidance. The Director Policy and Programmes is responsible for maintaining a forward programme for disbursement of the fund to provide clarity on the use of the fund throughout CP5. Rail Industry Planning Group (RIPG) provides an oversight on the use of the New Stations Fund. Key eligibility criteria are shown below:

- New Stations Fund schemes will be subject to the value for money test appropriate to the type of scheme under consideration

- Projects must be aligned with overall strategies for the route including Route Studies/Route Utilisation Strategies
- Improvements or refurbishments at existing stations, the funding of new or reopened lines (even if associated with a "new station") or the relocation of existing stations are excluded from this fund
- The proposed train service and timetable for the station must be supported by Network Rail as the timetable planner
- Qualifying projects must be for projects to build new stations in England and Wales only
- Third party contributions of 25 per cent or more of the New Stations Fund project costs will be provided
- New stations will become part of Network Rail's Regulated Asset Base (RAB)
- The New Stations Fund is only available for heavy rail stations.

A list of schemes authorised to draw down from the fund is shown below. The schemes will have a stage gate review before they are authorised to construct and deliver the station (GRIP 6 to 8).

Project	Applicant
Ilkeston	Derbyshire County Council – Completed
Newcourt	Devon County Council – Completed
Lea Bridge	London Borough of Waltham Forest – Completed
Pye Corner	Welsh Government – Completed
Kenilworth	Warwickshire County Council – Completed

There are two significant CP5 Programmes linked to two of the schemes within this fund:

- Lea Bridge new station is on the West Anglia Main Line and interfaces with West Anglia Main Line capacity increase scheme (A003)
- Kenilworth new station is on the Coventry to Leamington Spa route and interfaces with the Coventry to Leamington Capacity scheme

CP4 Station Commercial Project Facility (SCPF) - Completed

Details

Fund reference code: F013

Operating route: All except Scotland

Last updated: January 2016

Objective of the Fund

The aim is to generate a financial return to DfT and deliver passenger benefits by investing in commercial schemes, primarily at stations. As a result of investing in assets that generate increased income, the DfT are able to achieve a higher value for the franchise when it is let. Additionally, financial benefits are realised through the creation of a new revenue stream that reduces the level of subsidy or a possible revenue share arrangement.

Network Rail's obligation

Our obligation is to administer and programme manage this facility.

Where Network Rail are delivering the schemes or is in partnership, it is responsible for the delivery of the schemes to scope, programme and budget and is responsible for demonstrating to ORR that scheme costs are efficient.

Governance

The budget holder is the Director, Maintenance and Operational Services.

The fund has supported projects by Network Rail, train operators or third parties in England and Wales and was awarded on a competitive basis. It would also be available for projects in Scotland where a return would accrue to DfT.

There is no cap on the value of projects and there are no restrictions on station categories. A project using this facility must demonstrate a direct or indirect financial benefit to DfT. This increased value may come in various forms including:

- Increased value of a franchise at point of refranchising;
- Creation of new revenue streams from station trading or development;
- Increased income to franchisee or Network Rail as a result of increased car parks;
- Increased income from reduced fare evasion through ticket gating at stations;
- Projects that reduce the costs of operating the railway; and
- New innovative approaches.

Schemes delivered from the fund:

Project	Delivery agent
Driver only operation: Strood to Gillingham	Network Rail
King's Cross accelerated gate line renewals	Network Rail
Wakefield Westgate	East Coast
Bath Spa ticket gates	First Great Western
Car park scheme at Langley station	First Great Western
Extension of car park at Charlbury	First Great Western
Extension of car park at Radley station	First Great Western
Hanborough car park extension	First Great Western
Pangbourne station car park	First Great Western
Huddersfield automatic ticket gates	First TransPennine Express
Northallerton car park enhancements	First TransPennine Express
Southend East ATG	Greater Anglia
Car Parks at 6 Northern Stations	Northern Rail
New Pudsey Car Park	Northern Rail
Dore & Totley car park enhancement	South Yorkshire PTE
Denmark Hill ticket gating	Southeastern
Dover Priory automatic ticket gates	Southeastern
Rochester Station new ticket office and gating	Southeastern
Waterloo East balcony ticket gating	Southeastern
Brighton Station development	Southern
Three Bridges retail development	Southern
Horwich car park	Transport for Greater Manchester
Crewe car park enhancement	Cheshire East Council
Banbury East MSCP	Chiltern Railways

Project	Delivery agent
Ferne Park depot enhancement	East Coast
Wakefield Westgate station enhancement	East Coast
Newcastle Central station retail enhancements	East Coast
Hatfield MSCP and station enhancements	First Capital Connect
Bristol Parkway MSCP	First Great Western
Cheltenham Spa car park extension	First Great Western
Tottenham Hale ATG	Greater Anglia
Wakefield Kirkgate station enhancement	Groundwork Wakefield
Neville Hill depot enhancements	Network Rail
Manchester Victoria station re-development	Network Rail
Harpenden car park enhancements	Network Rail
Tonbridge car park enhancement	Southeastern
Orpington car park enhancement	Southeastern
Folkestone West car park expansion	Southeastern
ITSO smartcard installation at 91 Southern stations	Southern Railways
Farnborough car park extension	South-West Trains
Fleet car park extension	South-West Trains
Winchester car park extensions	South-West Trains

LSE Weather Resilience Fund

Details
Fund reference code: F014
HLOS driver: N/A (the fund is reparation for LSE under performance in CP4)
Operating route: Anglia, South East, Wessex, Western, LNW and LNE
Last updated: March 2018

Objective of the fund

This fund will be used to introduce projects that are over and above Network Rail's existing activities to improve the resilience of the infrastructure to adverse and extreme weather, reducing PPM delays and Cancellation and Significant Lateness (CaSL) to London and South East services.

Network Rail's obligation

Network Rail's obligation is to deliver the selected schemes for improving the resilience of services in London and the South East to the effects of adverse and extreme weather, and to administer the £25 million fund which has been created for this purpose.

The agreed schemes have been placed into five groups based on the weather risk that is being mitigated:

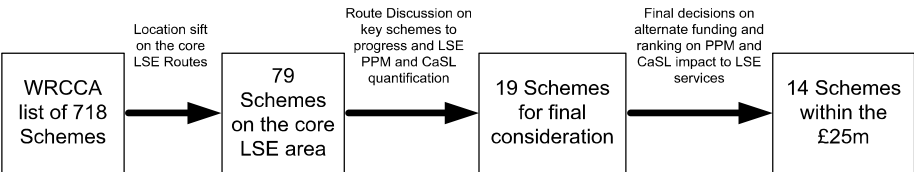
- **Flooding** – this includes flooding from rivers, ground water and rain run off
- **Lightning** – the focus is reduction of the impact on the signalling system
- **High Winds** – the focus is on reducing the risk of de-wirement and impact of speed restrictions
- **Cold** – resilience to low temperatures
- **Coastal** – resilience to coastal erosion

Governance

The fund holder is Network Rail's Director, Maintenance and Operational Services. The fund operates in accordance with Network Rail Investment Regulations.

Working with ORR, the Department for Transport, rail industry bodies and passenger groups a list of 14 schemes was proposed to, and subsequently agreed by, the ORR. The short list of schemes was derived from the long list formed by the routes' submissions for the Weather Resilience and Climate Change (WRCCA) work stream.

The schemes have been selected based on the delivery of benefit to the PPM and CaSL metrics in the LSE region. The wider industry was consulted on the methodology and the resulting list through a paper to the National Task Force (13 November 2014) and through Passenger Focus (27 November 2014) before being presented to the ORR on 3 December 2014. Network Rail formally wrote to the ORR on 10 December 2014 and the list of schemes was agreed by the ORR on 17 December 2014. The resulting work will be delivered by the routes.



Further discussion on the monitoring of schemes has taken place with ORR leading to the update of the Enhancements Delivery Plan. The schemes will be tracked through the Enhancement Delivery Plan, with an update to the National Task Force as part of the Weather Resilience and Climate Change work stream.

Significant interfaces include:

- **Track renewals** (schemes involving track raising (e.g. Hinksey and Axminster) may form part of a larger project with renewals opportunities)
- **Environment Agency** (ongoing modelling work at flood sites)
- **East Coast Power Supply Upgrade** (opportunities to undertake works where the relevant site is already part of a project possession)
- Thameslink Programme

Milestones Flooding

Route	Scheme	GRIP 6 Start (physical work)	EIS Infrastructure Authorised
South East	Flooding Mitigation at Shalmesford Street	Complete	March 17* (indicator)
South East	Flooding Mitigation at Balcombe Tunnel	Complete	March 17 * (indicator)
South East	Raise HV Room off Flood site at Pangdean	Complete	Complete
South East	Sussex Enhanced Drainage	Complete	March 17* (indicator)
Western	Hinksey Flood Resilience works	Complete	Complete
LNE	Elstree Tunnel (south end) drainage improvements	Complete	Complete
LNW	Kenton Station drainage improvements	Complete	June 17* (indicator)
South Western Railway Alliance	Wessex flooding resilience	Complete	March 19 (Regulated Output)

* Subject to ongoing change control

Lightning

Route	Scheme	GRIP 6 Start (physical work)	EIS Infrastructure Authorised
South Western Railway Alliance	Lightning Impact Mitigation Waterloo to Clapham	Complete	Complete
Anglia	Lightning Impact Mitigation GEML and East Suffolk	Complete	Complete

High Wind

Route	Scheme	GRIP 6 Start (physical work)	EIS Infrastructure Authorised
Anglia	OHL resilience (blow of mitigation)	Complete	Complete
LNE	OHL resilience (installing light weight portals)	Complete	December 18 (Regulated Output)

Cold

Route	Scheme	GRIP 6 Start (physical work)	EIS Infrastructure Authorised
Anglia	Improved Structures Drainage to mitigate Icicle formation causing OHL tripping	Complete	Complete

Coastal

Route	Scheme	GRIP 6 Start (physical work)	EIS Infrastructure Authorised
South East	Enhanced coastal defences at Folkestone Warren	Complete	Complete

Lostock to Wigan Electrification

Details

Project reference code: CashDfT001 (DfT-promoted Cash Funded)

Operating route: LNW North

Last updated: March 2017

CP5 output driver

Electrification of this route will enable the conversion of the busy Wigan to Manchester services from diesel trains to modern and higher capacity electric trains. This also supports a reduction in industry operating costs.

Network Rail's obligation

Network Rail's obligation is to develop the scheme to GRIP stage 3 (single option selection / approval in principle) and to develop a project cost estimate and programme through to delivery.

Scope of works

The Lostock to Wigan North Western route to be electrified comprises of a 10.5km double track section route. The route commences at Lostock Junction to Crow Nest Junction and finishes at Wigan North Western.

The project scope consists of:

- Electrification of the line between Lostock to Wigan North Western
- Signalling immunisation and sighting
- Assessment of the impact to the risk profiles on level crossings along the route
- Bridge reconstructions and track lowering to provide the required OLE vertical clearance
- Structure parapet works to achieve compliance to standards
- Feasibility study to support extension of electrification limits to include the route to Wigan Wallgate

¹ Once rolling stock types are known, an exercise to include rolling stock clearance work in the scheme will allow efficient delivery of activity.

Interfaces and assumptions

- NWEF Phase 4 - Electrification of Manchester Victoria to Euxton Junction including tie-in into the WCML. Consideration of the interface needs to be made in the designs
- Wigan North Western: Platform extension(s) to the bay platform(s) is currently in design development to enable 4 car operation. Consideration needs to be given in implementation plans
- There is an interface with the existing OLE at Wigan Station Junction; it is assumed that it allows electric rolling stock to arrive into Wigan North Western in Platform 1, 2 & 3 only.

The following critical assumptions on internal factors are being made:

- Standard clearances on structures are to be designed.
- No further route enhancements are required.
- The project does not include depot and stabling works
- Additional traction power supply for operation of this infrastructure is not required
- Rolling stock clearance work is not included¹

The following critical assumptions on external factors are being made:

- Industry resource availability; consideration of all electrification programmes
- All requested planning consents will be granted

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Completion of AIP	December 2017	Complete
GRIP 6 start	Start on site	To be determined	Indicative
EIS testing	Entry into Service for testing and driver training	To be determined	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	To be determined	Indicative
Output delivered	First timetabled public use of the infrastructure	To be determined	n/a

Gospel Oak to Barking Electrification

Details
Project reference code: CashDfT002 (DfT-promoted Cash Funded)
Operating route: Anglia
Last updated: June 2017

CP5 output driver

The Network RUS Electrification Strategy recommended a core strategy of rail infill electrification schemes in England and Wales, which included the Gospel Oak to Barking line.

As stated in the RUS, this scheme will enable the more efficient operation of passenger services on the route, replacing diesel traction with electric (typically a 4 car new or refurbished electric multiple unit). It will also enable freight operators to use electric traction (typically Class 86 or 92) on some flows emanating from the North Thameside area, so avoiding the need for electric traction to cross the Great Eastern Main Line at grade at Forest Gate Junction in order to access the North London Line.

Network Rail's obligation

Network Rail's obligation for this scheme is to deliver 25Kv AC electrified infrastructure capable of supporting electric passenger and freight services between Gospel Oak and Barking, a total of 24 single track miles.

The assumed train specification on which the CP5 traction power requirements for this scheme have been based is:

- 4 No. four-car Class 378 passenger trains per hour; and
- 3 No. Class 90 hauled freight trains of up to 2000 tonnes each per hour

Scope of works

- The core scheme will electrify the following sections of network:
- Gospel Oak Junction to South Tottenham West Junction;
 - Gospel Oak platform 3 (bay platform);
 - Upper Holloway Reception Line;
 - Harringay Park Junction to Harringay Junction;
 - South Tottenham East Junction to Woodgrange Park Junction;
 - Barking Station Junction to Barking Platform 1 buffer stops; and
 - all crossovers between Gospel Oak Junction and Barking Station Junction.

The scope of works also includes clearance to W12 gauge at rebuilt or altered structures within the track lowering sites.

Interfaces and assumptions

There are significant interfaces with the overall Anglia Route CP5 Business Plan programme. In particular, schemes which require significant disruptive access have been planned around this project so as to reduce disruption to operators and maximise efficiencies.

The following critical assumptions on internal factors are being made:

- The necessary traction power supply from Acton Lane feeder station required to feed the western half of the route will be available by the entry into service date as planned

The following critical assumptions on external factors are being made:

- The proposed access strategy, involving initial weekend possessions for enabling works followed by a blockade between Gospel Oak and Woodgrange Park, is accepted by the industry.
- Industry consents (e.g. Network Change) are forthcoming.
- External consents (e.g. council noise approvals) are forthcoming.
- The co-funders (the Department of Transport and Rail for London Limited) enter into the necessary commercial agreements with Network Rail to fund and progress the project to completion.
- The infrastructure changes necessary to support operation of longer passenger trains (e.g. platform extensions) will be funded and delivered by others.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	31 March 2015	Complete
GRIP 6 start	Start on site	19 December 2015	Complete
EIS testing	Entry into Service for testing and driver training	02 January 2018	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	June 2018	Complete
Output delivered	First timetabled public use of the infrastructure	02 April 2018	n/a

Stations – Station Commercial Project Facility 2 (SCPF2)

Details

Project reference code: CashDfT004 (DfT-promoted Cash Funded)

Operating route: England and Wales only

Last updated: January 2016

Objective

The aim of the fund is to generate a financial return to the Department for Transport and to deliver passenger benefits by investing in commercial schemes, primarily at stations. By investing in assets that generate increased income, the DfT is able to achieve a higher value for the franchise when it is let. Additionally, financial benefits are realised through the creation of a new revenue stream that reduces the level of subsidy or allows a possible revenue share arrangement.

Network Rail's obligation

SCPF2 is a DfT Cash funded initiative to build on the success of the CP4 SCPF Programme. The programme aims to deliver £30 million worth of commercially focussed station improvements in CP5. Our obligation is to administer and programme manage this facility.

Governance

The fund holder is the Director, Maintenance and Operational Services (DMOS). The fund will support projects by train operators or third parties in England and Wales and is awarded on a competitive basis. It would also be available for projects in Scotland where a return would accrue to DfT.

There is no cap on the value of projects and there are no restrictions on station categories. A project using this facility must demonstrate a direct or indirect financial benefit to DfT. This increased value may come in various forms including:

- Increased value of a franchise at point of refranchising;
- Creation of new revenue streams from station trading or development;
- Increased income to franchisee or Network Rail as a result of increased car park revenue;
- Increased income from reduced fare evasion through ticket gating at stations;
- Projects that reduce the costs of operating the railway; and
- New and innovative approaches.

Schemes being delivered by the fund:

Location	Improvement Work
Cheltenham Spa	Car Park
Exeter St David's	Various redevelopment works
Market Harborough	Car Park
Newbury	Car Park
St Albans	Retail
Weston-Super-Mare	Ticket Gates

Stations – Access for All (AfA) CP5 Additional Schemes

Details
Project reference code: CashDfT005 (DfT-promoted Cash Funded)
Operating route: All
Last updated: January 2016

Objective

The objective of the scheme is to increase accessibility at stations across the network, building on the significant work carried out to date which has delivered 142 schemes.

The CP5 programme from 2015 to 2019 is an extension of the CP4 fund.

Note that in light of the revisions to the CP5 fund value for the separate entry titled ‘Stations – Access for All (AfA)’ (F002b), the schemes listed on this page will also be reviewed by the AFA Programme Board over the coming months.

Network Rail’s obligations

Our obligation is to manage the programme and deliver efficiently the schemes that are authorised by DfT to draw down from the Access for All Fund.

At each station in scope, to achieve an unobstructed and obstacle free ‘accessible route’ within Network Rail controlled infrastructure, from at least one station entrance (usually the main one) and all drop-off points associated with that entrance, to each platform and between platforms served by passenger trains.

An accessible route is defined as:

- Meeting all applicable areas of ‘Accessible Train and Station Design for Disabled People Code of Practice’ technical standards, except where dispensations have been agreed;
- A distance, ideally not exceeding 400m, from station entrance (or drop off point if further) to the appropriate point of entry/exit of trains at platforms; and
- A route for a manually self-propelled wheelchair user to negotiate.

Governance

The Director, Maintenance and Operational Services (DMOS) is the fund holder for AfA.

AfA measures are proposed by Local Delivery Groups (LDG) and in Scotland by Transport Scotland in conjunction with Network Rail, based on existing award allocation criteria with the Transport Minister providing final approval for the schemes

to be taken forward. There may be instances where the Transport Minister is required to specify AfA measures.

The AfA Programme Board (consisting of NR (Chair), DfT, TS, ORR) and reports on a periodic basis, this provides governance of the fund, an overview of the delivery of the programme and to meet the requirements set out in the Secretary of State’s HLOS publication of July 2012, which stated that The Secretary of State wishes the industry to improve the passenger experience at stations including better passenger information and to provide easier access for older or disabled passengers and passengers with small children.

The programme is aligned with other station investment programmes, such as renewals and NSIP, which will wherever possible deliver efficient project management and contracting resource required to deliver the scheme(s).

Progress reporting on the fund will be undertaken by:

- Enhancements Delivery Plan updates – revised quarterly, update subject to the change control process, where appropriate.
- Network Rail’s main board via Investment Panel – DMOS will provide a quarterly update.

AfA Main Programme- additional schemes requested to be developed for the CP5 Programme following the 2014 Autumn Statement

England and Wales
Brondesbury; Teddington; Crawley; Palmers Green; Coulsdon South; Shortlands; Plumstead; Selhurst; Carshalton; Canterbury East; Bexley; Ewell West; Alexandra Palace, Tring, Stechford, Meols, Mills Hill, Torquay, Totnes, Scunthorpe, Headingly, Taff Wells, Treherbert,
Scotland
Kilmarnock, Westerton, Kilwinning

Cambridge North New Station

Details
Project reference code: CashDfT006 (DfT-promoted Cash Funded)
Operating route: Anglia
Last updated: January 2016

CP5 output driver

Cambridgeshire has one of the fastest economies of any county in the country and its level of road congestion is increasing. Almost 80% of car traffic to Cambridge railway station originates in the north of the city and crosses the central area. A station in north Cambridge will relieve some of this traffic by providing an alternative location to access the rail network.

The station will form an interchange with the Cambridgeshire Guided Busway, giving public transport access to the nearby business, technology and science employment areas. The ability to travel to and from Central London in less than an hour will be attractive to commuters and business travellers alike.

Network Rail's obligation

To deliver the new station at Cambridge North, with the associated supporting infrastructure changes.

Scope of works

Design and build of a scheme to deliver a new three-platform railway station at Chesterton sidings, in north Cambridge. The station site consists of mostly disused sidings, and is already owned by Network Rail.

The platforms will be of sufficient length to accommodate the longest 12-coach trains that currently serve the Cambridge area.

The development will include a station building, cycle and car parking facilities, access roads and an extension to the Cambridgeshire Guided Busway (to be delivered by others) to serve the station.

The scope includes the relocation of the adjacent aggregate rail freight terminals to segregate station and freight activities

Interfaces and assumptions

There are no significant interfaces with other current CP5 schemes.

The following critical assumptions on internal factors are being made:

- The existing traction power supply in the area is capable of supporting the train service that will serve the station

The following critical assumptions on external factors are being made:

- Industry consents (e.g. Network Change) are forthcoming
- The timetable will be developed to align to the infrastructure capability designed (as the train service to call at the station has not been specified)
- The station will be operated by the holder of the Greater Anglia franchise
- The station will be served by one or more of the three train operators that operate in the area

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Completion of AIP	30 August 2013	Complete
GRIP 4 completion	Single option scope defined	31 March 2014	Complete
GRIP 6 start	Start on site	8 November 2015	Complete
EIS Infrastructure authorised	Infrastructure authorised for passenger use	21 April 2017	Complete
Output delivered	First timetabled public use of the infrastructure	21 May 2017	n/a

Tram Train Pilot

Details

Project reference code: CashDfT007 (DfT-promoted Cash Funded)

Operating route: LNE

Last updated: December 2016

CP5 output driver

The output of the project is the provision of infrastructure capability enhancements to enable the pilot operation of Tram Train vehicles in the UK. The operation will contribute to the delivery of the agreed client objectives for the project:

- Understand the changes to industry costs of operating a lighter weight vehicle, with track brakes, on the national rail network;
- Determine changes to technical standards required to allow inter-running of light weight tram-type vehicles with heavy rail passenger and freight traffic and to gain the maximum cost benefit from Tram Train operation;
- Gauge passenger perception and acceptance of a light rail Tram Train service;
- Determine the practical and operational issues of extending Tram Trains from the national rail network to a tramway system;
- Devise a business case to support the long term operation of Tram Train services in Sheffield/Rotherham and the wider UK;
- Deliver the project within an agreed budget; and
- Gain direct experience of the processes that would allow Tram Train technology to be utilised elsewhere in Great Britain.

Network Rail's obligation

Network Rail's obligation is to provide infrastructure capability enhancements to enable the operation of the Stadler CityLink Tram Train on the Network according to the "Tram Train Project Client Requirements v8.0" agreed and approved by the project clients (Department for Transport, Network Rail, Northern Rail, South Yorkshire Passenger Transport Executive and South Yorkshire Supertram Limited).

Scope of works

The project concerns the provision of infrastructure enhancements to facilitate the operation of the Stadler CityLink Tram Train vehicle between Tinsley and Rotherham Parkgate. The infrastructure works comprise:

- 400m of plain line and associated junctions linking Network Rail and South Yorkshire Supertram Limited infrastructure at Tinsley;
- 11.5 single track kilometres of 750V dc overhead line electrification;
- 1 x 600kW substation;
- 200m single track turnback facility at Rotherham Parkgate;

- Reconstruction of College Road overbridge at Rotherham for electrical clearances;
- Renewal of signalling equipment at Woodburn Signal Box and the signal power supply to address existing asset condition;
- Provision of electrical control within York Electrical Control Room;
- Additional signals to control entry/exit with the South Yorkshire Supertram Limited network and at the turnback facility at Rotherham Parkgate;
- One new stop for the Tram Train service at Rotherham Parkgate;
- Low height platform extensions to enable the Tram Train service to call at Rotherham Central Station;
- Alterations to track and overbridges to accommodate the overhead line electrification; and
- The production of an industry learning report, created after completion of a 2 year pilot operation period following commissioning of the Tram Train passenger service.

Significant interfaces

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- GSM-R and FTN – this functionality is to be delivered prior to commissioning of the Tram Train service
- Sheffield signal reconrol –this scheme will be delivered in advance of the Tram Train project and include functionality required for Tram Train operation
- Sheffield to ECML 25kV AC electrification – potential changes to overhead line design to accommodate future proofing for 25kV electrification
- Replacement of SCADA system within York Electrical Control Room – this project is to be completed following the inclusion of the electrical control requirements for the Tram Train Pilot.

Key assumptions

The following critical assumptions on internal factors are being made:

- Suitable conventional or high output plant will be available for the installation of the overhead line system
- No additional feeder stations are required
- No additional infrastructure works, beyond that already identified, are required to provide for any future installation of 25kV ac overhead line electrification on the route
- The required product and system approvals for the overhead line electrification design will be granted in line with the project programme.
- Sufficient possessions can be agreed to implement the work required without impacting on the programme

- GSM-R and FTN programmes will have completed work along the full line of route
- Track lowering to achieve electrical clearances at overline structures will not result in additional works to the foundations of those structures
- Stations will be able to accommodate additional passenger flows
- Safety authorisation for the infrastructure will be granted in line with the project programme
- Electrical control facilities will be provided within Network Rail's Electrical Control Room in York
- The reconstruction of College Road overbridge will deliver a compliant solution for electrical clearances.

The following critical assumptions on external factors are being made:

- The Tram Train vehicle delivery programme matches the infrastructure delivery programme to permit joint commissioning of the system
- A vehicle wheel profile capable of sustaining safe operation on heavy rail and tramway infrastructure is identified and approved
- Sufficient capacity and outage opportunities exist to enable provision of the electricity supply points to the timescales required
- Information on the extent of third party services within overline structures is complete and accurate
- Additional power supply points for any motorised electrical switches are readily available along the line of route

Activities and milestones

Milestone	Description	Date	Status
GRIP 6 Start	Start on site	August 2015	Complete
EIS – Infrastructure Authorised	Entry into Service for testing and driver training of the Tram Train vehicle	December 2016 (baseline) August 2018 (update)	Complete
GRIP 8 Complete	Production of Industry Learning report	June 2019 (baseline) February 2021 (update)	Indicative

Western Route Flood Resilience

Details

Project reference code: IFDfT001 (DfT-promoted Investment Framework)

Operating route: Western and Wessex

Last updated: December 2017

CP5 output driver

Improve the resilience of the Western Route to the impacts of severe weather, including the resilience of the diversionary route through Wessex. Reduce delays incurred from the impact of flooding to train services and improve the route's ability to predict and recover from events.

Network Rail's obligation

To deliver the infrastructure upgrades at 9 discrete locations to reduce those locations' susceptibility to flooding, to achieve where possible a minimum level of protection of 1 in 50 year return period. Deliver an enhanced forecasting and monitoring system to enable smarter operational decision making during severe weather events.

Scope of works

- Cowley Bridge Junction – enhance existing culvert capacity
- Cowley Bridge Junction - removal of up to 3 weirs (funded to GRIP 5 only due to funding constraints)
- Chipping Sodbury – enhance existing drainage, increase capacity to existing lagoon
- Hinksey – raise the railway by c.500mm, install 2 culverts, renew life expired assets
- Whiteball Tunnel South – install new Crest drain, enhance drainage assets and undertake earthwork stabilisation
- Athelney to Cogload – increase capacity of current drainage system, install new attenuation pond (stopped at GRIP 3 due to funding and land constraints)
- Hele and Bradninch – improve conveyance of water around level crossing by roadway and drainage improvements
- Flax Bourton – enhance existing drainage and syphon, install new attenuation pond/s (funded to GRIP 5 only due to funding constraints)
- Patchway Up tunnel – new enhanced track drainage
- Exeter diversionary route – enhanced track drainage at 3 locations on the diversionary route

Working with the Environment Agency (EA), design and implement catchment instrumentation and flood prediction systems at critical locations across the route.

Interfaces and assumptions

- Great Western Route Modernisation, interfaces at Chipping Sodbury; proposed compound may affect the proposed enhanced lagoon.
- Oxford Flood Alleviation Scheme, being delivered by the Environment Agency (EA); the project considers the wider Thames catchment through Oxford and will install a series of channels for increased conveyance. The railway is a key pinch point for the project and the requirement to convey water across it led to the EA funding an enhanced culvert for the Hinksey flood alleviation scheme.
- Exeter flood defence Scheme, delivered by the EA to improve the existing flood defences to Exeter; the project interfaces at the northern end of the scheme at Cowley Bridge Junction.

The following critical assumptions on internal factors are being made:

- Critical plant and equipment is available for the delivery of the works

The following critical assumptions on external factors are being made:

- All consents are received from statutory consenting bodies
- Ground conditions during construction remain stable and the water table is at normal levels
- Third parties agree land purchase and/or temporary and permanent way leaves
- Access will be granted to deliver the schemes

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion (all sites)	Completion of AIP	February 2017	Complete
GRIP 6 start	Start on site	March 2014	Complete
GRIP 6 complete (Hinksey)	Complete site works	October 2016	Complete
GRIP 6 complete (all sites)	Complete site works	February 2019	Indicative

Oxenholme to Windermere Electrification

Details

Project reference code: IFDfT002 (DfT-promoted Investment Framework)

Operating route: LNW North

Last updated: September 2017

The electrification scope of this project has been removed following an announcement made by the Secretary of State for Transport on 20th July 2017.

The Enhancement Delivery Plan will be updated fully to reflect the revised scope once this has been determined.

CP5 output driver

The project delivers on the business objective to electrify the route from Oxenholme to Windermere in order to provide connectivity benefits for passengers between Manchester and the Lake District and also to reduce industry operating costs.

Network Rail's obligation

Network Rail's obligation is to develop the scheme to GRIP stage 3 (single option selection and approval in principle) and to develop a project cost estimate and programme through to delivery.

Scope of works

The line to be electrified is the single track, bi-directional route from Oxenholme Station to Windermere station.

The project scope details are:

- Electrification of the line between Windermere and Oxenholme
- Bridge reconstructions and track lowers to provide the required OLE vertical clearance.
- Assessment of the impact on level crossing risk profiles along the route.
- Signalling immunisation and sighting
- Structure parapet works to achieve compliance to standards.
- Interfaces and assumptions
- Burneside Higher Level Crossing renewal
- Burneside High Signal Box abolition and recontrol from Carlisle
- National Electric Control Centre (Migration from Crewe ECR to Manchester ROC)

The project is based upon a branch line which spurs off the WCML and as a result there are limited interfaces to other projects.

- Interfaces with existing OLE at Oxenholme Station on the WCML
- Oxenholme track renewals

The following critical assumptions on internal factors are being made:

- Additional traction power supply for operation of this infrastructure is not required
- Standard clearances on structure are to be designed.
- No further route enhancements are required.
- The project does not include depot and stabling works
- Rolling stock clearance work is not included

The following critical assumptions on external factors are being made:

- Industry resource availability; consideration of all electrification programmes
- All requested planning consents will be granted (location – National Park / Heritage)
- The train service specification has been assumed to be 1 passenger TPH

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 2 Feasibility	Completion of enhanced feasibility study including options	March 2017	Complete

Syston – Stoke Gauge Enhancement

Details

Project reference code: IFDfT003 (DfT-promoted Investment Framework)

Operating route: East Midlands & LNE

Last updated: June 2016

CP5 output driver

All work on this project is now planned for CP6.

The High Level Output Specification (HLOS) for CP5 requires the industry to develop and deliver a number of strategic capability enhancement schemes as part of the Electric Spine Development Programme (ES003) (see HLOS paragraph34; 36).

This scheme will provide enhanced gauge (W12/W6A) cleared routeing capability from Syston Junction to the West Coast Main Line (Stoke-on-Trent) and the Water Orton – Doncaster route (Trent Junction).

Delivery of the works will provide additional gauge capability resilience on the network for the operation of deep sea intermodal traffic and supports Government objectives for freight mode shift from road to rail. A secondary output is for the gauge clearance works between Syston and Trent to be integrated, where appropriate, with works to achieve electrification clearance for the Midland Main Line Electrification project (ES001).

Network Rail's obligation

Network Rail's commitment is to deliver a W12/W6A gauge cleared route from Syston to Stoke via Trent by the end of CP6.

Scope of works

- Develop GRIP3 design solutions to GRIP 4/5 designs
- Syston Junction to Trent Junction works will include 7 Bridge Reconstructions, 1 track slew and platform coper realignment at 5 locations.
- Trent Junction to Stoke Junction works will include 4 Bridge Reconstructions and platform coper realignment at 3 locations. Additionally, significant works at Meir Tunnel are required for gauge clearance.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- The significant interface with this project is Midland Main Line Electrification (ES001) between Syston and Trent Junctions. This interface recognises the opportunities for integration with the provision of electrification clearance where appropriate in aid of overall efficient delivery of the total works. Additionally, a share of funding with ES001 of the clearance works is assumed.
- Between North Staffs Junction and Stoke Junction there is a need for the gauge clearance solution for Meir Tunnel (singling the line through the tunnel) to link in with the Derby – Stoke re signalling project to ensure efficient delivery of the gauge clearance works

The following critical assumptions on internal factors are being made:

- That Midland Main Line Electrification works will proceed to planned timescales
- That Derby – Stoke re signalling works will proceed to planned timescales
- That possessions will be secured to ensure delivery of the output by the end of CP5

The following critical assumptions on external factors are being made:

- That highway authority road closures will be secured to support the delivery plan

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Completion of AIP	May 2014	Complete
EIS infrastructure authorised	Infrastructure authorised for passenger and freight services	CP6	Indicative

Ely to Soham Doubling

Details
Project reference code: IFDfT004 (DfT-promoted Investment Framework)
Operating route: Anglia
Last updated: January 2016

CP5 output driver

All work on this project is now planned for CP6.

The Ely to Bury St Edmunds line has been identified as part of the strategic cross country freight route. This project will develop a scheme to improve capacity for up to 48 freight train paths per day, with provision for the future capability to allow up to 56 freight train paths per day by 2030. In addition to this there is a requirement for the new infrastructure to accommodate an hourly passenger service. The track layout will provide the operational flexibility to allow for 775m trains to be held during times of perturbation.

Network Rail's obligation

In CP6 Network Rail is obliged to develop the project to engineering approval in principal (GRIP 3 AiP).

Scope of works

This project will increase the capacity for freight traffic between Ely and Soham on the F2N route. This project will:

- Double the existing track alignment between Ely and Soham
- Close 12 User Worked Crossings
- Upgrade 3 AHB Crossings to MCB-OD type
- Provide passive provision for future electrification of the line
- Provide a new bridge over Middle Fen drain
- Re-signalling works between Ely Dock Junction and Soham
- Embankment renewal and stabilisation works

To provide the permissions to construct and operate the railway, a Transport and Works Act Order (TWAO) will be required.

Interfaces and assumptions

Describe interfacing schemes and their potential impact:

- Cambridge Area Interlock Renewals – signal box modifications and determines infrastructure specification for Ely to Soham project
- Ely North Junction (A001) – S&C re-modelling, located close to the doubling scheme

- F2N projects – restricts access and resources to deliver the scheme
- Ely By-Pass – highway scheme being delivered by Cambridge County Council, enables greater transport access for construction activities
- Soham Station – Cambridgeshire County Council aspirations to deliver a new station alongside the doubling scheme

The following critical assumptions on internal factors are being made:

- A 6 month blockade will be available to deliver the works
- Resource and access availability to deliver the scheme
- Capacity on the network to divert freight paths during construction works

The following critical assumptions on external factors are being made:

- TWAO will be granted to construct the scheme
- The scheme is affordable. Network Rail has developed a scheme in line with funder requests with respect to scope. Should the current scope prove unaffordable alternative combinations of scope and output can be investigated through the change control process.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AiP completion	Completion of AiP	CP6	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	CP6	Indicative

Coventry to Nuneaton Enhancement – Phase 1 Package 2

Details

Project reference code: IFDfT005 (DfT-promoted Investment Framework)

Operating route: London North Western (LNW)

Last updated: September 2018

CP5 output driver

Phase 1, Package 2 of the Coventry to Nuneaton rail upgrade will improve capacity for passenger services on this route. Increased passenger services along the route will help to provide economic stimulus in the local area.

Network Rail's obligation

Network Rail's obligation is limited to the provision of a £5m contribution towards the final cost of the project.

Accountability for the outputs, delivery and provision of rolling stock for this project resides with the City of Coventry Council, the majority funding partner and the promoter for this project.

Scope of works

The scope of works proposed by the promoter, the City of Coventry Council, includes:

- Construction of a bay platform at Coventry Station
- Provision of a freight loop in the Three Spires area
- Provision of a crossover near Coventry Arena station, enabling a shuttle service to run during special events at Coventry Arena

Interfaces and assumptions

- Coventry Station Masterplan – the interface between the bay platform provided as part of the Coventry to Nuneaton rail upgrade and the Coventry Station Masterplan will be managed to avoid any design or construction conflict between the two projects.

The following critical assumptions on external factors are being made:

- Project funding will be provided by the City of Coventry Council, the majority funding partner for this project
- Diesel rolling stock will be made available to resource a half-hourly passenger service between Coventry and Nuneaton

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 4 completion	Single option scope defined	August 2018	Indicator
GRIP 6 start	Start on site	TBC	Indicative
EIS testing	Entry into Service for testing and driver training	TBC	Indicative
EIS Infrastructure authorised	Infrastructure authorised for passenger use	TBC	Indicative
Output delivered	First timetabled public use of the infrastructure	TBC	n/a

Milestones post-GRIP4 will be advised after the completion of that stage in the project

Hull to Selby Electrification

Details

Project reference code: IFDfT006 (First Hull Trains-promoted Investment Framework)

Operating route: London North Eastern and East Midlands

Last updated: June 2016

CP5 output driver

The electrification of the 33 miles of railway between Hull to Selby fits strategically with Government and industry aspirations. The project will contribute to improving rail industry efficiency and value for money, improving connectivity and opening up new journey possibilities and reducing the environmental footprint of rail.

First Hull Trains delivered a cost report for a guaranteed cost for GRIP 3 to 8 to allow the DfT to deliver a full business case.

The GRIP 2 development was completed by August 31st 2015.

Network Rail's obligation

Network Rail is to provide professional non design services to First Hull Trains, in respect of their proposals to electrify the route from Hull to Selby and Temple Hirst Junction.

Scope of works

Network Rail to provide the following services:-

- Attend project review meetings with First Hull Trains and /or their consultant
- Facilitate discussions with relevant Network Rail Asset Management and Property personnel
- Provide asset information and approved reports in relation to the customer's proposal
- Review reports provided by the customer

Interfaces and assumptions

Interfacing schemes which are delivering works adjacent to the proposed scheme are:

- North TransPennine electrification
- Journey Time improvements and Capacity improvements on the North TransPennine Route
- Ferriby to Gilberdyke Resignalling Scheme
- East Coast Main Line Power Supply Upgrade

The following critical assumptions on internal factors are being made:

- No further work has been instructed beyond the support for the current stage of development
- There is no further committed funding for this project

Cornwall Capacity Enabling Scheme

Details

Project reference code: IFDfT007 (DfT-promoted Investment Framework)

Operating route: Western

Last updated: September 2017

CP5 output driver

Studies carried out by Cornwall Council indicate that provision of the capacity to operate a half hourly service between Plymouth and Penzance would facilitate economic growth.

Network Rail's obligation

The service pattern proposed within the GWR franchise for 2018 will require infrastructure capable of delivering an additional 1 train per hour in each direction between Plymouth and Penzance. Network Rail's obligation is to work with the Franchisee and Unitary Authority (Cornwall Council) in the development of an infrastructure solution which provides the necessary signalling to deliver the December 2018 enhanced timetable.

Scope of works

- This is a signalling enhancement project.
- All new signals must be suitable for future electrification requirements.
- It is envisaged that the first phase of works in CP5 provides the additional capacity and the remainder of the signalling renewal will be in a future control period
- The infrastructure required to deliver the enhanced timetable will be commissioned in readiness of the December 2018 timetable.

Interfaces and assumptions

There are significant CP5 projects linked to this project including:

- F001, Level Crossing Risk Reduction works
- Potential alterations to St Erth station area (third party funded project);
- F010, Depot & Stabling Works;
- W009, West of England Diesel Multiple Unit Capability Works;
- W002a, Intercity Express Programme: Western Capability

The following critical assumptions on internal factors are being made:

- It is assumed sufficient signalling construction resources can be provided to deliver this new project

The following critical assumptions on external factors are being made:

- The Unitary Authority will continue to support and promote the project
- Suitable access will be agreed between the franchisee, the local authority, and Network Rail, to support the proposed programme, with opportunities sought to optimise deliverability
- Planning, Consents, Licences and Agreements will be obtained as required
- Station and Network Change will not be unreasonably withheld or delayed
- Capability works for the AT300 fleet are excluded from this project
- Works to provide an enhanced services pattern can be delivered within CP5.
- Access arrangements will be agreed in a timely and efficient manner to support the December 2018 timeline and the full commissioning strategy.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Completion of AIP	March 2016	Complete
EIS Infrastructure Authorised	Infrastructure ready for use	CP5	Indicative

Gatwick Airport Station Development

Details
Project reference code: IFDfT008 (DfT-promoted Investment Framework)
Operating route: Sussex
Last updated: June 2016

CP5 output driver

Gatwick Airport Station Development will provide improvements to the station environment which will offer a much improved passenger experience by relieving overcrowding, improving vertical circulation, horizontal flows and providing a more integrated concourse which offers intuitive connection with airport terminals and/or onward travel.

In addition to the benefits listed above the project will facilitate increased passenger revenues, an improved passenger experience and will support the Airport Commission's goal to improve surface access to Gatwick Airport. Funding for the design and construction activities was announced in the 2014 Autumn Statement.

Network Rail's obligation

Gatwick Airport Station Development is joint sponsored by Network Rail, the Department for Transport (DfT) and Gatwick Airport Limited (GAL). Network Rail will deliver the scheme. Revenue protection is required for all non-Gatwick Express platforms to meet TOC obligations.

Scope of works

The single option is not yet detailed but will involve construction of a new station concourse spanning the existing railway between the Airport South Terminal and the Airport Passenger Transport Interchange building. Portals will be created from the existing link bridges to provide access/egress to the concourse with the exception of the area behind Platform 7. There will be vertical circulation between the platforms and concourse and the widening of Platforms 5&6. More specifically the project will deliver:

- A solution which avoids negative impact on operational train performance
- A safe and secure station
- A larger concourse (with consideration for IATA standards) with clear concise information
- Intuitive passenger flow with improved vertical circulation between concourse and platforms with improved passenger distribution at platform level
- Solutions for the expected growth at both the station and airport and consideration for future proofing/passive provision for the growth generated by a second runway
- Solutions to reduce (eliminate) queues at gates

- Appropriate lighting and materials at platform level to mitigate reduction in natural light
- Appropriate heating, ventilation and draft exclusion
- Appropriate products for Airport service provision

Interfaces and assumptions

This is a station capacity scheme, the majority of the work will be to the concourse, any works at platform/track level will be to improve congestion on the platforms e.g. improve vertical circulation or passenger distribution on platforms. Any proposed improvement to capacity to track or trains is currently outside the scope of this scheme.

Co-ordination will be required with other rail industry projects along the Brighton Mainline (BML) including CP6 BML upgrade, Three Bridges re-signalling and Thameslink Programme.

There will be no additional material changes to rail passenger presentation; pedflow modelling will be based on the Thameslink timetable & committed rolling stock changes.

The following critical assumptions on external factors are being made:

- Any decision on a second runway at Gatwick is separate from this project and will not affect this scope. Co-ordination will be required with other Gatwick Airport development projects.
- Retail facilities will not be more than the existing offer
- Section 12 of the Fire Precautions regulations will not be applied to the scheme.
- Network Rail will utilise Permitted Development Rights for the scheme.
- The TSI derogation for OLE height will be granted.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and Approval in Principle	May 2016*	Indicative
GRIP 4 completion	Single option scope defined	September 2016*	Indicative
GRIP 6 start	Start on site	January 2017*	Indicative

*Subject to ongoing change control

EGIP – Electrification of Springburn to Cumbernauld

Details

Project reference code: SC001

HLOS driver: Increasing the capacity and capability of the Scottish network

Operating route: Scotland

Last updated: March 2016

CP5 output driver

The Scottish Government's 2012 HLOS sets out a requirement to increase the capacity and capability of the Scottish network. One means of supporting this aspiration is through the delivery of 50 single track kilometres of electrification permitting electric trains to operate between Springburn and Cumbernauld and Motherwell and Cumbernauld. This has allowed Glasgow Cumbernauld services to divert to Glasgow Queen Street Low Level, freeing capacity in Queen Street High Level.

In addition to the benefits listed above the project has, via the extension of existing EMU services from Springburn to Cumbernauld, facilitated a cascade of Class 158 DMU rolling stock to the new Borders Railway.

Network Rail's obligation

Network Rail's obligation was to electrify the Cumbernauld route to enable the introduction of electric services by June 2014 in time for Commonwealth Games 2014

Scope of works

- Electrification of Cowlares West / Sighthill Junction to Cumbernauld.
- Electrification of Gartsherrie South Junction to Gartcosh Junction / Garnqueen North 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 equated to circa 50 single track kilometres of new electrification, clearance works for remaining three foul structures, parapet raising on five other bridges and the immunisation of existing telecoms and S&T equipment.

Interfaces and assumptions

Not applicable – these works are complete.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 4 completion	Single option scope defined	February 2011	Complete
GRIP 6 completion	Infrastructure ready for use	March 2014	Complete

EGIP – Initial Phase Key Output 1

Details

Project reference code: SC002 (incl. EGIP Edinburgh Gateway (Advance Works))

HLOS driver: Increasing the capacity and capability of the Scottish network

Operating route: Scotland

Last updated: June 2017

CP5 output driver

The Scottish Government's 2012 HLOS sets out a requirement to increase the capacity and capability of the Scottish network. This project supports this aspiration by electrifying the route between Newbridge Junction and Glasgow Queen Street, including extensions to platform lengths. Together with alterations at Glasgow Queen Street and Edinburgh Waverley this will permit 7 car electric trains to operate on the route. In addition, a new station will be constructed at Edinburgh Gateway, which will include a tram interchange to give improved access to Edinburgh Airport and west Edinburgh.

The key outputs of EGIP include reductions in journey times and increased passenger capacity on the main Edinburgh to Glasgow route, giving benefits to passengers, contributing to the Scottish Government's goals of improving economic connectivity and reducing road congestion. Electrification will also reduce CO2 emissions on the route.

The increase in capacity will be achieved through electrification and the introduction of longer train formations. 7 car formations will operate during peak periods and intermediate station platforms will be extended to accommodate longer trains. These will replace the current 3 car DMUs which operate as 6 car formations during peak periods. End to end journey times will be progressively reduced from the current fastest journey time of 50 minutes to 42 minutes on completion of the EGIP Initial Phase and the electrification of other routes that connect with the corridor when 8 car trains will also be able to operate.

Network Rail's obligation

Network Rail's obligation is to deliver the necessary infrastructure to facilitate a minimum of one 7 x 23m car electric formation operating in each direction during the peaks on the Edinburgh to Glasgow via Falkirk High route. This was originally planned for the December 2016 timetable change.

Scope of works

Project	Physical outputs
Glasgow Queen St High Level to Newbridge Junction (via Falkirk High) Electrification	25kV OHL electrification
Cumbernauld to Greenhill Lower Junction Electrification	25kV OHL electrification
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 Edinburgh to Glasgow services, which may include platform, S&C and signalling alterations and additional S&C in the station throat.
East of Edinburgh EMU depot	Creation of a stabling and cleaning facility for new EMU rolling stock at Millerhill. This may require remodelling of Portobello Junction which is not currently within EGIP scope.
Edinburgh Gateway station	New station on the Edinburgh to Fife Line to provide an interchange with the Edinburgh Tram network for onward connection to Edinburgh Airport.

The extent of the above electrification works equates to approximately 150 STK (Single Track Kilometres) of new electrification, including provision of a new feeder station at Greenhill, electrification clearance works to 8 foul structures and immunisation of existing telecoms and signalling equipment.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Queen Street Station High Level Tunnel Slab Track Renewal; these works were completed in August 2016.
- Cowlairs track and S&C renewals: these works were completed in May 2016.
- Anniesland Connection: these works were completed in December 2015.
- Greenhill Upper Junction S&C renewals: these works were completed in 2016.
- Winchburgh Junction S&C renewals: these renewals were delivered at the same time as the EGIP works in Winchburgh Tunnel in June-July 2015.
- IEP Programme: platform extensions are required at Edinburgh Waverley for delivery of the IEP programme. The overall work in Waverley is being delivered by the EGIP team and there will be a funding contribution from the IEP programme.

The project also interfaced with the following previously authorised EGIP advance works, which are now complete:

- 2012 advance route clearance works
- 2013 advance route clearance works
- 2014 advance route clearance works
- Springburn to Cumbernauld electrification

The project will also interface with the following further EGIP works in CP5:

- EGIP Initial Phase Key Outputs 2 / 3 / 4.

The project will also interface with the following planned enhancement in CP5:

- Stirling / Alloa / Dunblane electrification facilitates the delivery of the 42 minute target journey time between Edinburgh and Glasgow.

The following critical assumptions on external factors are being made:

- The ScotRail EMU rolling stock will be available on time.
- The new grid supply point at Greenhill will be available for December 2017.
- Specialist OLE resources are available to deliver these works to the regulated milestone dates.

- The scheme to extend the Buchanan Galleries shopping centre is being reprogrammed by the developer. It is assumed that the reprogramming of the Buchanan Galleries extension scheme will result in the scheme being implemented post EGIP KO1, thus removing this potential interface issue.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 4 completion (electrification)	Single option scope defined	February 2011	Complete
GRIP 4 completion (majority of infrastructure works)	Single option scope defined	June 2012	Complete
GRIP 4 completion (further infrastructure development)	Single option scope defined	March 2014	Complete
GRIP 6 start	Start on site	October 2014	Complete
GRIP 6 completion (Edinburgh Gateway Advance Works)	Infrastructure ready for use	December 2014	Complete
GRIP 6 completion (Edinburgh Gateway Station)	Infrastructure ready for use	December 2016	Complete
EIS- Infrastructure authorised	Infrastructure authorised for passenger and freight use	October 2017	Complete

EGIP – Initial Phase Key Output 2, 3 & 4

Details

Project reference code: SC003

HLOS driver: Increasing the capacity and capability of the Scottish network

Operating route: Scotland

Last updated: June 2017

CP5 output driver

The Scottish Government's 2012 HLOS sets out a requirement to increase the capacity and capability of the Scottish network. EGIP forms a project to deliver on this aspiration, with key outputs including reductions in journey times and increased passenger capacity on the main Edinburgh to Glasgow route, giving benefits to passengers, contributing to the Scottish Government's goals of improving economic connectivity and reducing road congestion.

The increase in capacity will be achieved through electrification and the introduction of longer train formations. 4 car EMUs will be introduced, operating as 8 car formations during peak periods. These will replace the current 3 car DMUs which operate as 6 car formations during peak periods. End to end journey times will be progressively reduced from the current fastest journey time of 50 minutes to 42 minutes on completion of EGIP Initial Phase and the electrification of other routes that connect with the corridor.

In addition to the benefits listed above the project will reduce CO₂ emissions on the route as a result of the electrification works.

Network Rail's obligation

Network Rail's EGIP – Initial Phase Key Output 1 obligation is to deliver all necessary infrastructure to facilitate full 7 x 23m car electric services on the Edinburgh to Glasgow via Falkirk High route in time for the December 2017 timetable change.

Network Rail's obligation is to deliver infrastructure to facilitate 8 x 23m car electric services on the Edinburgh to Glasgow via Falkirk High route in time for the December 2018 timetable change and redevelop station architecture and buildings by March 2020.

Scope of works

Project	Physical outputs
Glasgow Queen Street High Level station : concourse works	Physical works required to allow extensions to a number of the existing platforms at their concourse ends to provide 8 car standage. Increased station concourse space and enhanced passenger facilities to accommodate forecast growth.
Edinburgh to Glasgow (E&G) line speed Improvements	Increased line speeds at a number of locations to allow end to end journey target to be achieved. (The timetable work and rolling stock specification indicated these will be required, a client change control has been issued to develop a single option design (GRIP 4).

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- Queen Street Station High Level Tunnel Slab Track Renewal; these works were completed in August 2016, and provided a line speed increase through the crossovers located within the high level tunnel.
- Cowlairs track and S&C renewals: these works were completed in May 2016, and provided a line speed increase on the Cowlairs incline Up line.
- Anniesland Connection: these works were completed in December 2015.
- Carmuir West S&C renewals: these works were completed in 2016.
- CP5 asset renewals between Polmont – Greenhill Upper Junction and Larbert Junction: EGIP need to take account of these renewals being delivered following the EGIP electrification works
- Stirling, Dunblane, Alloa electrification: facilitates the delivery of the 42 minute target journey time between Edinburgh and Glasgow
- EGIP Initial Phase Key Output 1.

The following critical assumptions on internal factors are being made:

- SC002 EGIP Initial Phase Key Output 1 will be delivered by October 2017
- The ScotRail EMU rolling stock will be available on time
- The timetable work and rolling stock specification indicate that a number of line speed enhancements are required. It is assumed that the client change controls associated with this additional work are signed off.

The following critical assumptions on external factors are being made:

- Due to the elongated Transport and Works (Scotland) Order (TAWs) process to authorise the redevelopment of Glasgow Queen Street Station the commencement of site works has been delayed. As such the associated regulated output has been revised. It is assumed that Network Rail will not be instructed to accelerate the programme.
- The scheme to extend the Buchanan Galleries shopping centre is being reprogrammed by the Developer. It is assumed that the south cutting extension scheme will not impact the programme for the Queen Street station redevelopment works, and that Buchanan Galleries (Land Securities) will provide Network Rail with access to the areas of Dundas Street necessary to deliver the works.
- It is also assumed that the Buchanan Galleries north cutting extension scheme will be implemented post EGIP, and any alternative proposals for the North Hanover Street Car Park site will not proceed, thus removing these potential interface issues.
- The Millennium Hotel will deliver the separation and mitigation works associated with disconnecting the 1970s hotel extension from the Georgian hotel without impacting on Network Rail's construction programme.
- It is assumed that the December 2018 timetable associated with an 8 car service will be agreed with the franchisee, given the infrastructure available at Queen Street.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion	Single option selection	May 2014	Complete
GRIP 4 completion	Single option scope defined	September 2014	Complete
GRIP 6 start	Start on site (TAWs works)	August 2017	Complete
EIS- Infrastructure authorised (Station works)	Infrastructure authorised for passenger use	March 2020	Regulated Output

EGIP – Haymarket Station Capacity Project

Details
Project reference code: SC005
HLOS driver: Increasing the capacity and capability of the Scottish network
Operating route: Scotland
Last updated: March 2016

CP5 output driver

The Scottish Government’s 2012 HLOS sets out a requirement to increase the capacity and capability of the Scottish network. The aim of this project was to deliver a rebuilt Haymarket Station to accommodate anticipated future passenger flows.

The project enhanced the facilities at Edinburgh Haymarket station to accommodate forecast future demand levels, including that generated by EGIP. A tram interchange became available on completion of the Edinburgh tram project.

Network Rail’s obligation

Network Rail’s obligation was to construct Haymarket Station in accordance with the agreed Delivery Plan dated 19/12/11.

Scope of works

The proposal involved the redevelopment of Haymarket station to extend the station concourse over the existing car park to the rear of the station building. Specific works undertaken were:

- An expansion of the existing station concourse
- The creation of an additional entrance off Haymarket Terrace facilitating improved accessibility and links to other transport modes
- The retention of the Grade A Listed building and refurbishment of the ground and lower ground floors
- A glazed roof structure over the new concourse with new station ticket office and retail outlets beneath
- A new footbridge concourse extension with lift, escalator and stair access to platforms below
- Removal of the old footbridge and stairs
- Re-profiled platform surfaces throughout including new copers and new surfacing with tactile strips
- New 6 car length platform canopies
- Refurbished platform facilities for staff and passengers
- New emergency escape facilities off the east end of platforms 2, 3 and 4

- Associated alterations to car park access and egress arrangements
- Enhanced security measures.

Interfaces and assumptions

Not applicable – These works are complete.

Activities and Milestones (NR)

Milestone	Description	Date	Status
GRIP 6 completion	Infrastructure ready for use	April 2014	Complete

2013 Advance Route Clearance Programme (Other Routes)

Details

Project reference code: SC006

HLOS driver: Increasing the capacity and capability of the Scottish network

Operating route: Scotland

Last updated: March 2016

CP5 output driver

The Rolling Programme of Electrification (Scotland) (see SC008) forms one element of the Scottish Government's 2012 HLOS aspiration to increase the capacity and capability of the Scottish network. This project undertook advance route clearance works at various structures to facilitate the electrification of the route to Stirling Dunblane and Alloa, which formed part of this rolling programme.

Network Rail's obligation

Network Rail's obligation was to clear the specified programme of structures in advance of electrification works being completed.

The project delivered electrification clearances at nine foul structures. GRIP 1 to 4 development of the project was undertaken as part of EGIP. The electrification is now being delivered on a standalone basis and does not form part of EGIP; however these advanced works were funded from the EGIP programme.

The specification for the works under the project was as follows:

- Detailed design of the previously identified value engineered solutions at these locations to provide electrification route clearance
- Implementation of the works, including any associated utilities diversion work.

Scope of works

The scope of work to be delivered by Network Rail for GRIP 5 to 8 (detailed design and implementation including commissioning, handover and completion) comprised of the following:

- Form B and 'approved for construction' drawings
- Implementation programme including commissioning and handover activities
- Compliance with appropriate planning and statutory consents
- Implementation of works including commissioning, handover and completion

- Replacement of Carmuir's twin tunnels with aqueduct to enable W12 gauge clearance and future linespeed improvements (part funded from Scottish Strategic Rail Freight Investment Fund).

Interfaces and assumptions

Not applicable – These works are complete.

Activities and Milestones (NR)

Milestone	Description	Date	Status
GRIP 6 completion	Infrastructure ready for use	December 2014	Revised
GRIP 6 completion	Infrastructure ready for use	June 2015	Complete

Borders Railway

Details
Project reference code: SC007
HLOS driver: Increasing the capacity and capability of the Scottish Network
Operating route: Scotland
Last updated: March 2016

CP5 output driver

To create a rail route in the Scottish Borders including seven new stations and the ability to operate a half hourly passenger service with a maximum 44 minute journey time. This project supports the Scottish Government's 2012 HLOS aspiration to increase the capacity and capability of the Scottish network.

Network Rail's obligation

Network Rail's obligation was to deliver a new rail route between Newcraighall and Tweedbank connecting to the existing rail network at Newcraighall.

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 to the existing rail network at Newcraighall.
- Provision of seven new stations at Shawfair, Eskbank, Newtongrange, Gorebridge, Stow, Galashiels and Tweedbank.
- Provision of six station car parks at Shawfair, Eskbank, Newtongrange, Gorebridge, Stow and Tweedbank; and
- 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 (Class 158 DMUs) (modelled using Railsys).

Interfaces and assumptions

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

The project was delivered and managed by Network Rail. It was financed by an addition to the RAB. Transport Scotland will fund the repayments

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 6 completion	Infrastructure ready for use	June 2015	Complete

Rolling Programme of Electrification (Scotland)

Details

Project reference code: SC008

HLOS driver: Increasing the capacity and capability of the Scottish network

Operating route: Scotland

Last updated: June 2017

CP5 output driver

As part of an ongoing rolling programme, this project will electrify the routes to Stirling, Dunblane and Alloa and Shotts Lines to permit services to be operated by electric trains. This will contribute to the Scottish Government's 2012 HLOS aspiration to increase the capacity and capability of the Scottish network, Scottish government environmental targets and the EGIP KO3 outputs. The benefits of the project are as follows:

- A reduction in environmentally harmful emissions, energy consumption, and operating costs by introducing electric trains
- Electrification of these routes supports the Scottish Government's stated aim of reducing journey times
- Electrification provides further diversionary routes for electric traction, thus enhancing network resilience
- Electrification of the Shotts Line and Cumbernauld to Grangemouth route sections facilitates freight traffic being hauled by electric locomotives thus reducing freight shipping costs and enabling heavier and longer trains to operate
- Electrification of the R&C route has delivered improvements in capacity, journey times and connectivity available by integrating the Whifflet (R&C) passenger services with the Argyle line group of services
- Electrification provides a diversionary route for Virgin and First Trans Pennine Express passenger services, thus enhancing network resilience.

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.

Network Rail's obligation

The infrastructure, electrification and 25kV distribution works will be delivered by Network Rail to enable the introduction of electric rolling stock on the routes described below from March 2019.

Scope of works

The scope of the works during CP5 is to complete the installation of a 25kV overhead electrification system on the nominated route sections detailed below:

- Greenhill Lower - Carmuir West Junction - Falkirk Grahamston and Polmont
- Carmuir West - Stirling - Dunblane - Alloa (including Larbert Junction to Carmuir East)
- Holytown Junction - Shotts - Midcalder Junction (the Shotts line)
- Rutherglen East Junction - Langloan Junction - Coatbridge Junction - Whifflet North Junction (the R&C line, implementation commenced in CP4).

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 has formed part of an enabling work package prior to the full electrification installation.

Interfaces and assumptions

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. The overall programme has interfaces with the following projects:

- EGIP KO1, 2, 3, 4. The electrification works interface in the Greenhill area in terms of scope, delivery programmes, and sharing of possessions.
- EGIP KO3. Stirling / Alloa / Dunblane electrification enables the delivery of the 42 minute target journey time between Edinburgh and Glasgow, which is required to achieve the EGIP KO3 regulated output milestone (December 2018).
- Electrification of the Grangemouth branch (planned to be funded from the Scottish Strategic Rail Freight Investment Fund). This branch has interdependencies in terms of specialist electrification resource.
- The Carstairs remodelling project. There is a dependency with the Shotts electrification as it has to be completed prior to Carstairs commencing to provide an electrified diversionary route.

- The national Gauge Restoration Plan on the Shotts line. This is linked to a CP4 commitment and the electrification route clearance works facilitate completion of the Gauge Restoration.
- Motherwell North Signalling Renewals (MNSR). This project is in delivery at the same time as Shotts electrification, there are synergies in terms of sharing possessions and delivery of some of the civils works.
- Scotland Accelerated NOS South signalling re-control (SANOS South). This project is being delivered at the same time as the electrification to Stirling, Dunblane and Alloa. There are synergies in terms of scope, sharing possessions and delivery programmes.
- Transport Scotland M8/M73/M74 trunk road improvements project. There are interdependencies in relation to engineering access and specialist resources.
- Interface with planned Network Rail renewals will be explored during the lifecycle of the project. There may be opportunities to maximise shared access and in some cases delivery contractors.

The following critical assumptions on internal factors are being made:

- SC002 EGIP Key Output 1 will be completed by October 2017
- SC002 EGIP Key Outputs 2, 3 & 4 will be completed by March 2020
- SANOS South will be completed by December 2017
- MNSR will be completed and commissioned during September 2018
- All route clearance works will be completed on the Shotts line by December 2017
- All compliance criteria will be achieved prior to March 2019 to permit energisation and commissioning of the OLE and 25kV distribution system.

The following critical assumptions on external factors are being made:

- The ScotRail EMU rolling stock will be available on time
- Currie Feeder Station Connection: The National Grid has noted they cannot deliver the new connection until 2022. Additional traction power modelling has been completed. It has demonstrated that there is a solution that enables Shotts electrification; however it places restrictions on electric hauled freight via Shotts to the East Coast Mainline until 2022. It is assumed that the feeder station will be delivered as a separate project.
- It is assumed that the Scottish Power/National Grid transformer issues at Gowkthrapple are resolved in time for energisation of Shotts.
- Specialist OLE resources are available to deliver these works to the regulated milestone dates.
- Consents will be secured for the critical structures works required for the electrification of SDA.

Activities and milestones (NR)

Greenhill Lower-Falkirk Grahamston-Polmont, Stirling, Dunblane and Alloa (SDA)

Milestone	Description	Date	Status
EIS- Infrastructure authorised	Infrastructure authorised for passenger and freight use	March 2019	Regulated output

Holytown Junction – Shotts – Midcalder Junction (the Shotts line)

Milestone	Description	Date	Status
EIS- Infrastructure authorised	Infrastructure authorised for passenger and freight use	March 2019	Regulated output

Rutherglen and Coatbridge (R&C) Electrification

Milestone	Description	Date	Status
GRIP 6 completion	Infrastructure ready for use	September 2014	Complete

Aberdeen to Inverness Improvements Phase 1

Details

Project reference code: SC009

HLOS driver: Increasing the capacity and capability of the Scottish network

Operating route: Scotland

Last updated: June 2017

CP5 output driver

This project forms part of the Scottish Government's 2012 HLOS aspiration to increase the capacity and capability of the Scottish network. 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 through 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.

Network Rail's obligation

Network Rail's obligation is to 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 infrastructure to facilitate a new station at Dalcross;
- Provide a half hourly service (other than after the evening peak) between Inverurie and Aberdeen, including infrastructure to facilitate 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; and
- Retain existing freight capacity.

The HLOS requires that the infrastructure capacity is provided for services at new stations at Dalcross and Kintore (subject to station promoter funding contributions), as well as introduction of more frequent commuter services on the Inverness - Elgin and Aberdeen – Inverurie sections of the route, with no detriment to existing end to end journey time. Following completion of GRIP 3 with AIP for the project a re-evaluation of the phasing of the scope of works was required.

Scope of works

The extent of scope to be delivered in CP5 has now been agreed and this will be as follows:

- Infrastructure capacity to provide a new single platform station at Dalcross
- New station at Forres on straight alignment
- Extending existing Forres loop westwards to include new station location on the straight alignment
- Removal of signalling token exchange arrangements at between Elgin and Nairn
- Signalling enhancements at Elgin to provide bi di on Platform 2 plus signalled access to/from the goods sidings
- Platform extensions at Elgin to accommodate 6 car trains and 2+5 HST's
- Reinstatement of double track between Dyce and Kittybrewster

The extent of the scope to be delivered in CP6 has been agreed as follows;

- Infrastructure capacity to provide a new twin platform station at Kintore
- Reinstatement of double track between Dyce-Inverurie
- Removal of signalling token exchange arrangements between Dyce and Inverurie
- Line speed improvements between Inverurie and Aberdeen
- Platform extensions at Insch to accommodate 6 car trains and 2+5 HST's.
- The scope to deliver later stages of the project is yet to be determined, but interventions in this phase will be consistent with the future requirements outlined by Transport Scotland

Interfaces and assumptions

For this stage the following project assumptions have been made:

- Rolling stock to be used on the route will be High Speed Train in a 2+5 and 2+4 formation, Class 170 and 158 diesel multiple units;
- Planned that all trains on the route will call at all stations between their originating and terminating points. This preferably includes 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;
- Access arrangements will be facilitated to achieve optimal delivery efficiencies;
- The A-I project is not specified to deliver additional scope required for the introduction of HST's outwith locations where interventions are already being undertaken.

In terms of interfaces the project does have 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 to Inverness line, on which the timetable is relatively inflexible due to its single line and passing loop configuration. Interfaces with planned renewals will be explored as the project develops. Interfaces with Elgin-Inverness freight gauging project, IEP enhancements and Waterloo Branch enhancements are also being reviewed as the project progresses.

The project had significant interface with the ScotRail refranchise process which concluded in October 2014, presenting a change in rolling stock for the route to High Speed Trains. Further timetable development work was then required to assure that the existing scope was sufficient for the revised rolling stock

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion without AIP	Single option selection	September 2014	Complete
GRIP 3 with AIP	Approval in Principle	March 2016	Complete
GRIP 6 start	Start on site	March 2016	Complete
'West End' EIS- Infrastructure authorised	Infrastructure authorised for passenger and freight use	December 2018	Indicator
'Kittybrewster-Dyce' EIS- Infrastructure authorised	Infrastructure authorised for passenger and freight use	December 2019	Indicator
EIS- Infrastructure authorised	Infrastructure authorised for passenger and freight use	December 2019	Regulated Output

Highland Main Line Journey Time Improvements (Phase 2)

Details

Project reference code: SC010

HLOS driver: Increasing the capacity and capability of the Scottish network

Operating route: Scotland

Last updated: June 2017

CP5 output driver

This project will provide infrastructure to permit the reduction of average end-to-end journey time between Edinburgh / Glasgow and Inverness by 10 minutes, the operation of one passenger train per hour in each direction taking into account longer term Strategic Transport Projects Review (STPR) aspirations and building towards the Scottish Government's 2012 HLOS aspiration to increase the capacity and capability of the Scottish network.

The principal driver for the project is the Scottish Government's priorities for transport which include improvements to journey times and connectivity reflected in the 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 17) with the stated aim of improving rail network capacity between Inverness and Perth and reducing journey times.

Network Rail's obligation

Network Rail's obligation is to create the infrastructure capacity to improve journey times between Glasgow / Edinburgh and Inverness by around 10 minutes, to provide capacity for a service in every hour between Glasgow / Edinburgh and Inverness and to provide more efficient options for freight.

Scope of works

A June 2014 GRIP 3 report concluded that considerable synergy was required between rolling stock, timetable and infrastructure strategy. Development work was then paused during the ScotRail refranchise process, awaiting the successful bidder's aspirations on rolling stock strategy and timetabling for the route. This was to allow for greater synergy between the rolling stock strategy, the timetable and the infrastructure required to meet the project's specified outputs. Following the completion of the ScotRail re-franchise process and the announcement of High Speed Trains as the intended rolling stock for the route, project timetabling was taken forward under the ScotRail Alliance. This was due to the significant interface required with the development of the EGIP timetable and the requirement for further investigation of

calling patterns on services, which was highlighted for review in the initial GRIP 3 report in June 2014. The aim of the ScotRail Alliance timetable development work was to find the optimal infrastructure solutions that deliver the passenger output requirements together with worthwhile efficiency gains for freight. The most efficient means of developing the project now optimises the timetable, rolling stock and infrastructure interventions. The proposed scope of works is as follows:

- The facility to allow trains to simultaneously arrive at Aviemore Station
- Betterment of the arrangements at Pitlochry Station to allow HSTs in a 2+5 formation to be accommodated and simultaneously arrive.

A revision to the current GRIP 3 programme has been prepared in order to develop the new scope for the project. Timetable development will continue in parallel with GRIP 3 development for the project to fully develop project scope for both passenger and freight services.

Interfaces and assumptions

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

- EGIP –the timing of HML trains to/from Edinburgh Waverley and Glasgow Queen Street will be determined by the EGIP timetable
- Aberdeen – Inverness Improvements Phase 1 –the timetable on the HML will need to integrate with the Aberdeen – Inverness timetable to enable good service connections
- Development work to identify Phase 3 opportunities using the future network development fund.
- An external interface exists with the A9 Dualling project which comes in close proximity to the railway at several locations along the corridor. Close collaboration is being undertaken with the Transport Scotland A9 Dualling project team to minimise any potential impact on both projects.

Interfaces with planned renewals will be explored as the project develops.

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

- Passenger rolling stock deployed on the route will consist of HST units, IEP units from 2018 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
- The stopping pattern of trains is not fixed and can be flexed to optimise crossing of trains travelling in opposite directions
- The GRIP 3 report will include a costed option to deliver the full average 10 minute reduction in journey times although additional option(s) which do not provide the full 10 minutes may be presented if they avoid significant infrastructure costs (to be decided by Transport Scotland). A minimum of 7

minutes average journey time reduction should be assumed and any proposal to deliver average journey time reductions in excess of 10 minutes will be welcomed if the incremental costs are relatively low

- A maximum interval of 90 minutes and minimum interval of 30 minutes between departures from both Inverness and Perth is deemed acceptable within the objective of providing one train an hour
- All trains will make passenger stops at both Pitlochry and Aviemore
- The minimum quantum of passenger stops per day (Monday – Saturday) at other stations to be as follows (excluding all sleeper calls):
 - Dunkeld & Birnam 9 each way
 - Blair Atholl, 7 each way
 - Dalwhinnie, 5 each way
 - Newtonmore, 5 each way
 - Kingussie, 11 each way (includes Virgin Trains East Coast services)
 - Carrbridge, 5 each way
- Land acquisition, to the extent that this may be needed for additional infrastructure, can be achieved without the need for statutory powers.
- For the purpose of the next phase of timetable development the proposed ScotRail Alliance timetable will go through a validation process with Network Rail Capacity Analysis.

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

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 3 completion without surveys and AIP	Single option selection	June 2014	Complete
GRIP 3 completion	Single Option Selection	December 2016	Complete
GRIP 6 start	Start on site	October 2017	Complete
EIS- Infrastructure authorised	Infrastructure authorised for passenger and freight use	March 2019	Regulated Output

Motherwell Area Stabling

Details
Project reference code: SC011
HLOS driver: Increasing the capacity and capability of the Scottish network
Operating route: Scotland
Last updated: March 2016

CP5 output driver

This project will electrify the remaining ‘back of Shops’ sidings to permit the stabling of additional EMUs at Motherwell required by the electrification with a longer term target to consolidate all stabling at Motherwell on one site with appropriate cleaning and servicing facilities.

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.

Transport Scotland requested that progress with the project was deferred until the announcement of the successful bidder for the new ScotRail franchise was made. This was to permit the opportunity to include the new franchisee in discussions regarding further development of the project.

Following completion of the ScotRail refranchise process and review of stabling requirements for the new franchise, a change in strategy is now required. ScotRail have identified that beyond the completion of the electrification of ‘Back of Shops’ sidings (Phase 1), no further facilities are required at Motherwell in CP5. The scope outlined for Phase 2 of this project is no longer required and will be closed down.

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. Delivery of the project will be in two phases.

Phase 1 – Motherwell Back of Shops sidings

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. The extent of scope deemed cost effective to take forward to implementation is modest and consists of improvements to the ‘Back of Shops’ sidings location (including additional electrification) in the former TMD. Electrification of No 1 siding was completed in January 2014 and electrification of Nos 4 and 5 by the end of May 2014. The other enhancement works to Nos 4 and 5 sidings were completed by the end of July 2014.

Phase 2 – Motherwell Bridge sidings

Following the ScotRail refranchise process and a review of stabling requirements for the new franchise, the scope for Phase 2 is no longer required.

Interfaces and assumptions

Following the ScotRail refranchise process delivery of Phase 1 of this project sufficiently meets current requirements in the Motherwell Area and Phase 2 is not a priority in this control period.

Activities and milestones (NR)

Phase 1 – Back of shops sidings

Milestone	Description	Date	Status
Electrification of sidings No. 4 & 5 GRIP 6 completion	Infrastructure ready for use	May 2014	Complete
No. 4 & 5 remaining enhancement works GRIP 6 completion	Infrastructure ready for use	July 2014	Complete

Motherwell Resignalling Enhancements

Details

Project reference code: SC012

HLOS driver: Increasing the capacity and capability of the Scottish network

Operating route: Scotland

Last updated: June 2017

CP5 output driver

This project will, in conjunction with the renewal of Motherwell signalling assets, provide appropriate and cost effective enhancements where appropriate including reduced headways.

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
- An RUS requirement to enhance the network in the Motherwell North area, specifically the suburban commuter routes which are approaching capacity
- Enabling the diversion of East Coast passenger and freight services, and diversion of West Coast passenger services when a route via Carstairs is unavailable
- The desirability of capturing opportunities for synergy in delivering potential enhancement initiatives alongside core renewals.

Network Rail's obligation

Network Rail's obligation is to develop options to deliver the required enhancements including reduced headways.

Scope of works

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

- Provision of 3-aspect signalling between Holytown Junction and Midcalder Junction is to deliver additional capacity. This enhancement project includes funding from the Scottish Network Improvement Fund and the Scottish Strategic Rail Freight Investment Fund.

Interfaces and assumptions

There are significant CP5 schemes linked to this project. Other interfacing schemes and their potential impact are:

- The rolling programme of electrification works includes the electrification of the Midcalder to Holytown route.

- Motherwell North signalling renewals will be renewing and re-controlling the Shotts route to West of Scotland Signalling Centre. This project is also in delivery at the same time as Shotts electrification, there are synergies in terms of sharing possessions and delivery of some of the civils works

The following critical assumptions on internal factors are being made:

- Motherwell North signalling renewals are progressed and delivered in CP5.
- The project assumes, and will make passive provision for, 25kV OLE on the Shotts line by immunisation and earthing of all signalling equipment and bonding of all lineside apparatus. The track circuits, where used, will be AC immune single rail. The Motherwell North signalling renewal project is currently liaising with the OLE project over positioning of OHNS, TSCs, Boosters etc.

The following critical assumptions on external factors are being made:

- The project assumes some future rolling stock may be electrified, however the precise type/class of rolling stock is not known at this stage. The infrastructure will be compatible with electric rolling stock.

Activities and milestones (NR)

Motherwell North – Carfin/Holytown

Milestone	Description	Date	Status
GRIP 3 AIP completion	Single option selection and AIP completion	July 2016	Complete
GRIP 4 completion	Single option scope defined	July 2016	Complete
GRIP 6 start	Start on site	January 2017	Complete
EIS- Infrastructure authorised	Infrastructure authorised for passenger and freight use	September 2018	Regulated Output

ECML (North) – WCML (Carstairs) Gauge Enhancement

Details

Project reference code: SC013

HLOS driver: Network Availability

Operating route: Scotland

Last updated: June 2016

CP5 output driver

To deliver infrastructure enhancements to permit W12 freight gauge traffic to operate between Temple Hirst Junction and Carstairs improving overall network availability.

Gauge clearance to W12 enables 9'6" high containers to be conveyed on standard height wagons, Freight Operating Companies to achieve operating efficiencies and to compete with road hauliers to win new traffic to rail.

In addition to the benefits listed above the project will provide operational flexibility between the WCML and ECML in the event of perturbation, planned blockades, or to facilitate additional maintenance access.

Network Rail's obligation

Network Rail's obligation is to deliver the infrastructure upgrades required to enable the operation of W12 freight gauge traffic by 31st March 2016.

Scope of works

- Two major bridge reconstructions on the Edinburgh Suburban Lines;
- Track lifts;
- Track slews (including S&C); and
- Minor civil works

Interfaces and assumptions

Clearance of any lower sector infringements out with the scope of the project will be funded by Scotland Route.

The works have synergy with the planned electrification of the Edinburgh Suburban lines in CP6 and the major structural works delivered by this project will also deliver electrification clearances.

The following critical assumptions on internal factors are being made:

- Fully compliant W12 clearance at one worksite on the Edinburgh Suburban lines will be delivered by the Electrification project in CP6.

Activities and milestones (NR)

Milestone	Description	Date	Status
GRIP 6 completion	Infrastructure ready for use	March 2016	Complete

Scottish Stations Fund

Details

Fund reference code: SF001

HLOS driver: Scottish Stations Fund

Operating route: Scotland

Last updated: June 2017

Objective of the Fund

The fund was set out in the Scottish Government's 2012 HLOS with the purpose of improving the public's access to railway services. To support this objective, Scottish Ministers would expect that this will fund, or will support the funding of:

- Improvements to station buildings and facilities
- Improvements to passenger facilities at stations supporting long-distance services
- Up to £6 million towards improving the Caledonian Sleeper station facilities as specified as part of the franchise objectives
- The development of new and improved car and cycle parking facilities
- New stations
- Accessibility works.

Network Rail's obligation

Network Rail's obligation is to work in partnership with third party promoters to enable improvements and new stations.

Governance

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 investment regulations. Proposed schemes will be considered and discussed at Scotland Route Strategy Planning Group; and Scotland Route Investment Review Group involving all relevant train operators to inform Transport Scotland of the industry view and the overall strategic fit.

Following advice from Route Investment Review Group; Scottish Ministers will then agree which projects can be drawn down against this fund.

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).

The proposal associated with the Caledonian Sleeper franchise objectives will be assessed as part of the evaluation process of the franchise bids. Transport Scotland will advise the works to be funded to support the Caledonian Sleeper franchise up to a maximum value of £6 million.

The Office of Rail and Road (ORR) does not intend to scrutinise all individual proposals for investment. However, they will review efficiency at a high level over the whole fund and in detail for a sample of schemes. 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.

For new stations it is expected that promoters will follow the Scottish Transport Appraisal Guidance (STAG) process. In addition promoters should consult Network Rail's Investment in Stations document prior to requesting investment from this fund.

Projects delivered using this fund:

- Mobile information screens at Glasgow Central and Edinburgh Waverley stations
- Newton station – cladding of underpass
- Johnstone car park extension
- Haymarket Cycle Hub
- Serco Branding project
- Kilmarnock Station underpass improvements

The following projects are being progressed through this fund for delivery:

- Edinburgh Waverley station cycle hub
- Leuchars car park extension
- Falkirk High new car park

- Serco station enhancements
- Kintore new station
- Robroyston new station
- Aberdeen Station enhancements
- Stirling Station enhancements
- Inverness Station enhancements
- Dundee Platform improvements
- Perth Station – Guest Lounge & Experience Centre

There are a number of schemes which may be delivered with the assistance of this fund and are listed below. They include, amongst others:

- Dalcross new station

These schemes are indicative and this list will be updated as we confirm the schemes that will draw down on the fund.

Scottish Strategic Rail Freight Investment Fund

Details

Fund reference code: SF002

HLOS driver: Scottish Strategic Rail Freight Investment Fund

Operating route: Scotland

Last updated: June 2017

Objective of the Fund

The fund was set out in the Scottish Government's 2012 HLOS. 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 it replicate, the grant elements of the Scottish Government Future Transport Fund, which aims to encourage a shift of freight to rail and water.

Network Rail's obligation

Network Rail's obligation is to enhance the rail freight network through standalone opportunities or in conjunction with planned renewals.

Governance

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.

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; or
- £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).

The Office of Rail and Road (ORR) does not intend to scrutinise all individual proposals for investment. However, they will review efficiency at a high level over the whole fund and in detail for a sample of schemes. 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 reduce road congestion.

The following projects have been delivered using this fund:

- Carmuir's Aqueduct in conjunction with SC006 Advance Route Clearance programme of work for electrification part funded from this fund

The following projects are being delivered using this fund:

- Shotts 3-aspect signalling (multi-funded project)
- Mossend Yard enhancement
- Craiginches enhancements (multi-funded project)
- Grangemouth electrification
- Waterloo branch improvements
- Inverness Yard crossover

The following projects are currently being considered as possible candidates for funding in Control Period 5 and include, amongst others:

- Looping facility south of Perth
- Central Scotland gauge capability (including review of G&SW)
- Coatbridge Area capacity

Scottish Network Improvement Fund

Details

Fund reference code: SF003

HLOS driver: Scottish Network Improvement Fund

Operating route: Scotland

Last updated: June 2017

Objective of the Fund

The fund was set out in the Scottish Government's 2012 HLOS with the purpose of delivering, or supporting 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 Scottish Ministers, including improved journey times, improved connectivity and resilience. The fund should exploit opportunities available through current or planned works.

Network Rail's obligation

Network Rail's obligation is to enhance the network through standalone opportunities or in conjunction with planned renewals.

Governance

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.

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 or
- £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).

The Office of Rail and Road (ORR) does not intend to scrutinise all individual proposals for investment. However, they will review efficiency at a high level over the whole fund and in detail for a sample of schemes. 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.

The following projects have been delivered using this fund:

- AOCL+B
- Kilwinning S&C new turnback signal
- Anniesland new connection
- North Berwick Platform extension
- Greenock Central crossover and bi-directional working to Wemyss Bay Jn
- Gourock Station flexible working
- Kingsknowe level crossing upgrade
- Milngavie Platform extension (development)
- Stirling Station DDA improvements (development)

The following projects will be delivered in Control Period 5 using this fund:

- Various linespeed improvements linked with renewals
- Polmadie to Glasgow bi-directional working
- Rutherglen East S&C Junction remodelling
- Shotts 3-aspect signalling project
- Aberdeen to Stonehaven enhancements (multi-funded project)
- EGIP Harmonic Dampeners
- Carmuir West junction LSI
- Greenhill Upper to Larbert LSI
- Far North LSI
- Murie level crossing LSI
- HST Maintenance & Stabling (Haymarket & Inverness)

There are a number of projects being considered for delivery in Control Period 5 using this fund:

- Aberdeen to Central Belt improvements (multi-funded project)
- Portobello junction signalling easement
- Greenhill Upper to Larbert LSI
- Inverness Motorail sidings enhancement
- Shieldmuir Platform extension
- Grangemouth to Polmont additional signalling capacity

There are also a number of projects being developed in Control Period 5 using this fund for proposed delivery in CP6 (funding permitting):

- Perth depot stabling and servicing
- Forth Bridge experience
- Ladybank to Hilton journey time improvements
- Dunbar Station new down platform (delivery in 2019)
- Dunblane to Perth corridor enhancements
- Currie new feeder station
- Central Scotland gauge capability & clearance
- Carstairs junction remodelling

Future Network Development Fund

Details

Fund reference code: SF004

HLOS driver: Future Network Development Fund

Operating route: Scotland

Last updated: June 2017

Objective of the Fund

The fund was set out in the Scottish Government's 2012 HLOS to 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.

Network Rail's obligation

Network Rail's obligation is to develop opportunities to enhance the network in Control Period 6.

Governance

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.

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.

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.

The Office of Rail and Road (ORR) does not intend to scrutinise all individual proposals for investment. However, they will review efficiency at a high level over the whole fund and in detail for a sample of schemes. As the ORR's acceptance criteria includes 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 were developed through this fund:

- Aberdeen to Stonehaven enhancements
- Dunbar Down Platform
- Millerhill signalled through route
- Carstairs junction remodelling
- Edinburgh Suburban electrification
- Route Study pre-GRIP development

The following strategic projects are being developed through this fund:

- Slateford Junction enhancement
- Portobello Junction redoubling
- Currie new feeder station

The following strategic projects may be considered for further development under this fund:

- Passenger capacity at Glasgow Central, Glasgow Queen Street and Edinburgh Waverley, 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
- Aberdeen to Inverness corridor improvements phase 2
- Highland Main Line corridor phase 3
- Far North capacity improvements
- East Kilbride & Barrhead corridor enhancements
- Perth remodelling (linked with renewals)
- Edinburgh Suburban Enhancement Programme
- Edinburgh West Approaches
- Edinburgh Waverley Platform extensions on 1, 20 & 10
- Greenhill junction grade separation
- G&SW Gauge capability & clearance

Scotland Level Crossing Fund

Details
Fund reference code: SF005
HLOS driver: Scotland: Level Crossing Fund
Operating route: Scotland
Last updated: June 2017

Objective of the Fund

The fund was set out in the Scottish Government's 2012 HLOS. 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 and partial closure of level crossings in Scotland to reduce wider industry costs.

Network Rail's obligation

Network Rail's obligation is to work in partnership to facilitate the closure and partial closure of level crossings in Scotland to reduce wider industry costs.

Governance

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.

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.

The Office of Rail and Road (ORR) does not intend to scrutinise all individual proposals for investment. However, they will review efficiency at a high level over the whole fund and in detail for a sample of schemes. 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.

The following level crossing have been closed using this fund:

- Camperdown
- Broadslaps

Level crossings in development:

- St Ninians (in delivery)
- Dalcross
- Cornton No. 1 & 2
- Panholes
- Delny (likely to be CP6)

There are a number of level crossings which may benefit from the assistance of this fund including, amongst others:

- St Germain's
- Toft Hill
- Markle
- Carmont