Route Strategic Plan

Western Route

Version 7.0: Strategic Business Plan submission
2nd February 2018

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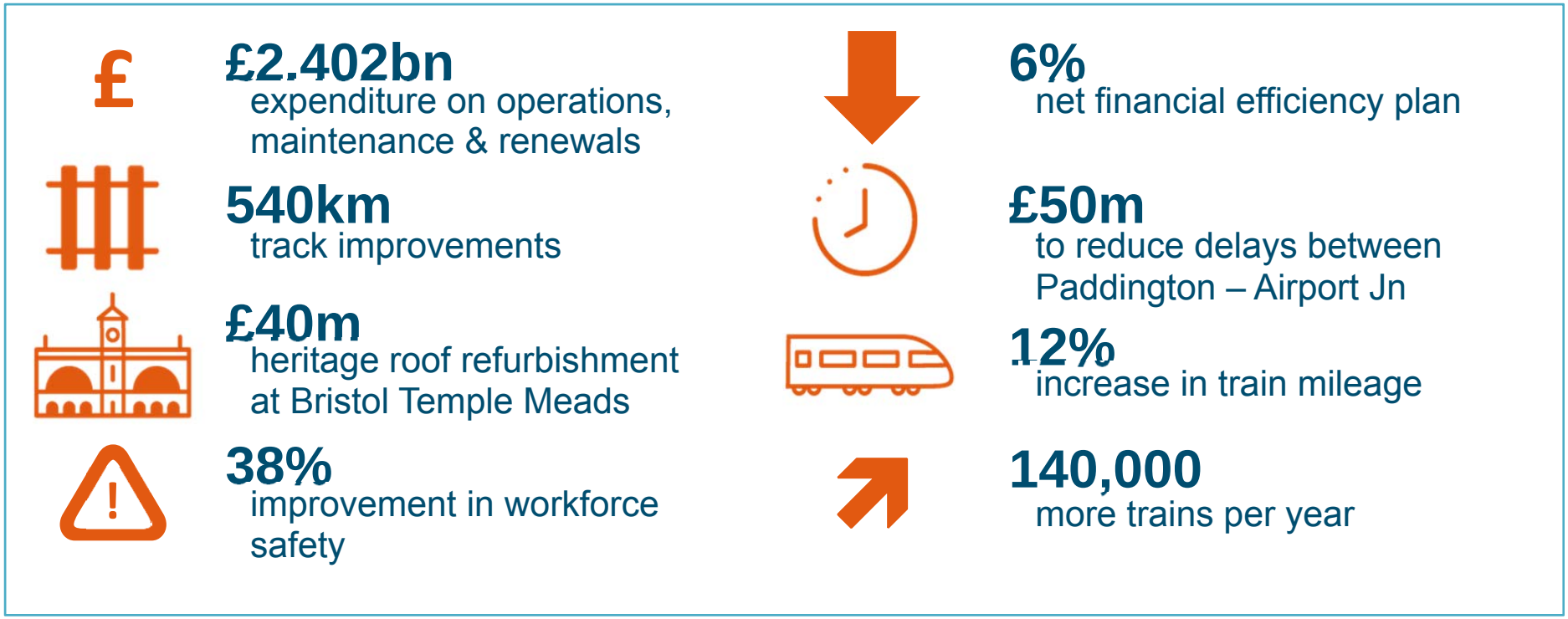
1. Foreword and summary

The Great Western Mainline is undergoing its most significant upgrade since it was built by Brunel over 175 years ago. Our Control Period 6 plan funds services to realise and support significant passenger benefits, particularly more services and new connections, enabled by the investment in Control Period 5.

By the end of CP5 we will have electrified the route from Paddington to Reading, Bristol and Cardiff and from Reading to Newbury, modernised signalling and infrastructure, and enabled the biggest fleet upgrade in a generation benefiting passengers across the whole route. In early 2019 passengers will benefit from the introduction of a new timetable which, combined with the new trains already delivered, will further improve their journeys, providing more services with more seats, faster journey times and new connections.

This has been a tremendous achievement and is the result of unprecedented levels of public investment from Government; the support of our customers, the train and freight operators; and of course passengers, line side residents and businesses across the route.



From 2019 we will enable higher frequency, long distance services across the route together with a new train service – the Elizabeth line – offering passengers a metro frequency service and new connections from Reading into and across Central London. We will also improve local and long distance cross-country services in the Bristol area through further signalling upgrades and the redoubling of the line between Bristol Temple Meads and Bristol Parkway; and enable improved journey times to Devon and Cornwall and support the increase in services between Plymouth and Penzance. We will work closely with HS2 as they start the construction of a new interchange station at Old Oak Common which will link the West with the Midlands and North West. Meanwhile we will continue to improve the reliability of the infrastructure supporting the Heathrow Express service and the national connections offered by CrossCountry.

During CP6 we will deliver an even safer railway, aiming to get everyone home safe every day, further reducing train accident risk, improving passenger and workforce safety and reducing risks at level crossings. We will continue to drive a philosophy of "better every day" to deliver a net 6% efficiency plan which we have set ourselves for the Control Period.

Bringing track and train closer together is critical to future success. We will continue our alliance with Great Western Railway, supported by the independently chaired Western Route Supervisory Board, and work closely with all our train and freight customers to deliver the targets for performance we have jointly agreed, and set out in our CP6 scorecards.

Given the continued growing demand for rail, improved passenger and freight services are essential to the region's economic growth. To support this we will continue to develop affordable plans to grow the railway for Government and other funders to consider.

Our plans for CP6 have been developed with substantial input from our customers and stakeholders, and I thank them for their invaluable input. We look forward to working with them to deliver an improved, more reliable, growing and affordable railway for the communities and businesses we serve.

Mark Langman, route managing director

Our purpose: Excel in delivering a **safe, high performing, reliable and affordable railway,** be ambitious in creating **greater capacity,** be responsible for **connecting people** and **caring for the environment**

Our vision: To deliver a great railway that supports jobs, housing and the economy across our route, now and for the future

Our strategic priorities:
Everyone Home Safe Every Day
Delighting our customers
Affordable and efficiency
Supporting jobs, housing and growth
Great people and great culture

These priorities can be found throughout this plan, which is focused on our core activities of operating, maintaining and renewing the railway. Enhancements or changes arising from the refranchising of the Greater Western franchise are not included and will require controlled changes to our plan.

The Western route stretches across the Thames Valley to Oxford, Worcestershire, the Cotswolds, South Wales, the West and South West. It encompasses some of Britain's most important towns and cities, as well as one of Britain's busiest rail routes, the Great Western Mainline. We own, maintain and operate over 900 miles of railway and manage London Paddington, Reading and Bristol Temple Meads stations.

Western Route at a glance in 2018

- 2,200 train services per day
- Network Rail management of London Paddington, Reading and Bristol Temple Meads stations, with a combined annual footfall of over 65 million. 198 stations managed by Great Western Railway
- 2,600 colleagues
- 92 million journeys per year with approximately 32 million journeys starting or end from a Western station in 2016/17
- Passenger demographics: 13% business travellers, 51% commuters, 6% leisure / other travellers
- 2,974 km track (1,847 miles) running across 1,558 km of route (968 miles)
- 2,839 bridge structures, 46% 145 years or older and 141 listed structures
- 18,000 earthworks including: 10,000 embankments, 6,500 soil cuttings and 1,500 rock cuttings
- 650 level crossings
- Supporting the Elizabeth line connecting west to east via central London and Heathrow Airport from 2019
- Second busiest freight route into London moving 11m tonnes of freight per annum
- £7.5bn investment modernising and electrifying the Great Western Mainline enabling the biggest fleet upgrade in a generation between 2017-2019
- £2.1bn spend in CP5 on operating, renewing and maintaining the existing railway

Carrying more than 20,000 people a day to and from Heathrow, Europe's busiest airport

Working with the Port of Bristol to deliver 10% of the UK's coal, 25% of the UK's aviation fuel, and 600,000 motor vehicles annually

Supporting automotive industries (Swindon and Oxford), aggregates (Mendips), metals (South Wales) and petroleum (Westerleigh and Theale)

Serving seven passenger and six freight operators

Engaging with 55 local authorities, ten local enterprise partnerships, 66 members of parliament and four elected mayors

What our stakeholders told us

In developing these plans we engaged with a wide range of stakeholders through a series of workshops and written submissions. We engaged with over 85 separate organisations in two series of workshops across 2017.

Our stakeholders' views influenced the plans set out in this document, including our vision, our approach to business development, the performance metrics we will use, and our boundaries.

Our stakeholders told us that their priorities are:

- Growing the economy through rail;
- Attracting more third-party investment;
- Providing meaningful performance figures;
- Increasing our focus on environmental impacts;
- Reducing journey times;
- Investing in stations.

Our priorities for CP6

Everyone Home Safe Everyday

We will continue to work day and night to keep our railway one of the safest in Europe.

We are committed to continuous improvement for workforce safety through our planning and delivery of safe work, improving trackside working; improving manual handling; reducing slips, trips and falls, and maintaining a focus on safe driving. To support this, we have increased funding for our route workforce safety and health improvement programme, with a focus on fatigue risk amongst signallers and improvements in general health and wellbeing of our workforce, aspiring to match world class organisations for workforce safety.

We will work with our alliance partners GWR, other train operators and stakeholders to keep passengers and the public safe, continuing to reduce the risk of train accidents. We will work with operators to better assess and manage risks to passengers at stations and reduce operational risks across the route. In CP6 we will invest £70m upgrading and enhancing level crossings in addition to other asset improvement funds so that we continue to reduce safety risks on our infrastructure.

We will continue to promote our social responsibility for safety and the environment so that we work more safely and responsibly, reducing our impact on the environment and the communities we serve.

Delighting our customers

Working with our customers we will work to improve performance through asset reliability, excellence in operations, a robust timetable and collaborative joint working, with a 1.6% improvement in PPM performance for GWR, while running 140,000 more trains per year across the route.

Following our customers' feedback, we will introduce additional measures to monitor performance against punctuality of trains at all recorded stations to help drive better services for passengers.

With 20,000 passengers a day travelling to and from Heathrow Airport and 114,000 local jobs based there we will continue to make sure that services to the airport are the best they can be, both via Heathrow Express and MTR Crossrail.

To enable and support the passenger benefits enabled in CP5 we will:

- Work with a new operator – MTR Crossrail – and GWR to improve maintenance planning to improve infrastructure reliability and reduce delays;
- Work closely with GWR, MTR Crossrail, Heathrow Express, CrossCountry and other train and freight operators and BTP to improve our response times to train-delaying incidents and restore services quicker;
- Work closely with HS2 Limited to manage building a new rail interchange station at Old Oak Common on the Great Western main line with minimal disruption;
- Continue to deliver the final elements of the Greater West and Crossrail Programmes.

Track & Train together: Our Alliance with GWR

In 2016 we successfully established an Alliance with GWR that covered working together across a range of areas including operations, HR, commercial development, safety and communications.

Our Alliance has been critical to enabling us to jointly deliver CP5 passenger benefits including new trains with more capacity, more modern infrastructure and station improvements.

We will continue working together to pursue our Alliance objectives of cost-effective delivery of capacity, improving customer experience and reducing industry costs. We will work together to efficiently deliver our CP6 works; minimising disruption whilst seeking to maximise passenger outcomes when we do work. We will also improve the alignment of our operations teams to improve joint working and manage disruption better, while we seek to embed a more customer focussed culture measured in our jointly agreed customer scorecard.

Our CP6 plan provides the services and support to build on CP5 investment and deliver more new services, improved journey times, greater capacity and new connections.

Working with our Train and Freight operating partners, in CP6 we will support:

- 140,000 more trains per year on the Route;
- Two more fast off-peak trains per hour from Bristol Temple Meads and London Paddington via Bristol Parkway;
- One more peak time train per hour between Bristol Temple Meads and Paddington via Bath;
- One more peak time train per hour between South Wales and Paddington;
- Doubling the service between Plymouth and Penzance to two trains per hour.

- **New Journey Time Improvements:**
  - Journeys between Bristol and London reduced by up to 17 minutes;
  - Journeys between Cardiff and London reduced by up to 14 minutes;
  - Journeys between London and Penzance reduced by up to 14 minutes.

- **The new Elizabeth line at the end of 2019 will bring:**
  - New, longer Class 345 trains, each with space for 1,500 passengers;
  - Direct links from Reading, Maidenhead and Heathrow Airport directly to the West End, the City of London and Canary Wharf;
  - Paddington - Liverpool Street in 10 minutes, Paddington - Canary Wharf in 17 minutes.

Improving freight services

The Western Route is the second-busiest route into London for the UK's rail freight industry, which contributes £30bn to the UK economy annually. This in turn supports a number of major industries, including the Port of Bristol, car plants in Swindon and Oxford, aggregate industries in Somerset and petroleum businesses in Berkshire.

During CP6 we will:

- Improve reliability of the network for freight transport through our asset reliability improvement plan;
- Continue to support "jumbo" stone trains, which consist of 34 wagons against the normal 21, freeing up extra capacity on the network by moving more freight in one go;
- Further examine the potential of improved freight facilities in west London.

Affordable and efficient

Our plans to maintain the railway, improve its reliability and affordability

Renewing and maintaining the railway to make sure it is safe, reliable and affordable is one of our core, continuous jobs. Parts of the railway we maintain are over 145 years old, built for Victorian levels of use. So repairing and renewing the railway at the right time, with minimal impact to operators and passengers, is critical to maintaining service levels, improving reliability and making the railway more affordable for passengers.

In CP6 we will continue our programme of renewals to maintain the sustainable condition and performance of the railway infrastructure including:

- investing £407m renewing or refurbishing 543 km, nearly 20%, of the 2974 km of plain line railway track we maintain;
- renewing or life extending 280 points out of the 1,792 points we maintain;
- maintaining the safety and performance of the signalling system including significant life extensions to signalling systems in Cornwall, Exeter Gloucester, Westbury and Worcester;
- repairing, maintaining or renewing more than 150 underbridges including Windsor Viaduct and bridges across the River Fowey and Parrett;
- investing over £93m repairing or renewing more than 2,300 individual earthwork structures like embankments and cuttings, including renewing Doublebois embankment in Cornwall and renewing Kelston Park embankment near Bath;
- spending £17.9m on steps to prevent rock cuttings falling onto the railway;
- renewing a number of our coastal and estuary sea defences including the sea defences between Lostwithiel and Fowey.

We will invest £40m on the renovation of the heritage roof at Bristol Temple Meads station which is essential to the continued safe use of the station and improving user experience.

We will also invest £35m in works to improve the railway's resilience to extreme weather in particular at Teignmouth, Dawlish and other flood-prone areas.

We will invest £50m to significantly reduce delays into Paddington by replacing over 700 track circuits systems on the approach to Paddington with modern axle counter technology which is far more reliable at monitoring train locations and therefore reducing delays caused by signalling failures.

Taken together, our asset management plans aim to improve reliability by over 11%, to support the increased levels of usage across our route.

We are excited to trial a traffic management system in 2018-2019 to see if we can help reduce the operational impact of incidents on service punctuality by as much as 12%. In CP6 we will analyse the results of this trial and take further steps should digital traffic management visibly improve train performance.

Supporting jobs, housing and growth

Western Route provides rail and freight services to important, dynamic and growing economies, supporting jobs, housing and growth across the Thames Valley and South West.

Supporting jobs, housing and growth

The Office for National Statistics values the economies we support as:

- South West Tourism economy: £10.3bn;
- M4 corridor, Oxfordshire: £113.3bn;
- Bristol, Bath & surrounding areas: £66bn;
- Gross Value Added of the South West is £126bn (the amount being generated by production of services and goods, this includes fishing, tourism, farming, and manufacturing).

Where we invest in rail we see more growth. For example, property values in some areas directly benefiting from future Elizabeth line services have risen by between 20-30% as people look to move to benefit from better rail connectivity.

Supporting a growing railway

In the 2015 Western Route study we predicted that by 2023 passenger numbers will have grown by the following percentages (compared to 2015):

- 29% increase into London Paddington on main lines;
- 198% increase into London Paddington on relief lines;
- 29% increase into London Paddington from Thames Valley branch stations;
- 40% increase between London Paddington and Cornwall;
- 28% more passengers using Reading;
- We also forecast a 45% increase in demand of container traffic freight growth by 2043.

Proposed CP6 projects to grow or improve the railway

Speed to the West: To support the growing demand for rail travel to Devon and Cornwall our core plan proposes funding to enhance track condition between Totnes and Hemerdon as the first stage to enable higher line speeds and reduce journey times to Devon and Cornwall. We will also explore more opportunities for further improvements with our customers and the Peninsula Rail Task Force.

MetroWest: On behalf of the West of England Combined Authority and North Somerset Council we will continue to develop their proposed MetroWest scheme to provide better rail services for Bristol, Bath, North Somerset, South Gloucestershire and Wiltshire.

Choices for funders

We will continue to develop business cases and investment option choices for funders, both Government and third parties, including ongoing development work to link Heathrow to the Great Western Mainline for consideration by HM Government. Network Rail's System Operator is also working on a number of other investment options on the route, to be worked through in due course with third parties interested in providing funding for the railway.

Great people and great culture

Our people are our most valued asset and we will continue to invest in their development such that everyone can achieve their potential. The focus for CP6 is to invest in the building blocks we put in place in CP5 to strengthen our people manager capability and attract and retain talent more effectively. To succeed we need to continue to improve our culture, creating a route which is even more welcoming, diverse and inclusive. Our ambition in CP6 is to increase the percentage of women in our workforce from 11.9% (2017) to 20% by 2020.

Our efficiency and value strategic priority is directly supported by the Better Every Day programme which has, at its core, the principle of removing waste and becoming more efficient as integral to the way we do day to day business.

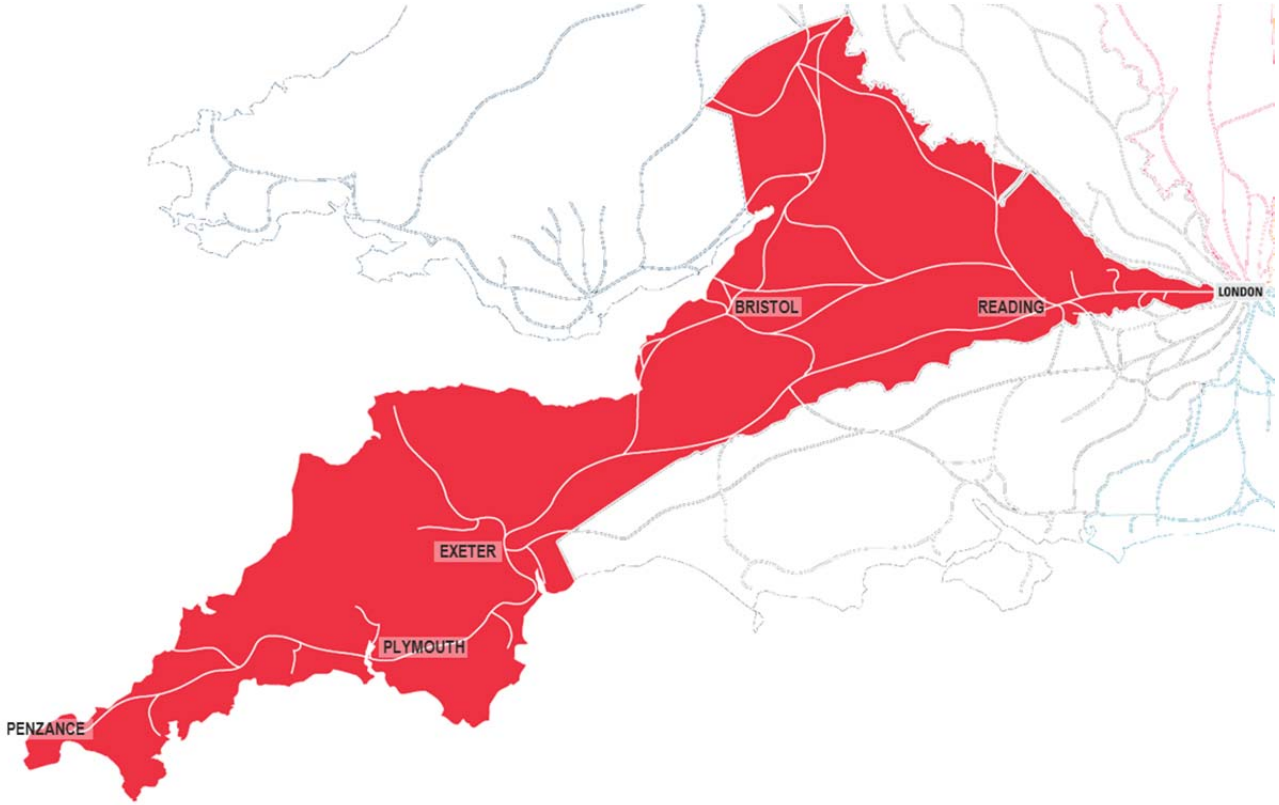
The key objectives for CP6 include:

- People manager training delivered to all people managers;
- Succession plans for all key roles;
- 100% attendance at Everyone Learning facilitated or online sessions;
- Embedding Better Every Day Lean principles throughout our business and delivering £14m efficiencies through Better Every Day initiatives;
- Investing £10m to improve our work place facilities; improving access to basic facilities to support safer and more efficient working, the needs of a more diverse workforce and making efficiencies through better use of our property portfolio.

The future of the Great Western rail franchise

The Department for Transport (DfT) is currently undertaking a review into the shape of the Great Western rail franchise which, at the time of our planning for CP6, is scheduled to end in 2020. We will support the DfT as they conduct their review and public consultation on the future of the Great Western rail franchise. We will prepare accordingly following any decisions that Government takes before and during CP6 on the future shape and service levels that we will be required to offer future franchisees.

As a result the plans set out in this document are based on the current service levels provided to GWR in the existing franchise, and as such may require review if this service level is changed during CP6.



Western Route

Proud to **deliver a better railway** for the Thames Valley and the South West

Our purpose

Excel in delivering a **safe, high performing, reliable and affordable railway,**
be ambitious in creating **greater capacity,**
be responsible for **connecting people** and **caring for the environment**

Our vision

To deliver a **great railway** that supports **jobs, housing and the economy** across our route, **now and in the future**

Our values

Proud to be **relentless** in getting **everyone home safe every day**	Proud to **listen and understand** the needs of those around us	Proud to **nurture** talent and **care** for our colleagues	Proud to **be part of** the **communities** we serve
Proud to **collaborate** with our partners and **put customers first**	Proud to **innovate** and care for the network	Proud to be **better every day**	Proud to be a **diverse employer** offering **great career opportunities**

2. Stakeholder priorities

Our stakeholders

Our stakeholders are many and diverse, spread across the route and beyond, and include:

Lead train operators	Other train operators	Freight operators	Funders and government	Industry groups	Others
Great Western Railway Heathrow Express	CrossCountry West Midlands Trains MTR Crossrail (from 2018) Arriva Trains Wales South Western Railway	Freightliner Intermodal Freightliner HeavyHaul DB Cargo DRS GBRf Colas Rail	DfT Local and Combined Authorities Local Enterprise Partnerships	RDG Transport Focus	ORR Passengers Local business groups Heathrow Airport Environment Agency

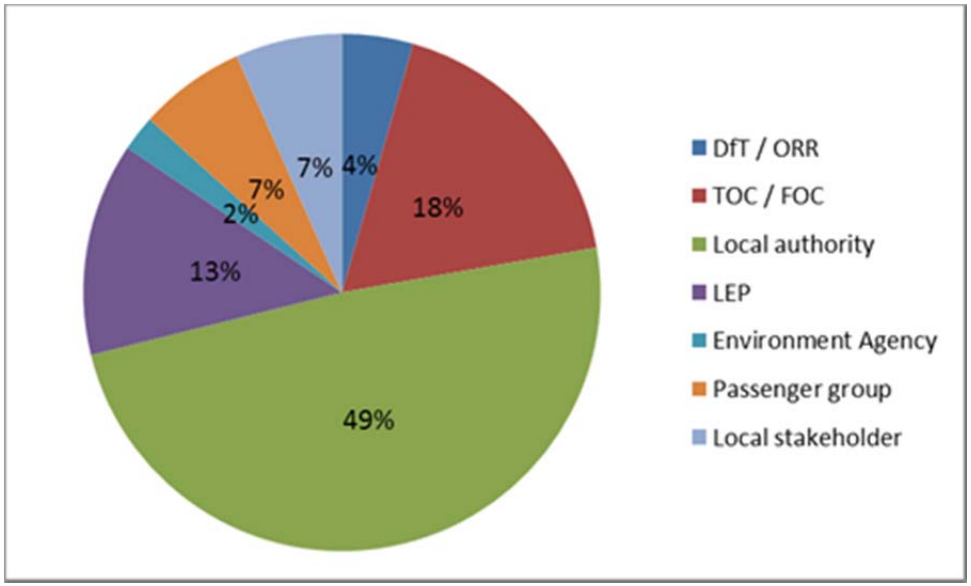
Stakeholder engagement

In developing our CP6 plans we are engaging with a wide range of stakeholders through a series of workshops and written invitations to contribute. We adopted a multi-channel engagement approach, summarised in the diagram, right.

Aside from a series of bi-lateral engagement with our customers and other stakeholders, in February and March 2017 we held four workshops where we met with 73 people from 45 separate organisations, seeking stakeholder views on our outline plans, and to understand their ambitions for the future and how Network Rail can contribute to them. Written feedback was also sought via an online survey and was incorporated into the workshop feedback. The summary attendance at our first round of workshops was as follows:

Workshop	Focus	Attendees	
		People	Organisation
Swindon, 24th February	Industry stakeholders (TOCs, FOCs, DfT, RDG, ORR)	15	11
Bristol, 1st March	West Country North stakeholders (LAs, LEPs, local business groups, ORR)	18	14
Reading, 10th March	Thames Valley stakeholders (LAs, LEPs, Transport Focus, local business groups, Heathrow Airport, ORR)	20	17
Exeter, 16th March	West Country South stakeholders (LAs, LEPs, local business groups, ORR)	20	15

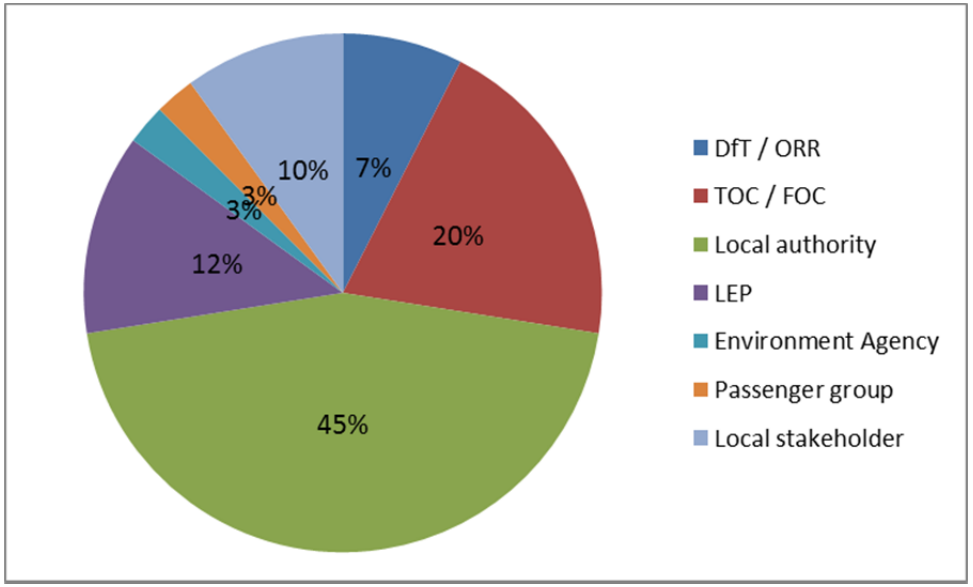
The following chart shows the percentage of attendees by organisation across the four first round workshops.



A further series of workshops was held in June 2017, where we held three workshops meeting with 49 people from 40 separate organisations, updating our stakeholders on progress since the first round of workshops, and seeking their views on our scorecard and the role of Network Rail's System Operator function. As with the first round of workshops, written feedback was also sought via an online survey and was be incorporated into the workshop feedback. The summary attendance at our second round of workshops was as follows:

Workshop	Focus	Attendees	
		People	Organisation
Exeter, 8th June	West Country stakeholders (LAs, LEPs, local business groups, ORR)	14	12
Swindon, 9th June	Thames Valley stakeholders (LAs, LEPs, Transport Focus, local business groups, Heathrow Airport, ORR)	22	21
Swindon, 16th June	Industry stakeholders (TOCs, FOCs, DfT, RDG, ORR)	13	11

The following chart shows the percentage of attendees by organisation across the three second round workshops.



Bi-lateral engagement with our lead train operators on CP6 plan development has also been undertaken. Most engagement to date has concentrated on the detail of the CP6 planning process, but has included overviews of signalling and track renewals workbanks. We have also met with Transport Focus to discuss passenger concerns about industry performance metrics, and the Rail, Maritime and Transport Union to discuss our overall approach to CP6.

In addition, there continues to be regular engagement with our stakeholders as part of our normal business activities, covering a wider range of issues, which can include CP6 activity where appropriate, as outlined below:

Topic	Engagement approach	Route lead	Stakeholders involved
General	Route Supervisory Board	Route Managing Director	All Western lead TOCs, Transport Focus, System Operator and DfT
General	Level 1 Directors' liaison meetings	Route Managing Director	All Western lead TOCs
Performance	Performance Exec, Area Business Reviews Quarterly Performance Strategy Review	Head of Performance	All Western lead TOCs
Network improvements and changes	Quarterly Route Investment Review Group meetings Enhancement scheme boards and delivery group meetings	Principal Strategic Planner Route Managing Director	TOCs and FOCs operating on Western route
Access Planning	Access planning process	Head of Route Planning	All Western lead TOCs
Timetable planning	Capacity Planning Working Group	Head of Operations Delivery	TOCs and FOCs operating on Western route
Stations & depots	Local delivery groups	Route Enhancements Manager Route Asset Manager	All Western lead TOCs
CP6 liaison	1:1 meetings	Route Asset System & Integration Manager	All Western lead TOCs, CrossCountry, MTR Crossrail
Cross-route	Engagement with Freight & National Passenger Operators team	Route Asset System & Integration Manager	CrossCountry

Stakeholder feedback

Following the two rounds of stakeholder workshops, common themes have been identified across the different stakeholders. The workshops asked eight broad questions with regards to the Route Strategic Plan:

a. Stakeholder requirements (workshop round one)
   1. What are the most important outputs for our stakeholders?
   2. Does the strategic vision align with stakeholder requirements?
   3. What is needed for our stakeholders to be successful?
   4. What could be done collaboratively to reduce the whole industry cost through the strategic plan?

b. Scorecard (workshop round two)
   5. What are your views on our Scorecard?
   6. Are there too many metrics, or some which are missing?
   7. Should the finance metrics be part of the scorecard or should they be measured separately?
   8. Is the NRPS (National Rail Passenger Survey) the best way to measure passenger satisfaction with Network Rail?

Feedback from each of the workshops has been independently reviewed and analysed using either a grounded analysis methodology, which was carried out in two stages for questions 1 - 4 and 7 & 8, or a SWOT analysis for questions 5 & 6. This allowed common answers, questions and sentiments to be identified without any predefined expectations.

The first stage of analysis was to study the feedback given by each group from each of the workshops, then group common feedback and answers into categories. The second stage was to take a holistic view of the feedback that had been collected, identify common categories from all eight workshops then group these into common themes. This approach means that the priorities and concerns of all stakeholders have been considered.

Theme	Description	How could this be addressed?
Economic growth	Economic growth is considered a key output for many stakeholders. The railway should be seen as a catalyst for growth to create more jobs and housing opportunities.	Promote interconnectivity between cities. Promote housing and jobs in partnership with the railway, through integrated strategic plans. Have economic benefits play a stronger part of the vision.
Third party engagement	Network Rail should maintain engagement with third parties to ensure that there is an alignment of outcomes and strategies.	Increased communications. Stakeholder engagement and development of integrated plans Develop third party strategies to fund projects
Alternative funding	When addressing the different methods of reducing costs, many stakeholders identified different methods of funding which can be used to reduce the cost to Network Rail.	Bring in more third party funding. Mature, affordable schemes. Adjust franchise agreements. Alliance funding. Choices for funders pipeline of proposals Look into smaller schemes which can be 'pulled off the shelf'
Enhancements	Enhancements should include upgrade of equipment as well as capacity upgrades to stations.	Bring in more third party funding. OMR to include incremental improvement & enhancement. Network Rail could enhance its product as it carries out capital renewals in CP6, as part of a long-term strategy. Vision could have more focus on enhancements over renewals.
Performance	Performance is defined by many factors. These include: Reliability, Resilience, Capacity and Timesaving.	Consider alternative ways we measure performance (PPM). Increased focus on reliability, resilience and capacity.
Passenger experience	The end to end experience of a train journey for the passenger is an important factor across the board for our stakeholders.	Explicitly state in the vision how the passenger is Network Rail's customer. Address capacity issues. Improve mobile connectivity. Alliance working together.

Scorecard: strengths	Provides overview of route performance in CP6. Grouping of metrics into categories makes the scorecard more accessible and relevant to all parties interested.	Continue to display scorecard metrics clearly by category
Scorecard: weaknesses	Individual station-specific metrics do not accurately represent train performance across the route. Greater clarity on measures is needed. A number of potential metrics are missing (including economic growth, environmental impact, level crossing safety, station safety, customer disruption).	Provide clarity on metrics. Add further metrics to the scorecard.
Scorecard: opportunities	Include a metric to cover overall passenger journey experience (door to door), include additional customer satisfaction, third-party funding, economic growth, environmental benefit and connectivity metrics.	Add further metrics to the scorecard.
Scorecard: threats	Scorecard could become too complex if all potential metrics included. Lack of alignment between NR and train operator outcomes.	Carefully manage the number of metrics on the scorecard. Seek to align train operator and NR performance targets.
Inclusion of finance metrics on the scorecard	Broad agreement that financial metrics should be available, but mixed views as to whether relevant to include on the route scorecard.	Continue to include financial metrics on the route scorecard.
Use of the National Rail Passenger Survey to measure passenger satisfaction	There are some perception and influence issues with the NRPS, so greater use of direct survey and social media should be made.	Measure passenger satisfaction through other means, as well as the NRPS.

In addition, our bi-lateral and routine engagement identifies the following stakeholder needs:

Theme	Description	How could this be addressed?
Capacity improvement	Delivery of capacity improvements to time and budget	Cover as part of the Enhancements Delivery Plan
	Reduce journey times (through infrastructure intervention)	Cannot be addressed under current renewals or maintenance plans except in very limited circumstances. Investment opportunities are subject to funding.
	Address pinchpoints and other asset issues	Cannot be addressed under current renewals or maintenance plans except in very limited circumstances
	Increase train frequencies	Specify additional train services, however, in recent franchises, more paths than the infrastructure can reliably accommodate have been specified

	Extend hours of train operation (late night / early morning and weekends)	Specify additional train services, however, increasing hours of operation will impact on white period durations used for maintenance
Performance delivery	Delivery of performance levels for franchises	Joint strategies with each TOC allowing sensible targets to be set and realistic plans to be implemented. However, this will be challenging with continuing traffic growth, disruption from HS2 on the network and with our supply chain, and declining asset condition in certain areas
	Minimise delay per incident	Joint strategies with each TOC allowing sensible targets to be set and realistic plans to be implemented. This is an industry challenge and not just one which NR can solve; we will work with our TOCs and FOCs to reduce.
Passenger experience	Invest in stations	Our asset policies target the maintenance of conditions at current levels. Enhancements will require external funding.
System operation	Train planning resources	Ongoing discussion with capacity planning teams to influence provision of further resource and retain train planning staff

Addressing stakeholder feedback

We have worked within the financial and operating constraints to incorporate the varied items of stakeholder feedback received. Where there have been conflicting requirements we have sought to balance the different priorities we have been advised of to date, principally though qualitative assessment. There have also been some items of stakeholder feedback which we have been unable to take forward due to the constraints of this process, notably with respect to funding the Western Rail Link to Heathrow Airport (which as an enhancement is not part of this plan). We also note that our proposed scorecard outputs remain draft until agreed with our customers and, in particular, the level of disruption and funding of mitigations by HS2 have been clarified.

Our responses to stakeholder feedback include:

Theme	Issue	Response
Economic growth	Need to work together better with our stakeholders on growing the economy through rail	An Alliance workstream has been set-up with GWR to build an aligned approach to business development Our route supervisory board also has a role in bringing together stakeholders, as does the contribution of third-party finance to the railway
Alternative funding	Need to attract greater third-party investment to rail	Route has appointed a Business Development Director
Enhancements	Need to do incremental enhancements when doing renewals	We have set up a renewals planning review group to identify incremental enhancement opportunities

	Need to prioritise Western access to Heathrow Airport	This remains an enhancements choice for funders, but we have revised our route strategic plan to make this option clearer. We will continue to support stakeholders to secure funding for this scheme.
Performance	Passengers don't like or trust our existing performance measures	Our performance plan has been recast to record and forecast "on time" performance at all recorded stations. This is now included on the scorecard.
Other	Route vision needs to include more on the environmental benefits of rail	The route vision has been revised to reflect stakeholder feedback
	Network Rail's route boundaries in the Worcester area need review	A joint review has been agreed with LNW route and project managers appointed to scope a potential boundary change
Scorecard	Individual station-specific metrics do not accurately represent train performance across the route.	This refers to a metric of CrossCountry train performance at Bristol Parkway, which was nominated to the scorecard by CrossCountry, and remains on our scorecard at their request.
	Greater clarity on measures is needed.	The detailed scorecard supporting document now includes definitions.
	Include a metric to cover overall passenger journey experience (door to door), include additional customer satisfaction, third-party funding, economic growth, environmental benefit and connectivity metrics.	Scorecard metrics have been added to cover train accident and level crossing risk reduction milestones.
	Scorecard could become too complex if all potential metrics included.	Noting this point, not all the suggested metrics have been able to be taken forward; the scorecard needs to be customer-focused and balance internal and external metrics.
	Lack of alignment between NR and train operator outcomes.	The scorecard process, and the performance planning process, allow for greater discussion and alignment between NR and TOCs for performance outcomes.
	Broad agreement that financial metrics should be available, but mixed views as to whether relevant to include on the route scorecard.	Financial metrics have been included on the scorecard for visibility and transparency. Our funding management and efficiency delivery is a key priority of our business
	There are some perception and influence issues with the NRPS, so greater use of direct survey and social media should be made.	NRPS is included on the scorecard for consistency with other routes, and as it is Transport Focus' preferred metric. Our customers also note the profound impact that NR activity can have on NRPS scores, and that NRPS is often a franchise metrics. Measurement of social media is now being undertaken by the route communications team

Capacity improvement	Delivery of capacity improvements to time and budget	The scorecard includes tracking of enhancement milestones and financial performance of enhancements. The route governance structure has been improved to focus attention on achieving timely delivery
	Reduce journey times (through infrastructure intervention)	Our plans include money for infrastructure improvements between Totnes – Hemerdon to achieve faster journey times to Plymouth and Cornwall (as recommended in the "Speed to the West" study).
	Address pinchpoints and other asset issues	We have set up a renewals planning review group to identify incremental enhancement opportunities
	Increase train frequencies	We have set up greater dialogue and liaison with DfT about appropriate franchise specification
	Extend hours of train operation (late night / early morning and weekends)	We have set up greater dialogue and liaison with DfT about appropriate franchise specification, and are introducing a risk-based maintenance regime for Paddington – Reading to respond to the reduction in maintenance access. A minimum of access for maintenance will be required, however.
Performance delivery	Delivery of performance levels for franchises	Our scorecard performance objectives are linked to our core asset plans and are subject to regular monitoring
	Minimise delay per incident	
Passenger experience	Invest in stations	Alliance workstream set-up with GWR to build an aligned approach to business development to drive investment in our stations. Our core plan includes the renewal of the roof at Bristol Temple Meads which will improve passenger experience at this station.
System operation	Train planning resources	We have ongoing discussion with capacity planning teams to influence provision of further resource

Continuing engagement

As noted above, stakeholder engagement continues with a number of stakeholders through existing meetings. The route is also planning to continue with the wider stakeholder engagement undertaken for CP6, and in response to a suggestion from one of our stakeholders the route is now planning a stakeholder conference for spring 2018 which is hoped to become a regular event. In addition, the route supervisory board continues to fulfil a valuable role in representing wider stakeholder interests and scrutiny.

Freight & National Passenger Operators (FNPO) route: key priorities for Western route

This summary sets out how the Western route and FNPO routes will work together to deliver the Route Strategic Plan for Western. It outlines existing FNPO activity, and then describes the impact of the plans and aspirations of FNPO customers to grow and develop their businesses. It summarises what Network Rail needs to do to deliver these strategies and how, in doing so, efficiencies can be identified and realised.

National passenger operators	Freight operators
CrossCountry is a significant operator on Western route, in terms of train mileage and track access payments. Charter trains also operate across Western route, especially at weekends, to a variety of leisure destinations being hauled by both standard and heritage steam and diesel locomotives. This leisure market is expected to grow during CP6.	A diverse range of freight flows operate in and through Western route and contribute greatly to the national economy. All of the rail freight operators in the UK run services to and from Western route, with traffic being carried including aggregates from the Mendips to London, intermodal traffic, coal traffic from Avonmouth, and automotive, petrochemical, MOD, waste, timber, cement and scrap metal services across the route.

FNPO: Challenges and opportunities

Key Challenges, Risks and Opportunities	What we plan to do
Aggregate Growth O: Volume growth from quarries in Mendips and Wales to SE and Anglia O: Aggregate for export via Avonmouth O: Reactivation of rail connected quarries e.g. Tytherington R: Infrastructure not able to cope with traffic demand R: Timetable may not be able to accommodate increased traffic	• Explore opportunities for longer and heavier trains maximising loco capability • Facilitate new wagons that maximise payload/length ratio • Support terminal / yard developments e.g. proposed Southall Campus • Support introduction of 'pop-up' terminals, bringing out of use infrastructure back into use and increased use of lineside loading • Explore opportunities for new capacity
Domestic & Deep Sea Intermodal Growth O: Volume growth from Southampton will feed through Western R: Train paths and SRT discrepancies with longer, heavier trains	• Work with customers and routes to realise benefits from Southampton – West Midlands corridor upgrade, including Reading grade separation • Work with customers to maximise opportunities to increase length of trains • Look for opportunities to increase Average Journey Speed origin to destination • Recognised Diversionary routes with adequate capability
Gauge establishment C: Establishment of recognised diversionary routes for gauge critical traffic	• Documented diversionary routes for core intermodal flows • Review of RT3973 provision to more closely align with traffic flows – reduced duplication
Commodity Traffic Growth O: New aviation fuel terminal at Colnbrook O: Increased movements from BMW Oxford via Southampton Docks O: Higher tonnages of steel shipped to EU from Wales will transit Western route R: Brexit impact could affect commodity traffic adversely	• Explore opportunities for longer and heavier trains maximising loco capability • Develop new flow from Grain to Colnbrook • Look for opportunities to free-up capacity following the decline of Avonmouth coal • Support introduction of 'pop-up' terminals, bringing out of use infrastructure back into use and increased use of lineside loading • Work with FOCs and Freight End Users to deliver new network connections and necessary capacity and capability, or bring out of use infrastructure back into use

Logistics and Mail Opportunity O: Potential mail growth on main corridors and premium logistics developments	• Explore opportunities for business growth with existing and potential new customers
Franchise changes / Elizabeth line R: Refranchising of TOC in route seeks greater capacity on shared lines R: Development of Elizabeth line will increase capacity demands on the most congested part of the route	• Retain adequate capacity, capability and flexibility for existing and forecast freight • Review Impact on possession strategy from new flows • Review stabling plans for new rolling stock / change of locations
Infrastructure enhancements / electrification O: Greater capacity/opportunity following enhancement (eg. East West Rail on Western and LNW) R: Loss of Capacity following timetable change (eg. Elizabeth line on Western)	• East West Rail provision for gauge and freight diversions • MML Electrification – risk from faster trains? • Support route forums (RSPG etc) to influence scope and secure freight benefit following scheme delivery
Construction projects / HS2 O: Opportunity for spoil and waste out and aggregate and other commodities in to support construction	• Work with DfT, HS2 Ltd, FOCs and End-customers to offer solutions to demands of major projects • Work with customers to manage the impact of major projects on their business (HS2) • Terminal / Yard developments ('pop-up' terminals / lineside loading potential) • Work with FOCs and Freight End Users to resolve any conflicts with existing freight facilities • Work with FOCs and Freight End Users to deliver new network connections and necessary capacity, or bring out of use infrastructure back into use
SRFI Terminal Development O: SRFI terminal development supports intermodal growth especially addressing demand for inland terminals C: Securing of sufficient capacity to support SRFI developments through planning and into use	• Work with Developers to understand SRFI proposals progression through planning • Offer NR support to proposals when adequate strategic fit and capacity • Work with System Operator to support funded early stage timetable work for SRFI developers
End User-customer service O: Closer working with FEUs enables greater understanding of customer priorities for future (e.g. Mendip Rail)	• Work with end-customers to strengthen service delivery and support • Work with end-customers to develop business growth and support modal shift to rail
Review of redundant and unused assets O: Following traffic changes in CP5 and structural change in energy market, opportunity exists to review size and organisation of non-passenger network	• Identify opportunities to reduce maintenance costs and remove unneeded infrastructure • Regularise the status of freight assets (actual v published) • Explore potential to transfer ownership of redundant lines / assets to secure better opportunities for redevelopment
Yards and sidings infrastructure R: Yard and Siding Infrastructure asset condition is critical to avoid derailment events and customer LTIs	• Working with routes and customers to review asset condition on regular basis, • Working with routes and customers to establish and benchmark walking route use and condition
Timetable Review O/R: Timetable Improvements to closely reflect capability of trains and capacity of network required on busier network	• Continuation of CP5 work to review path usage • Work with System Operator and customers to review opportunities to improve average speed origin-destination • Review with System Operator and customers suitability of current systems to capture network constraints and traction capability (Loads Book, Timing Loads, Lengths)
Digital Railway O: Successful introduction of Digital Railway offers potential for growth on busiest corridors	• Act as internal client on behalf of Freight to build sympathetic capability for freight traffic needs

FNPO: CrossCountry priorities

Consistently good performance is critical for CrossCountry as the majority of their passenger base is leisure and discretionary. The average CrossCountry passenger only travels with XC once or twice a year so every journey matters and there is a need to deliver consistently across the whole network and into a number of key nodes not just one major hub. 40% of XC's passengers interchange so right time delivery is crucial across the network with Network Rail Routes needing to work together to achieve this.

Western performance priorities for CrossCountry:

- RT departures from Bristol Parkway (supported by the provision of an additional platform);
- RT arrivals at Reading;
- Weather resilience;
- Fatalities and trespass, including those off route (Thames Valley) impacting CrossCountry;
- Asset reliability in the West Country and in the Abbotswood area;
- Regulation of northbound services between Reading and Oxford.

Minimal well-planned disruption is key for CrossCountry customers. In order to achieve this XC needs:

- Possession planning process and people recognise the impact multiple disruption has on a cross-route operator and commits to working with CrossCountry to minimise the impact of overall disruption to our passengers and reduce conflicts across the network; adherence to XC's Rules of the Revenue;
- Robust capacity studies completed within industry timescales;
- Late-notice cancellations or possession requests to be avoided wherever possible;
- Deliver within industry timescales;
- Adhere to contractual obligations;
- Learn lessons from CP5 and introduce improved network-wide governance;
- Make the most of the access granted

Crosscountry would like more engagement and emphasis on enhancements that could offer benefit to CrossCountry and journey time improvement opportunities / service frequency opportunities for CrossCountry.

Further details on FNPO's plans for CP6 can be found in appendix G.

3. Route objectives

This plan is predicated on the key assumptions laid out in Appendix B and will be impacted as these assumptions change.

3.1. Route scorecard summary

Our route scorecard is our main tool for reporting business performance. It is used internally within the route, and externally with our customers and our supervisory board to monitor our performance. It is developed collaboratively through consultation with our customers. Accordingly, the metrics and output requirements will be subject to change as we work with our stakeholders and customers.

Our scorecard consists of metrics related to all areas of business performance, a target and a lower and upper range ("worse than target" / "better than target") to enable detailed monitoring of performance. The scorecard is driven by the plans summarised below and outlined further in this plan. Our long-term scorecard also includes an assessment of the achievability of the proposed outputs, using the definitions, below. Although our route serves many customers, where operator-specific metrics are shown on the long-term scorecard, they generally refer to our lead customers only. Other route customers not shown on this scorecard will be shown on their specific lead route scorecard.

Achievability definitions (applies to "target" value)	
RED	Very challenging, likely to require substantial organisational and cultural change to achieve and/or highly dependent on third party involvement
AMBER	Challenging, likely to require moderate organisational and cultural change to achieve and/or dependent on third party involvement
GREEN	Achievable, builds on existing organisational and cultural capabilities and little or no dependency on third parties for delivery

In our long-term scorecard, for **safety** we continue to target reduction in our lost time injury frequency rate (LTIFR), reduce risk at our level crossings, reduction in operational train accidents and public safety risk, and increasing our environmental performance with improving rates in close call reporting and closure. We expect to meet 2017/18's targets with additional improvements into 2018/19, and have provided funding in CP6 to further improve safety.

Our overarching strategy for safety, health, wellbeing and environment is:

- Further development of our inclusive safety programme; with clear accountabilities built upon a foundation of trust.
  With focus on building trust with our people, creating openness in safety, promoting reporting of incidents, accidents and close calls. This allows us to learn and act, thus making our infrastructure a safer place.

- Improving our learning culture; developed by driving safety improvement through analysis and focused intervention planning.
  With focus on risk detection with analysis; this allows us to be targeted with our resources. We are aware of our risk profile and collaborative in the development of countermeasures whilst contributing and considering wider shared learning.

Our objective is to further improve our safety and environmental position through a series of targeted initiatives, mainly aimed at improving how we can work more safely and responsibly. At this stage, our route plans are continuing to be developed alongside technology development led by the central Safety, Technical & Engineering function, therefore our output achievability is assessed as "amber".

For CP6, our plan has been developed so route objectives align with Network Rail's "Home Safe" plan, selected deliverables within the Rail Industry / RSSB "Leading Health and Safety on Britain's Railway - A strategy for working together" and emerging priorities within our Route Safety Alliance plan (delivered with GWR, MTR Crossrail, HEx and the British Transport Police). Detail on this activity is held within the Route Safety Improvement Plan.

The lost time injury frequency rate (LTIFR) target is set to reflect Network Rail's national aspiration to benchmark ourselves against other industries who lead on safety. We are targeting a challenging reduction of more than 60% in our LTIFR with a scorecard target of 0.170 by the end of CP6, which will require a suitably funded plan developed and implemented by the route and Network Rail's Safety, Technical and Engineering team, combined with the activities articulated in our route strategic plan. This will result in workforce safety levels comparable with the best of other industries such as oil and gas. However, the criteria used by other such industries vary from how Network Rail currently measures LTIFR. As a result it is recognised that there will need to be a level playing field with which to compare NR's LTIFR, which will require changes to the definition of what incidents are counted as lost time injuries in Network Rail.

In **train performance** we are focusing on a wider suite of metrics than in CP5, in response to our stakeholder feedback. As well as using the CP5 metric of public performance measure (PPM) for comparison purposes, we are focusing our achievement on new metrics, notably punctuality at all recorded stations. Overall, despite the challenges of the increased number of trains and passenger volumes, we are forecasting a modest net overall improvement in performance. This has an "amber" delivery rating in view of the level of risk from the introduction of the new Elizabeth line services, the potential impact of HS2 construction, and the inclusion of train operator delivered improvements which are not in NR's direct control. Deployment of a traffic management system and a connected driver advisory system has the potential to deliver an increase in performance; however, as traffic management system is only planned as a trial at this stage it has not been included in the scorecard forecast.

Our **locally-driven customer measures** continue to focus on the passenger and public impact of the railway upgrade plan, which will be a feature on Western throughout CP6. The metrics also reflect the content of the Level 2 scorecards agreed with our lead train operators.

For **asset management** our measures focus on our asset reliability, sustainability and volume delivery. Our forecast asset reliability is likely to reduce slightly at the start of CP6 compared to the end of CP5, partly due to the impact of the completion of electrification, but is then forecast to improve through the end of the control period as benefits accrue from the conversion of track circuits to axle counters between Paddington and Airport Junction. The forecast for the composite reliability index shows the impact of the calculation resetting to compare to the end of CP5, and the impact of the full extent of electrification. As with service affecting failures, improvement is forecast to the end of the control period reflecting the benefits of our improvement plans. Our asset volumes are forecast to be deliverable, based on the local delivery assessments carried out, which are detailed in section 7 of this strategic plan.

Our **financial performance** measures are subject to development and confirmation. Our financial scorecard targets are based on variance to our plan. If we deliver all our objectives to the plan we would end each year with a zero variance to targets. With the recent deferral of parts of the electrification programme, and the potential for disruptive works at Old Oak Common as a result of the HS2 programme, definition of targets and achievement assessment will be completed once the full programme and timeline of works in confirmed.

3.2. Long-term scorecard

Safety		2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Achievability
Workforce Safety (Lost Time Injury Frequency Rate)	**Worse than target**	0.483	0.420	0.410	0.370	0.340	0.310	0.310	*Assumes measurement of LTIFR in line with external industries*
	Target	0.460	0.383	0.320	0.277	0.223	0.170	0.170	
	Better than target	0.437	0.364	0.304	0.263	0.212	0.170	0.170	
Train accident risk reduction measures	**Worse than target**	60%	60%	60%	60%	60%	60%	60%	
	Target	80%	80%	80%	80%	80%	80%	80%	
	Better than target	100%	100%	100%	100%	100%	100%	100%	
Top 10 Milestones to reduce level crossing risk	**Worse than target**	6	6	6	6	6	6	6	
	Target	8	8	8	8	8	8	8	
	Better than target	10	10	10	10	10	10	10	
RM3 (Risk management maturity model)	**Worse than target**	tbc	tbc	tbc	tbc	tbc	tbc	tbc	*Targets to be set once measure defined; expected from STE by mid-2018*
	Target	tbc	tbc	tbc	tbc	tbc	tbc	tbc	
	Better than target	tbc	tbc	tbc	tbc	tbc	tbc	tbc	
Train Performance		**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Achievability**
Consistent Route Measure – Performance (CRM-P)	**Worse than target**	1.95	1.91	1.88	1.86	1.84	1.82	1.82	
	Target	1.85	1.80	1.77	1.75	1.71	1.69	1.69	
	Better than target	1.76	1.69	1.66	1.63	1.60	1.58	1.58	
Freight Delivery Metric – Route (FDM-R)	**Worse than target**	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	*Targets set by the FNPO route in conjunction with Western*
	Target	94.0%	94.0%	94.0%	94.0%	94.0%	94.0%	94.0%	
	Better than target	94.4%	94.4%	94.4%	94.4%	94.4%	94.4%	94.4%	
Great Western Railway: Punctuality at all recorded station stops	**Worse than target**	55.3%	55.9%	56.3%	56.7%	57.1%	57.4%	57.4%	*Based on known increase in train volumes and evolving plans*
	Target	56.6%	57.4%	57.8%	58.2%	58.6%	58.9%	58.9%	
	Better than target	57.8%	59.0%	59.4%	59.8%	60.2%	60.4%	60.4%	
Great Western Railway: Public Performance Measure (PPM)	**Worse than target**	86.7%	87.1%	87.4%	87.7%	88.0%	88.2%	88.2%	*Based on known increase in train volumes and evolving plans*
	Target	87.6%	88.2%	88.5%	88.8%	89.0%	89.2%	89.2%	
	Better than target	88.5%	89.3%	89.5%	89.8%	90.1%	90.3%	90.3%	
Great Western Railway: Average Passenger Lateness	**Worse than target**	4.52	4.36	4.25	4.15	4.04	3.97	3.97	*Based on current models*
	Target	4.19	3.96	3.85	3.74	3.63	3.56	3.56	
	Better than target	3.85	3.55	3.44	3.33	3.22	3.15	3.15	
Great Western Railway: Level of cancellations	**Worse than target**	2.25%	2.17%	2.11%	2.06%	2.01%	1.97%	1.97%	*Based on Total Cancellations*
	Target	2.08%	1.96%	1.91%	1.85%	1.80%	1.76%	1.76%	
	Better than target	1.91%	1.76%	1.70%	1.65%	1.59%	1.56%	1.56%	
Great Western Railway: NR caused delay minutes	**Worse than target**	910k	972k	940k	931k	921k	911k	911k	*Based on 12% traffic growth*
	Target	856k	889k	860k	852k	842k	833k	833k	
	Better than target	827k	864k	836k	828k	819k	810k	810k	

Heathrow Express: Punctuality at all recorded station stops	**Worse than target**	76.6%	79.5%	79.5%	79.9%	80.0%	80.1%	80.1%	*Based on current models*
	Target	77.5%	79.9%	80.0%	80.1%	80.3%	81.0%	81.0%	
	Better than target	78.4%	80.4%	80.4%	80.6%	82.0%	83.0%	83.0%	
Heathrow Express: Right-time at destination	**Worse than target**	66.0%	69.3%	69.3%	70.1%	70.3%	70.4%	70.4%	*Based on evolving plans*
	Target	68.0%	70.0%	70.3%	70.6%	70.8%	71.0%	71.0%	
	Better than target	69.2%	71.0%	71.0%	71.1%	71.2%	71.4%	71.4%	
Heathrow Express: Level of cancellations	**Worse than target**	1.55%	1.57%	1.55%	1.52%	1.50%	1.47%	1.47%	*Risk as a changing relationship*
	Target	1.25%	1.27%	1.25%	1.22%	1.20%	1.17%	1.17%	
	Better than target	1.15%	1.17%	1.15%	1.11%	1.10%	1.07%	1.07%	
Heathrow Express: NR caused delay minutes	**Worse than target**	37k	38k	47k	46k	44k	43k	43k	*Based on current models*
	Target	34k	36k	44k	43k	41k	40k	40k	
	Better than target	31k	34k	40k	39k	38k	37k	37k	
MTR Crossrail: Punctuality at all recorded station stops	**Worse than target**	73.3%	72.8%	72.8%	72.8%	72.8%	72.8%	72.8%	*Targets set by Anglia route and reflect end-to-end Elizabeth line delivery*
	Target	73.4%	72.9%	72.9%	72.9%	72.9%	72.9%	72.9%	
	Better than target	73.6%	73.0%	73.0%	73.0%	73.0%	73.2%	73.2%	
MTR Crossrail: Public Performance Measure (PPM)	**Worse than target**	94.3%	93.8%	93.8%	93.8%	93.8%	93.8%	93.8%	*Targets set by Anglia route and reflect end-to-end Elizabeth line delivery*
	Target	94.4%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	
	Better than target	94.5%	94.0%	94.0%	94.0%	94.0%	94.2%	94.2%	
MTR Crossrail: Level of cancellations	**Worse than target**	1.8%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	*Targets set by Anglia route and reflect end-to-end Elizabeth line delivery*
	Target	1.7%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	
	Better than target	1.6%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	
CrossCountry right-time departure at Bristol Parkway	**Worse than target**	55.5%	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%	*Targets set by the FNPO route in conjunction with Western route*
	Target	57.5%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	
	Better than target	58.0%	61.0%	61.0%	61.0%	61.0%	61.0%	61.0%	
CrossCountry right-time departure at Reading	**Worse than target**	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	*Targets set by the FNPO route in conjunction with Western route*
	Target	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	
	Better than target	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	
Locally Driven Customer Measures		**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Achievability**
Level 2 Great Western Railway scorecard	**Worse than target**	0%	0%	0%	0%	0%	0%	0%	
	Target	50%	50%	50%	50%	50%	50%	50%	
	Better than target	100%	100%	100%	100%	100%	100%	100%	
Level 2 Heathrow Express scorecard	**Worse than target**	0%	0%	0%	0%	0%	0%	0%	
	Target	50%	50%	50%	50%	50%	50%	50%	
	Better than target	100%	100%	100%	100%	100%	100%	100%	
Managed stations passenger satisfaction (NRPS)	**Worse than target**	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	
	Target	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	
	Better than target	89.0%	89.0%	89.0%	89.0%	89.0%	89.0%	89.0%	

Reduction in railway work complaints	**Worse than target**	1,250	1,250	1,300	1,300	1,300	1,300	1,300	*Dependant on impact of HS2 and other projects in Thames Valley*
	Target	1,150	1,150	1,200	1,200	1,200	1,200	1,200	
	Better than target	1,050	1,050	1,100	1,100	1,100	1,100	1,100	
Sustainability / Asset Management		**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Achievability**
Reduction in service affecting failures	**Worse than target**	0.5%	-0.4%	0.5%	2.6%	2.5%	1.7%	0.5%	*Includes provision for new overhead electrification*
	Target	1.0%	0.6%	1.5%	3.6%	3.5%	2.7%	1.0%	
	Better than target	1.5%	1.1%	2.0%	4.1%	4.0%	3.2%	1.5%	
Composite Reliability Index (CRI)	**Worse than target**	2.8%	-4.1%	-3.8%	0.1%	4.0%	6.6%	0.5%	*Includes provision for new overhead electrification; note CRI baseline resets at the end of each control period*
	Target	6.0%	-3.0%	-2.8%	1.1%	4.9%	7.5%	1.0%	
	Better than target	8.5%	-2.0%	-1.8%	2.0%	5.9%	8.4%	1.5%	
7 Key Volumes	**Worse than target**	90%	90%	90%	90%	90%	90%	90%	
	Target	95%	95%	95%	95%	95%	95%	95%	
	Better than target	100%	100%	100%	100%	100%	100%	100%	
Top Investment Milestones	**Worse than target**	60%	60%	60%	60%	60%	60%	60%	
	Target	80%	80%	80%	80%	80%	80%	80%	
	Better than target	100%	100%	100%	100%	100%	100%	100%	
Network Sustainability (Composite sustainability index)	**Worse than target**	2.2%					1.2%		*Measured only at end of control period*
	Target	2.3%					1.3%		
	Better than target	2.4%					1.4%		
Financial Performance		**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Achievability**
Financial Performance Measure (FPM) - Gross excl. enhancements (£m)	**Worse than target**	£-19.9m	£-22.6m	£-23.2m	£-23.5m	£-21.7m	£-19.6m	£-19.6m	
	Target	£0m	£0m	£0m	£0m	£0m	£0m	£0m	
	Better than target	£19.9m	£22.6m	£23.2m	£23.5m	£21.7m	£19.6m	£19.6m	
Financial Performance Measure (FPM) - Gross enhancements only (£m)	**Worse than target**	£-60.4m	£-18.9m	£-18.9m	£-18.9m	£-18.9m	£-18.9m	£-18.9m	
	Target	£0m	£0m	£0m	£0m	£0m	£0m	£0m	
	Better than target	£60.4m	£18.9m	£18.9m	£18.9m	£18.9m	£18.9m	£18.9m	
Cash Compliance – Income & Expenditure	**Worse than target**	£-9.3m	£-5.6m	£-5.7m	£-5.8m	£-5.5m	£-5.1m	£-5.1m	
	Target	£0m	£0m	£0m	£0m	£0m	£0m	£0m	
	Better than target	£46.6m	£28.0m	£28.5m	£28.7m	£27.3m	£25.6m	£25.6m	

3.3. Customer engagement with scorecard

We have engaged with our customers and stakeholders in a number of ways. Our second round of stakeholder workshops included discussion on the metrics to be used on the scorecard. We have also used our regular meetings with our customers to discuss measures, notably for 2018/19. The train performance metrics have been developed collaboratively with our train operators. For GWR, the metrics have been subject to review at our alliance board, with a consensus on the first years of the control period, and an opportunity to assess opportunities for further improvement from 2020/21 onwards through the annual scorecard process. For Heathrow Express, metrics have been shared with their operations director and formally tabled to the directors' liaison meeting for review. Formal sign-off of the scorecard with our customers will be achieved through our bi-lateral directors' meetings on an annual basis.

Performance metrics have been set on the basis of the current franchise geography for Great Western Railway. Any changes to the franchise geography and any future refranchising will impact on the performance metrics for both GWR and other customers on the route, and therefore these metrics will be subject to review and change as the refranchising process continues.

3.4. Regulatory floors

In order to give greater clarity on the minimum levels of performance and sustainability expected by the ORR, our plan includes regulatory floors for the key metrics in these areas. These floors, set out in the following table, will act as a level below which ORR would consider undertaking formal investigation for licence breach. Further information on the methodology used to calculate these regulatory floors is in appendix I.

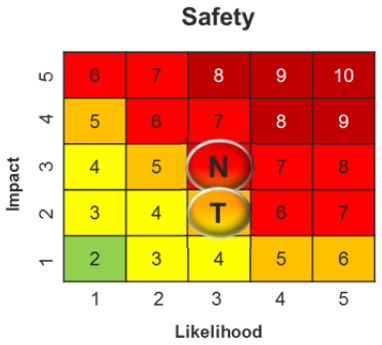
Regulatory floors	2019/20	2020/21	2021/22	2022/23	2023/24
Consistent Route Measure – Performance (CRM-P)	2.39	2.36	2.34	2.31	2.29
Freight Delivery Metric – Route (FDM-R)	92.1%	92.1%	92.1%	92.1%	92.1%
Network Sustainability	90%	90%	90%	90%	90%

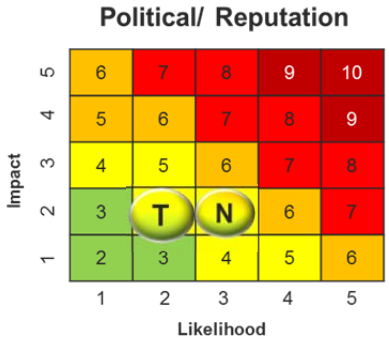
4. Activity prioritisation on a page: Safety

Summary of objectives	Improve delivery of injury free (workforce, passenger and public) infrastructure operations so “everyone” who interacts with our railway “returns home safe everyday”, in line with Network Rail’s “Home Safe Plan”, whilst causing minimum environmental impact.

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Timescale
1	Opportunity: Planning and Delivering Safe Work (PDSW)	Phase 1, upskill our people to create on track safety leadership and improve planning. Phase 2; start to develop electronic safe work packs for simplification and easy identification of risks and controls.	RPD(C)	Phase 1: end 2017/18 Phase 2: by 2020/21
2	Opportunity: driving safety improvements	Improve driver behaviour via vehicle speed warning system data, reducing breaches of Life Saving Rules, completing driver risk assessments, providing driver training and having improved fleet safety specification	DRSAM, HoRSHE	Through CP6
3	Opportunity: route workforce safety and health improvement fund	Funding has been allocated for workforce safety and health improvements as part of the core submission. This fund will be used on a priority basis to support track worker protection equipment, manual handling, reductions in slip / trip / falls and improvements in general occupational health, wellbeing and welfare. This is aligned to activities in the HomeSafe plan.	HoRSHE, RPD(C), COO	Through CP6
4	Opportunity: route level crossing improvement fund	Funding has been allocated for level crossing renewals, enhancements and closures as part of the core CP6 submission, to be used to fund targeted closures at high risk level crossings to improve public safety.	HoRSHE	Through CP6
5	Opportunity: Fatigue Management	Funding has been allocated (£3.463m) for the route to align to Homesafe Plan and agreed fatigue management standards.	COO	Through CP6
6	Constraint: increase in passenger numbers constrains opportunities for passenger risk reduction	Improve assessment of passenger train interface risk and slip/trip/fall risks at stations with our TOCs via Alliance Plan activities.	HoRSHE	End CP6
7	Risk: Asset failures impacting train operations	Asset renewals and enhancements in CP6 to address high risk sites and reduce potential number of service affecting failures.	DRSAM	Through CP6
8	Opportunity: reducing operational risk on track and at stations, benefiting train and freight companies staff	Through Alliance activities with route FOCs / TOCs, improve collaborative risk assessment and incident investigations. Linking recommendations into wider improvement Alliance plan activities. This will complement established NR operational safety programmes, such as critical communications and SPAD reviews	DRSAM, COO	Through CP6
9	Opportunity: reduce intended or unintended public misuse and access to our railway infrastructure, reducing suicide incidents	Focus and engage with vulnerable and high frequency demographic groups through community/ ops safety, route teams and wider stakeholders (BTP, F/TOCs). We will build on improved data collection at emerging hotspot locations and respond with timely planned preventive improvement actions. This programme will also support our linked programme for Suicide Prevention.	HoRSHE	Through CP6
10	Opportunity: improve our environmental sustainability and energy management	Increase our environmental our environment and ecology management in line with ISO 14001. Building weather resilience and climate change adaptation. Enhance our energy management capability to improve energy efficiency and reduce our carbon footprint.	DRSAM	Through CP6

11	Opportunity: improve employee engagement via route Safety Culture initiatives	Further improve and own at route level safety culture activity to improve safety leadership, employee engagement and ownership throughout all levels of the business whilst encompassing third party stakeholders.	RMD, route leadership team	Through CP6
12	Opportunity: Home Safe plan activities.	Develop a fully developed and costed implementation plan for delivery of prioritised National Homesafe Plan activities. Route has allocated of £5.5m for these programmes (excludes LX and Fatigue programmes that are costed separately). This will cover passenger, public, workforce safety, health and wellbeing activity and supporting HSE risk (and assurance) management implementation.	HoRSHE	Through CP6





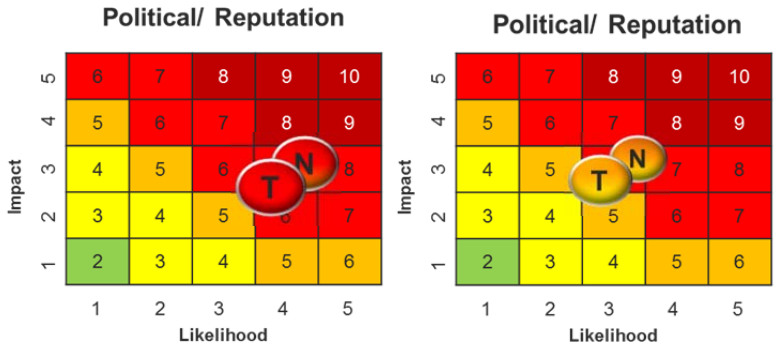
Summary of risk outcome
Considerable mitigating activity will be undertaken, notably benefiting workforce and passenger & public safety and health, the forecast risk position (target) is to improve the current position (net). This will be subject to continued risk reviews via visualisation, periodic business reviews and enterprise risk management to identify additional mitigating actions.

Train performance

Summary of objectives	Our core objective for train performance is to improve the forecast CP5 levels of train performance through CP6, in spite of the additional volume of trains (140,000 more trains, resulting in a 12% increase in passenger train mileage and greater increase in vehicle mileage) and passengers forecast with the opening of full Elizabeth line, with the risk of delay imported and exported to other routes, and electric GWML services from December 2019. We will work collaborative to achieve the 92% Elizabeth line PPM commitment, as demonstrated by system modelling of this service. In addition, there will be potential for disruptive, but as yet to be confirmed, HS2 works at Old Oak Common.

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Customers impacted	Timescale
1	Risk: Increase in train mileage (12% from 2020 onwards, compared to 2018/19) and service complexity due to timetable service increases (Elizabeth line and IEP)	Allianced Operation - Work to introduce a joint Control Pod onto the Operating floor of TVSC comprised of TOC and NR staff to speed decision making to enable better service management and recovery	COO	GWR, HEx, MTR Crossrail, CrossCountry	Through CP6
2	Opportunity: Impact of fleet changes and asset changes on performance, driven by the delivery of the Elizabeth line and electrification	For the start of CP6 • EMU running from Paddington to Didcot and Newbury (110mph), improved acceleration and reliability • IEP introduced, removal of slam door stock • DMU cascade to the West Country, improved reliability to West fleet (dependant on future franchise shape) • Elizabeth line stock introduced, three door and through trains to speed passenger loading	Director Route Sponsorship	GWR, MTR Crossrail	By end of 2019
3	Risk: Asset condition deterioration	Business as usual performance planning across the route to undertake additional maintenance to focus on poor performing assets and locations. Maintain for reliability and compliance.	COO	GWR, HEx, MTR Crossrail, XC, FOCs	Through CP6
4	Opportunity: Upgrade to Paddington to Airport Jn train detection	Convert obsolete track circuits to axle counters between Paddington and Airport Jn to improve reliability, this will build on current upgrade work converting analogue to digital.	DRSAM	GWR, HEx, MTR Crossrail, FOCs	Development: from 2017/18 Delivery from 2019/20
5	Opportunity: Implementation of Risk-based Maintenance regimes	Implement a risk-based maintenance regime for the core inner Thames Valley section of the route	DRSAM / COO	GWR, HEx, MTR Crossrail	From start of CP6
6	Risk: Trend of increasing delay per incident across all incidents (asset and train operators)	Implement a comprehensive delay per incident plan to improve train service delivery, including stock and crew diagramming, building on our current activities to improve delay per incident.	HoP	All train operators	By end of CP5
7	Risk: December 2018 timetable	December 2018 will be a significant timetable change for the route, with the full introduction of the enhanced IEP service, and major restructuring of the suburban service pattern from Paddington. As this is developed review groups to develop appropriate mitigations and contingency plans will be put in place.	HoP, DRS	All train operators	December 2018
8	Opportunity: Robust timetable planning	Integrated timetable planning with Capacity Planning and TOCs/FOCs into the route. CP5 will see an increase of 11 staff within the Western section of capacity planning.	COO	All on Western	By end of 2020

9	Opportunity: Traffic management trial	Ongoing work is looking to trial Integrated Traffic Management in the final year of CP5. This will cover the area signalled by Thames Valley Signalling Centre.	Director Route Sponsorship	GWR, HEx, MTR Crossrail, XC, LM, FOCs	End CP5
10	Risk: HS2 development and construction work at Old Oak Common	Integrated planning with HS2 team & detailed performance mitigation planning	DRSAM & COO	GWR, HEx, MTR Crossrail	Through CP6
11	Opportunity: Great Western Refranchise (DfT work is reviewing the future shape of the Western Franchise)	Engage with DfT and bidders at an early stage and understand what the long term joint strategy should look like. Provides an opportunity to implement TRIP recommendations. Two route posts created to work with the DfT on the specification (one to be seconded to DfT demonstrating collaborative working). In addition, System Operator is creating a post to lead on the franchise to align the working of the System Operator and the route. However, continued direct awards and any remapping of the franchise geography will potentially erode this opportunity.	COO PSP	GWR	From late CP6 (depending on franchise timetable)
12	Risk: GWR refranchising	Ongoing work will define the shape of the new franchise(s) which will impact on our plans. DfT launched a consultation on the future shape of the Greater Western franchise in November 2017 and any change will result in change control being required for performance targets.	COO	GWR	From late CP6 (depending on franchise timetable)



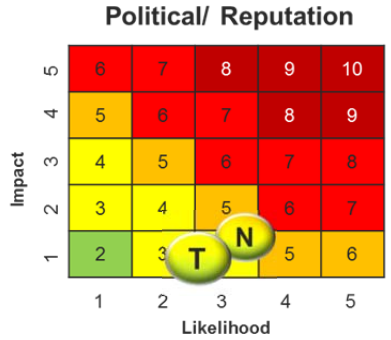
Summary of risk outcome

In view of the increase in planned train services, and the potential impact of HS2 construction on performance, performance risk (and consequently reputational risk) will be outside of appetite. However, depending on the outcome of the current trial, implementing traffic management and a connected driver advisory system could bring improvements to service management and delay per incident.

Locally driven customer measures

Summary of objectives	Our aim is to maintain customer and passenger satisfaction through CP6 due to the significant number of passenger improvement projects being implemented. This is against the backdrop of increased challenges on performance and during continued construction and modernisation works. We aim to do this through robust risk and mitigation planning.

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Customers impacted	Timescale
1	Risk: HS2 development and construction work at Old Oak Common will impact our ability to run a train service against our commitments	Integrated planning with HS2 team & detailed performance mitigation planning, working with LNW route	DRSAM & COO	GWR, HEx, MTR Crossrail	Through CP6
2	Risk: Declining asset performance as asset condition deteriorates	Undertake additional maintenance to focus on poor performing assets and locations	COO	GWR, HEx, MTR Crossrail, XC	Start of CP6
3	Constraint: continued modernisation work is likely to generate a volume of railway work complaints	Continued focus on “being a good neighbour”, advance warning of disruption through direct public and media engagement	HoRC	All on Western	Through CP6
4	Opportunity: alliance working with train operators (notably Great Western Railway and MTR Crossrail) to present unified public messaging	Continue to develop our alliance approach to communications and customer and stakeholder engagement to develop joint strategies to address potential impacts on passenger and customer satisfaction	COO	GWR, MTR Crossrail	Through CP6
5	Opportunity: use of level 2 scorecards	Continue to use level 2 scorecards to focus our delivery of priorities for our customers	HoCRM&P	GWR, HEx	Through CP6
6	Opportunity: managed stations passenger satisfaction	Develop local plans at our managed stations to improve passenger satisfaction	HoCRM&P	GWR, HEx, MTR Crossrail, XC	Through CP6
7	Opportunity: Bristol Temple Meads passenger satisfaction	Planned works to renew the roof at Bristol Temple Meads should result in an improved passenger experience on completion	DRSAM	GWR, XC	By 2020/21

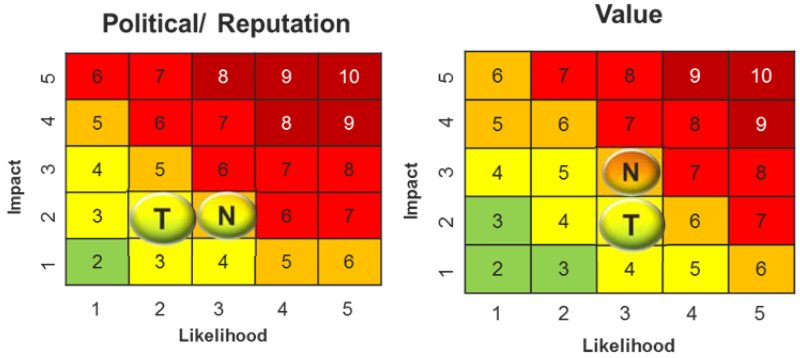


Summary of risk outcome
Reputation risk clearly linked to likely train performance outturn, as well as impact of community disruption through continued modernisation works. The risk likelihood worsens due to the linkage to performance and the deferral of electrification schemes between control periods extending the construction disruption period.

Sustainability & asset management capability

Summary of objectives	We will adopt and embed a structured continuous improvement approach to developing and delivering our enhancement, renewals and maintenance asset management plans to provide a safe and reliable railway. This will be managed through the DRSAM organisation via regular reviews and progress monitoring

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Timescale
1	Opportunity: Implementation of Risk-based Maintenance regimes	RBM will help us to make a step change in the way we manage asset reliability and asset whole life cost and allow us to safely maximise asset and reliability. This means moving from time based fix and find regimes to intelligent proactive functional based regimes.	RPD(C)	March 2019
2	Risk: Delivery of CP5 renewal volumes	Robustly monitor and manage renewals volume deliver through the DRSAM periodic business review and the track governance process.	DRSAM	March 2019
3	Opportunity: Demonstrate compliance with ISO 55000	Undertake a gap analysis of the route to the requirements of ISO 55000 and complete subsequent actions to achieve compliance during CP6.	DRSAM	By end 2021.
4	Opportunity: Use of Activity Based Planning tool	Introduction of the Activity Based Planning tool will improve our understanding of maintenance costs and volume achievement and further engage RAMs in DU delivery of maintenance volumes	DRSAM / COO	End of CP5
5	Opportunity: Intelligent Infrastructure	Work with STE to develop and adopt the Intelligent Infrastructure programme products to help us to get the most out of our assets, manage assets and work in the best way and to manage asset knowledge to support better exploitation.	STE	Through CP6
6	Risk: Inadequate governance of asset data	Implement a route asset data improvement programme. The route has already appointed a route asset data manager who will be accountable for implementing improvements to asset data governance.	DRSAM	End of CP5
7	Risk: Asset data is not mature enough to be used effectively to identify at risks sites to enact a predict and prevent intervention methodology	Implement improvements to remote condition monitoring equipment and data quality in FMS and Ellipse to facilitate a predict and prevent interventions	DRSAM	By end of CP5
8	Risk: Asset Management (AMEM) score deteriorates due to cost constraints enforcing decisions that do not realise the maximum benefits from routes asset	Increase asset management training and use tools such as those proposed by the Intelligent Infrastructure programme to optimise asset management decision making	DRSAM	By end of CP6



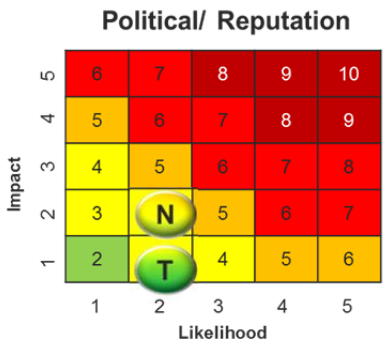
Summary of risk outcome

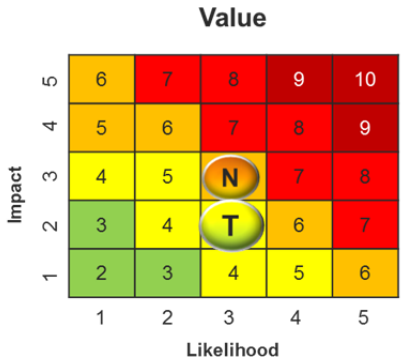
We aim to maintain asset sustainability and to manage the risk to asset condition. A failure to implement the risk-based and predict & prevent maintenance strategies will place this achievement at risk. Failure to implement new technologies will hamper our efforts to maximise the whole life cost of assets through implementation of an effective and mature asset management approach.

Financial performance

Summary of objectives	The route will deliver its CP6 plan within the funding/cash allowance agreed and delivering the planned level of efficiencies. The route has planned on delivering a net zero FPM in line with target – a net zero position will mean the route has managed its risks, opportunities and efficiencies appropriately.

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Customers impacted	Timescale
1	Assumption: The RSP does not take into account any future enhancements other than those being delivered at the point of the final SBP in February 2018. It is assumed that future enhancement project funding will allocate additional funds to the route to cover incremental operating, maintenance, support and renewal costs and any shortfall in income (e.g. Sch 8)	As part of the business planning process moving forward we will include any additional enhancements which NR are asked to deliver. During this process we will highlight additional costs to the route to ensure these are part of the initial project estimate, and our business plan for the core business goes through the appropriate change control.	RFD	All on Western	Through CP6
2	Assumption: The route will be funded to authorise key CP6 projects in advance of CP6. The target date for these authorities is September 2018. This will enable contracting strategies and development to commence early to hit our efficiency plans.	We have agreement to start authorising projects for CP6 and will do so at the start of 2018/19. We will highlight the financial implications of not having this upfront investment capability should this position change.	RFD	All on Western	April 2018
3	Dependency: National employee relations allow us to make structural changes to realise planned efficiencies	Continue to work through our efficiency plans articulating what the route needs in order to realise these benefits. We will feed these into the national transformation team	RFD	All on Western	December 2019
4	Risk: Introduction of new GWR timetable and Elizabeth line services impact Maintenance and renewal activities far greater than expected. The main impact will come from far greater wear and tear and our reduced access	Continued planning using the activity based planning tool in conjunction with detail of the Elizabeth line timetable when this is confirmed. Identify and manage any risks materialising.	RFD	All on Western	April 2019
5	Risk: Extreme event (e.g. storms) causes substantial damage to the network resulting in multi million pound damage which the route hasn't planned for in the SBP.	Provide analysis and knowledge into the central requirements for contingency as part of the SBP. Ensure we deliver our own plans in CP6 improving asset condition and our ability to predict and prevent.	RFD	All on Western	April 2019
6	Risk: Our operations, maintenance and renewals efficiency plans are not delivered at the pace and scale required to meet our plan	Our internal change team will continue to plan and deliver our improvements. Many of our planned CP6 improvements are locally driven which less emphasis on national strategies and direction. Milestones for all improvements will be developed with owners and due dates and will be subject to regular monitoring.	RFD	All on Western	July 2018





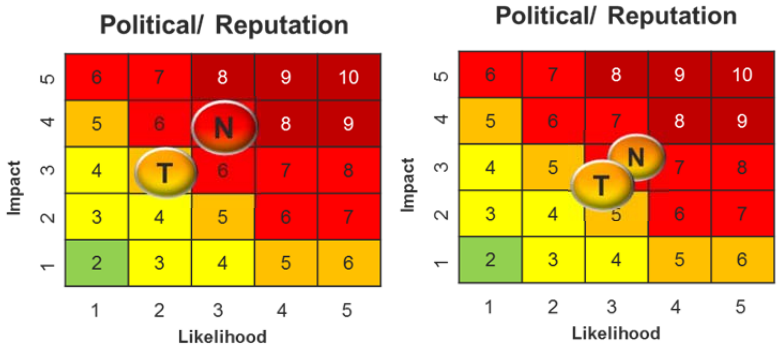
Summary of risk outcome

CP6 efficiencies will be challenging in conjunction with new significant passenger benefit projects going live. We are continuing to develop our plans for CP6 so we understand all our key milestones and who owns delivery.

Investment: capacity & growth

Summary of objectives	Complete the delivery of the CP5 Enhancements Delivery Plan (for CP5) which is being sponsored by the route. Establishment of a CP6 Enhancements Plan which is managed by the System Operator. Attract further levels of third party funding investment in the rail network

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Customers impacted	Timescale
1	Constraint: Affordability of the enhancements portfolio nationally will limit scope for new CP6 choices beyond Hendy and HS2	CP5/6: Continue to make the case for funding through planning process and with Third Parties. Appointment of a Business Development Director and developing relationships with the Sub National Transport bodies	PSP RBDD	All	On-going
2	Constraint: A number of enhancements projects are presently politically committed but have no firm funding commitment (Hendy "Tail")	CP5/6: Continue to make the case for funding through planning process and with Third Parties. Appointment of a Business Development Director and developing relationships with the Sub National Transport bodies	DRS RBDD	All	On-going
3	Assumption: Route continues on devolution path to support the franchises to achieve growth and to avoid misaligned objectives	CP5: Implementing "Delivering for our Customers" Transformation Plan	Route Exec	All on Western	By end of CP5
4	Constraint: Disruption caused by HS2 on-network works will adversely impact passengers	CP5/6/7: Continue to manage through Enterprise Risk process to identify, plan and mitigate issues	HSRD	GWR, HEx, MTR Crossrail	Through CP6 and CP7
5	Risk: Passenger growth at some stations will require local control measures	CP5/6: Crowd management plans	Station Managers	GWR, HEx, MTR Crossrail	On-going
6	Opportunity: Introduction of new train fleets will provide additional capacity	Work with GWR to optimise timetable to maximise additional capacity benefits of new trains	COO	GWR	By end of CP6
7	Constraint: Electrification deferral will constrain full deployment of optimised EMU timetable in the Thames Valley and subsequent fleet cascade	Work with GWR to optimise timetable to maximise additional capacity benefits of new EMUs	COO	GWR	By end of CP6
8	Opportunity: third party financing	Implement a business development strategy, led by a business development director, to develop third-party funding streams	RBDD	All on Western	Through CP6



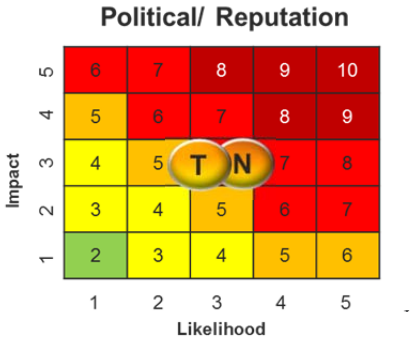
Summary of risk outcome

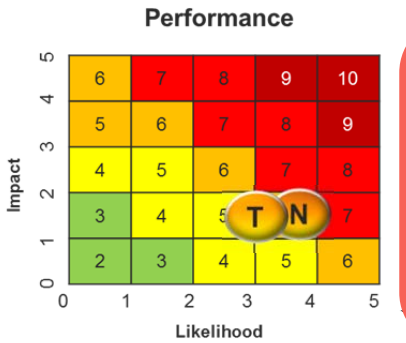
Our aim is to manage growth by safely delivering sufficient capacity in CP5 and CP6. Risks to this outcome are availability of funds and resources including disruptive access for HS2 and other major programmes. Mitigations include implementing a strong route-led business to work with third party funders and improving customer focus, as well as optimising the utilisation of the higher-capacity trains being introduced on the route in CP5. Reputation risk is outside of appetite due to the stakeholder interest and concern in the progress of the electrification programme and the scope deferrals into CP6.

High Speed 2

Summary of objectives	HS2 will be under construction at Old Oak Common (notably a surface station on the Great Western Main Line) and alongside Western route in CP6. The route will work with LNW and HS2 colleagues to minimise the potential for significant impact both on our ability to deliver a high performing railway for our customers and also in terms of availability of operational and supply chain resources, significant access requirements and additional traffic for moving spoil. The decommissioning of the Old Oak Common site will fundamentally change the Heathrow Express and Great Western Railway train operator arrangements for start of service, which will need cross-industry cooperation throughout CP6.

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Customers impacted	Timescale
1	**Risk**: HS2 works at Old Oak Common (notably to construct a surface station on the GWML), and along the Western route will cause disruption to passengers and freight customers	Integrated planning with HS2 and train and freight Operators teams & detailed performance mitigation planning	DRSAM & COO	GWR, HEx, MTR Crossrail	Through CP6
1	**Risk**: HS2 works at Old Oak Common (notably to construct a surface station on the GWML), and along the Western route will use access opportunities otherwise available for core OMR and require industry resource to supervise	Integrated planning with HS2 and train and freight Operators teams & detailed performance mitigation planning	DRSAM & COO	GWR, HEx, MTR Crossrail	Through CP6
2	**Risk**: HS2 funding constraints result in failure to fund all identified Western route mitigation works	Prioritise activities on the basis of protecting Western route performance, operations and maintenance through design or asset protection activity	DRS, COO	GWR, HEx, MTR Crossrail	By 2019
3	**Constraint**: HS2 occupation of Willesden HOOB will disrupt renewals in CP6	Amend High Output plans, utilising an existing route-based facility, but note that this will extend transit times, increase costs and affect access throughout the route. Pathing will need to minimise risk to other route operators.	IP	All on Western	By 2019
4	**Risk**: HS2 mass haul traffic impact on asset condition and haulage availability	Manage applications for paths using existing protocols. Forward planning of haulage requirements for Western works	COO, DRSAM	All on Western	Through CP6
5	**Risk**: Reduction in supply chain capacity available to Western route due to HS2 workload in CP6	Confirm resource availability with framework and other suppliers and give early visibility of CP6 workbanks	RDD, DRSAM	All on Western	Prior to CP6





Summary of risk outcome

We anticipate the Old Oak Common mitigation measures currently being developed will be adopted which will allow us to manage through the Old Oak Common construction period. By good management, and working closely with TOCs and FOCs we also expect to mitigate other impacts of HS2 to deliver planned performance levels throughout CP6. There remains a risk that our management approaches prove insufficient or significant changes and costs occur which render them ineffective.

5. Activities & expenditure

5.1. Cost and volume summary

This plan is predicated on the key assumptions laid out in Appendix B and will be impacted as these assumptions change.

RENEWALS COSTS (post headwinds and efficiencies at 2017/18 prices)

			Control Period 5 (at RF6)						Control Period 6						Control Period 7
	Unit	Funded by	14/15	15/16	16/17	17/18	18/19	Total	19/20	20/21	21/22	22/23	23/24	Total	24/25
Track	£m	Renewals	£77.2	£64.3	£76.7	£105.2	£91.9	**£415.3**	£88.2	£87.4	£96.2	£57.9	£77.7	**£407.5**	£84.3
Conventional Signalling	£m	Renewals	£102.1	£83.8	£79.9	£85.1	£87.7	**£438.6**	£95.9	£91.4	£56.6	£97.9	£60.4	**£402.2**	£50.8
Structures	£m	Renewals	£49.3	£28.6	£26.2	£25.0	£31.0	**£160.1**	£37.9	£35.0	£34.8	£34.4	£31.5	**£173.6**	£44.2
Earthworks	£m	Renewals	£33.2	£25.4	£20.8	£15.2	£8.1	**£102.8**	£22.1	£18.9	£19.2	£18.7	£18.7	**£97.5**	£25.2
Drainage	£m	Renewals	£2.3	£8.9	£2.6	£3.0	£2.0	**£18.8**	£2.5	£2.5	£3.2	£2.5	£2.0	**£12.7**	£3.2
Buildings	£m	Renewals	£18.0	£18.6	£6.7	£11.2	£7.9	**£62.3**	£11.0	£36.8	£42.0	£30.4	£15.9	**£136.2**	£16.9
Electrification & Fixed Plant	£m	Renewals	£2.5	£4.0	£9.5	£12.4	£10.0	**£38.4**	£5.6	£11.8	£19.7	£23.3	£14.4	**£74.8**	£15.6
Total Renewals	**£m**	**Renewals**	**£284.6**	**£233.6**	**£222.4**	**£257.1**	**£238.6**	**£1,236.2**	**£263.2**	**£284.0**	**£271.7**	**£265.0**	**£220.6**	**£1,304.5**	**£240.2**
Digital Railway	£m	DR Programme	£0	£0	£0	£0	£0	**£0**	£0	£0	£0	£0	£0	**£0**	£0
Speed to the West	£m	Renewals	£0	£0	£0	£0	£0	**£0**	£15.0	£5.0	£30.0	£0.0	£0.0	**£50.0**	£0.0
Total Renewals + Digital Railway + Speed to the West	**£m**	**All**	**£284.6**	**£233.6**	**£222.4**	**£257.1**	**£238.6**	**£1,236.2**	**£278.2**	**£289.0**	**£301.8**	**£265.0**	**£220.6**	**£1,354.6**	**£240.2**

The above table shows our renewals costs inclusive of cost increases ("headwinds", such as the impact of additional overhead electrification on our working practices and track access) and our planned efficiency initiatives. Structures shows a net increase over CP5 expenditure due to prioritisation of additional spending on renewals activities which have been deferred from CP5. Buildings includes funding to complete a renewal to the roof at Bristol Temple Meads station, while our E&P spending is reflective of the changed asset base due to electrification. The costs also include provision for the "Speed to the West" scheme, however these should be considered indicative in both value and timing at this stage as the scheme is developed. Full details of this scheme and our asset strategies are outlined later in this section.

Details of our net 6% efficiency plan can be found in section 7.

KEY VOLUMES

	Unit of Measure	Funded by	Control Period 5 (at RF6) 14/15	15/16	16/17	17/18	18/19	Total	Control Period 6 19/20	20/21	21/22	22/23	23/24	Total	Control Period 7 24/25
Plain Line	Linear track m	Renewals	101,207	79,793	96,744	161,956	119,511	**559,211**	113,684	122,245	142,840	63,955	100,709	**543,432**	113,000
S&C	No. of S&C units	Renewals	40	46	59	45	79	**270**	49	54	43	87	48	**280**	59
Conventional Signalling	SEU	Renewals	137	366	213	0	479	**1,194**	58	219	62	176	65	**580**	25
Digital Railway	SEU	DR Programme	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0
Embank/Soil Cut/Rock Cut	No. of	Renewals	477	950	507	268	246	**2,448**	482	467	462	458	454	**2,323**	475
Underbridges	Number of assets intervened on	Renewals			*To be advised*				27	36	33	30	27	**153**	25
Underbridges	m2 plan deck area worked on	Renewals	11,232	6,544	1,815	2,539	630	**22,760**	7,409	6,544	6,815	7,209	8,182	**36,159**	7,000
Wire runs	No. of	Renewals	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0
Conductor Rail renewal	Km	Renewals	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0
Speed to the West	Linear track m	Renewals	0	0	0	0	0	**0**			*To be advised*				0

HEADROOM (at 2017/18 prices)

	Unit	Control Period 6 19/20	20/21	21/22	22/23	23/24	Total
Headroom	£m	£12.6	£12.6	£12.6	£12.6	£12.6	**£63.0**

Please note phasing shown is indicative

We do not want to be in a position where we have to re-plan our activity every time a risk materialises in CP6 as this would be very inefficient. Therefore, in addition to the core plan cost figures shown in this document, our strategic plan includes £63m of route headroom, which has been created by holding back some SoFA funding from Network Rail's overall CP6 plan. This route headroom is particularly for the business performance risk we face in the control period.

Ideally, actual results will be in line with our CP6 plan and we will be able to release our route headroom to invest it in improving the railway: this headroom can be considered as contingent investment. If needed, we will also have the opportunity to access portfolio headroom in CP6, particularly for inflation risk. Again, we will ideally spend this on further investment to improve the railway. Portfolio headroom will be controlled through our corporate business planning process. Increased investment will depend on successful delivery of the company's plans and good business cases.

OPEX COSTS (post headwinds and efficiencies at 2017/18 prices)

		Control Period 5 (at RF6)						Control Period 6						Control Period 7
		14/15	15/16	16/17	17/18	18/19	Total	19/20	20/21	21/22	22/23	23/24	Total	24/25
Track								51	50	50	50	49	**250**	49
Off track								7	7	7	7	7	**34**	7
S&T								20	21	21	21	21	**105**	21
E&P								11	11	11	11	10	**53**	10
DU HQ								10	9	8	8	8	**43**	8
DU / WD Maintenance	excl. B&C	69	73	77	84	91	**394**	98	98	97	96	96	**485**	96
Non DU Maintenance		30	33	36	38	30	**167**	27	31	24	24	24	**130**	24
Non-reactive maintenance total		99	107	113	121	121	**561**	124	129	122	121	120	**615**	120
Civils: Buildings maintenance		0	0	10	10	10	**29**	10	10	10	10	10	**52**	10
Civils: Structures maintenance		0	0	8	7	7	**22**	8	8	8	8	8	**42**	8
Civils: Earthworks maintenance		0	0	2	2	2	**6**	1	1	1	1	1	**6**	1
Total Maintenance costs		**99**	**107**	**133**	**140**	**140**	**618**	**144**	**149**	**141**	**140**	**140**	**715**	**140**
Operations		43	45	46	52	55	**240**	64	64	63	63	62	**315**	62
Support		9	9	10	4	4	**36**	4	4	4	4	4	**18**	4
Operations & Support costs		**52**	**54**	**56**	**55**	**58**	**276**	**67**	**67**	**67**	**66**	**65**	**333**	**65**
Total Controllable Costs		**150**	**161**	**189**	**196**	**198**	**894**	**212**	**216**	**208**	**207**	**205**	**1,047**	**205**
Non-Controllable Costs		**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
Headcount														
Permanent		2,240	2,370	2,508	2,676	2,693	**2,693**	2,672	2,697	2,619	2,619	2,619	**2,619**	2,619
Agency		12	9	9	3	2	**2**	0	0	0	0	0	**0**	0

The above table shows our renewals costs inclusive of cost increases (“headwinds”, such as the impact of additional overhead electrification on our working practices and track access) and our planned efficiency initiatives. Overall, we are planning to spend more money on maintaining the infrastructure in view of the addition train services which will operate. CP6 maintenance costs are shown with delivery unit costs separated from the costs of the rest of maintenance, which includes the route asset management directorate, workplace management, civils examinations and route-wide vegetation management activity.

ENHANCEMENTS

A number of enhancement schemes are post-Final Investment Decision (FID) and funding for these is included in this route strategic plan. Schemes in Network Rail's current enhancements delivery plan (September 2017) which if authorised by funders are anticipated to be delivered in CP6 are referred to as the "Hendy Tail" and are the outputs of the Hendy Review in November 2015 and subsequently announced additional deferrals in November 2016, which deferred their implementation from the CP5 portfolio. These schemes are at various stages of the lifecycle and are still subject to a final investment decision by the funder for delivery in CP6. These schemes are not funded through this plan. HS2 schemes are funded outside this plan. This route strategic plan has only factored in operations, maintenance and renewals expenditure for schemes which are post-FID and the plan will require change control as new projects are agreed at FID.

The table below shows the current position with respect to the "Hendy Tail". The schemes in this table are still subject to a final investment decision and are not included in this plan:

Ref.	Scheme name	Potential CP6 output and benefits
W001c	Reading Independent Feeder (Bramley)	• New national grid supply at Bramley or independent feed between Reading and Didcot (subject to outcome of GRIP 3); • Minimisation of the impact of power and distribution failures on the operations of the GWML.
W015	Bristol East Junction	• Improvements to the existing junction layout east of Bristol Temple Meads to meet current and future forecasted demand.
CR007	Acton to Willesden Electrification	• EMU and electric freight capability WCML to GWML for timetabled and disrupted services
W001a	Filton Bank Electrification	• Electrification of route between Bristol Temple Meads and Bristol Parkway
W001a	Wootton Bassett Jn to BTM Electrification	• Electrification of route between Wootton Bassett Jn and Bristol Temple Meads
W001a	Didcot to Oxford Electrification	• Electrification of route between Appleford and Oxford
W002a	Western IEP Capability	• Completion of the platform extensions (Chippenham: GRIP 1 to 8, Bath and Neath: GRIP 4 to 8 and Swansea: GRIP 3 to 8); • Performance and safety benefit.
W003a	Henley and Windsor Electrification (Thames Valley Branches)	• Electrification of Henley and Windsor branches
W003b	Southcote to Basingstoke Electrification	• Electric service introduction between Southcote Junction and Basingstoke Station (assumed Platform 5 only); • 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.
	DNO clearance works associated with the following electrification schemes: W003a, W003b, CR007	• Cable diversions complete in advance of electric train services
W004	Thames Valley EMU Capability	• Completion of platform extensions at Bramley, Mortimer, Appleford, Culham and Radley as electrification is progressed.

W005	Western Rail Link to Heathrow	• Start of construction and completion of the scheme; • Introduction of service - 4tph from Reading Station to Heathrow Airport.
W006	Oxford Corridor Phase 2	• Deliver level crossing mitigation solutions north of Oxford, between Wolvercote and Heyford; • Deliver infrastructure solutions to support capacity improvements for additional EWR Phase 2 services from Oxford to Bedford / Milton Keynes (2tph); • Deliver infrastructure solutions to support increased frequency Freight (2tph) and Cross Country services (1tph); • Deliver infrastructure solutions to support increased frequency Freight (2tph) and Cross Country services (1tph).
W008	Bristol Temple Meads Capacity - platforms 0 &1 in Midland Shed	• Provision of additional capacity that will provide a foundation for future proposed developments at Bristol Temple Meads Station.
W009	West of England DMU Capability	• Completion of gauge clearance works Plymouth to Penzance, Gunnislake and St Ives branches
W014	West of England Platform Extensions	• Platform extension works leading to improved capacity and performance

HS2 enabling schemes

The following schemes are HS2-related intervention that we propose to be funded by HS2 Limited to allow HS2 to successfully operate on our network in accordance with the Hybrid Bill:

- OOC Hex Depot relocation (Langley)
- OOC GWR West Ealing Sidings Phase 2
- HS2 ONW South (OOC enabling, GWML Station, Willesden)
- OOC GWML Station
- OOC Essential works
- OOC Depot Decommissioning
- HS2 ONW Ground investigation
- HS2 ONW HS2 HALO
- PH1 enhance - HS2 mass haulage strategy

CP5 funded projects to GRIP 1-8 that will finish in CP6

The following schemes are CP5 schemes which have some final delivery expected in CP6. These schemes are post-FID and are included in this plan:

- Stations – Access for All (AfA)
- GWEp close-out/snagging
- A2A Enhanced Access Points
- 0-12mp CMEs and electronic securing
- A2A OLE campaign changes
- Crossrail close-out / snagging
- Filton Bank Four Tracking
- Interim Gatelines (Bristol Temple Meads)
- Bristol Parkway snagging
- DNO works
- Par and Tavistock MDUs

The above table and lists of schemes reflects the current recorded position in Network Rail's financial systems at January 2018 for enhancements schemes. Such schemes and costs do not form part of the route's operations, maintenance and renewals submission for CP6, however, the schemes are shown here for planning assumption purposes. It does not represent the full enhancements portfolio, which is outlined below.

Future enhancements will need to include ongoing operations, maintenance and renewals costs in the funding. They also need to assess their impact on other route scorecard measures and the routes CP6 plan may require amendment to reflect these impacts. Without this significant cost and reputational risk will transfer to the route with a high chance of this risk materialising in CP6.

Future enhancements: developed in conjunction with System Operator

On behalf of the rail industry, Network Rail published the Western Route Study in August 2015 presenting a 30-year strategy for accommodating forecast passenger and freight demand to 2043. The strategy was produced working in collaboration with key industry stakeholders such as the Department for Transport, Transport for London, train and freight operators, Crossrail Ltd and the Office of Road and Rail. Regional and wider stakeholder groups were also convened to incorporate the requirements of the Local Authorities, Local Enterprise Partnerships and other rail users to ensure the end strategy is fit to meet the future demands that will be placed upon it, whilst continuing to drive and support economic growth across the route.

The Western Route Study is a key part of the industry's Long Term Planning Process presenting choices for funders to inform decisions for infrastructure and capacity requirements in Control Period 6 (CP6, 2019-2024) and the longer term (2043). The strategy identifies where constraints across the 2019 rail network will arise and proposes choices to mitigate these through train lengthening, additional services and infrastructure enhancements.

Key corridors where interventions are envisaged to be required in CP6 include London Paddington – Reading, Reading – Oxford, Didcot – Swindon and Exeter – Castle Cary via Yeovil Junction. Freight demand is also likely to drive requirements between Basingstoke and Oxford. For each of these corridors, development work has been undertaken to help shape requirements (scope, cost and value for money assessments) with the outputs from the studies used to inform the industry's planning cycle for CP6.

The programmes within the enhancements portfolio have been categorised within four areas:

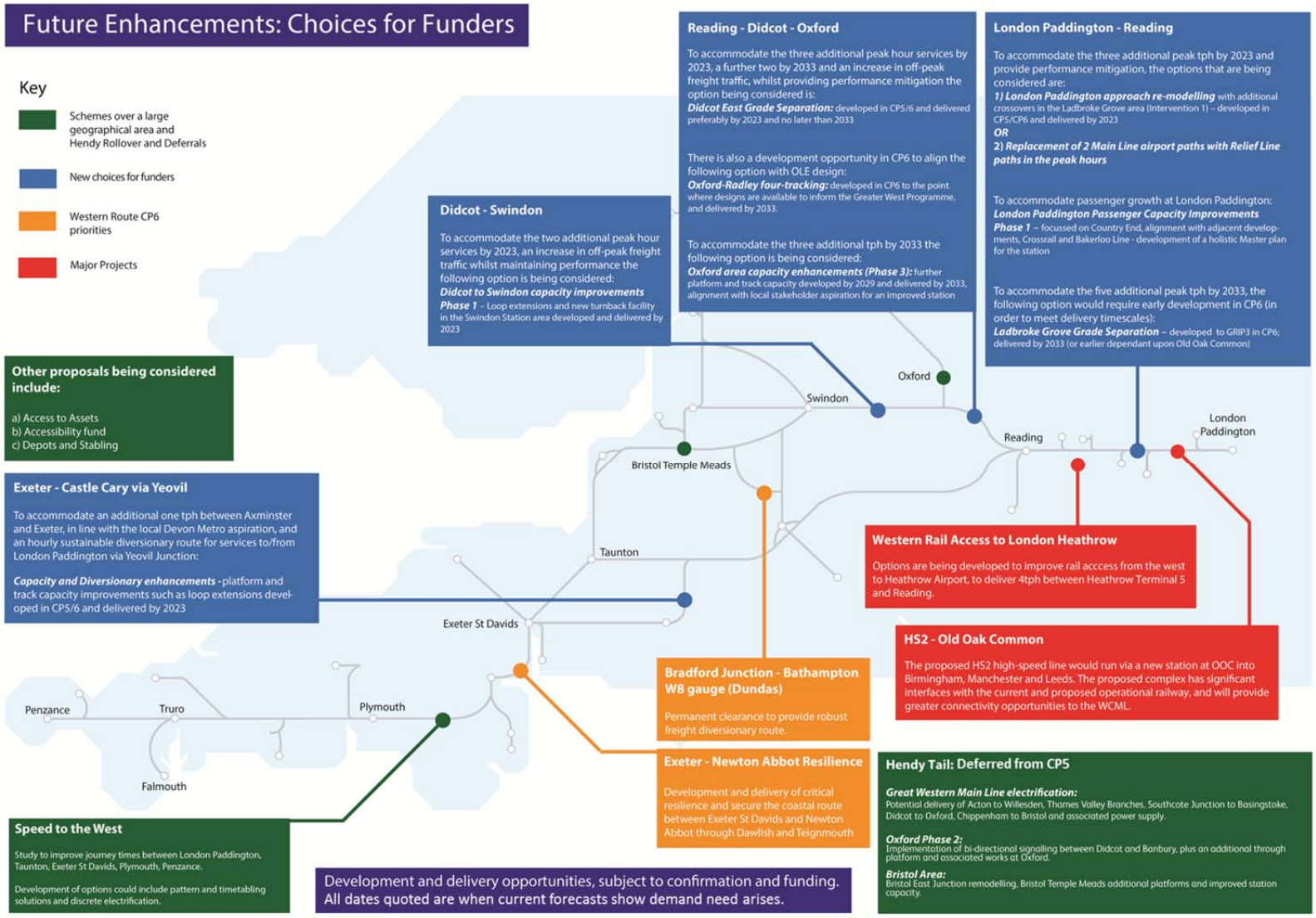
- Hendy rollover and additional deferrals including Oxford Phase 2, Bristol Temple Meads (additional platforms) and Electrification;
- Major Projects (Western Rail Access to Heathrow Airport and works to facilitate HS2);
- Capacity & Performance Hotspots (including London Paddington Station);
- New choices for funders "pipeline".

We have presented a number of new choices for funders which capture the priorities identified through the Western Route Study combined with a number of additional elements that have emerged more recently. The map, overleaf, provides a summary of these choices. Inclusion of a scheme on the map should not be taken as a commitment to proceed with that scheme; dates quoted refer to forecast demand from the Western Route Study and the indicative need for intervention. Actual delivery dates will be confirmed if and when schemes are authorised.

For CP6, a continuous planning approach for enhancements is intended whereby proposed interventions will form a "pipeline" of options which could address key capacity challenges and offer connectivity improvements. The combination of our bid for CP6 reflects this pipeline and incorporates schemes that need initial or more detailed development, as well as those which are ready to progress to implementation. As part of the development and management of these schemes, a significant element of programme management and integration will be required to collectively draw together the wider elements of industry and system requirements into a coordinated and integrated plan to ensure that the optimum development, delivery and implementation processes are undertaken and to ensure the full spectrum of benefits can be realised.

As part of its CP6 planning process, Network Rail is currently undertaking a prioritisation exercise to ascertain which individual interventions are required to deliver the outputs that the funder originally wished to buy and whether they are still the best way to achieve these outputs. Prioritisation of these schemes is required to reflect financial constraints, so that recommendations can be made on which investment projects are key for future strategy, ensuring that they

have clear and measurable passenger or freight benefits and deliver the outcomes that the funder requires. The output of this work will be to identify those enhancement schemes which require funding.



Digital Railway

The route fully supports the Digital Railway programme; however, there are no specific interventions on Western route in CP6, in line with Digital Railway programme. The route will trial traffic management technology in the Thames Valley Signalling Centre by the end of CP5 in order to assess the benefits which may arise from such an intervention.

Digital Railway ready specifications

Passive provision

For like-for-like renewal (e.g. no capacity enhancement), provision for DR Ready specifications is termed **passive provision.** For these schemes, a DR Ready specification is assumed not to add material cost. This is based on the following assumptions:

- No change to train detection and therefore no need to design a separate ETCS compliant option
- Competitive procurement arrangements embedding the DR Ready Specification from inception of the scheme
- Support is given to the routes by a core team (DR, STED and IP) to ensure a consistent interpretation of the specifications.

Active provision

Where signalling renewals coincide with the need for an increase in capacity, based on a need identified in the Route Studies, there would be an increase in project scope to comply with the digital ready specification. This scope is termed **active provision** and is driven by additional train detection requirements.

The table below illustrates the assumed cost changes (drivers, efficiencies and net) for the signalling scheme affected:

Scheme	Provision type	Activity/scope changes (£m)		Net change to plan (£m)	Funded by
		Drivers	Efficiencies		
Paddington – Airport Jn axle counters	Passive	0.0	(0.0)	0.0	Renewals

Speed to the West

In 2016, GWR commissioned Network Rail to investigate how incremental conventional infrastructure solutions could improve journey times between London Paddington and various calling points in the South West, namely Taunton, Exeter St Davids, Plymouth, Truro and Penzance. The work, which fed into the Peninsula Rail Task Force's 20-year rail plan, concluded that the investment required would be significant. Attention has now turned to how track and train can work together to generate innovative solutions to improve journey times. These include engaging with the market to develop discrete electrification solutions for the South Devon Banks; marginal gains in line speed identified by GWR drivers and validated and assessed by NR maintenance, ops and asset managers; and timetabling solutions.

Our plan includes for the development and delivery of the first phase of journey time improvements, resulting in a reduction in journey times between Totnes – Hemerdon of c. 2 – 3 minutes by raising linespeeds from 60mph to 75mph. The project has a Benefit Cost Ratio (BCR) of 6. The project is at an early stage of development (GRIP 0) and therefore there is an uncertainty range associated with this scheme, which will be narrowed as the scheme develops. The route and System Operator are working together to progress this scheme as an incremental enhancement alongside the operations, maintenance and renewals plan.

5.2. Asset intervention strategy

5.2.1. Summary route asset strategy

Asset area	Intervention strategy
Cross-asset prioritisation and maintenance / renewals balance	In developing the asset strategy for CP6 the route has adopted an approach of targeting the inclusion of a number of strategic objectives, notably to fund the renewal of the roof at Bristol Temple Meads (identified as a critical renewal activity for CP6 due to the condition of the existing asset) and to focus on greater use of refurbishment and mid-life intervention volumes to allow a wider number of assets to receive an intervention while delivering value for money. Funding for the conversion of track circuits to axle counters between Paddington and Airport Jn has been prioritised to improve reliability and train performance. The share of funding between assets has been informed by historic splits, modified to take into account structural changes, notably in the electrification and plant asset group. Reactive maintenance expenditure has also been increased to reflect where renewals items have been deferred, notably in buildings, structures and earthworks. Increased reactive volumes for track have also been included through the activity based volumes set for our maintenance delivery units. The overall asset strategy is therefore set on a totex basis, with opex and capex numbers reviewed and rebalanced accordingly to achieve the best possible outcome for the asset and living within our financial means.
Track	Track reliability is currently behind target for the composite reliability index, with a result of 1.2% against a target of 2.2% at the end of period 2017/18_P10. Performance in managing Condition of Track Temporary Speed Restrictions has been successful with the route beating target but overall track reliability has been adversely affected by other issues on high track criticality routes including failed crossings and insulated rail joints. The planned increase in train numbers and tonnage with the introduction of the Elizabeth line and enhanced Intercity Express Programme services continues to be a challenge to asset condition and reliability. Core elements of our track intervention programme include: **Plain Line** As in CP5, delivery of the plain line track renewals programme will be challenging as it is primarily based upon condition drivers on main line sites and high output islands which are likely to be inefficient to deliver. The plan removes approximately 75km of pre-1976 rail, however, some remains in high track categories. There is minimal opportunity for improvements such as stepping distances, restoring structural / electrical clearances, continuous welded rail conversions of existing jointed track and new check rails, with these options having not been taken up. CP5 will finish with a deferred renewal register comprising around 250 plain line items. One reason for this has been cost escalation and it is noted that there is no headroom in this plan for a similar position in CP6. There is 85km of deferred renewals addressed within our CP6 plan, however 33km will remain and have to be managed via enhanced maintenance activity and/or refurbishment work. Plain line pattern recognition will be implemented to undertake inspections of our plain line track, supplemented by Risk Based Maintenance where PLPR is not practical. These initiatives will ease resource demand to allow greater focus on maintenance compliance which will be needed to mitigate any risk associated with reduced renewal volumes. Plain Line delivery will be split between Track IP and Works delivery in similar proportions to CP5. The plan assumes that rail milling

	technology becomes available and can deliver at the forecast unit rates. **High Output** Our high output programme is dominated by work on the Didcot – Banbury route and west of Exeter. Conflict with late running enhancement programmes and application of cost constraints has resulted in 33km of CP5 volumes slipping to CP6. Areas particularly affected are between Maidenhead & Reading, and Didcot and Oxford. **S&C** S&C renewals focus is on further replacement of wooden bearer main line layouts for improved hot weather resilience at locations such as Abbotswood Junction between Bristol and Birmingham. The plan also includes several heavy refurbishments of 125mph main line concrete bearer units between Didcot and Swindon although this remains subject to finding a satisfactory method of delivering this work. The much needed works at Bristol East are not included in this plan as they are part of the wider Bristol enhancements scheme. Risk-based maintenance for S&C will be implemented, building on initial schemes on Reading and Plymouth Delivery Units. **Off Track** Our off-track plans include tactical level crossing surface renewals on a condition basis. Enhancement sites solely to address poor road profiles are excluded. Section 10.5.2 of the Lineside Asset Policy identifies an “action zone” for vegetation clearance from a 45 degree line out from the cess. The Policy recognises that this area is not expected to be cleared in CP6 and indeed the Western submission will not achieve this. Further, vegetation will not achieve compliance to the Company Standard NR/L2/TRK/5201 by the end of CP6. However, clearance of vegetation in line with the minimum requirements of running an electrified railway will be achieved.
Signalling	Measured through the composite reliability index (CRI), points asset performance is -1.8% against a target of 1.8% (at the end period 2017/18_P10). A key focus is reliability of points in the core inner Thames Valley corridor and the route has taken corrective action with the implementation of points care teams and a reliability improvement programme. This is expected to improve reliability towards target levels by the end of CP5, and our reliability plans for CP6 are aimed at improving that level of asset performance. Signalling CRI is better than target, with a result of 6.2% compared to the target of 4.2% at the end of period 2017/18_P10. The focus is on train detection reliability in the Thames Valley as well as signal and signalling system failures. A key part of the signalling asset intervention plan is to invest to replace obsolete track circuit equipment between Paddington and Airport Jn with axle counters, thus improving reliability and train performance. After a CP5 intervention programme of major upgrades to signalling systems on the mainline from Paddington to Bristol, we focus on targeted interventions to extend the asset life of signalling at Gloucester and in Cornwall, the latter building on the CP5 capacity improvement through the installation of a number of intermediate block sections. Targeted interventions are also planned for Exeter and Westbury Panel Signal Boxes, due to the condition of the cables installed in the early 1980s; and in the Worcester and Bristol South areas to prolong the asset life of the interlockings and external equipment at those locations. Track circuit works are planned on the lower part of the Berks & Hants line, and on the Bristol South area to manage issues of obsolescence, which will also improve reliability.

	We are working with the Digital Railway programme to assess the business case for the replacement of the Great Western Automatic Train Protection system installed between Paddington and Bristol with an ETCS solution. Pending that, financial provision is made within the signalling plan for a life-extension of GW-ATP so that the safety benefit can be maintained reliably. Provision is also made in the submission for interventions at active level crossings, and a large minor works provision has been made to allow for tactical asset intervention based on condition or reliability, reflective of the deferral of the major resignallings previously planned. The minor works allocation includes some provision for upgrading the current signalling centre at Didcot to a Railway Operating Centre. Additional maintenance money is allocated to support increased maintenance and fault response, notably for the Paddington – Reading section which will see additional train services as a result of both the Elizabeth line and enhanced Intercity Express Programme timetable changes. A risk-based maintenance programme is underway to review our current approach to signalling maintenance to identify and implement the changes needed to support the new train service and to maintain asset reliability as much as possible.
E&P	E&P reliability is currently better than target with a result of -4.7% compared to the target of -5.9% at the end of period 2017/18_P10. The worse reliability compared to the end of CP4 is reflective of the changed asset position on Western with electrification assets in place which were not part of the baseline for CP4. CRI is expected to be rebaselined for CP6 which will enable the increase in electrification to be incorporated properly into the reliability metrics. The overall condition and risk level of the Western Route E&P portfolio will be sustained in CP6 at the CP5 level. As the majority of the OLE system will either be newly constructed or substantially upgraded in CP5, E&P renewals focuses mainly on power distribution. However, our plans include the conversion of 20 headspans to improve safety in stations in the event of a dewirement. Works planned also include improvements to electrical clearance at a number of station platforms in the Thames Valley in line with current policy. The continuation of campaign changes started in CP5 will continue on the existing infrastructure in CP6. Power distribution works planned consist of the renewal of life-expired signalling power cables, predominantly on the Westbury to Castle Cary line, the renewal of six principal supply points including supplies at TVSC and Didcot Critical Data Centre, the renewal of life-expired HV switchgear and which is subject to operating restrictions, and the refurbishment of a number of UPS systems to life extend them pending full renewal in CP7. The largest challenge will be taking on, running and maintaining new OLE assets across the route and the learning that all parts of the organisation needs to go through to enable this to be a success. The route has adopted a route-based SCADA system in order to support energisation and introduction of electric traction whilst the new national SCADA system is being rolled out. There is no budgetary provision for the transition to the national SCADA nor for any capex required of the system.
Structures	Structures reliability is presently in line with target for CRI. Funding provision in CP6 requires activity to be primarily focussed on maintaining capability of assets for the loading, and intervention on poor condition assets to maintain safety and reduce likelihood of impact on performance. Deferral of work from CP5 due to budget changes has resulted in the early part of CP6 being fully populated and scoped. Later stages are being developed and defined against known works drivers already encompassed in the prioritised bottom up work bank.

	Structural works will target strengthening and repairs that remove current risk and short term degradation. Work activity will drive lowest implementation cost, and move away from lowest whole life cost, with less activity associated with painting and waterproofing. Overall, our overbridge works shall be targeted at maintaining bridge capability to Network Rail's liability, while tunnel works will target areas of the lining to enhance the overall condition Minor portfolio spending on culverts, retaining walls and coastal & estuarine defences will address known defects and performance issues that affect the operational infrastructure, thus restoring the capability to a suitable level with minimal spending per asset. Minor works provision has been set against the current spend profile, at approximately £8m per year. Additionally funding has been used to allow for a more reactive nature to emerging asset deterioration and defect rectification.
Geotechnical	**Earthworks** The overall condition and risk level of the Western route earthworks portfolio will be sustained in CP6 at the CP5 entry level, such that the asset base will not degrade in either condition or risk; as measured by the Earthwork Condition Score and the Risk Score (Composite Reliability Index, CIV028) respectively. Earthwork interventions will be prioritised based on the highest safety risk. Currently the highest risks are posed by the deferred renewal sites. As such it is proposed that these sites, such as Wootton Bassett Cutting, Studley Grange Cutting and Doublebois Embankment, are completed in precedence of other sites in the early part of CP6. The use of better decision making tools (Civils Strategic Asset Management System), remote condition monitoring equipment and a continued collaborative relationship with our Delivery Partners (IP, Works Delivery and the Maintenance Delivery Units) will be progressed in CP6. These proactive measures will continue to be adopted to ensure targeted interventions are completed prior to reduction in level of service occurring. The CP6 earthworks policy continues a broader approach to the management of the asset by requiring greater proportional application of the lower cost interventions of refurbishment and maintenance, rather than complete renewal. Packages of refurbishment works targeting discrete issues, such as embankment scour, rock cutting de-vegetation / scaling and burrowing remediation, will be continue in CP6; having found to be effective, in terms of cost and asset improvement, in CP5. Western route is committed to reacting to the challenges of climate change to ensure the long-term resilience and sustainability of all assets. All CP6 earthwork renewal schemes shall fully consider the potential effects of climate change and, where reasonably practical, incorporate long-term resilience measures to mitigate the effects of adverse weather events into scheme designs. Extensive works to provide resilience at Dawlish and Teignmouth are provided as an investment option. Although small in volume and cost, Mining represents a significant risk to railway operations, notably in Cornwall due to the historic undocumented nature of mining mineral veins. In CP6, as in CP5, detailed studies (and subsequent intervention works, where necessary) will target Mining assets deemed to pose the highest risk to the operational railway; based on outputs from the STE developed Mining Risk Rating System (MRRS) tool. Western route will continue to work collaboratively with the STE Mining team to ensure risks posed by Mining assets are mitigated in an appropriate manner.

	Drainage Continuing from CP5, in CP6 there will be an increased focus on the management of drainage as a system; this approach will allow better support to be offered to parent assets including track, earthworks and structures. Targeted intervention works, particularly between London Paddington and Reading on the Great Western Main Line, will be implemented to improve the service condition of drainage assets and the resultant performance improvement to the track asset. Furthermore a continued focus on strategic intervention works on cutting slope crest drainage channels will ensure safety risks from washout / earthflow failures are mitigated against. An increase in the capabilities / skills of the drainage maintenance and inspection teams in Delivery Units, which were established in CP5, will be progressed in CP6. The maintenance teams will allow further fundamental and straightforward drainage work to be completed for the lowest possible cost whilst retaining the skills and experience within Network Rail. Increased work on drainage assets to improve the resilience of systems to ensure changes in seasonal climatic effects do not cause cyclical performance issues. Intervention schemes are proposed to be undertaken at key flood locations to provide further resilience to the drainage systems. These projects will build upon preparatory and investigative works completed in CP5. The use of Remote condition monitoring shall be considered and its implementation selected where appropriate to allow for continuous monitoring of high risk assets. In CP6, as in CP5, Western route will continue, when deemed necessary, to enhance the frequency of preventative maintenance at high risk drainage locations considered for Remote Condition Monitoring fitment; such that a proactive risk management philosophy is adopted. Collaborative working with Project teams and Third Party organisations will be continued in CP6. Where opportunities are identified equipment will be provided to enhancement and project teams to enable the fitment of new catch pit rings and lids during drainage investigation works. Western route believes the adoption of this practice is the lowest whole life cost intervention to improve asset condition without compromising on quality and most importantly enhancement/project budgets.
Buildings	Buildings asset reliability (measured through CRI) is currently 2.9%, ahead of the 2.3% target for period 2017/18_P10. Major renewals schemes are planned to include 15 station rewires, including a major operational platform rewiring scheme at Plymouth, 27 platform and canopy lighting schemes, works on 12 lifts and escalators at Paddington. There is also a series of works planned at Bristol St Philips Marsh depot, consisting of renewals to the wheel lathe, HST wash, fuel tank and shed on the fire alarm, pit lighting and power. Major works are also due for the trainshed roof and station wiring systems at Bristol Temple Meads station which are essential to the continued safe operation of the station. £10m has been provided for an accommodation upgrade programme for the NR non-franchised estate to meet the modern requirements for our colleague facilities. This will address a period of under investment and is reflective of our route vision commitments to our people and our communities.

Telecoms (NRT)

As an asset owner in its own right, Network Rail Telecom has developed the telecoms submission for Western as part of their overall national submission, working closely with Western route through a series of stakeholder engagement meetings. Principal points of the NRT submission include:

- Budget concentrated to address concerns with ageing telecoms equipment and power supplies to support assets with earlier FTN transmission roll-out
- Budget allocated across all of the SISS assets on Western route and a reactive minor works budget allowance included for cable and route renewals
- Budget targeted at level crossing improvements (including migrations to Network Rail services to suit performance), telephone concentrators and voice recorders. Some limited budget on DOO assets
- Significant budget evenly allocated on PA/PAVA, CIS and CCTV

NRT CP6 Themes	Drivers
Transition to a single IP telecommunications network	Improve availability, performance, scalability and security of national connectivity and assets Remove non-maintainable and end-of-life assets and spares Reduce cost and complexity i.e. improve sustainability Exploit new technology and extend use of assets for passengers and lineside neighbours
Improve network management, monitoring and orchestration capabilities	Deliver better business knowledge enabling better business decisions
Standardise assets and services	Deliver open architecture enabling secure 'plug and play' Improve delivery lead times Reduce cost and complexity Simplify training and competency requirements Move towards an end-to-end SLA-focused delivery
Mature our business operations	Develop processes Deliver Operations Support Services (OSS) platform Ensure the right people have the right competencies for their role Develop self-service opportunities
Mitigate decline of asset sustainability level	Rectify underinvestment in assets from previous control periods
Extend the use of assets and infrastructure	Underpin the digital railway Satisfy government desire (from DfT & DCMS) for mobile connectivity on trains and digital inclusion for lineside neighbours Shape industrial strategy and policies
Safety, security and innovation feature throughout NRT's plans and activities	

Asset data	The route has been engaged with a number of CP5 asset programmes; notably we were at the forefront of Asset Data Governance as the pilot for the country. We successfully upgraded to Ellipse 8 and are involved with the exploitation of Ellipse working group. Throughout CP5 the route is implementing, utilising and embedding ORBIS and Asset Information Services systems to maximise the benefit opportunities they bring. Recognising the importance of data and treating it as an asset in its own right, the route identified a need for a new data organisation which was designed, consulted and created on behalf of all routes and has been deployed in Western. As we exit CP5 and move into CP6 work will continue to improve our asset data quality, including completeness, across the seven asset disciplines. New trains will introduce a range of sensors that will analyse various parts of our infrastructure and provide near real time information about our Assets. Tools from ORBIS will continue to be embedded and the Intelligent Infrastructure programme will provide additional new tools to aid decision making. The data team will take data from the various sources and turn it into information and intelligence allowing Route Asset Managers to make informed decisions. As the route continues to devolve self-assurance will become critical to ensure the data and intelligence we are acting upon is accurate. CP6 will continue to see the introduction of tools and systems to enable better predict and prevent approach to managing assets, whilst using performance and asset data to identify root causes. A risk to having accurate data stored in one location is that of security. The route will need to develop a cyber security plan on how to protect the data and the physical assets from any threats in this area. It will also need to be mindful of data protection laws and freedom of information requests that it may be subjected to. Utilising industry best practice and taking guidance from standards such as ISO 55000 and ISO 8000 will aid with this and other activities. In CP6 Western route will look to use the tools and capabilities provided by ORBIS, EBAK and other national programmes to change the way we work. In turn we expect these will enable us to invest in the right infrastructure at the right time.
Level crossings	We have ringfenced funding to develop, progress and complete the closure of Tackley bridleway level crossing, located on a key section of the railway north of Oxford. In addition, four open level crossings will be renewed as the ABCL type, adding barriers, yodelarms and wigwags at sites which have been subject to near misses in the past. Full, conventional renewals will take place at a further 19 level crossings around the route, bringing crossings up to modern standards and extending asset life. This will encompass a range of crossing types included MCBs, AHBs and MSLs. Within our overall safety fund we have provision to be able to commence implementation of some technological improvements, such as overlay MSLs and / or the new active warning system dubbed ‘Project Meerkat’; the scope of these is as yet undefined and will be developed through CP6. A minor works fund has been set aside to target both planned and reactive minor works to passive level crossings. This is a continuation of the fund set up in CP5 which has proven crucial in delivering safety improvements at footpath, bridleway and user-worked crossings. We will continue our programme of level crossing closures beyond those funded by the CP5 national level crossing risk reduction fund. These are route-led closures focusing on the rationalisation of footpaths and bridleways, and the buy-out of user-worked crossing rights-holders. Our

	programme of narrative risk assessments and asset inspections will also continue, identifying closure and enhancement opportunities with schemes progressed under the oversight of the route level crossing steering group, subject to suitable cost-benefit analysis. Our total financial spend on level crossings in CP6 will be at least £69.6m. This will provide risk reductions of: • Circa 90% at four open crossings being renewed as ABCL type; • 100% risk reduction at Tackley, one of the Route's top 10 level crossings by FWI risk and the only crossing providing sole access between two platforms on a two-track, high-speed railway on Western; • Circa 60% risk reduction at two footpath crossings being renewed as MSL type, with the same risk reduction applied to any other crossings identified for fitment of overlay MSL through the safety fund; • Between 5-10% risk reduction at passive crossings where civils improvements take place using the minor works fund.

5.2.2. Research and development

Western route has a programme of development work aligned to the Network Rail Capability Delivery Plan. The focus of route work is around the tactical requirement to improve the availability of the railway system for customers; and to the requirements and opportunities presented by new train fleets and technologies delivered to the route for the start of CP6. Each of our locally driven initiatives is aligned to the national challenge statements and we work closely with other routes and customers to address emerging requirements. Our main CP6 R&D initiatives comprise:

- **Earthworks stability monitoring**
  This is additional to the national programme of earthworks monitoring as part of Intelligent Infrastructure. The route has accelerated monitoring of high risk sites using arrays of inclinometers and loggers to provide alerts on earthwork instability. The benefit is increased safety of the line and higher asset availability through timely and appropriate interventions

- **Service train infrastructure data collection.**
  5 x Class 801 and 3 x Class 802 IEP trains are fitted with Unattended Track Geometry Measurement Systems (UGMS) under the contract with Hitachi. This data is available to the route to process and align to track maintenance and asset management activity. The route has worked jointly with LNW and STE to develop the tactical hub at Coventry University to support data storage and analysis under "Big data" analytics. 3 x Elizabeth line class 345s allow MTR Crossrail to collect track and OLE data on Western infrastructure and the route are developing analytics with TfL under RSSB research project R685, which is focused on the principles of data sharing agreements for the management of the railway system. The route is undertaking innovative collaborative research with Oxford University and LNW in developing OLE pattern recognition for dynamic measurement of overhead line using the cameras fitted to the roof of every new train. This allows maintainability of the OLE to be addressed on the high speed sections, closing a measurement gap in the dedicated measurement fleet.

- **Traction Change Management**
  The IEP bi-mode (diesel or electric traction) timetable requires transition at speed between traction power in addition to changeover at station calls. The route is developing the operational methodology, linked to Automatic Power Change Over (APCO) balise management.

- **Intelligent Infrastructure extension**
  The route is the chosen pilot for fixed infrastructure trials on the extension of Intelligent Infrastructure for HPSS S&C reliability and busbar monitoring. If successful, the equipment will be extended across the country, further improving safety in maintenance by more timely and planned intervention.

- **Dynamic foundations for Track Bed**
  The route has known track bed instability associated with poor ground conditions, particularly over marshland (Somerset levels) or high groundwater areas – typically spring line locations created by geological conditions of chalk and greensand common in Southern England. The route is developing a dynamic track foundation solution which reduces the requirement for extensive ground stabilisation programmes required to address instability. The benefit is capital saving and improved track maintainability.

5.2.3. Weather resilience

Western route is committed to reacting to the challenges of climate change to ensure the long-term resilience and sustainability of all assets.

All earthwork renewal schemes shall fully consider the potential effects of climate change and, where reasonably practical, incorporate long-term resilience measures to mitigate the effects of adverse weather events into scheme designs.

In CP5, Western route has developed a Weather Resilience and Climate Change Plan which is targeting those highest risk sites where performance and safety are compromised. Some of these sites will rollover into CP6 and other Adverse Weather sites will also be incorporated into the strategy. In some cases the use of remote condition monitoring will be employed to manage the risk. Operational practices such as vegetation clearance will also be implemented to maintain reduced levels of vegetation on newly electrified routes.

Following prioritisation of the risk mitigation provided, the status of specific weather resilience schemes for Western route is shown overleaf. The proposed works to improve the resilience of the railway between Exeter and Newton Abbot is presented as an investment option in Appendix D.

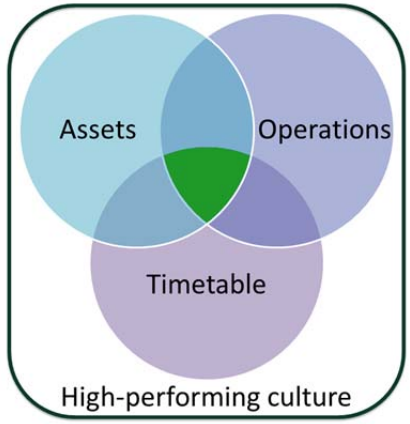
Weather resilience schemes *included* in OMR submission		Weather resilience schemes *excluded* in OMR submission	
Scheme	**£m**	**Scheme**	**£m**
High risk culvert renewals	4.0	Flooding targeted culvert works	1.0
Coastal & estuarine defences: Teign and Exeter works	5.0	Coastal & estuarine defences: Penzance and Exe estuary	2.6
Remediation at 12 high risk scour sites	4.6	Remediation at a further 27 scour risk sites	5.4
Dawlish sea wall minor works	1.25	Coastal & estuarine defences minor works	1.3
Culvert minor works (reactive)	3.3	Culvert policy compliance works	3.6
Bath Road cutting resilience	1.5	10 underbridge scour and flood risk sites	4.1
Soil cutting crest drainage refurbishment	9.5	Soil cutting resilience to adverse weather	15.0
Embankment toe drainage refurbishment	1.5	Embankment scour schemes	1.7
Earthworks minor works (reactive)	4.6	Exeter to Newton Abbot resilience (CP6 funding; see also appendix D)	286.2
Total	**35.3**	**Total**	**320.9**

5.3. Operational plan

5.3.1. Train performance strategy (linked to plans in appendix A)

Train performance is achieved through the whole industry working together. Excellence in train performance arises when good asset management is combined with good operation of a robust, well-specified timetable. For the remainder of CP5 and into year 1 of CP6 the benefits from recent infrastructure work will be seen with the introduction of new Operators, new fleet and timetables, this changes current performance relationships giving uncertainty to the CP6 outturn metrics. A collaborative strategy between asset manager, maintainer and operator within Network Rail, and between ROSCO, maintainer and operator within the train operators will be required throughout CP6, with strengthening of Alliance activities, overseen by the Route Supervisory Board including Operators Network Rail and industry stakeholders such as Transport Focus.

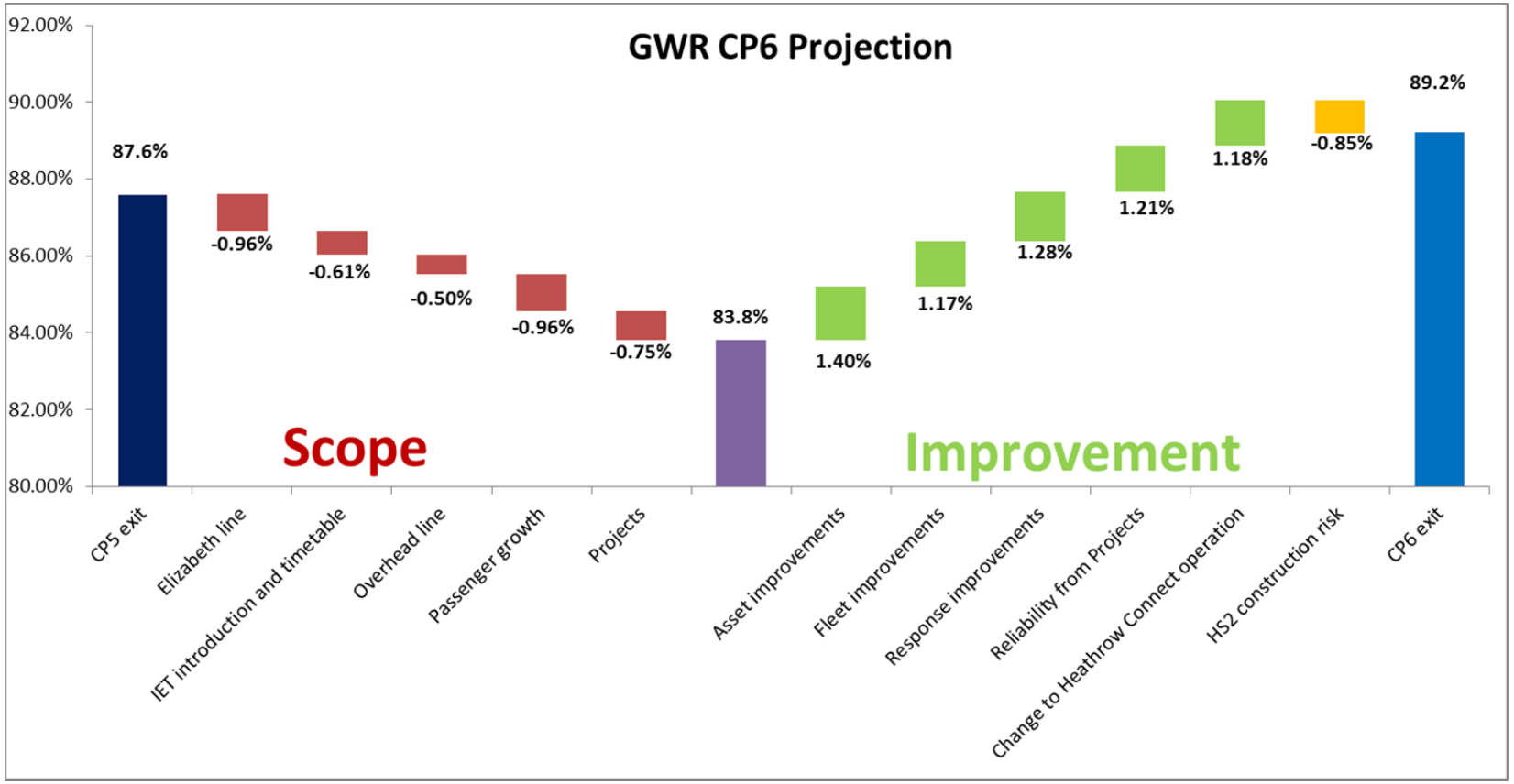
The performance strategy accordingly comprises the following elements:



- Achievement of the asset reliability outcomes predicted by the volumes documented elsewhere in this Route Strategic Plan: the means to achieve this need to include the implementation of an appropriate risk-based maintenance regime and holistic management of assets in relevant system groupings, including the use of dedicated care teams as appropriate;
- Development of excellence in operations for the route which effectively manages the consequences of delay through robust train service management, and which develops constructive relationships with MTR Crossrail to minimise overall network delay and the risk of delay import and export through the Elizabeth line central operating section. Vital to this is the development and implementation of a Traffic Management System and Connected Driver Advisory System and the location of Control Activity on the operating floor of TVSC, comprising of NR, GWR, MTR Crossrail and Hitachi. The route will trial a traffic management system in for a year starting in the summer of 2018;
- Working to implement a robust timetable (linked to refranchising opportunities), based on accurately calculated planning values, which is optimised to make the most effective use of the available capacity, supported by an appropriately resourced timetable planning team. This will require cross-industry collaboration to achieve the required performance outputs;
- Underpinned with the development of a high-performance culture on the route, embedded through front-line colleague engagement in running the railway right-time.

These four strategic elements for Network Rail will need to be supported by joint working between performance teams and continued cross-agency and cross-industry working to minimise the risk of suicide on the network, and an appropriate strategy for weather resilience and climate change. In addition, joint working with all our train operating colleagues will be required, (e.g. fleet reliability, train crew availability, driving style and mode of operation, and in the effective management of the train service) both during disruption and in normal running. There is also an opportunity to align performance objectives through the refranchising of the Greater Western Franchise.

It is expected that the current performance recovery programme will provide the foundation for the performance strategy in CP6, through both the continuation of the tactical actions and the development and implementation of the strategic actions outlined in that programme.



The above graph shows the projected movement in GWR train performance from CP5 exit to CP6 exit. It is expressed in PPM for comparison between control periods. A number of significant scope changes occur at the beginning of CP6 which have the impact of reducing performance. The introduction of new services for Crossrail and the enhanced IEP timetable, as well as provision for electrification delay and passenger growth have the effect of structurally reducing performance. However, these are in turn offset through improvements to asset reliability (principally the conversion of track circuits to axle counters between Paddington and Airport Junction), improvements in response to incidents, and the expected improved reliability of the newer train fleets result in an overall improved position, which is tempered by provision for disruption to operations arising from HS2 construction at Old Oak Common near Paddington. The improvement profile builds on our current performance initiatives, where we are working closely with GWR and other TOCs to improve.

5.3.2. Route operations strategy

By the beginning of CP6, Western route will have seen a transformation of its operating landscape with the majority of the railway between London Paddington and Bristol controlled from the Western Rail Operating Centre (ROC) and with an operational Electrical Control Room functioning from the same location. Throughout CP6 this pace of change, particularly in respect of timetabled services is expected to continue and as a result there are some key operational considerations for the route in CP6.

Elizabeth line
From 2019, MTR Crossrail will run services on the route, combining metro and outer-suburban services which will run every 2.5 minutes through the central section. In conjunction with Rail for London and other stakeholders we are developing an end to end control strategy which will set out a consistent way of managing the Elizabeth line network regardless of infrastructure manager. The key aspects will be strong contingency planning, speed of intervention, clear inter-control standard operating processes and effective communication.

We will work closely with Anglia route colleagues, Rail for London and Heathrow Airport Limited to deliver the Elizabeth line successfully across the network. Anglia are the lead route, however we will set up a governance structure, underpinned by the alliance board, to direct cross route performance management and decision-making. Through CP5 we have been developing an end to end Elizabeth line performance regime which sets out the delay attribution principles and looks to minimise the impact of importing delays between the various infrastructure managers.

The final pillar of our end to end strategies for managing the Elizabeth line is the maintenance strategy which will set up aspirational common targets and consistent ways of working between Romford and Reading delivery units. The governance for this forum is in place in CP5 and will continue in to CP6 and is jointly attended by both routes and Rail for London.

We are increasing our operations and maintenance response capability to address the challenges of increased train services. The key to success is being transparent and building greater alliancing and collaboration with train operator colleagues.

Western ROC
Currently, Thames Valley Signalling Centre is not designed with the capability to house the full operational control function for Western route with some significant shortfalls in key requirements. Therefore we are currently focusing the TVSC at Didcot on the Eastern end of the route with Exeter Panel Signalbox (PSB) being considered for operational control of lines to Penzance and the Westbury area in future years. This enables constrained space at TVSC to be utilised for other purposes such as potential for some operational control functionality and to maximise the benefits of Digital Railway initiatives. In CP5, a remit has been developed to explore the operational requirements for TVSC and during CP6 we will look to address the best use of our operational buildings to fulfil route requirements. In addition we will work to consider Exeter PSB as a suitable location for the control and management of services in the West.

Operational and Signalling Control
The route is currently engaged in developing digital railway tools using Resonate's "Luminate" product which is expected to be brought into trial use in 2018. Following a period of assessing the benefits afforded by this digital technology the route team expects to develop these products further to maximise the benefits and align the operational organisation to achieve those benefits. We will continue to drive excellence in railway operations to reduce disruption to services to deliver the planned train service as punctually as possible.

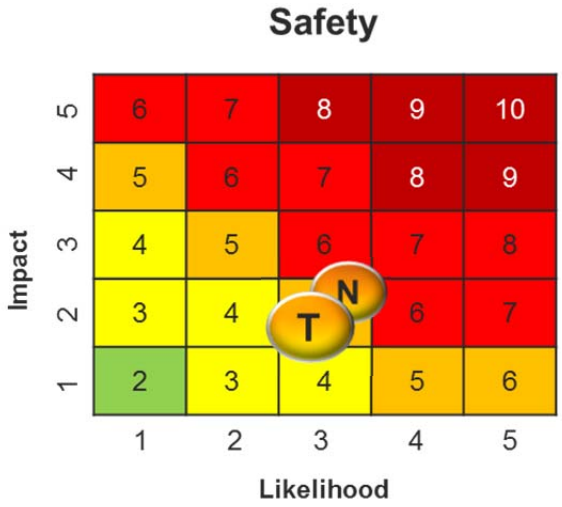
Infrastructure Interventions
A number of projects have introduced systems into TVSC under separate governance arrangements; as a result these systems have not necessarily been optimised and we believe there are untapped opportunities to use the equipment better. In CP6 we will look to continue exploring and implementing these opportunities the deliver greater business benefits.

5.3.3. Approach to resilience

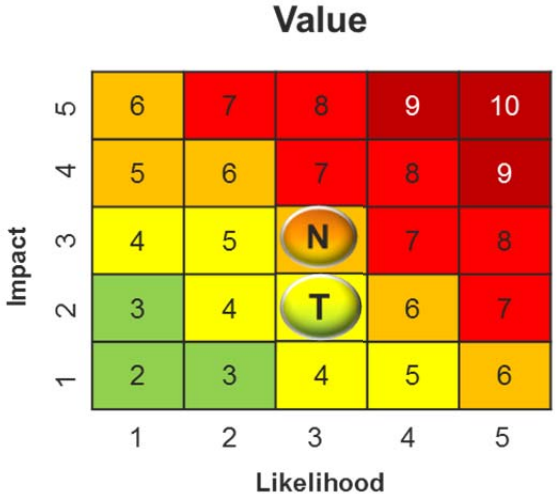
Through CP6 Western will continue to develop its approach to resilience (including business continuity, information governance and cyber security), through the adoption and implementation of a business continuity framework for the route with appropriate business impact statements and continuity plans in place. Further, the route will continue to develop its contingent operating resource in order to maintain a level of service on the network if required. In developing these plans, the route will continue to work close with our customers so that contingent resources are optimised based on customer service pattern aspirations.

5.4. Output risk summary

5.4.1. Risk

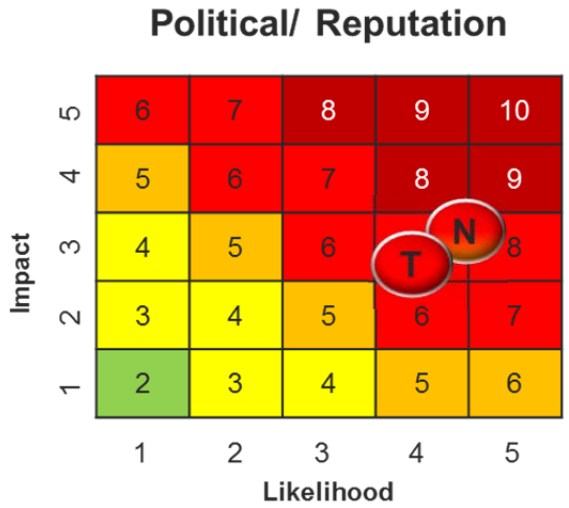


Summary of risk outcome
Through CP6 we will increase our asset refurbishment volumes to offset the risk of asset deterioration from CP5 reductions to renewals expenditure. Further, we will implement a number of initiatives benefiting workforce and passenger & public safety, including dedicated funding for the closure of level crossings. Our safety risk profile therefore remains within the corporate appetite for safety risk.

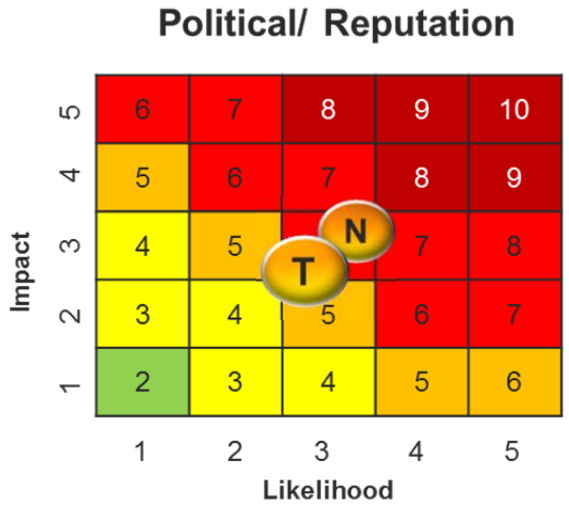


Summary of risk outcome
With current asset policies and delivery mechanisms, delivering value is challenging. We intend to address these issues prior to CP6 to be able to reduce risk in this area. Key contributors will include Activity Based Planning for maintenance, value based incentives for Infrastructure Projects and upgrading of our approach to clienting and selection of delivery partners. We have also managed our plans to meet the financial expectations for the route.

N = current risk position (net), T = forecast risk position (target)

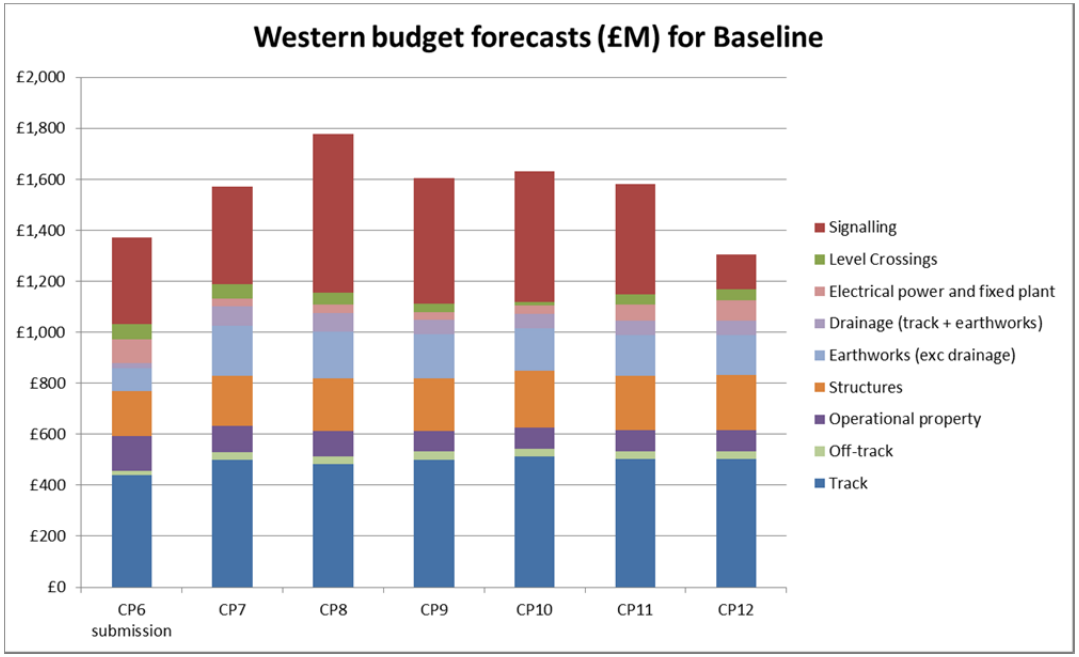


Summary of risk outcome
In view of the increase in planned train services, and the potential impact of HS2 construction on performance, performance risk (and consequently reputational risk) will be outside of appetite. However, depending on the outcome of the current trial, implementing traffic management and a connected driver advisory system could bring improvements to service management and delay per incident.



Summary of risk outcome
Reputation risk is clearly linked to the likely train performance outturn and the impact on Elizabeth line services, as well as the impact of community disruption through continued modernisation works, and HS2 works at Old Oak Common. The risk likelihood worsens due to the linkage to performance and the deferral of electrification schemes between control periods extending the construction disruption period.

5.4.2. Long-run forecast



- This graph describes the long term expenditure forecast to control period 12, assuming expenditure levels for CP6 are consistent with the levels outlined in this plan.
- Beyond the end of CP6, the assumed level of investment is that to retain the character (condition and performance) of the asset at CP6 levels.
- Individual asset condition and output long term trajectories for this long term level of spend can be found in Appendix F.

Expenditure and implications	Mitigations
Modelling shows a baseline assumption of c. £206m additional long-term expenditure per year over CP6 submission, mainly in the signalling asset group. This refers to planned resignallings at Worcester, Gloucester and Cornwall (deferred from CP6, now due CP7 – CP8), and at Exeter and Westbury (CP9 – CP11). Track and earthworks expenditure is also forecast to increase, while there is a reduction in operational property, where the CP6 expenditure level is dominated by significant works at Bristol Temple Meads station which are not forecast to be repeated. Overall, such expenditure is forecast to bring an improvement in plain line and S&C track remaining life, a significant improvement in signalling remaining life, and generally positive benefits to all assets.	Digital Railway (ETCS) may provide an opportunity to reduce expenditure on the planned resignalling schemes. Given that forecast increased volumes of expenditure will require the wider supply chain to be in a position to deliver, early engagement with the supply chain on forward workbanks is required to mitigate any resource constraints, including smoothing of the annual and control period profiles to create a sustainable delivery plan.

6. Customer focus & capacity strategy

6.1. Capacity & timetabling

The Greater West Programme delivers a number of benefits incrementally during CP5 and CP6, key amongst which is additional capacity on services across the route. This additional capacity is delivered through the introduction of Intercity Express Trains on mainline routes along with the cascade of higher-capacity rolling stock from the Thames Valley to provide additional seats on journeys in to urban centres in the South West such as Bristol and Exeter.

Faster, higher-capacity rolling stock will also be capable of shortening journey times across the route. To enable the benefits of this increased performance to be realised in the timetable, Network Rail fulfils an important role as System Operator to work with train operators and achieve robust timetables which deliver those improvements. Integration of Elizabeth line and MetroWest services proposed for introduction during CP6 with a significant change in long-distance services between London, Bristol, South Wales and the South West is a central part of this challenge.

Enabling the delivery of additional capacity on an increasingly busy network during CP6 will require collaborative, innovative ways of allocating capacity on the network. We are embedding a customer-focussed approach to major timetable change events which maintains focus on the benefits sought by funders through industry Event Steering Groups. To make sure that any capacity allocation follows the corporate framework, all timetable changes involving additional services will be assessed by the route and submitted to the Sale of Access Rights Panel for authority to contract.

During CP6, key passenger benefits will be delivered by new Greater Western and CrossCountry franchises. We will work with the Department for Transport to inform the development of these significant franchise specifications. We will also work with users of the network to agree outputs which are cognisant of the competing demands on finite network capacity such as with forecast growth in freight traffic.

The establishment and integration of the System Operator will be fundamental to achieving this, and the route is working closely with the System Operator team. Consideration is being given to potential aligned scorecard metrics between the System Operator and the route.

6.2. Future capacity & growth

The transformational Greater West programme delivers significant additional capacity to the network at the start of CP6. As a key output of the Long Term Planning Process the Western Route Study envisages growth in demand that continues for both passenger and freight services on the network. Demand for travel in to London Paddington during peak periods on Main Line services is forecast to double by 2043 with up to 29% of that increase expected by the end of CP6. Significant growth factors also drive forecast growth in regional journeys to Bristol Temple Meads of up to 47% by the end of CP6 and up to 111% by 2043.

Improved rolling stock and journey times delivered at the start of CP6 are expected to contribute to this growth and build on the phenomenal success of the rail industry in attracting more passengers. The challenge of meeting this growth alongside forecast increases in freight volumes whilst delivering the high levels of punctuality which passengers and stakeholders expect is considerable. To meet this challenge, infrastructure and technology interventions are under development to enhance the capacity and performance of the Western route.

These interventions will be presented as choices for funders and will form a “pipeline” of potential enhancement options which could address key capacity challenges and offer connectivity improvements over the next 30 years. Opportunities to attract parties new to the rail industry to contribute funding to this portfolio of investment options will be actively explored. This portfolio of interventions will be kept under review to adapt to changes in the rail market and context as well as to incorporate understanding

gained from iterative development of interventions. This process is in line with the memorandum of understanding reached between Network Rail and the Department for Transport in March 2016 and incorporates lessons learnt from the portfolio of CP5 enhancement projects.

Further description of the interventions along with their outputs currently proposed for development in CP6 is contained in map in section 5.1. Due to the need to align with deferred enhancement scope from CP5, part of the development funding sought for these interventions is required in CP5. Interventions which address junction capacity at Bristol, Didcot and London Paddington are significant due to the need to address challenges which are anticipated to exist from the start of CP6. Forecast growth in intermodal traffic from ports in combination with passenger growth leads to the need to consider interventions between Reading and Oxford, between Didcot and Swindon and capability enhancements between Bradford Junction and Bathampton.

Growth in passenger volumes of the magnitude forecast in the Western Route Study will require increases in the quantity of rolling stock and changes to the configuration of that rolling stock. We will work with the Department for Transport and wider rail industry to develop a depots and rolling stock strategy which supports this level of growth and identify choices for funders within that strategy.

6.3. Digital Railway

Western is working closely with Group Digital Railway to develop business case options for deployment schemes on the route. Specifically under development by Digital Railway is a business case for a traffic management and connected driver advisory system deployment on the route which would address concerns of delay per incident and improve train performance. In support of this, the route is trialling Traffic Management technology in the Thames Valley Signalling Centre by the end of CP5 in order to assess the benefits which may arise from such an intervention. Furthermore, the route is planning to upgrade track circuits to axle counters between Paddington and Airport Junction as part of the signalling plan. These will be delivered to Digital Railway Ready specification for any future rollout of wider digital technologies.

6.4. Communications

The Western route communications strategy for Control Period 6 (CP6) will be customer-focused, built on our Alliance with the Great Western Railway, and reflect our devolved status.

The Western route at the start of CP6 will be transformed compared to the route which started CP5. These five years have seen the completion of the Reading Station Area Renewal, the introduction of Elizabeth line services, and above all a massive effort to electrify the Great Western Mainline. These and hundreds of other improvements will be more fully realised over CP6, and joined by further upgrades.

Communications strategy has developed to reflect the changes in the route during this period. The communications team benefits from a revised structure, broader professional expertise and a much closer working relationship with Great Western Railways and other partners. As we move into CP6, our communications effort will support both the upgrade and operational work and roll them into a narrative of continuous, customer-focused improvement. This will cover internal and external audiences and build on the significant strides which have already been taken in this area. We will continue to be guided by the research-based intelligence we have built up over recent years and focus on the key drivers of public opinion; mainly safety-consciousness, caring about passengers and lineside neighbours, and improving performance.

6.5. Property

The route works collaboratively with Property and requires strategic property and town planning advice together with associated property acquisitions and transactions to support the delivery of operational, maintenance, renewals and enhancements on the Western route, currently with particular support and emphasis on:

- HS2;
- Western Rail Link to Heathrow Airport;
- Great Western Route modernisation;
- Metro West

- All other major enhancement projects.

Continued focus will be on engaging with Property and planning projects at an early stage in order that appropriate delivery strategies can be put in place to enable projects to be delivered efficiently. Early engagement will lead to joint planning of the delivery of projects via Transport & Works Act Orders or Development Consent Orders where appropriate.

Land Strategies
We will also look to develop detailed land strategies with Property to help inform the optimum use of land, realise additional benefits, such as better operational facilities where that may release development land, and leverage in third party investment. The route through the System Operator, Business Development Director and Sponsor teams, with the support of Property, will continue to build on the good record of the Western route to attract inward investment to the business (such as through Section 106 contributions) making best use of Property/route expertise and experience in commercial activities and initiatives particularly for station and network enhancements. In particular:

- Thames Valley land strategy, a broad strategy for our land holdings between Paddington and Reading;
- Bristol Gateway project, where we are working with stakeholders towards an integrated funding strategy to deliver the station masterplan vision
- Oxford Station Masterplan, where we are working with a third party investor and key stakeholders to fund and deliver a new station gateway and enhanced station facilities
- Swindon Station Regeneration scheme where we are working with key stakeholders as part of a town centre regeneration scheme supported by One Public Estate. Aspiration to secure station enhancement and release of land for housing and commercial development.
- Plymouth Station Masterplan where we are working with Plymouth City Council and Plymouth University to deliver their aspiration for a new station gateway and release of land for delivery of new University faculty building.
- Exeter St David's land strategy working with GWR to deliver new LMD and key stakeholders for delivery of new station interchange and release of residential land.

Disposals and Income Generation
The route will work together with Property, helping to fund Network Rail's Railway Upgrade Plan by selling assets not core to Network Rail operations and seeking to release surplus railway land for housing to achieve government targets. Key sites identified for housing include Westbourne Park MDU, Slough West Yard and Reading Napier Road. In addition, the disposals programme may be supplemented by identifying surplus freight sites, for instance West Drayton and Bath Westmoreland Road, but only where the value release proposal protects current traffic generating operations and in a way that uses land strategy to optimise freight operations in the route. These sites are all currently being considered under the Thames Valley Land Strategy.

All sites that are being considered for disposal will be subject of early consultation with the route teams in order that operational uses can be protected, and where possible, enhanced. The route/ Property will work together to dispose of land where it presents a liability to the route (e.g. Oxford Swing Bridge Ancient Monument).

The route and Property are also seeking to work more collaboratively with the Train Operator to look at joint disposals where this benefits the industry through reduced costs or enhancing passengers experience (existing projects include the station masterplans aforementioned). Alliance Development Exec has been formed between route, Property and TOC to deal with these matters.

The route, in partnership with Property, will continue to help grow Property's sustainable growth model by generating income to reinvest and create a better railway for a better Britain. This will include increasing Retail income and passenger outcomes, and working with Asset Protection to generate income where developers seek to use or develop Network Rail land.

7. Cost competiveness & delivery strategy

7.1. Summary route deliverability statement

The volumes proposed in this Route Strategic Plan are considered deliverable, having been subject to local delivery assessment between the route asset managers and their delivery partners at an early stage of development. Further, the volumes are considered deliverable as across all assets and years they are below the peak volumes delivered in the early years of CP5.

Earlier in the route strategic plan development process the route commissioned an independent deliverability assessment of our workbanks to inform this submission. Following this, engagement between the route and our delivery partners was improved to inform this submission, and we have worked collaborative with our deliverers on both our plans and efficiency opportunities.

A detailed data room has been prepared in support of the route strategic plan, which contains the individual workbank activities for each asset. Attached to these workbank activities are attributes which have allowed us to inform the process, such as named deliverer, year, location and type of intervention, which gives further assurance of deliverability.

To support assessment of deliverability, the route has used a self-assessment approach developed by the Independent Reporter, and used with their permission. This uses a 1-5 (immature – mature) assessment scale against a series of criteria to show how developed and deliverable our plans are for each asset. The summarised position is shown to the right, and further work will be undertaken to increase the level of maturity.

In addition, in assessing deliverability, the route has considered the workbank activities where critical resources are needed to plan effectively. The list is drawn from the data room and is identified against a timetable year for engineering access purposes.

- There are no OLE critical resources required in CP6 as only campaign changes remain for the Great Western Electrification;
- There is no major resignalling within CP6 but design and testing resource is required for train detection work between Paddington and Airport Junction;
- We have given an indication by year for Kirow Cranes, S&C and Plain Line Tampers. Our assessment also includes the underbridge activities where track lifting and tamping is required;
- No firm resources have been agreed but the volumes shown give an indication of demand for the resource.

	Workbank Definition	Key Resources	Access Requirements	Cost Confidence	Delivery Agent
2019/20	4	4	4	4	4
2020/21	4	4	3	4	4
2021/22	4	3	3	3	4
2022/23	4	3	3	3	4
2023/24	4	3	3	3	4

7.2. Access

Access to the railway in CP6 to undertake maintenance and renewals works will be more complicated than is presently the case as the route will be operating the additional Elizabeth line services and the enhanced Intercity Express Programme timetable. Services, notably Elizabeth line, will also be running later in the night and starting earlier each morning, further restricting maintenance access.

Furthermore, the deferral of electrification work at Oxford and other enhancement projects, and the potential for disruptive works at Old Oak Common for the HS2 programme place further constraints on access to the infrastructure for routine works, including the potential for large-scale disruptive access requirements.

The route is therefore developing a strategy to integrate project works and maintenance works to optimise the access plan to make the best use of the limited access available. The route is working in collaboration with IP to create an integrated access and logistics plan enabling the most effective and efficient use of access and resources and minimising customer disruption.

The route will also look to leverage benefits afforded by our alliance with GWR to collaboratively develop access strategies which enable safe and effective delivery whilst providing the best possible train service for passengers and freight, working with all operators on the route.

The access restrictions will also require new work delivery methodologies for standard maintenance and renewal activities and will also require route teams to take opportunities to reduce possession and electrical isolation operational times through use of new processes and technologies. However, access remains a significant risk to meeting our plan.

7.3. Maintenance delivery

"Delivering a Safe, Sustainable & Improving Railway"

The route is experiencing unprecedented change, posing significant maintenance challenges:

- A new urban high capacity rail service demanding sustained reliable infrastructure (Elizabeth line);
- A modernised inter-city electrified railway affecting working methods in our delivery units;
- Continued increase in traffic levels and tonnage, with associated increased asset wear and degradation;
- New infrastructure maintained alongside existing ageing assets in reduced access periods.

These challenges are addressed through changes to our maintenance approach.

Customer satisfaction is the outcome of our maintenance strategy, built on a safely delivered reliable infrastructure;

Developed from existing knowledge, skill and experience – whilst focused on future challenges requiring an updated approach, our strategy:

- Leverages improvements in productivity through numerous aligned work streams
- Reflects the increasing use of Western's inter-city, urban and rural railway through targeted increases in maintenance activity
- Accounts for productivity impacts arising from an electrified railway with increased tonnage and service patterns

At the strategy's core are our people.

The strategy is based on moving to a "predict & prevent" maintenance regime together with effective team working at all levels of maintenance support and delivery. This is combined with our people's passion and skills, as the catalyst for delivery in an increasingly challenging environment.

Our strategy has five key themes:

1. Adopting "Transformation In Maintenance" founded on task standardisation and improved team collaborative working; supported through the route's 'Teams Improving Maintenance' programme
2. Increasing adoption of Risk-based maintenance regimes founded on improving asset intelligence;
3. Effective and responsive organisation founded on multi-disciplinary approach and appropriate terms & conditions of employment;
4. Increase in mechanisation and technology advances to ensure deployment of the right solution for each task.
5. An embedded "Better Every Day" culture of continuous improvement

In addition, we are developing an end to end maintenance strategy for managing the Elizabeth line which will set up aspirational common targets and consistent ways of working between Romford and Reading delivery units. The governance for this forum is in place in CP5 and will continue in

to CP6 and is jointly attended by both routes and Rail for London. We are also increasing our S&T response capability to address the challenges of increased train services.

Based from existing delivery, impacts of Headwinds and Efficiencies have been assessed and revised bottom up volumes modelled through the Activity Based Planning (ABP) tool to establish future activity.

7.4. Project delivery

In CP6 the route will develop a diverse contracting strategy with NR Infrastructure Projects, Works Delivery and other third-party contractors to deliver our renewals workbank. The route will seek to introduce contestability in CP6, bringing in new contractors to drive further competition and efficiency, reducing unit rates.

Track renewals will continue to be shared between IP Track and Works Delivery as is the case in CP5, with Works Delivery leading for track renewals in Devon and Cornwall. IP Signalling will continue to be a leading deliverer for our signalling works, with IP Western & Wales' SP&C organisation a potential delivery partner for some of our mid-life intervention works. Across our civils assets, the Works Delivery Buildings & Civils team will continue to be a leading delivery partner.

Of the total CP6 renewal expenditure of £1,305m (excluding Speed to the West, £882m is allocated to IP, £367m to Works Delivery and £56m for a competitive tendering process associated with Bristol Temple Meads station.

7.5. Supply chain

Early engagement with our various supply chain partners is key to securing delivery of our plans. We are confirming our workbanks as early as possible to enable our Route Services and IP delivery partners to mobilise in a cost-efficient and effective manner.

Route Services supplies Western with the services we decide are best provided from a national team. This approach enables national co-ordination, and for Network Rail to benefit from economies of scale and greater efficiency from specialised delivery. Route Services consists of four primary functions. **Supply Chain Operations** (SCO) delivers the logistics, materials, components and fleet that enable the maintenance and renewal of our railway infrastructure. **IT** shapes, builds and runs the technology services needed to support our railway, now and into the future. **Business Services** manages and delivers support services on our behalf such as shared services, and training, and national **Contracts and Procurement** (C&P) secures and manages the national contracts and supplier relationships which we rely on. Delivered through a team of c.3,000 employees, the Route Services portfolio consists of c.58 services, with £1bn of direct spend as well as the management of a further £2bn of indirect spend on behalf of the route businesses.

The introduction of Service Catalogues with customer-facing KPIs has enabled us to hold Route Services to account at a local level, as well as identify mission critical services for the route, and collaborate on joint improvement plans.

Through the services they deliver, we look to Route Services for subject matter expertise, access to their supply chain, and strong delivery partnerships with suppliers, to get the best value and quality possible for our route. Route Services is responding positively to our challenge to them to deliver the outstanding performance, cost competitiveness and commercial approach which we expect.

In Western route we include senior members of the Route Services leadership team within our key meetings, including weekly Visualisation. As an example of collaboration, Route Services is supporting the Alliance in developing the use of technology collaboration tools.

Further, as a route we have already begun to work closely with Route Services with respect to on track machines and on track plant. Specifically, responding to the challenges of additional tonnage and reduced maintenance access, we are working with Route Services to achieve the following OTM requirements for the route:

Tampers: Predicted requirement is 536 maintenance shifts per annum. Coupled with renewals and project work results in the Route requesting the following fleet

from SCO:

- 2 x 08 4x4 Unimats to be replaced in 2020/21 with 2 x 09 4s Dynamic Tampers (these machines will be fitted with CAL, Intelligent DTS and DRP);
- 2 x 08 4x4 Unimats (in place throughout the control period and potentially fitted with DRP)
- 2 x 08 Compact (fitted with Sprinter and potentially DRP throughout the control period);
- 2 x B41s (throughout the control period).

Stoneblowers: Predicted requirement 265 plain line, 165 multi-purpose shifts per annum

- 1 x MPSB;
- 2 x PLSB for 2017/18 and 2018/19, reducing to x1 PLSB for the remainder of CP6;
- 1 x 3GSB (third generation stone blower) from 2021/22 onwards.

Regulators: Predicted requirement 165 shifts per annum

- 1 x USP 5000 Regulator

Currently the Route has access to two plain line stoneblowers which are shared with Wales along with a proportion of the three multipurpose machines which operate nationally. In CP6 the Route has significantly increased demand for both plain line and S&C stoneblowing due to proven track geometry outputs & the associated durability of the improvement which allow life extension of the track rather than renewal. This situation is mirrored nationally and therefore capability to meet the additional S&C demand will not be available in the first two years of the control period whilst new multipurpose machines are sourced by Route Services to replace life expired plain line machines. The business will need to prioritise stoneblowing resources and where appropriate undertake alternative treatment in the meantime.

With respect to seasonal treatment trains, we require the overhaul of the railhead treatment train (RHTT) fleet to enable continued robust seasons delivery through CP6 and will work with Route Services to identify changing RHTT requirements arising from amended traffic patterns and new passenger rolling stock. Specifically, additional treatment sites in the inner Thames Valley may be required along with additional treatment runs may be required in Cornwall as a result of the enhance train service. It will also be important in CP6 to consider what measures can be taken to improve responsiveness to emerging operational requirements, including having greater localised fitter and repair capability as well as being able to provide additional treatment as needed.
Pressure on train paths with the new enhanced timetable may also require service trains to be fitted with infrastructure monitoring equipment to provide information about the impact of the additional tonnage in operation on the route, notably in the Thames Valley.

7.6. Costing approach

Asset	Supplier of cost	Basis of cost	% of asset covered
Track	IP Track (HQ team)	RF2 release; emerging and modelled costs	45%
	IP Track (local team)	Emerging rates, review of workbank incl. S&C	25%
	Works Delivery	Emerging 16/17 rates, adjust to reflect workmix	25%
	RAM analysis	Emerging rates for off track and other items	5%
Track total			**100%**
Signalling	STE	Signalling infrastructure cost model	**100%**

E&P (Signal Power Cable 650V, HV Switchgear (Non traction), PSP Renewal, Conversion of headspans to MIR in public locations, Other)	Unit rates confirmed with IP	Based on the CP5 unit rate with an adjustment to allow for inflation and additional civil works based on learning from live CP5 schemes. Confirmed with IP	68%
E&P (0-12 OLE Campaign Changes)	Based on present development work	Estimate based on development work carried out in CP5 for campaign changes in the 0-12 mile section of OLE. Funding requirement for required work is £24m with only £12 available. This line allows for the remaining work to be carried out with an allowance for setting up a new scheme and some slippage of delivery from CP5 into CP6.	16%
E&P (HABD)	Unit rates confirmed with IP	Locally derived rate based on quote from equipment manufacturer and allowance for installation, FTN connection and testing.	9%
E&P (pantograph monitoring)	Unit rates confirmed with IP	Based on experience of Heathrow Express Pan Monitor project costs.	5%
E&P (Electrical clearances at stations)	Priced up based on rate sheet at £102K per platform face	We have applied the standard CP6 unit rate for this work, however this does not allow for any structural modifications	2%
E&P total			**100%**

Structures	IP Structures	Review against current Unit Rates	22%
		Review against cost curves	8%
		Review against historic delivered rates	25%
	Works Delivery	Review against current Unit Rates	38%
		Review against historic delivered rates	7%
Structures total			**100%**

Geotechnics	RAM / IP GW & Crossrail (renewals and mining assets)	Historic Delivered Project Costs	60%
Geotechnics	RAM / STE (maintenance & refurbishment)	Based on CAM2 Derived Rates	40%
Geotechnics total			**100%**

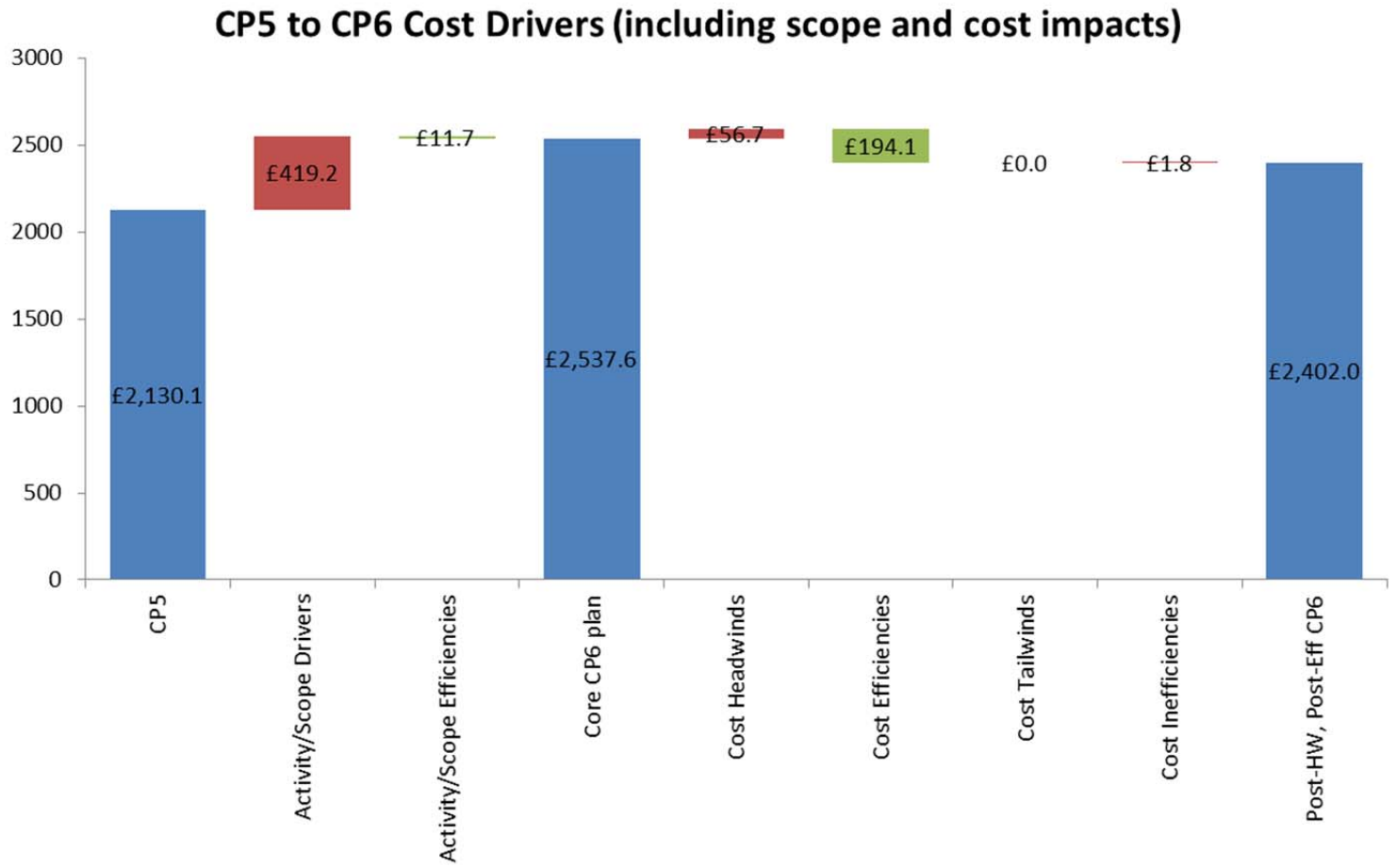
Drainage (Track)	RAM / STE	Drainage Policy Unit Cost	50%
Drainage (Off-Track)	RAM / STE	Derived from Earthworks volumes based on generic drainage recipe/rules	50%
Drainage total			**100%**

Buildings (All assets except Bristol Temple Meads roof & rewire)	RAM / WP	Historic Delivered Rates cross checked with London North Eastern route rates.	56%
Buildings (Bristol Temple Meads roof & rewire)	IP	GRIP 3 estimate – November 2013	37%
Buildings (Accommodation Upgrade Programme)	Route Exec Team	Provision based on route estimate	7%
Buildings total			**100%**

Maintenance opex	DU, Route Finance	Activity-based planning	40%
Asset management, operations, support opex	Route Finance	Bottom-up planning based on existing run-rates	60%
Opex total			**100%**

7.7. Cost drivers, headwinds and efficiency

Summary of cost changes between CP5 and CP6



The main drivers of increased cost in CP6 compared to CP5 pertain to the electrification of the route, the increase in train services and the resultant reduction of access, which is then more complicated to achieve. The route has worked collaboratively with delivery partners in IP to identify a range of efficiencies, which are summarised below.

Summary of route efficiency

	Year			Year					
Totex (O,M,R)	**16/17**	**17/18**	**18/19**	**19/20**	**20/21**	**21/22**	**22/23**	**23/24**	**CP6 total**
Pre-efficient plan[1] (£m)	**£414.9**	**£456.7**	**£440.9**	**£498.2**	**£530.7**	**£543.2**	**£513.7**	**£451.8**	**£2,537.6**
Activity/scope efficiencies (%)	-0.5%	-0.5%	-0.5%						
Core plan (including Speed to the West) (£m)	**£411.0**	**£452.8**	**£437.0**	**£498.2**	**£530.7**	**£543.2**	**£513.7**	**£451.8**	**£2,537.6**
Head winds (%)				2.2%	2.4%	2.2%	2.2%	2.3%	**2.2%**
Efficiency (%)				-4.1%	-7.3%	-8.3%	-10.4%	-8.1%	**-7.6%**
Tailwinds (%)				0%	0%	0%	0%	0%	**0%**
Inefficiency (%)				0.2%	0.0%	0.0%	0.0%	0.0%	**0.1%**
Post-HW, post-Eff spend (£m)				**£490.0**	**£504.8**	**£509.9**	**£471.6**	**£425.8**	**£2,402.0**

Route headwinds and efficiency by theme

Theme	Area	Description	Net % change *(+ve: worsenment -ve: improvement)*
Access (3)	Efficiency (3a)	Optimisation of access (use, agreement, planning).	-0.8%
	Tailwind (3b)	None	
	Inefficiency (3c)	None	
	Headwind (3d)	Reduced access due to the Elizabeth line, increased train services. Increased access complexity due to electrification.	
Workbank planning (4)	Efficiency (4a)	Stable workbank	-0.4%
	Tailwind (4b)	None	
	Inefficiency (4c)	None	
	Headwind (4d)	None	

[1] Note that pre-efficient plan is equivalent to core CP6 plan + 2a (activity/scope efficiencies) in the waterfall

Technology (5)	Efficiency (5a)	Innovation and technology benefits, including Intelligent Infrastructure programme, corporate rostering and electrical safety delivery programmes.	-0.7%
	Tailwind (5b)	None	
	Inefficiency (5c)	None	
	Headwind (5d)	Obsolete technology - higher support costs, scarce resources, skills fade.	
Delivery (6)	Efficiency (6a)	Development of works delivery capabilities, organisation restructure, LEAN (Right First Time delivery, Better Every Day, Structured Continuous Improvement) within renewals portfolio	-0.7%
	Tailwind (6b)	None	
	Inefficiency (6c)	None	
	Headwind (6d)	Increase in shift signal managers at TVSC	
Design (7)	Efficiency (7a)	Early contractor involvement, early scope definition, and use of minimum specification solutions	-0.9%
	Tailwind (7b)	None	
	Inefficiency (7c)	None	
	Headwind (7d)	None	
Commercial (8)	Efficiency (8a)	Improved contracting strategies/rates (inc. packaging of works), Supply Chain Organisation initiatives	-2.5%
	Tailwind (8b)	None	
	Inefficiency (8c)	Contracting strategies/packaging/rates (change from owned to leased vehicles, including increased safety specifications)	
	Headwind (8d)	SCO Lease costs at Ryton. Increased contract rates driven by market pressures.	
Other (9)	Efficiency (9a)	LEAN (Right First Time delivery, Better Every Day, Structured Continuous Improvement) in operating expenditure.	0.3%
	Tailwind (9b)	None	
	Inefficiency (9c)	None	
	Headwind (9d)	Holiday pay in overtime, Apprentice levy, Fatigue management policy in Operations, External draw on signalling resource (HS2).	

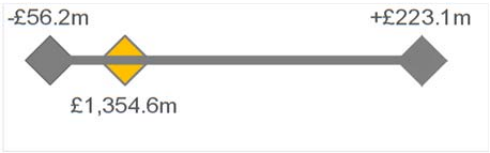
7.8. Financial certainty analysis

This section provides an explanation of the how we have built up our overall plan and sets out our estimate of the degree of financial uncertainty within this plan.

Pre-efficient costs in our plan are based on “current rates” but include any additional scope needed to deliver the outputs in the plan. We have used rates as outlined in section 7.6 to develop our capital expenditure forecasts and CP5 exit rates for support, operations and maintenance expenditure forecasts. Drivers of rate increases (headwinds / inefficiencies), or rate reductions (efficiencies / tailwinds), where there is a reasonable expectation they will occur, have been identified separately from the core CP6 plan.

The combination of our core CP6 plan, headwinds / tailwinds and efficiencies / inefficiencies is our submission and represents the most likely outcome for CP6. The content of our plans reflect the funding that we understand to be available in CP6. We consider this plan to be realistic and, therefore, deliverable in CP6.

Whilst it is difficult to precisely estimate the likelihood of delivering to target in CP6, the consideration of uncertainty in the preparation suggests a 15% overall variance to the spot figure. This is dominated by the renewals portfolio which contains 80% of the expenditure and has the most margin for positive gain. The main drivers of uncertainty in our plan are identified in the table overleaf.

Area: (R, M, S, O, Income)	Potential range (low – spot – high)	Summary of key drivers of uncertainty range	
		Driver of range	% of range
Renewals		• Track uncertainty mainly driven by deliverability risk, notably for the High Output programme based on current delivery trend • Uncertainty across assets driven by access constraints and potential increase in costs as more reactive works needed following CP5 renewals deferrals • Low uncertainty over efficiency realisation with deliverers	• 18% • 66% • 16%
Maintenance		• Additional volumes resulting from the Elizabeth line and electrification • Uncertainty in realising cash savings within maintenance	• 70% • 30%
Support and operations		• Additional staff costs due to higher volume of traffic with Elizabeth line services	• 100%
Total expenditure			
Income		• Uncertainty of Schedule 8 (captured as income reduction)	• 100%

8. Culture strategy

8.1. Safety, health and wellbeing

Western route has a clear Safety Culture Strategy that is aligned to the RSSB industry plan and Network Rail's Home Safe plan.

Our plan is structured around three main streams:

- Workforce Safety: reducing injuries by road driving, train striking persons on track, slip trip falls and manual handling injuries;
- Passenger & Public Safety: reducing risk of train derailments, train striking objects and train striking persons;
- Compliance, community & beyond: improvements to our safety management system to strengthen assurance and improve health, safety and environment engagement.

Each of these streams has a number of constituent projects which individually and collectively deliver benefits. Our plan also reflects Network Rail's commitment to improving working conditions and employee health and wellbeing, with funding committed for the improvement of delivery unit accommodation and facilities.

We will work with STE colleagues on their delivery of key projects, use of external health providers and collaboration with other business functions, to further a health and wellbeing programme aiming to optimise the occupational health management and safety of our workforce by effectively mitigating, monitoring and diagnosing occupational health conditions. Our intention is to be more proactive than reactive in supporting improved health awareness by changing behaviours that influence long term health and safety.

Mental health continues to be the second highest reason for sickness absence within Network Rail nationally and is recognised to be a huge impact for the UK economy. In CP6 we will continue to work with STE colleagues as they drive forward the deliverables and benefits of a mental health and resilience project to address the stigma associated with mental health, the high levels of sickness absence and ensure that all staff have the necessary tools and information to provide the correct support to those that are suffering with psychological conditions.

The route safety, health and wellbeing plan will be updated regularly to maintain alignment to business priorities. The plan will evolve to reflect and empower the significant work undertaken at local level by managers, frontline teams, individuals and union safety representatives. These programmes will be driven using Lean methods. Progress will be tracked and managed every period, widely communicated so the plan becomes a truly route-owned plan.

8.2. Change

Safety, performance, value for money and modernisation will be key themes for business change in CP6. In CP5 we established a framework to deliver sustainable change through a dedicated function in the route, a robust governance process (MSP4NR), and in line with Network Rail's transformation priorities: becoming more **customer-focused**, more **competitive** and more attractive **commercially** to investors; building a **culture** where safety and performance go hand in hand, where we continuously improve (Better Every Day), and where we embrace new digital technology to increase **capacity** for our growing economy.

The route change function is accountable for streamlining and prioritising business change activities and ensuring an integrated business readiness approach for infrastructure upgrades. The function is accountable for delivering sustainable benefits to the business and our customers. It is accountable for ensuring business initiatives have a positive business case or alternative funding to ensure we do not import financial risk in to the business. A robust "hopper" process was put in place in CP5 to assess and prioritise new programmes. Executive level Senior Responsible Owners give direction and support for their portfolio of programmes. Networks were established with the main impacted business units to inform how these programmes are best sequenced. This helps ensure that the route's resources are focused on the programmes

which give the most value. Effective reporting mechanisms were also created in CP5. These change portfolio management processes will be further enhanced in CP6 to ensure the route maintains its change capability and capacity, and that lessons from previous programmes are truly shared and applied.

There is significant work required to modernise our processes, digitise our asset condition data and do more activities off the track. This will build on the programmes we started in CP5 to move to predict and prevent maintenance as well as free up capacity on the network to run more trains. In CP6 the change agenda will focus on driving improved decision making based on analysis and improved ways of working based on better tools and processes.

The focus areas for Process, People, Infrastructure and Technology are listed on the diagram shown right.

Western change team

Delivery of our CP6 commitment will inevitably require changes to our organisation and culture, not least of which will be the drive to a more devolved route business. Any changes will be delivered with as little distraction as possible and underpinned by genuine consultation with both affected employees and their representatives, supported by timely and ongoing communications. A large part of our culture change will be that of further embedding safety leadership behaviours, expanding the impact of Better Every Day, realising the benefits from Teams Improving Maintenance and a culture which encourages continuous improvement.

8.3. Organisational capability

Our focus towards the end of CP5, alongside organisational change, has been about upskilling the route's people managers to better equip them to lead teams into and throughout CP6 and the challenges this will inevitably present. Efficiency will remain a key requirement throughout.

One of the main drivers is to make Western route an employer of choice in the marketplace and to create an environment in which everyone is engaged with the business and focussed on delivery - a place where colleagues can be themselves and give their best and safety comes first in everything we do. We know the external labour market will continue to evolve and we need to be ready for this – offering where possible the increased flexibility and agility being sought by external talent in the labour market as often as possible.

Organisational change will continue to be inevitable given our need to be prepared for the known future demands yet sufficiently flexible to meet any currently unknown demands such as infrastructure and technology changes. Maintaining strong relationships with our union colleagues will form an integral part of effective consultation for any changes, providing a basis for positive and constructive dialogue about the impact of organisation change and mitigating any associated risks.

Outside our collective bargaining arrangements, we will encourage a culture where everyone is encouraged to learn and share their experiences, with leaders who listen and respond to feedback and seek to drive a high performing, ever safer organisation. This will be underpinned by well-defined accountabilities and objectives, with positive behaviours demonstrated, promoted and recognised by leaders and managers.

Employee engagement will continue to be vitally important and progress in this area will be monitored by regular surveys which enable every employee to have a voice in how we strive to make Western route a better place to work – we will be transparent in sharing our results, identifying best practice and responding openly to the feedback provided.

Our early engagement work with schools, colleges and particularly University Technical Colleges (UTCs) across the route and our regular attendance at careers and educational events will continue to contribute towards us being recognised as a great place to work, supporting our desire to attract a diverse range of high performing candidates to Western route. There is anticipated to be an increasing focus towards STEM subjects in support of our increasing demand for engineering and technical skillsets in the route business; we are already well placed to meet this challenge given the relationships we have in place with local UTCs. Alongside our apprenticeship scheme, historically focussed on maintenance roles though increasingly proving an entry into other roles within the organisation, our route Year in Industry placements will continue to focus on engineering opportunities and provide an effective pipeline of high calibre, proven graduates to join the business on completion of their degrees.

Underpinning the above and vital to all of this, robust strategic workforce planning will enhance our ability to predict and plan for future resource demand, identifying any potential skills gaps in sufficient time to plan attraction and selection activities to efficiently design, size and resource the organisation. This will be in place in advance of and throughout CP6 to enable us to respond effectively to any changes in demand for the organisation and its people; particularly critical given the existence of some roles is to support the investment portfolio of the route so our planning and resourcing needs to be appropriately forward looking and flexible in approach.

This will further enable us to identify, attract and retain the best people available for opportunities in the route. Along with robust talent management and more effective succession planning, supported by personal development plans and underpinned by effective recognition, this will result in a safer, higher performing organisation, focussed on delivering to customers and sustaining positive relationships with stakeholders.

The above will be achieved in collaboration with others (such as our TOC and IP colleagues) to achieve the best results possible for the organisation and our people.

8.4. Social & environmental performance

Our commitment to environment and social performance stems from our route vision commitment to care for our environment and our communities and to be a good neighbour to those around us. Our activities focus on three main areas: environment and ecology, energy and our communities.

- Environment and ecology
  - Enact a committed long-term biodiversity action plan, with the support of Natural England;
  - In line with ISO14001, implement an independently accredited environmental management system, defining committed and funded plans for:
    - Responsible sourcing and procurement;
    - Diverting waste from landfill and improve recycling rates;
    - Carbon emission reductions;
    - Improved route environmental consciousness;
    - Climate change impacts and reductions;
    - Higher specification infrastructure works within environmentally sensitive sites;
    - Further mitigation against contamination risks.
  - Increase the dedicated route environmental specialist resources on the route with improved ecology management.

- Energy
  - Build on our planned 11.2% reduction in CO_2 in CP5 to achieve a 25% reduction in carbon emissions by the end of CP6;
  - Minimising energy usage in the workplace through effective management of our utilities connections;
  - Continue with a carbon psychology project to look at people's behaviours to reduce waste.

- Communities
  - Improving our social performance and our connection with our communities building on our successful approach to community engagement for the Greater West programme, continuing to work to reduce public complaints;
  - Work to improve accessibility to our network;
  - Encourage colleague community contributions through charitable leave;
  - Work alongside our train and freight operator colleagues to benefit customers, and build our relationships with community rail groups.

8.5. Diversity & inclusion

Western route has an ongoing diversity and inclusion plan, supported by an active, enthusiastic and growing network of employees, who represent the diversity of the people across the route. However, we continue to strive to become a more respectful, diverse, inclusive, and welcoming organisation; where every employee feels respected and valued for who they are and what they bring to the route.

This action plan will be underpinned by the completion of the roll out of the Everyone Learning facilitated sessions to all employees and an ongoing programme of sessions as part of the welcome for all new employees. This will be driven by a leadership team who are visible across the route, attendance at public events which enhance our reputation as an inclusive employer, people managers who listen and respond to feedback and a drive to encourage more inclusive design in all we do.

Specifically early in CP6 will be the focus on our "20 by 20" initiative such that 20% of our workforce are female by the year 2020 – achieving this will be the result of focussed activities in terms of early engagement to attract as diverse a range of candidates as possible and sustain the progress, provision of appropriate welfare facilities for everyone within the route and a culture which genuinely recognises and celebrates the benefits of diversity.

8.6. Quality

As a route, we are engaging with the corporate strategy to implement an integrated management system. We have undertaken a gap analysis to the requirements of ISO 55001 to identify improvements to our asset management capability to enable alignment to the standard, and network-wide programmes such as "Better Every Day" and Home Safe Plan

projects such as Business Critical Rules are also improving our quality management.

Western route aligns to Network Rail's three level model of assurance, where first line or supervisory assurance focuses on management of day to day operational risk and control activities (or self- assurance), second line focuses on overall effectiveness of individual policy and controls, and third line is fully independent assurance of the overall control frameworks. With devolution, the route has implemented a Business Assurance Committee to provide the route leadership team with oversight that the three levels are operating satisfactorily. Any further devolution of activity will be assured through this model.

In the context of change programmes, it is critical that these start from the requirements capture stage, without clear requirements there is no assurance that the programme contributes to the route strategy. It is also critical to conduct a detailed change impact assessment to ensure the full effect of the change is taken in to account across people, process, infrastructure and technology. In CP5 the route change function embedded governance and assurance through the mandating of MSP4NR, the introduction of decision making boards and stage gates. This will be enhanced in CP6 through the introduction of a comprehensive programme assurance strategy which formalises the use of compliance reviews and deep dives as well as a focus on requirements capture and change impact assessments at the inception of a programme in to the hopper. There is also a maturing process for milestone identification, reporting and target setting through strategy meetings and scorecards. This is being continuously improved and provides a visible measure of progress throughout the year for risk and opportunity management.

In the context of asset renewal, improving the quality of requirements documentation submitted, agreed, authorised at the outset is the key focus to improve the quality across the whole lifecycle of project delivery. Through our robust governance process, project go-live is dependent on the requirements of the project having been delivered successfully before a go-live approval is received.

For workforce safety, we will reduce potential harm by reducing the frequency of staff accessing the track. This will be delivered through the further use of automation introduced in CP5 by programmes such as Plain Line Pattern Recognition and Remote Condition Monitoring and will be supplemented by emerging technologies via Digital Railway in CP6. We also continue to place an emphasis on our people's behaviour, driving safety improvement by staff owning safety and the strengthening of our compliance assurance framework using RM3 approaches.

8.7. Information Technology

The constant advances in information technology pave the way for a technology enabled future. Almost every department and function relies on technology in some form and CP6 will see that reliance deepen. Western route has no current aspirations to devolve information technology (IT) services into the route and see route Services Information Technology (RSIT) as a partner. As such the route will need to be proactive and welcome change to maximise the benefits the partnership will bring.

Document sharing and collaboration will be a key driver for CP6, reducing the need to travel but more importantly enabling a deeper alliance with our customers. System and data integration will enable seamless third party access to use NR systems. Document storage will evolve from restrictive shared drives into cloud based solutions. There will be need for a common file naming standard and the use of metadata to allow easy searching and sharing of documents. Microsoft Office 365 will provide the latest versions of the standard office products along with additional collaborative software not currently available. Cloud based applications provide always on availability will support the routes "around the clock" working. Personal conferencing tools will continue to evolve which will allow the route to become more productive by reducing the need for staff to travel as frequently saving time and money. To maximise the benefits the route will need to provide training and change mind sets with virtual meetings being first choice as the location of choice across all staff levels.

As technology advances, mobile working will become more common place. This will allow buildings to offer a more agile way of working. Track side staff will have increased information at their fingertips allowing for

decisions to be made real time. Mobile working will however bring additional costs to the route as equipment will likely get lost and damaged and mobile technology such as iPads have a shelf life of four to five years, meaning almost all devices will need replacing by the end of CP6. The route need to provide adequate guidance when working on mobile devices to ensure staff only use when in a position of safety and review the ergonomic work space when agile working to reduce risk of injury.

As we move towards a predictive maintenance approach, the responsibilities between corporate office IT and the operational railway will continue to merge. Real time information from the track side will continue to develop, allowing proactive decisions to be made in advance of possible failures. New trains will come with various sensors which will provide further near real time information about the quality of the assets. The route will is engaging with RSIT to understand how to extract the data, process and analyse it. With connected equipment comes the risk of data and cyber security, a risk to track assets, digital information screens and operational equipment as well as the more commonly known office risk. Proactive measures will need to be undertaken to minimise any risk to disruption.

Real time operational data will be pivotal to improving performance within the route. Live proactive data during disruptions, decision support tools to predict and recover train paths; automated delay attribution and precise train location and status will aid recovery of train services and reduce the chances of delay or further disruptions.

9. Strategy for commercial focus: third-party cash funded contributions

Please note that the potential schemes in this section would require third party investment to proceed.
No government funding can be assumed to be available.

9.1. Current and planned third party funding

Western route has a good track record of attracting third party funding primarily facilitated through the System Operator and route Enhancement Manager. This process has created strong relationships with regional / local government, local enterprise partnerships (LEPs), Train Operators and other third party funders. This strategy has seen the development and implementation of some significant projects across the route, including;

Project	Funder	Current Project Status
Newcourt new station	Devon County Council	Close out - complete
Cornwall Capacity improvement	Cornwall Council	Delivery
MetroWest Phase 1	North Somerset Council	Development
MetroWest Phase 2	South Gloucestershire Council	Development
Portway Park & Ride new station	Bristol City Council / Central Government	Development
Bristol Temple Meads Gateway	West of England Combined Authority / HCA	Development
Worcester Parkway	Worcestershire County Council	Delivery
GWR Station Improvement Programme	GWR / LEPs / Local Authorities	Development and Delivery
Penzance TCMD	Cornwall Council / NR	Delivery

Local authorities continue to recognise the benefits of rail supporting economic growth through local plans, outlining proposals for further new stations, reopening rail lines and converting freight only networks to accommodate passenger services.

9.2. Capability & business development

However, passenger growth continues to outstrip forecast growth across the route with the railway being a significant driver of economic growth. Continued significant growth in passengers and freight markets is forecast to continue through to 2043. To keep pace with this level of growth the route will explore new ways of funding capacity enhancements for passengers on the railway, as noted in the Shaw Report; this includes those who stand to benefit from rail network improvements, such as housing developers, commercial estate landlords and businesses.

In support of this initiative, Western is developing a route business development strategy to attract further levels of third party funding investment in the rail network. This strategy includes recruiting a dedicated director of route business development to lead activities; developing our approach for third-party funding, and stakeholder engagement. This role will enable the route to maintain its portfolio of third party funding using a strategy of directing effort towards

the greatest reward through the existing Sponsorship organisation, while pursuing third party funding, transferring liabilities where appropriate, and developing innovative funding streams.

Our vision is for a customer facing organisation, with the feel of a private entity, attracting funding from external funding sources (for example business, developers and other parts of the public sector including local government and LEPs) supporting passenger capacity growth.

In addition to the route business development strategy, the route has implemented a revised governance structure aligned to existing investment and contracting frameworks to support further investment and respond to the Hansford Review. This governance structure will aid the route focus on the customers' needs, bringing together various sectors of the Network Rail business, it will provide a platform for amongst others, change control, contracting, risk management, estimating, delivery, and where appropriate, contestability.

9.3. Focus for third party involvement

Western route has been the leading mind in collaborating with our industry partners creating an Alliance with the primary train operator, and the creation of the first route supervisory board. These forums collectively explore capital investment opportunities from 3rd parties delivering closer ties with external parties for mutual gain such as Local Government, Port authorities and Airports.

Our objective for business development for CP6 is to achieve the following three key elements:

- Develop a funding strategy in support of the DfT and business case for Western Rail Link to Heathrow;
- Support third parties in identifying, developing and delivering rail projects meeting local needs enabling economic growth;
- Core network enhancements identified within our long term planning process to accommodate growth, are funded for development or delivery.

Priorities for new investment across Western route include:

- Strategic network enhancements, including Western Rail Link to Heathrow and works required to support the introduction of HS2;
- Investment in stations, with particular emphasis on passenger capacity issues, including Oxford, Bristol Temple Meads and Paddington;
- Working with DfT, franchise bidders and train operators to develop opportunities for accommodating growth, especially depots / stabling, car parking, and station enhancements for the clear benefit of passengers;
- Providing visibility of a credible forward project pipeline of opportunities for third parties in the rail infrastructure sector;
- Working with the new west of England combined authority mayor to develop new approaches to funding and delivering rail projects;
- Exploring opportunities for alternative funding, financing and delivery models for railway projects;
- Working with the System Operator, Property and Freight to develop line of route strategies leading to enhancement and development opportunities;
- Enhancement priorities identified and funded by industry partners, local government and local enterprise partnerships;
- Specific investment in route weather resilience intervention supporting economic continuity.

Please note that the potential schemes shown above would require third party investment to proceed. No government funding can be assumed to be available.

10. CP6 regulatory framework

This chapter sets out the funding implications of our plan for Control period 6 (CP6), which runs from 1st April 2019 to 31st March 2024.

10.1. Expenditure forecast

Table 10.1, below, sets out our forecast of CP6 route expenditure. It includes all costs that are directly incurred by the route and those that are allocated / attributed to the route.

Table 10.1: CP6 forecast of route expenditure

£m in 2017/18 prices	18/19	19/20	20/21	21/22	22/23	23/24	CP6
Route expenditure							
Support	4	4	4	4	4	4	**19**
Operations	55	64	64	63	63	62	**315**
Maintenance	140	144	149	141	140	140	**715**
Renewals	271	278	289	302	265	221	**1,355**
Enhancements	1,010	0	0	0	0	0	**0**
Schedule 4 & 8	40	18	25	25	21	18	**108**
Allocated / attributed expenditure							
Traction electricity	32	23	26	26	26	27	**129**
Industry costs and rates	24	26	26	26	35	35	**148**
System Operator	0	5	5	6	6	5	**27**
Support and operations	39	45	46	42	43	42	**219**
Schedule 4 & 8	7	5	5	5	5	5	**27**
Renewals	100	56	75	62	48	49	**289**
Group Portfolio Fund	0	29	37	55	55	69	**246**
Non-SoFA expenditure							
BT Police costs	8	7	7	7	7	7	**35**
Financing costs	227	211	179	151	119	100	**760**
Corporation tax	0	5	7	0	0	10	**22**
Total expenditure	**1,956**	**922**	**944**	**917**	**837**	**792**	**4,412**

Expenditure incurred by the route increases from CP5 as a result of implementing the Great Western Route Modernisation and Crossrail programmes. Allowance is made for maintenance and renewal of new electrified railway assets as well as for increased traffic and reduced access, driving up the price of both maintenance and renewals.

Renewals expenditure includes £50m for "Speed to the West", an investment option which has been included in core renewals per planning instructions.

Please note that we are still assessing the impact of Elizabeth line services on EC4T costs so our forecast is likely to change.

10.2. Income forecast

The expenditure set out in Table 10.1 needs to be paid for. In Table 10.2, overleaf, we provide a breakdown of the income that we expect to receive during CP6 from access charges, commercial income and grants from governments to cover the expenditure in our plan. Breakdowns of access charges and other single till income are provided in Appendix E.

Table 10.2: Total CP6 income

£m in 2017/18 prices	18/19	19/20	20/21	21/22	22/23	23/24	CP6
Variable and station charges	(99)	(41)	(42)	(40)	(40)	(40)	**(203)**
EC4T	(34)	(23)	(26)	(26)	(26)	(27)	**(128.3)**
Schedule 4 ACS	(27)	(23)	(29)	(29)	(26)	(22)	**(129)**
FTAC / Network Grant (SOMR)	(335)	(349)	(392)	(405)	(374)	(353)	**(1,873)**
Grant for tax, financing and BTP	(235)	(223)	(193)	(158)	(126)	(117)	**(817)**
Income from FNPO	0	(191)	(190)	(186)	(172)	(159)	**(899)**
Other single till income	(164)	(71)	(72)	(72)	(73)	(74)	**(362)**
Subtotal (gross revenue requirement)	**(894)**	**(922)**	**(944)**	**(917)**	**(837)**	**(792)**	**(4,412)**
Capital grant for enhancements	(224)	0	0	0	0	0	**0**
Total income	**(1,118)**	**(922)**	**(944)**	**(917)**	**(837)**	**(792)**	**(4,412)**

Please note: *Government grants for corporation tax, financing costs, BT Police costs and enhancements will be agreed outside of the periodic review but we have included them in our forecast of income for completeness.*

Network Rail continues to be a corporate entity. Therefore, whilst our funding arrangements will change for CP6, we think that it is important to keep the key elements of the regulatory framework to maintain transparency of our performance and to retain flexibility for the future. This includes keeping the regulatory building blocks approach to calculating our CP6 revenue requirement.

We have calculated the CP6 route revenue requirement in Table 10.3, below, using a similar approach to CP5 (i.e. similar to the adjusted WACC approach), which focuses on the funding we need to pay for expenditure during the control period (excluding funding for enhancements). The net revenue requirement in Table 10.3 is the amount of income that we need to recover from regulated access charges, and government grants, in lieu of fixed charges in CP6. This presentation of CP6 funding also supports our calculation of the appropriate amount of fixed costs to recover through Fixed Track Access Charges (FTACs) paid by train operators.

Table 10.3: CP6 route revenue requirement

£m in 2017/18 prices	19/20	20/21	21/22	22/23	23/24	CP6
Route support, operations and maintenance	212	216	208	207	205	**1,049**
Allocated support and operations	45	46	42	43	42	**219**
Traction electricity, industry costs and rates (including BTP)	56	59	59	69	69	**312**
Schedule 4 & 8	24	30	30	27	23	**134**
System Operator	5	5	6	6	5	**27**
Group Portfolio Fund	29	37	55	55	69	**246**
Allowed return	211	179	151	119	100	**760**
Amortisation	334	364	364	313	269	**1,643**
Tax	5	7	0	0	10	**22**
Gross revenue requirement	**922**	**944**	**917**	**837**	**792**	**4,412**
Other single till income	(71)	(72)	(72)	(73)	(74)	**(362)**
Income from FNPO route	(191)	(190)	(186)	(172)	(159)	**(899)**
Net revenue requirement	**659**	**682**	**659**	**592**	**559**	**3,151**

Please note: *Following the creation of the Freight and National Passenger Operator (FNPO) route in April 2017, Network Rail's CP6 plan separately identifies the fully allocated costs of the FNPO route (i.e. including costs from central functions and geographic routes). In Table 10.3, above, we show the amount of income we expect our route to receive from the FNPO route. This 'Income from FNPO route' is based on the share of our costs that are allocated to freight and national passenger operators on our route. The allocation reflects where, and how much, freight and national passenger operators use our route infrastructure.*

10.3. CP6 financial information

The changes to our CP6 funding arrangements will address our concerns about unsustainable increases in our debt – our debt will fall over CP6 as new enhancements are grant funded, or funded/financed by third-parties, and maturing debt is paid down. As a consequence, the value of our RAB will not increase (in real terms).

Table 10.4 sets out the impact of our CP6 funding approach and forecast expenditure on key financial metrics.

Our CP6 plan includes funding for risk and uncertainty (the 'Group Portfolio Fund'). Ideally, actual results will be in line with our CP6 plan and this funding will be gradually released to invest in improving the railway. In CP6, some of this funding will be held at a route-level, with the remainder held at a portfolio-level. There is no 'central' route in our SBP submission so we have allocated all funding for risk and uncertainty to routes and System Operator. Table 10.4, below, includes our allocation of the Group Portfolio Fund for CP6.

Table 10.4: Financial metrics

£m in 2017/18 prices	18/19	19/20	20/21	21/22	22/23	23/24	CP6
Closing net debt	(7,278)	(5,863)	(5,016)	(3,884)	(3,409)	(2,986)	**(2,986)**
Closing RAB	9,665	9,646	9,646	9,646	9,646	9,646	**9,646**
Average net debt / RAB	75%	61%	52%	40%	35%	31%	**31%**
Group Portfolio Fund		29	37	55	55	69	**246**
Route		13	13	13	13	13	**63**
Portfolio		17	24	43	43	56	**183**
Maturing debt		1,283	760	1,052	437	397	**3,929**
Working capital		150	(27)	(4)	(4)	(2)	**112**
Cash requirement (incl. working capital and external debt repayment)		1,094	1,050	944	841	916	**4,846**

11. Sign-off

This document and accompanying templates are owned by the Route Managing Director (RMD).
Submission of this document indicates confirmation that:

- **all appropriate level 1 assurance activities have been undertaken (see separate advice on definition of level 1 assurance);**
- **the RMD is satisfied with the quality, currency and appropriateness of the content of this document as well as the cost, volume and activity projections to which it refers;**
- **the signatories are satisfied that the plan has been assessed as deliverable, subject to the assumptions articulated in Appendix B.**

Authorised by:

M T Langman	Mark Langman Route Managing Director	31/01/2018
M Gallop	Mike Gallop Director Route Safety and Asset Management	29.01.18
L. Watkins	John Watkins Route Finance Director	31/1/18
P Stanford	Paul Stanford IP Route Delivery Director	31st January 2018.

Appendix A Joint performance activity prioritisation by lead route TOC: Great Western Railway

This plan is predicated on the key assumptions laid out in Appendix B and will be impacted as these assumptions change.

Train Performance	Route	Current	Lower	Expected	Upper	Achievability	Timeframe
Great Western Railway PPM	Western	87.0%	88.2%	89.2%	90.3%		End 2023/24

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Timescale
1	Risk: Increase in train mileage (12% from 2020 onwards, compared to 2018/19) and service complexity due to timetable service increases (Elizabeth line and IEP)	Allianced Operation - Work to introduce a joint Control Pod onto the Operating floor of TVSC comprised of TOC and NR staff to speed decision making to enable better service management and recovery	COO	Through CP6
2	Opportunity: Impact of fleet changes and asset changes on performance, driven by the delivery of the Elizabeth line and electrification	For the start of CP6 • EMU running from Paddington to Didcot and Newbury (110mph), improved acceleration and reliability • IEP introduced, removal of slam door stock • DMU cascade to the West Country, improved reliability to West fleet (dependant on future franchise shape) • Elizabeth line stock introduced, three door and through trains to speed passenger loading	Director Route Sponsorship	By end of 2019
3	Risk: Asset condition deterioration	Business as usual performance planning across the route to undertake additional maintenance to focus on poor performing assets and locations. Maintain for reliability and compliance.	COO	Through CP6
4	Opportunity: Upgrade to Paddington to Airport Jn train detection	Convert obsolete track circuits to axle counters between Paddington and Airport Jn to improve reliability, this will build on current upgrade work converting analogue to digital.	DRSAM	Through CP6
5	Opportunity: Implementation of Risk-based Maintenance regimes	Implement a risk-based maintenance regime for the core inner Thames Valley section of the route	DRSAM / COO	From start of CP6
6	Risk: Trend of increasing delay per incident across all incidents (asset and train operators)	Implement a comprehensive delay per incident plan to improve train service delivery, including stock and crew diagramming	HoP	By end of CP5
7	Risk: December 2018 timetable	December 2018 will be a significant timetable change for the route, with the full introduction of the enhanced IEP service, and major restructuring of the suburban service pattern from Paddington. As this is developed review groups to develop appropriate mitigations and contingency plans will be put in place.	HoP, DRS	December 2018
8	Opportunity: Robust timetable planning	Integrated timetable planning with Capacity Planning and TOCs/FOCs into the route. CP5 will see an increase of 11 staff within the Western section of capacity planning.	COO	By end of 2020

9	Opportunity: Traffic management trial	Ongoing work is looking to trial Integrated Traffic Management in the final year of CP5. This will cover the area signalled by Thames Valley Signalling Centre.	Director Route Sponsorship	End CP5
10	Risk: HS2 development work at Old Oak Common	Integrated planning with HS2 team & detailed performance mitigation planning	DRSAM & COO	Through CP6
11	Opportunity: Great Western Refranchise (DfT work is reviewing the future shape of the Western Franchise)	Engage with DfT and bidders at an early stage and understand what the long term joint strategy should look like. Provides an opportunity to implement TRIP recommendations. Two route posts created to work with the DfT on the specification (one to be seconded to DfT demonstrating collaborative working). In addition, System Operator is creating a post to lead on the franchise to align the working of the System Operator and the route. However, continued direct awards and any remapping of the franchise geography will potentially erode this opportunity.	COO PSP	From late CP6 (depending on franchise timetable)
12	Risk: GWR refranchising	Ongoing work will define the shape of the new franchise(s) which will impact on our plans. DfT launched a consultation on the future shape of the Greater Western franchise in November 2017 and any change will result in change control being required for performance targets.	COO	From late CP6 (depending on franchise timetable)

Heathrow Express

This plan is predicated on the key assumptions laid out in Appendix B and will be impacted as these assumptions change.

Train Performance	Route	Current	Lower	Expected	Upper	Achievability	Timeframe
Heathrow Express Right-Time Arrival	**Western**	**63.7%**	**70.4%**	**71.0%**	**71.4%**		**End 2023/24**

No.	Key constraints, risks and opportunities	What we plan to do	Owner	Timescale
1	Risk: Increase in train mileage (12% from 2020 onwards, compared to 2018/19) and service complexity due to timetable service increases (Elizabeth line and IEP)	Allianced Operation - Work to introduce a joint Control Pod onto the Operating floor of TVSC comprised of TOC and NR staff to speed decision making to enable better service management and recovery	COO	Through CP6
2	Opportunity: Impact of fleet changes and asset changes on performance, driven by the delivery of the Elizabeth line and electrification	For the start of CP6 • EMU running from Paddington to Didcot and Newbury (110mph), improved acceleration and reliability • IEP introduced, removal of slam door stock • DMU cascade to the West Country, improved reliability to West fleet (dependant on future franchise shape) • Elizabeth line stock introduced, three door and through trains to speed passenger loading	Director Route Sponsorship	By end of 2019
3	Risk: Asset condition deterioration	Business as usual performance planning across the route to undertake additional maintenance to focus on poor performing assets and locations. Maintain for reliability and compliance.	COO	Through CP6
4	Opportunity: Upgrade to Paddington to Airport Jn train detection	Convert obsolete track circuits to axle counters between Paddington and Airport Jn to improve reliability, this will build on current upgrade work converting analogue to digital.	DRSAM	Through CP6
5	Opportunity: Implementation of Risk-based Maintenance regimes	Implement a risk-based maintenance regime for the core inner Thames Valley section of the route	DRSAM / COO	From start of CP6
6	Risk: Trend of increasing delay per incident across all incidents (asset and train operators)	Implement a comprehensive delay per incident plan to improve train service delivery, including stock and crew diagramming	HoP	By end of CP5
7	Risk: December 2018 timetable	December 2018 will be a significant timetable change for the route, with the full introduction of the enhanced IEP service, and major restructuring of the suburban service pattern from Paddington. As this is developed review groups to develop appropriate mitigations and contingency plans will be put in place.	HoP, DRS	December 2018
8	Opportunity: Robust timetable planning	Integrated timetable planning with Capacity Planning and TOCs/FOCs into the route. CP5 will see an increase of 11 staff within the Western section of capacity planning.	COO	By end of 2020
9	Opportunity: Traffic management trial	Ongoing work is looking to trial Integrated Traffic Management in the final year of CP5. This will cover the area signalled by Thames Valley Signalling Centre.	Director Route Sponsorship	End CP5
10	Risk: HS2 development work at Old Oak Common	Integrated planning with HS2 team & detailed performance mitigation planning	DRSAM, COO	Through CP6

Appendix B Key assumptions

Ref no.	Topic	Assumption	Areas of spend impacted
WES-CP6-Fin-A-02	Enhancements	The route business plans do not take into account any new committed enhancements post 26/5/2017, and excludes the "Hendy Tail" (with the exception of Bristol East Junction remodelling and Reading Independent Feeder), or arising from refranchising. This is typically projects that move into GRIP 6. Change control will apply to the enhancements to align with OM&R plans as it is assumed that future enhancement project funding will also allocate additional funds to the route to cover incremental operating, maintenance, support and renewal costs and any shortfall in income	All areas, capex and opex
WES-CP6-Route-A-12	Unit Rates	The unit rates used for the submission are calculated based on current H&S regulations and requirements. No allowance is made for further tightening of H&S regulations led by either external organisations or internal to Network Rail, as it is assumed that there will be no significant changes to health, safety and environmental legislation or any additional requirements imposed by the ORR above today's standards.	All areas, capex and opex
WES-CP6-Main-A-07	Standards Changes	No allowance has been made for the impact of Standards or Policy changes made during CP6. It is assumed that cost implications of changes are accounted centrally and provisions made by Standards Owners.	All areas, capex and opex
WES-CP6-E&P-A-10	Overhead line	The Great Western Electrification programme deliver against the route Project Requirements Specification in relation to a 5 minute permit to work. Failure to meet this requirement will have an impact on Opex and the resource levels within the OLE maintenance teams.	Maintenance opex
WES-CP6-E&P-A-09	Overhead line	The isolation and earthing strategy and equipment being implemented by the Great Western Electrification programme is accepted by the ORR with no requirement for additional infrastructure or funding from the E&P business plan.	E&P capex
WES-CP6-E&P-A-17	TPCMS SCADA	No allowance or consideration has been made for transfer to, or up keep of TPCMS SCADA.	E&P capex and opex
WES-CP6-CRE-A-01	Franchise	GWR refranchising does not change the volume of Lead Customers on the route with one franchisee for existing GWR route map area	All areas, capex and opex
WES-CP6-Route-A-04	Refranchise	Customer requirements after refranchise will be the same as at the time of submission.	All areas, capex and opex
WES-CP6-CRE-A-05	Franchise	No provision is made for any works required to facilitate the introduction of any new or changed rolling stock as a result of the franchising process.	All areas, capex and opex
WES-CP6-CRE-A-04	HEx	No provision is made for change to Heathrow Express Track Access Contract which is due to expire in 2023	All areas, capex and opex
WES-CP6-Bld-A-01	Managed Stations	Managed Station portfolio of Paddington, Reading and Bristol Temple Meads remains unchanged.	All areas, capex and opex

Ref no.	Topic	Assumption	Areas of spend impacted
WES-CP6-Bld-A-03	GWR franchise	New GWR Franchise operational property regime will be per the existing arrangements.	Maintenance, opex
WES-CP6-Route-A-16	HS2	The following HS2 enabling schemes are assumed to be funded for CP6 by HS2: OOC Hex Depot relocation (Langley), OOC FGW West Ealing Sidings Phase 2, HS2 ONW South (OOC enabling, GWML Station, Wil), OOC GWML Station, OOC enabling works, OOC Willesden Euro (HOOB), OOC Depot Decommissioning, HS2 ONW Ground investigation, HS2 ONW HS2 HALO, PH1 enhance - HS2 mass haulage strategy	All areas, capex and opex
WES-CP6-Fin-A-06	OMR costs and income	No Impact of HS2 on costs and efficiencies built into the plan. It is assumed that HS2 will re-imburse such costs or lost revenue.	All areas, capex and opex
WES-CP6-Trk-Bld-A-08	Stepping distances at Crossrail stations	Any required correction or adjustment to stepping distances at stations to be used by Elizabeth line services or other new trains will not be funded through renewals.	Track and buildings, capex and opex
WES-CP6-Trk-A-02	Access	Minimum of 8 hour midweek access is available for the delivery of High Output campaigns. 9 hrs will be available in axle counter areas	All areas, capex and opex
WES-CP6-Trk-A-06	Rail milling	Rail milling technology and resource will be available to the route to treat rolling contact fatigue.	Track capex
WES-CP6-Sig-A-11	Digital Railway	For the RF6 submission it is assumed that the Western route does not have a traffic management system operating at the start of CP6. However, we are working closely with Resonate to trial their implementation of traffic management in CP5 in order to establish the benefits which would be derived from this technology.	Operations opex, signalling capex
WES-CP6-Bld-A-18	Didcot Core Node	Didcot Core Node will be transferred to NRT	Buildings capex
WES-CP6-Data-A-03	Intelligent infrastructure	The Intelligent Infrastructure programme delivers the various tools and systems required	All areas, opex
WES-CP6-SHE-A-04	Level Crossing Risk Reduction	The route will achieve the necessary external permissions to enable planned level crossing closures to take place.	Safety and signalling, capex
WES-CP6-SHE-A-06	Home Safe Plan	National programmes contained in the Home Safe Plan will be delivered and funded nationally.	Safety, opex
WES-CP6-Route-A-01	Boundary Change	Assets which will transfer to LNW route as part of the proposed boundary change have been included in the Western RSP. The areas controlled by following signal boxes which currently form part of Western route will be resignalled and control transferred to LNW route: Droitwich Spa; Henwick; Ledbury; Malvern Wells; Newland East; Norton Junction; Worcester Shrub Hill; Worcester Tunnel Junction.	All areas, capex and opex
WES-CP6-SHE-A-12	LTIFR target	Lost time injury frequency rate target is set to compare to the best of other industries such as oil and gas. However, the criteria used by other such industries vary from how Network Rail currently measures LTIFR. As a result it is recognised that there will need to be a level playing field with which to compare NR's LTIFR, which will require changes to the definition of what incidents are counted as lost time injuries in Network Rail	Safety scorecard, opex

Appendix C Route context

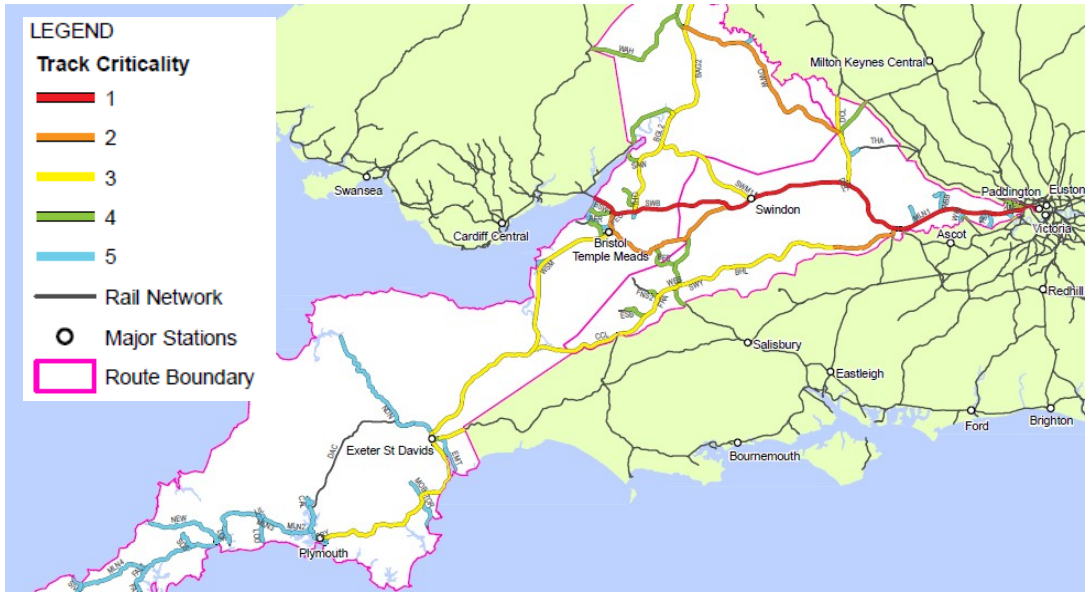
Stretching from the heart of London to the Atlantic coast, the Western route is vast and diverse and faces a unique set of challenges.

The route has two key axes. One runs from London to South Wales, via Reading, Swindon and Bristol Parkway. The other branches off at Reading and leads to the far Southwest at Penzance, taking in Newbury, Taunton, Exeter and Plymouth along the way. Around that are lines to Oxford, Worcester, Gloucester, Cheltenham, and a host of branch lines from the Thames Valley to Cornwall.

The route borders the Wessex, Wales, Anglia and London North Western routes, and serves seven passenger train operators, who between them run over 2,200 trains on the network, both within and beyond the Western's borders. From 2019, an eighth will be added to this in the form of MTR Crossrail. The route also contains several dedicated freight lines, including the second busiest freight corridor into London, which is used by DB Cargo and Freightliner. More than 1,000,000 freight miles are covered each year.

Western is a mixed traffic route with a maximum line speed of 125mph and track categories from 1A (between Reading and Paddington) to 5. The capacity constraints of the route lie between Swindon and Paddington. The route is a mix of criticality bands from 1 to 5 with the higher criticality (1) being the main line between Paddington and the Severn tunnel.

The criticality map for Western route is shown right. The volume of train movements on the Western route is 447,000 per annum; Western route accounts for 6% of the national train movements.



198
stations

1,850
track miles

2,600
colleagues

347
suppliers

7
train operators covering two million train miles per year

£

£2.130bn
CP5 operations, maintenance and renewals spend

2,200
train services per day

7,823
structures

A changing Western
The introduction of electrification, Elizabeth line services and the enhanced IEP timetable brings a significant increase in services and tonnage (through more, longer, heavier trains).

- Service increases between Paddington – Reading
  - Main line: Peak: **+16%** Off-peak: **+23%**
  - Relief line: Peak: **+27%** Off-peak: **+60%**
- Tonnage increase between Paddington – Reading
  - Main line: **+33%**
  - Relief line Paddington – Airport Jn: **+219%**
  - Relief line Airport Jn – Reading: **+120%**
- Electrification increase: **+731%** *(compared to CP5 entry)*

Appendix D Scenario planning

Part 1: Tactical scenario planning for CP5
Information on the impacts on CP5 of each of the following scenarios:

- Scenario 1: 20% increase in total remaining expenditure

Asset	Yr 4-5 outstanding spend	Potential investment increase	Benefits of increased expenditure			Comment on benefits
			Performance	Sustainability	Reputation	
Track	£197.1m	£39.4m	G	A	G	G+ for safety – marked reduction in safety risk
Signalling	£172.8m	£34.6m	A	A	A	
Level Crossings			G	A	A	
E&P	£56.0m	£11.2m	G	A	A	
Structures	£23.3m	£4.7m	A	A	G	
Earthworks	£5.1m	£1.0m	G	A	A	G+ for safety – marked reduction in safety risk
Drainage	£19.0m	£3.8m	G	A	A	
Buildings	£22.3m	£4.5m	A	A	G	
Total	**£495.7m**	**£99.1m**	G	A	A	

Key to risk colours

A: no additional benefit
G: some additional benefit
G+: considerable additional benefit

- Scenario 2: 20% decrease in total remaining expenditure

Asset	Yr 4-5 outstanding spend	Maximum potential saving	Risk of curtailing expenditure			Comment on impacts/issues
			Performance	Sustainability	Reputation	
Track	£197.1m	(£39.4m)	A	A	G	A for Safety – increase in safety risk
Signalling	£172.8m	(£34.6m)	A	A	G	
Level Crossings			G	A	A	
E&P	£56.0m	(£11.2m)	A	A	A	A for Safety – increase in safety risk
Structures	£23.3m	(£4.7m)	G	A	G	A for Safety – increase in safety risk
Earthworks	£5.1m	(£1.0m)	R	A	A	R for Safety – marked increase in safety risk
Drainage	£19.0m	(£3.8m)	A	A	A	A for Safety – increase in safety risk
Buildings	£22.3m	(£4.5m)	G	A	A	A for Safety – increase in safety risk
Total	**£495.7m**	**(£99.1m)**	A	A	A	

Key to risk colours

G: no additional risk
A: some additional risk
R: considerable additional risk

Part 2: CP6 scenario planning: investment options

This section describes the benefits of additional investment in the route, over an appraisal period of 30 years.

Weather resilience	**CP6 total: (£m)**	£286.2m	**CP6 capex: (£m)**	£286.2m	**CP6 opex: (£m)**	£0.m	**Total BCR**	2.4	**Appraisal period**	60 years
Description	**Qualitative benefits**						**Quantitative benefits**			
Exeter to Newton Abbot resilience: a package of works to improve the resilience of the railway between Exeter and Newton Abbot to severe weather events, consisting of: • £10m to construct a rock-fall shelter at Clark Tunnel (Parsons Tunnel – Kennaway Tunnel section, near Dawlish); • £26.2m for seawall strengthening at Marine Parade, Dawlish (Kennaway Tunnel – Dawlish Warren section); • £250m for cliff face remediation and beach reclamation between Teignmouth – Parsons Tunnel.	Development and delivery of critical resilience and secure the coastal route between Exeter St Davids and Newton Abbot through Dawlish and Teignmouth, enabling the route to remain open to the South West during severe weather. The Programme is to be staged over multiple control periods; the timing of delivery of works is to align with the risk profile to the railway. Priority 1 sites which include work between Teignmouth and Parsons Tunnel, Parsons tunnel and Kennaway Tunnel and Dawlish and Kennaway Tunnel shall be developed in CP6 with substantial delivery in CP6, Priority 2 sites shall be developed during CP6 with delivery in CP7.					The consequence of not doing this programme would result in more frequent, sustained long periods of closure and service disruption with events akin to those during 2014 (currently a 1 in 25 year event) occurring on an annual basis by 2115, This incident saw the line closed for several months at a cost to Network Rail of £50m and an estimated impact on the local and regional economies of up to £1billion. Increases in future services on the route will mean that the impact of disruption cause by severe weather will be compounded with a greater number of services affected. GRIP 1 Business case appraisal for the whole programme has been undertaken indicating a BCR of 2.4 if considered over 60 years which falls into the DfT's high value for money category. However the resilience strategy has considered the resilience of this route over a 100 year period, when the BCR is calculated over this timeframe the BCR is more than 90 indicating a very high value for money classification.			

Further level crossing safety improvements	**CP6 total: (£m)**	£222.8m	**CP6 capex: (£m)**	£217.8m	**CP6 opex: (£m)**	£5.0m	**Total BCR**	0.05	**Appraisal period**	30 years
Description	**Qualitative benefits**						**Quantitative benefits**			
Level crossing safety reduction and asset improvement programme: a series of work packages to further reduce level crossing risk across the route through a variety of interventions, in addition to benefits already included in core plan. Each package is capable of being progressed separately to align to funding available.	**Package 1:** Facilitates capacity enhancement on key freight route (DCL); eliminates high-risk crossings; eliminates only remaining 2-track, high-speed station access crossing; reduces safety incidents; reduces risk of AHB failures impacting train service; reduces maintenance costs. CAPEX: £22.2m OPEX (CP6): £15k **Package 2:** Eliminates high-speed passive crossings; provides compliance with ORR level crossing guidance; reduces safety incidents. CAPEX: £12.6m OPEX (CP6): £450k **Package 3:** Eliminates requirement for whistle boards; ensures delivery of *Transforming Level Crossings – A long term strategy to improve safety at level crossings 2015-2040*; alignment with *Western route Strategic Route Asset Management Plan, May 2016*; provides compliance with ORR level crossing guidance; reduces safety incidents. CAPEX: £43.8m OPEX (CP6): £1.2m **Package 4:** Eliminates telephone protection at level crossings; ensures delivery of *Transforming Level Crossings – A long term strategy to improve safety at level crossings 2015-2040*; alignment with *Western route Strategic Route Asset Management Plan, May 2016*; eliminates signaller involvement in UWC operation; reduces safety incidents. CAPEX: £82.2m OPEX (CP6): £2.25m **Package 5:** Eliminates open crossings; reduces safety incidents. CAPEX: £12m OPEX (CP6): £150k **Package 6:** Provides compliance with ORR level crossing guidance; reduces safety incidents; significantly improves passive crossing asset condition and life; provides consistency of appearance across passive crossing estate. CAPEX: £15m OPEX (CP6): £960k **Package 7:** Ensures focus on crossing closures; provides means to pursue Transport and Works Act Order; provides dedicated closure resource and expertise. CAPEX: £30m OPEX (CP6): £0	**Package 1:** FWI benefit = 0.06073388. **Package 2:** FWI benefit (if closures) = 0.00771992. FWI benefit (if MSLs) = 0.00463195. **Package 3:** FWI benefit (if closures) = 0.02981013. FWI benefit (if MSLs) = 0.01788608. **Package 4:** FWI benefit (if closures) = 0.05525563. FWI benefit (if MSLs) = 0.03315338. **Package 5:** FWI benefit = 0.02276787. **Package 6:** FWI benefit = 0.00790022. **Package 7:** FWI benefit = 0.08308915. Reduction in user human error incidents at upgraded (MSL and ABCL) crossings of 100%.				

Appendix E CP6 regulatory framework – Breakdown of Access Charges and Other Single Till income

In Table E.1, we present our forecast of income from each regulated charge in CP6. Our charging income forecast reflects our latest forecast of CP6 traffic levels and is consistent with our total CP6 income forecast set out in Section 10.

As ORR has not yet concluded on the structure or level of CP6 charges, we assume the continuation of CP5 (2018/19) access charge rates. However, we have not included a forecast for the Capacity Charge because ORR has already concluded it will not continue in CP6.

Table E.1: Charging income

£m in 2017/18 prices	18/19	19/20	20/21	21/22	22/23	23/24	CP6
Route charging income							
Variable Usage Charge	(28)	(22)	(23)	(23)	(23)	(23)	**(115)**
Electrification Asset Usage Charge	(1)	(2)	(3)	(3)	(3)	(3)	**(13)**
Schedule 4 Access Charge Supplement	(27)	(23)	(29)	(29)	(26)	(22)	**(129)**
FTAC / Grant (SOMR)	(570)	(349)	(392)	(405)	(374)	(353)	**(1,873)**
Station Long Term Charge	(16)	(16)	(16)	(14)	(14)	(14)	**(75)**
FNPO income	0	(191)	(190)	(186)	(172)	(159)	**(899)**
Charging income allocated to routes							
Electric Current for Traction	(34)	(23)	(26)	(26)	(26)	(27)	**(128)**
Total charging income	**(676)**	**(627)**	**(679)**	**(686)**	**(638)**	**(601)**	**(3,233)**

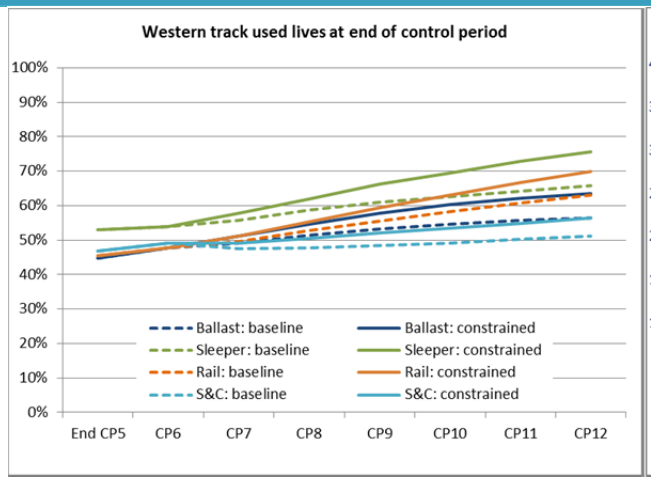
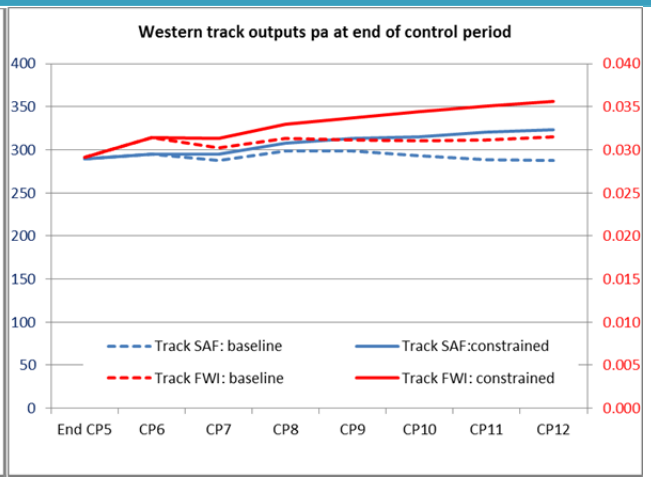
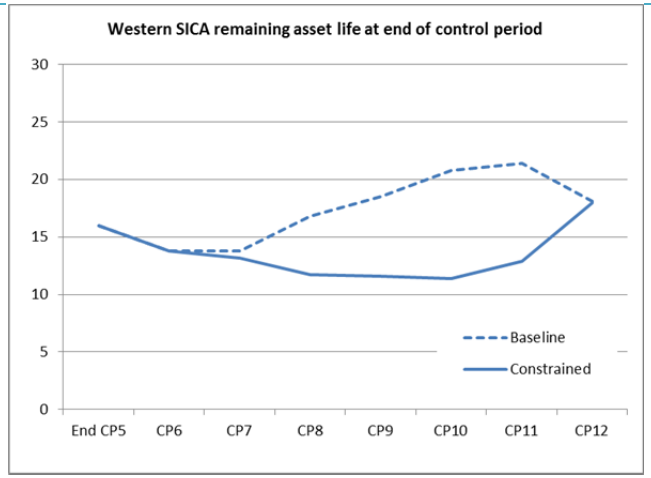
Table E.2 provides a breakdown of forecast other single till income for CP6, which is included in Table 10.2 and 10.3, above. Other single till income represents Network Rail income that is received from sources other than access charges and network grants.

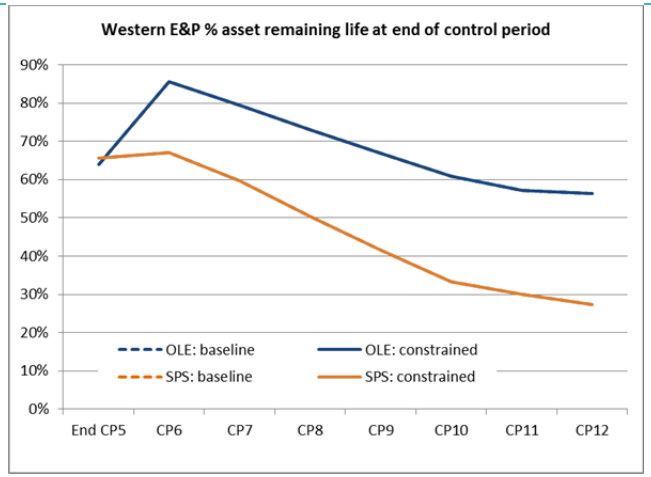
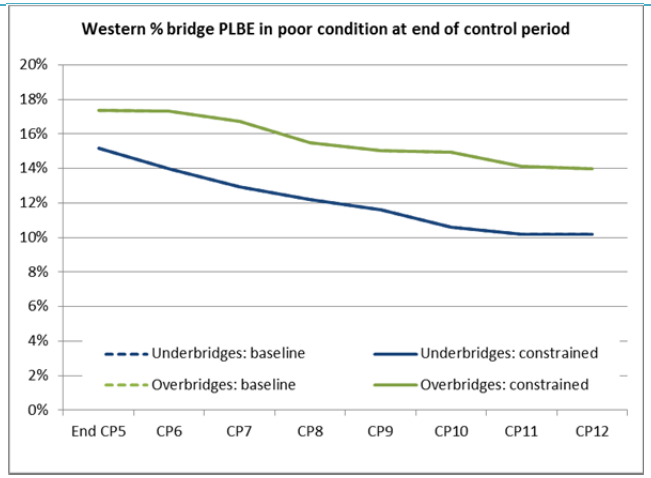
Table E.2: CP6 forecast of other single till income

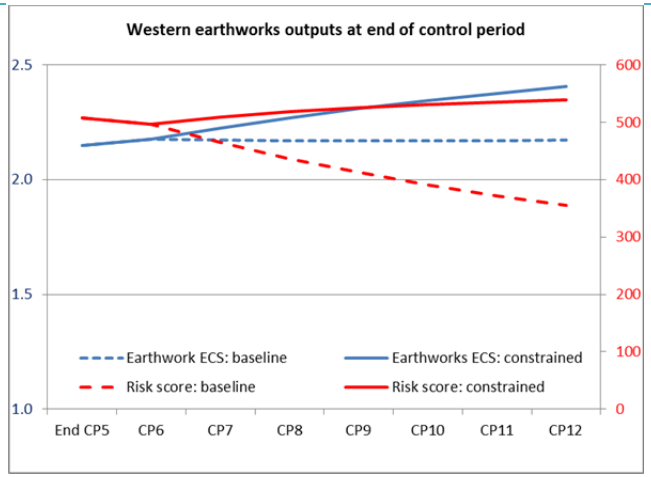
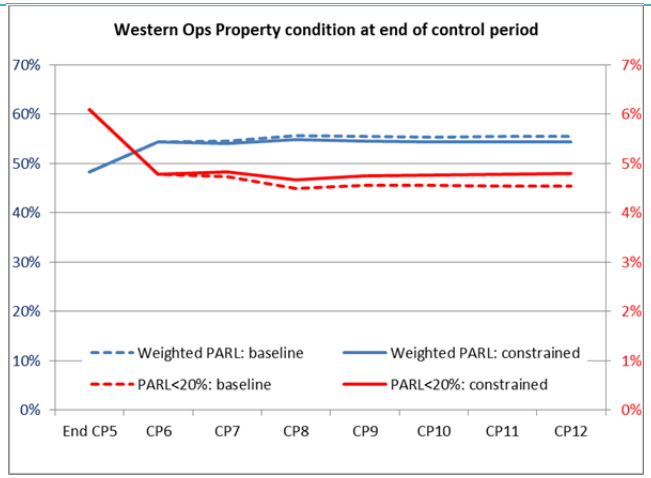
£m in 2017/18 prices	18/19	19/20	20/21	21/22	22/23	23/24	CP6
Route income							
Managed station QX	(10)	(10)	(10)	(10)	(10)	(10)	**(48)**
Franchised station lease income	(3)	(3)	(3)	(3)	(3)	(3)	**(17)**
Open access fixed contractual contribution	(9)	(9)	(9)	(9)	(9)	(9)	**(45)**
Depots	(8)	(8)	(8)	(8)	(8)	(8)	**(39)**
Finance charges (e.g. Crossrail)	0	0	0	0	0	0	**0**
Facility charges	(13)	(13)	(13)	(13)	(13)	(13)	**(67)**
Other route income	(23)	(1)	(1)	(1)	(1)	(1)	**(3)**
Income allocated to routes							
Property rental	(75)	(25)	(25)	(27)	(27)	(27)	**(131)**
Property sales	(22)	(3)	(3)	(2)	(2)	(3)	**(12)**
Total other single till income	**(164)**	**(71)**	**(72)**	**(72)**	**(73)**	**(74)**	**(362)**

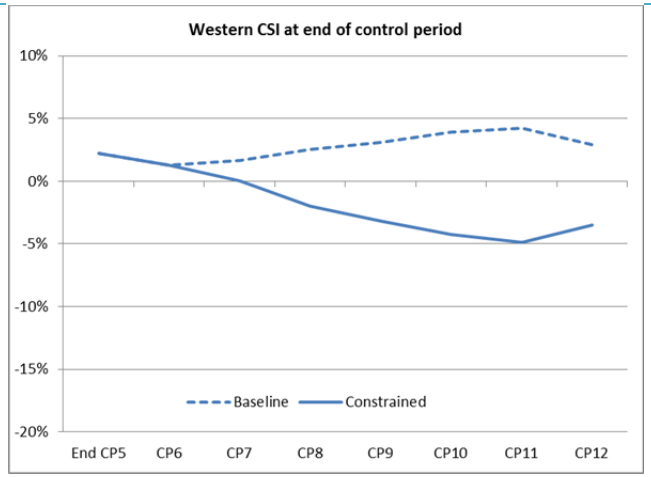
***Please note**: We no longer include stations long term charge income, open access income (with the exception of the open access fixed contractual contribution) or freight income in other single till income.*

Appendix F Long term forecast

Asset	Condition trajectory	Comment
Track	 	Forecast increased expenditure under the baseline scenario increases asset life, with consequent steady impact on service affecting failures. Constraining funding in the alternate scenario worsens asset life and performance and FWI outcomes.
Signalling		The planned resignallings for Worcester, Cornwall, Gloucester, Exeter and Westbury impact favourably on the remaining asset life remaining to CP11. Both scenarios assume this essential work is completed, albeit with phasing differences.

E&P				The forecast for long-term E&P asset life remaining is skewed by the lack of overhead line renewals in CP6 (due to the significant new construction in CP5), which is therefore not factored into future works by the forecast model. It is expected that there will be mid-life refurbishment works between CP7 and CP12 in order to sustain asset condition.
Structures				Both the baseline and constrained scenarios have similar outcomes with reductions in poor condition structures through to CP12, with similar, increased, spend profiles assumed in both scenarios, with more significant interventions due to an increase in metallic renewals works in future control periods, as 46% of structures assets are over 145 years old and earlier structures tended to be masonry construction and the age profile of metallic structures will increase.

Earthworks				The baseline scenario for earthwork assumes expenditure increases in future control periods with consequent improvements to condition and reductions in the risk score. Under the constrained scenario such favourable outcomes are not sustained, with a worsenment in risk score and condition.
Operational Property				Forecast outcomes for the buildings assets are similar between the two scenarios, with a minor worsenment in the constrained scenario compared to the baseline forecast, provided in both scenarios that sufficient funding is available for infrequent major interventions, such as managed station rewires and roof works which typically fall due every 25 years.

Composite sustainability index				With the reduction in asset spend forecast under the constrained scenario, and as a consequence of the individual movements noted above, forecast composite sustainability index performance is forecast to worsen over future control periods, whereas it will improve under the baseline scenario.

Appendix G Freight and National Passenger Operators Route plan

Section	Key themes	Strategy	Specifics	Owner	Timescale
Safety	Lost Time Incidents	Reduce LTIs through concentration on Network Rail yard infrastructure, connecting sidings and walking routes conditions.	• Published rolling programme of joint health and safety visits with customers (FOCs/TOCs) to agreed sites including Acton, Westbury, Southall and Brentford • Complete review of authorised walking routes/crew change locations per customer • Subject to funding, a programme of improvements will be specified and implemented • 'Go Look See' with customer within two weeks of any reportable customer LTI event on network infrastructure	FNPO Operations and Safety Manager/ SRFM	Initial Programme to be published March 2018 then annually during CP6
	Freight Train derailments	Reduce freight train derailments through concentration on Network Rail yard and sidings infrastructure.	• Published rolling programme of joint health and safety visits with customers to agreed sites • End Customer Forum to be implemented to share issues of concern around connection points and maintenance either side of boundary point , in particular covering the quarries at Whatley and Merehead • Subject to funding, a programme of improvements will be specified and implemented	FNPO Operations and Safety Manager/ SRFM	Initial Programme to be published March 2018 then annually during CP6
	FNPO SPADs	Reduce freight SPADS by collaborative working	• SPAD Forum to be implemented with FOCs to share learning and best practice	FNPO Operations and Safety Manager	Creation of Forum by April 2018. Meeting regularity proposed quarterly
Performance	Right time departure performance at key hubs and terminals	Use Strategic Freight Corridors to focus delivery Measuring Right Time Departures from terminals at the start of the journey	• Local Working Groups (e.g. Mendip Rail, Acton Yard) • Use of Control Rooms and Visualisation at major sites (e.g. Merehead) • Re-brief Freight Strategy – 'Freight Delivery Matters' and linkage between RTD and FDM delivery	SRFM/ FNPO Performance Manager	Existing Working Groups to continue into CP6. Quarterly FNPO review of terminal engagement arrangements
	Measuring FDM and FDM-R	Focus on defined key routes: - Asset Performance - Asset Resilience - Effective contingency plans	• Target FDM-R route target for end CP6 of 94.5% • Input to route CP's for consistent application of freight contingency arrangements • FSDM input to incident recovery real-time to build consistency • Asset Reviews with route Asset teams to share traffic forecasts and asset challenges with SRFM • Influence at RSPG to define future asset strategy in terms of renewals to support freight growth	SRFM/FNPO Performance Manager	Annual target setting during CP6. Periodic review of FDM-R delivery and key influencers

	Joint Freight Performance Improvement Strategies	Agreed joint strategy with each FOC including details of plans to reduce each delay area	• Complete plan annually with each FOC concentrating on primary delay categories • Agreed industry information share • Regular reviews against plan with each route and FOC customer, in particular targeting A2F improvement at the Eastern end of the Western route where the greatest congestion occurs.	FNPO Performance Manager/CRE	Joint Strategy Plan per Operator to be published annually during CP6 and reviewed quarterly
Capacity & Capability	Identifying future capacity and capability needs.	Bring together all freight capacity plans: • Route Studies • SFN • Customer specific	• All future project specifications to include a specific output level for freight services, reflecting the SFN specifications and forecast future traffic requirements. • Future Capability needs assessment to be undertaken – RA, Gauge, HAW – future plans for improvement to meet capacity requirements • Interactive maps for Gauge, RA to be created and maintained • Continued support for longer, heavier trains programme	Project Sponsor/SRFM SRFM/ FNPO Head of Strategic Capability/ FNPO Head of Network Management	Future capability programme definition by April 2018 and delivery per strategic route
	Review existing capability constraints	Undertake Capability Review	• Improved gauge and operational flexibility on key freight corridors • Robust gauge cleared diversionary routes • Transparent network capability per route for customers	SRFM/ FNPO Head of Strategic Capability/ FNPO Head of Network Management	Existing capability constraints review definition by April 2018 and delivery per strategic route
	Freight Train Average Speed	Undertake Average Speed Review	• Establish framework for average speed measurement and improvement • Work with stakeholders to target specific flows and services • Annual plan in connection with annual timetable change	FNPO Head of Performance/ FNPO Head of Strategic Capability/ FNPO Head of Network Management	Measurement framework to be agreed by industry May 2018. Flows to be agreed for Dec 2018 TT change and annually thereafter
	Connections to new terminals and SRFIs	Facilitate connections to the network and associated capacity	• Work with FOC's, Freight End Users and Developers to identify potential new connections, including development of SRFI's • Information share of prospective sites via RSPG • Facilitate new network connections if required • Identify potential sites (new connections, bringing out of use infrastructure back into use and increased use of lineside loading) to facilitate growth, e.g. (route TBC) for aggregates • Advice to System Operator of future sites and flows to understand timetable and capacity impact • Timetable studies for major terminal developments, e.g. SRFI's	SRFM/ FNPO Business Development Managers	Forward programme of FEU and Developer engagement to be agreed annually during CP6. Freight Developments Register to be held by SRFM for review at RSPG quarterly.

	Delivery of agreed CP6 freight enhancement programme	Continuation of Strategic Freight Network funding and industry governance group	• Promotion of potential freight projects and enhancement schemes • Prioritise funding to best meet demand and facilitate growth • Align SFN proposals with route and National proposals to deliver a coherent forward strategy which best meets overall requirements	FNPO Head of Freight Development/ System Operator	Ongoing
	Consideration of incremental freight improvements in all schemes	Structured review process with route planners and Sponsors	• Work with FOC's and System Operator to identify opportunities for incremental freight enhancements as part of the development of enhancement and renewals proposals, e.g. faster entrance/exit speeds into loops and through crossovers. • Defined and consistent engagement process to be agreed with route Planning team and Sponsors	SRFM/ System Operator	Defined engagement process and inputs to be in place with route Strategy by April 2018

Network Availability	Engineering plans that meet both FNPO customer and route needs.	Regular and co-ordinated freight input into
		• Engineering Access Statements
		• Access Planning Requests
			• Engineering plans that are;
			  • Transparent
			  • co-ordinated
			  • consistent across routes
			  • planned well in advance and
			  • take into consideration contingency arrangements for long distance services
				SRFM/ FNPO Capability and Planning Manager	Annual review of process/requirements between FNPO and Engineering Planning from March 2018 incorporating end to end Access process

Appendix H Route Services working with Western route

Route Services: services offered to Western route

Supply Chain Operations

Aerial Survey
Breakdown Recovery
Delivery of Materials by Rail
Delivery of Materials by Road
High Output
iStore
Lifts and Escalators
Mechanical Electrical Lock Fitting
Mobile Flash Butt Welding
National Signalling Works
On Track Plant
Operational Property Helpdesk
Overhead Line Condition Renewal Works
Product Management
Project Engineering
Project Management Services
Rail Profile Treatment Grinding and Milling
Recycling
Road Fleet
Seasonal Autumn
Seasonal Summer Weedspray
Seasonal Winter
Stoneblowing
Tamping

Information Technology

Building Infrastructure IT (BIIT) Projects
IT Delivery Projects
IT Helpdesk
IT Strategy and Planning Services
Local IT Delivery Management
Technology Infrastructure Services

Business Services

Accounts Payable
Apprentices
Billing and Income Collection
Business Intelligence Team
Competency Assurance
Content Management
COOM (Call-off Order Management)
Energy Bureau
Engineering Graduates
Expenses
HRSS Employee Records
HRSS Medicals
HRSS Payroll
HRSS Recruitment
Leadership and Professional Development
Organisational Data Maintenance
PPE Helpdesk
Records Management
Schedule 4 Compensation
Taxation and Accounting
Technical Competencies
TOC Billing and Income Collection

Contracts & Procurement

Category Management
Contract and Supplier Management
Governance and Assurance
Procurement

Route Services Supply Chain Operations working with Western route

Our strategic business plan includes a reliance on Supply Chain Operations being able to maintain and in some areas enhance its capability across a number of our key products and services. In particular, we are planning to increase the usage of stoneblowers to help sustain and improve our track geometry. In support of this, Supply Chain Operations are replacing the plain line stoneblower fleet during CP6. This will not only deliver a more reliable and technologically enabled fleet but also increase capability, as these new machines will be able to work on S&C units as well as plain line track.

As the route is also embracing eddy current and ultrasonic testing to better identify rolling contact fatigue (RCF), we depend on Supply Chain Operations to deliver the new rail milling machines during CP6 to treat areas of severe RCF. The introduction by SCO of new rail grinders in 2017/18 will maintain capability and the reliability required to deliver our preventative and corrective rail grinding.

The environment in which we operate our route is becoming more challenging due to a forecast increase in traffic and fewer and shorter access windows. This means we will depend on faster, higher speed S&C tamping machines in CP6. Our plan includes two new tampers that will help us to meet our business plan targets and enable higher speed hand backs, reducing the impact of track renewals on our passengers. The decision to procure these new machines was made as part of the collaborative tender exercise for the new on track machine contract which commences in 2019, with our new machines being available in 2020/21.

Conflict with late running enhancement programmes and application of cost constraints has resulted in CP5 volumes of high output volumes slipping to CP6. The capability to deliver the required volumes forms a critical role in the route's strategy for track.

With respect to seasonal treatment trains, we require the fleet to continue to provide robust delivery through CP6 and will work with Route Services to identify changing RHTT requirements arising from amended traffic patterns and new passenger rolling stock. Specifically, additional treatment sites in the inner Thames Valley may be required along with additional treatment runs in Cornwall as a result of the enhanced train service.

Route Services Contracts & Procurement (C&P) working with Western route

The creation of Route Businesses and subsequent devolution of authority and accountability is an important opportunity to gain greater value from the supply chain. Network Rail expenditure outside of Infrastructure Projects is around £3bn, covering a wide range of works, goods and services. It includes the largest single contract in the company and the UK's largest contract with EDF for fossil-free electricity for traction power.

Although the total sum varies, around £750m of new or replacement contracts are tendered each year. For the replacement contracts in particular, large savings have been achieved through multiple cycles of tendering and these provide ongoing benefit through CP6. The focus of pure procurement savings going forward will be targeted on around 20 contracts over £50m (in total value) which will be placed in the year prior to CP6 starting, and a further 20 in the first two years of CP6. The procurement savings target of £20m pa reflects this pipeline.

There is opportunity to drive further reductions in the total cost of ownership of our contracts, through integrated working with customers and improved collaboration and contract management with suppliers. Across the £3bn of expenditure there are currently 3860 suppliers, and these have been segmented to support the prioritisation of opportunities. As Network Rail's demand and requirements for CP6 and the remainder of CP5 becomes clear, the Route Services C&P team will be able to create targeted strategies for each of the 30 categories of spend within the £3bn, and also identify any opportunities to drive further value through increased integration with Infrastructure Projects.

This work is at a relatively early stage, reflecting the recent move to a devolved C&P structure, and hence it's not yet possible to quantify the scope for further benefits in full detail. It may also be that, to an extent, total cost of ownership savings are offset by headwinds such as input price inflation, supply base skill and capacity shortages, and the need to invest in new plant and equipment. In any case, however, the strategies should deliver benefit by increasing the safety engagement and performance with the supply base, as well as an increased focus on continuous improvement and reliability (through techniques such as Total Productive Maintenance and Design for Reliability).

For CP6, both Route Services and route C&P will continue to focus on key themes in our supply chain, such as levels of sustainability, applying the principles of the Modern Slavery Act, improving Diversity & Inclusion and supporting the Government's Growth Agenda.

The final 18 months of CP5 will see the Route Services Contracts & Procurement team, in partnership with Route Businesses, re-introduce four key strategies to improve the value from the supply chain:

1. Integrated category management
2. Supplier account management and engagement
3. Customer account management
4. Better Every Day systems, processes and behaviour (including post-contract and supplier performance management)

There will be ongoing dialogue between Route Services C&P and route colleagues to achieve the right balance between what national and devolved supply chain management (options are currently being explored with LNW, for example, and South East route is trialling a local buying trial for one category). Route Services CP6 Contracts and Procurement approach is founded on the principle that each route is our customer, and they have the right to the best service they can find.

Route Services Information Technology (IT) working with Western route

The constant advances in information technology pave the way for a technology enabled future. Almost every department and function relies on technology in some form and CP6 will see that reliance deepen. Western route has no current aspirations to devolve IT services into the route and see Route Services Information Technology (RSIT) as a partner. As such the route will need to be proactive and welcome change to maximise the benefits the partnership will bring.

Document sharing and collaboration will be a key driver for CP6. This not only will reduce the need to travel as frequently but will enable deeper alliance with our customers. System and data integration will enable seamless third party access to use NR systems. Document storage will evolve from restrictive shared drives into cloud based solutions. There will be need for a common file naming standard and the use of metadata to allow easy searching and sharing of documents. Microsoft Office 365 will provide the latest versions of the standard office products along with additional collaborative software not currently available. Being cloud based this always on availability will support the routes around the clock working. Personal conferencing tools will continue to evolve which will allow the route to become more productive by reducing the need for staff to travel as frequently saving time and money. To maximise the benefits the route will need to provide training and change their mind set with virtual meetings being first choice as the location of choice across all staff levels.

As technology advances mobile working will become more common place. This will allow for buildings to move to a more agile way of working. Track side staff will have increased information at their fingertips allowing for decisions to be made real time. Mobile working will however bring additional costs to the route as equipment will likely get lost and damaged and mobile technology such as iPads have a shelf life of four to five years, meaning almost all devices will

need replacing by the end of CP6. The route need to provide adequate guidance when working on mobile devices to ensure staff only use when in a position of safety and review the ergonomic work space when agile working to reduce risk of injury.

As we move towards a predictive maintenance approach, the lines between corporate office IT and the operational railway will continue to merge. Real time information from the track side will continue to develop, allowing proactive decisions to be made in advance of possible failures. New trains will come with various sensors which will provide further near real time information about the quality of the assets. The route will need to engage with RSIT to understand how to extract the data, process and analyse it. With connected equipment comes the risk of data and cyber security. More commonly thought to relate to the office environments, cyber security is also a risk to track assets, digital information screens and operational equipment. Proactive measures will need to be undertaken to minimise any risk to disruption.

Real time operational data will be pivotal to improving performance within the route. Live proactive data during disruptions, decision support tools to predict and recover train paths; automated delay attribution and precise train location and status will aid recovery of train services and reduce the chances of delay or further disruptions.

Route Services Business Services working with Western route
Business Services is committed to delivering the existing core services detailed in its service catalogues, whilst continually looking for new areas of service, for example looking at the provision of more end to end services which the route businesses value.

Shared Services continues to evolve, adopting external good practice to maximise efficiencies and value to the route. We encourage Shared Services' plans to maximise existing technology solutions and invest in new systems to improve our experience, whilst market testing to give us independent assurance on value for money.

Network Rail Training supports us in developing a clear idea of demand through its route-based training Support Managers. They are designing modern & engaging training and other learning support, and will deliver as locally as possible. We are supportive of their exploration of 'block' training to reduce the impact of training on our rosters and to further drive efficiency, as well as exploring how support can be provided post training such as assisting in competence management. Network Rail Training will support our introduction of major programmes, digital technologies and/or signalling schemes in the route, actively seeking to simplify and streamline the route to competence that these programmes almost always require for our people. An essential part of this service is to identify our people capability issues early and feed upstream into the system design or operating practices in a way that makes the best use of our workforce. At all stages we are working with NR Training to continuously improve, modernise the service and products they offer.

We are pleased to see Route Services developing a culture of **Continuous Improvement,** aligned to the Better Every Day corporate initiative. Their training and experiments link directly to the high level value stream for each service catalogue entry to maximise benefit for the route.

National Records Group supports the route with improved access to information and enhanced collaboration, including more efficient exchange of asset information with increased self-service and improved 3rd party access. This includes the support and development of **content management** systems including Hub and Office 365. We are pleased that National Records Group maintains external quality standards such as ISO 9001:2015 certification and national accreditation for archives.

Appendix I Regulatory floor methodology

This section gives further information on the methodology for calculation of the regulatory floor metrics in section 3.4.

Consistent Route Measure – Performance (CRM-P)

Simple Definition
Annual minutes of Network Rail attributed delay to passenger trains from incidents occurring within the route boundary normalised by the actual mileage travelled by passenger trains within that route.
(Total attributed delay to the NR Route) / (train kms in the route) * 100 only including passenger trains

The figure quoted is the MAA (annual total) per 100 train kilometres quoted to 2 decimal places.

Definition Notes
Delay Minutes: includes both primary and reactionary delay, and delay suffered in other routes from incidents occurring in your route. All attributed delay minutes are included
Passenger trains: Only in service passenger train services are included (ie Empty Coaching Stock moves are not counted) the measure does though include delays to minor passenger operators such as NYMR, Tyne & Wear metro and London Underground.
Actual mileage: The mileage is as calculated by PSS for in service passenger train movements within the route boundary. The mileage is based on actual rather than planned train movements. Mileage is measured in 100 train kilometres
Cancellations: Full cancellations are excluded from the metric. Delay minutes and mileage of part cancelled trains are included in the measure.
Disputed minutes – the measure should be assessed after all disputed minutes have been settled.

Assumptions
- The trajectory is based on the DAG as of December 2017 – any significant shift in attribution practices will have a material impact on the metric.
- The trajectory is based on the current (minimal) level of attribution of sub-threshold delays any shift in attribution practices will have a material impact on the metric.
- The trajectory is based on current route boundaries and definition of NR geography.
- The trajectory is based on the current balance of delay transfer between routes and the assumed level of traffic growth by each Operator in each Route.

CRM-P floor setting
The CRM-P floor has been set using a consistent, simple to understand, methodology across all routes to derive a floor which should only be breached when a route is displaying signs of being in systematic failure. The floor has been set on the basis that ORR will first investigate a breach of the floor and check whether the route is doing everything reasonably practicable to manage the relevant issues before taking regulatory action. This recognises that CRM-P can be impacted by extreme events outside the direct control of the railway (including weather) and potentially by major changes in the reliability of TOC operations.

We are proposing that the floor for the route CRM-P is based on setting a “buffer” which becomes for that route a fixed absolute level of allowed deviation away from the proposed trajectory for each year in CP6.

The buffer is set at:

- 30% of the Period 10 2017/18 value of CRM-P (MAA) for that route

So for instance:

Current CRM-P for a route is 4.00 minutes
The buffer for the route would be 1.2 minutes (i.e. 30% of 4 minutes)
If expected CRM-P in 2021/22 for the route is 3.80 minutes the floor would be set at 5.00 minutes (i.e. 1.2 minutes worse than the trajectory).

This logic keeps the proportional level of failure for all routes similar and follows the current methodology used by the DfT to set Breach levels around the TOC on Self Delay target within the franchise agreements. It does though recognise that confidence in delivery of improvement is slightly less than the confidence of delivering current performance.

The 30% level is between the 25% used by the DfT in the South Western Railway franchise and the 40% proposed by the DfT for the South Eastern franchise. It also aligns to our proposal for the floor on the FDM-R measure for freight performance.

Freight Delivery Metric – Route (FDM-R)

The regulatory floor is calculated following the same methodology as is used for the FDM-R target. Using a two year average of historical data the FDM-R methodology establishes, by route, the number of allowed delay failures each route should contribute in order to achieve the national FDM target of 94%. The regulatory floor calculation adds 30% to these allowed delay failures.

Network Sustainability (Composite sustainability index)

The Sustainability assurance has identified a small part of the overall plan that can be deferred and remain deliverable in future control periods. The regulatory floor for sustainability is therefore set at this level which has been assessed to be limited to a 10% loss in proposed plan activity across the control period.

Routes will therefore be required to demonstrate that delivery is kept to a level to perform above the 90% threshold and demonstrate that forward plans will allow this to remain the case at the end of the control period.

In addition to the regulatory floor, Network Rail internal assurance and review will monitor route delivery through an annual route specific threshold. Where a single year’s delivery falls to <85% of the plan a route specific improvement plan will be required for Executive approval & monitoring.

This measure of sustainability reflects a balance which, whilst allowing a certain amount of re-phasing, also requires a retained margin within the overall control period headroom, supporting remedy ahead of any regulatory breach.

Appendix J Scorecard definitions

This section provides definitions for the measures show on the long-term scorecard in section 3.2.

Safety	Definition
Lost Time Injury Frequency Rate (LTIFR)	The number of injuries leading to absence from work among staff and contractors per 100,000 hours worked.
Passenger train accident risk reduction measures	Measures our achievement of the key milestones and metrics to reduce train accident risk. This will be reported at route level as well as national, providing greater visibility and accountability in delivering a safer railway.
Top 10 Milestones to reduce level crossing risk	Measures our achievement of the Top-10 milestones to reduce level crossing risk.
RM3	Measures our achievement of milestones for health and safety risk management. This measure will be defined in more detail over the next year as targets will be set year on year.
Train Performance	**Definition**
Consistent Route Measure – Performance (CRM-P)	Annual minutes of Network Rail attributed delay to passenger trains from incidents occurring within the route boundary normalised by the actual mileage travelled by passenger trains within that route. (Total attributed delay to the NR Route) / (train kms in the route) * 100 only including passenger trains The figure quoted is the MAA (annual total) per 100 train kilometres quoted to 2 decimal places.
Freight Delivery Metric (FDM-R)	FDM is our indicator of how many freight services have arrived at their destination on time.
Great Western Railway: Punctuality at all recorded station stops	Percentage of Recorded Station Stops called at on time or early. To be “On Time” the lateness at a particular Recorded Station Stop has to be less than 1 minute (i.e. time to 59secs) as measured against the Public Timetable time (GBTT) within TRUST. Early trains count towards the “On Time” total.
Great Western Railway: Public Performance Measure (PPM)	The percentage of trains arriving at terminus within a punctuality threshold (within 5 minutes for London & South East and Regional sector services, and within 10 minutes for Long Distance services) having called at all of its planned station stops. Any train which is a full or part Cancellation as measured by reference to the Applicable Timetable is regarded as a PPM Failure.

Great Western Railway: Average Passenger Lateness	The APL for each service group on each day or each period is defined by the August 2017 average minutes lateness (AML) calculation set out in the template Passenger Schedule 8 of the Track Access Agreement and currently calculated in PEARS.
Great Western Railway: Level of cancellations	The percentage of planned trains which either did not run their full planned journey or did not call at all their planned station stops.
Great Western Railway: NR caused delay minutes	Delay minutes affecting the TOC attributable to Network Rail in line with the PfPI definition of a delay minute
Heathrow Express: Punctuality at all recorded station stops	Percentage of Recorded Station Stops called at on time or early. To be "On Time" the lateness at a particular Recorded Station Stop has to be less than 1 minute (i.e. time to 59secs) as measured against the Public Timetable time (GBTT) within TRUST. Early trains count towards the "On Time" total.
Heathrow Express: Right-time at destination	To count as "Right Time", the train must arrive at destination within 59 seconds of the scheduled public arrival time at the destination as shown in the Applicable Timetable. Any train which is a full or part Cancellation as measured by reference to the Applicable Timetable is regarded as a Right Time Failure.
Heathrow Express: Level of cancellations	The percentage of planned trains which either did not run their full planned journey or did not call at all their planned station stops.
Heathrow Express: NR caused delay minutes	Delay minutes affecting the TOC attributable to Network Rail in line with the PfPI definition of a delay minute
MTR Crossrail: Public Performance Measure (PPM)	The percentage of trains arriving at terminus within a punctuality threshold (5 minutes) having called at all of its planned station stops. Any train which is a full or part Cancellation as measured by reference to the Applicable Timetable is regarded as a PPM Failure.
MTR Crossrail: Punctuality at all recorded station stops	Percentage of Recorded Station Stops called at on time or early. To be "On Time" the lateness at a particular Recorded Station Stop has to be less than 1 minute (i.e. time to 59secs) as measured against the Public Timetable time (GBTT) within TRUST. Early trains count towards the "On Time" total.
MTR Crossrail: Level of cancellations	The percentage of planned trains which either did not run their full planned journey or did not call at all their planned station stops.
Cross Country right time departure at Bristol Parkway	Right-time departures for CrossCountry services which have called at Bristol Parkway. To count as "Right Time", the train must depart Bristol Parkway within 59 seconds of the scheduled public arrival time. Any train which is a full or part Cancellation as measured by reference to the Applicable Timetable is regarded as a Right Time Failure.

Cross Country right time departure at Reading	Right-time departures for CrossCountry services which have called at Reading. To count as "Right Time", the train must depart Bristol Parkway within 59 seconds of the scheduled public arrival time. Any train which is a full or part Cancellation as measured by reference to the Applicable Timetable is regarded as a Right Time Failure.
Customer	**Definition**
Great Western Railway - Level 2 Scorecard	Measures our achievement against the metrics in the GWR Level 2 scorecard
Heathrow Express - Level 2 Scorecard	Measures our achievement against the metrics in the Heathrow Express Level 2 scorecard
Managed Stations Passenger Satisfaction (NRPS)	Passenger satisfaction at Paddington, Reading and Bristol Temple Meads, as measured in the National Rail Passenger Survey conducted by Transport Focus.
Reduction in railway worker complaints	The number of public complaints recevied about railway work on the route.
Sustainability / Asset Management	**Definition**
Reduction In Service Affecting Failures (SAF)	Measures the impact of asset failures on train performance
CRI	This is a measure of the short-term condition and performance of our assets including track, signalling, points, electrification, telecoms, buildings, structures and earthworks.
7 Key Volumes	Measures delivery against budget of the seven key renewals volumes
Top Investment Milestones	These milestones measure our achievement of interim milestones of our top-10 renewals and enhancement projects.
Network Sustainability (Composite sustainability index)	This is a measure of the long-term condition of our assets including track, signalling, points, electrification, buildings, structures and earthworks.
Financial Performance	**Definition**
Financial Performance Measure (FPM) - Gross Excl. Enhancements (£m)	Measures how we are performing against our Income, Opex and Renewals budget.
Financial Performance Measure (FPM) - Gross Enhancements only (£m)	Enhancement expenditure measures how we are performing against our Enhancement expenditure budget.
Cash Compliance – Income & Expenditure	This is a measure of how well we have remained within our funding envelope in total.

Appendix K Glossary of terms

Term	Full description	Supporting explanation with route context
ABP	Activity Based Planning	An established accounting process used widely across organisations and introduced by Network Rail to develop maintenance resource and costs in CP6
Balise		A generic term for an asset (hardware) which receives and transmits a signal as part of a command or control process. Commonly used term as part of Western routes Automatic Train Protection (ATP) system
BCR	Benefit Cost Ratio	A key indicator, as a single figure, required in business case evaluation, to summarise the overall value for money of a proposal by calculating the income received over cost of implementation over the lifecycle of the proposal
C-DAS	Connected Driver Advisory System	A system which provides an indication in the Driving Cab advising speed in order to regulate train movement in conjunction with the signalling and route control process.
CAL	Curve Assisted Laser	Technology which assists in aligning track thus improving safety and quality of trackwork
CAPEX	Capital Expenditure	An accounting term used to classify money spent on acquiring or improving fixed assets which is then depreciated in the accounts and non-consumable. Renewals and enhancements are treated as capex in the CP6 submission
CCTV	Closed Circuit Television	Television systems used primarily at stations are part of the SISS assets
CIS	Customer Information System	Display screens and voice announcements relayed from the signalling system to inform passengers
Control Period		The five year timespans used by Network Rail and ORR for financial and regulatory planning purposes as part of the Network Licence under which Network Rail owns and operates the national rail network.
COO	Chief Operating Officer	Organisational lead for route operation
CP5	Control Period 5	April 2014 - March 2019: the current Control Period
CP6	Control Period 6	April 2019 - March 2024: the next Control Period.
CRI	Composite Reliability Index	An indicator agreed between Network Rail and ORR which summarises the contribution of asset reliability to the safety and performance of the railway.
DCO	Development Consent Order	The legal means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIP)
DfT	Department for Transport	The government department accountable for rail transport in Great Britain
Digital Railway		A generic term for a Cross Industry Programme addressing improvement in capacity of the UK rail network by introducing for example improvements in digital command control and signalling systems and intelligent infrastructure and trains thus creating a more agile and dynamic network response to support supply chain and passenger flows on the national rail network.
DOO	Driver Only Operation	A method of train operation where the driver is responsible for the operation of the train doors
DRP	Dynamic Rail Profiling	Technology which supports the checking and alignment of rail profile – thus improving safety and quality in track work.
DRSAM	Director Route Safety and Asset Management	Organisational lead in the route for safety of the railway system and staff and the asset management of all subsystems.
DRS	Director Route Sponsorship	Organisational lead for sponsorship of enhancement programmes
DTS	Dynamic Track Stabilisation	Machinery and techniques to consolidate track support and allow reopening of lines with no restriction of speed

Elizabeth line		The new railway service linking Reading and Heathrow in the west to Shenfield and Abbey Wood in the east using a tunnel section to route main line trains through central London. The service is operated by MTR Crossrail under a concession awarded by Transport for London (TfL) and in part uses assets owned and managed by Network Rail, as well as a central operating section built and managed by Crossrail Ltd
ETCS	European Train Control System	The signalling and control component of the European Rail Traffic Management System (ERTMS) developed to replace existing incompatible individual systems and integrate rail networks across Europe. A key component of Digital Railway
FDM	Freight Delivery Metric	Performance measure for freight operating companies
FDM-R	Freight Delivery Metric – Route	As FDM but where responsibility lies with the route
FDSM	Freight Delivery Service Manager	Real-time organisational lead for freight service management
FEU	Freight End User	The customers of the freight operating companies
FNPO	Freight and National Passenger Operators	All freight and train operators with long distance services transiting a number of routes who are therefore not allocated to one route for accounting and commercial management purposes but are managed through a central FNPO team, such as CrossCountry, DB Cargo and Freightliner
FOC	Freight Operating Company	A freight company with access rights to operate train services on Network Rail infrastructure
FPM	Financial Performance Measure	A measure of Network Rail's financial performance.
FTN	Fixed Telephone Network	The assets which transmit data and voice over physical cables (as opposed to wireless transmission)
FWI	Fatality Weighted Injury	An indicator commonly used in safety assessments and as part of the Common Safety Method to assess the level of safety.
GRIP	Governance for Railway Investment Projects	The management and control process developed by Network Rail for developing and delivering projects on the rail network.
GW-ATP	Great Western Automatic Train Protection	System which supervises the speed of high speed trains operating between Bristol and London
GWR	Great Western Railway	Great Western Railway – the principal Train Operating Company on Western operating under a direct award from DfT to April 2020.
HABD	Hot Axle Box Detector	Assets and supporting systems which alert Route Control to faults with vehicle axle support (normally bearings) allowing intervention before the vehicle fails
HAL	Heathrow Airport Limited	The Infrastructure owner for the railway from Airport Junction on the Great Western Main Line to Heathrow Airport.
HEx	Heathrow Express Limited	The non-franchised Train Operating Company operating between London Paddington and Heathrow Airport terminals.
HoCRM&P	Head of Customer Relationship Management & Performance	Organisational lead for both train performance and the route's commercial relationship with our customers
HoP	Head of Performance	Organisational lead for delivering train performance to customer requirements and for initiatives which improve performance
HoRC	Head of Route Communications	Organisational lead for internal and external communications, public affairs and community relations
HoRSHE	Head of Route Safety, Health and Environment	Organisational lead for health, safety and environment activities on the route.

HS2	High Speed 2	A generic term used to describe all activity connected with High Speed Two Limited, the executive non-departmental body sponsored by Department of Transport and responsible for developing and promoting the UKs new high speed rail network. Western route main activity is at Old Oak Common.
HSRD	High Speed Rail Director	Network Rail's organisational lead for the interface with HS2
IP	Investment Projects	Network Rail organisation responsible for implementing projects as remitted by Sponsors – to date the principal delivery partner for Network Rail investment.
ISO14001		The international standard on Environmental Management adopted by Network Rail as part of good business practice.
ISO55000		The international standard on Asset Management adopted by Network Rail as good business practice.
LA	Local authority	Local county, borough, district and unitary councils
LEP	Local economic partnership	Partnership groups of local authorities and business groups who work to foster economic development in their area
LMD	Light Maintenance Depot	A depot licenced and regulated by ORR to provide routine maintenance services to passenger and other trains
LNW	London North Western route	Network Rail's route which covers lines from Euston to the West Midlands and the North West, including the West Coast Mainline.
LTI	Lost Time Incidents	One of a set of key safety metrics used to improve and monitor safety management
MDU	Maintenance Delivery Unit	The main resource centre for Network Rail route maintenance – Western route has four at Reading, Swindon, Bristol and Plymouth.
MetroWest		A project promoted by four unitary authorities in Bristol, Somerset and Gloucester with Government support to improve rail transport services across Bristol and surrounding areas with a main aim of half-hourly services through central Bristol.
MIR	Mechanically Independent Registration	A specific safety related requirement in OLE which limits the impact of failure of cables. It is specifically required in station areas to improve safety to passengers and rail staff I the event of dewirement.
MSP4NR	Managing Successful Projects for Network Rail	The process adopted by Network Rail for governance of all change projects
MTR Crossrail		The wholly owned subsidiary of MTR Corporation to whom TfL awarded the concession for operating the Elizabeth line
NR	Network Rail	Network Rail: the owner and operator of the railway infrastructure in England, Wales and Scotland as defined in the Network Licence
NRPS	National Rail Passenger Survey	Significant passenger experience survey carried out every six months by Transport Focus
OLE	Overhead Line Equipment	The system of assets fitted above track which provides electrical power to the electric trains. The supply on OLE is 25 thousand volts and the transfer is between the conductor wire and the train pantograph
OPEX	Operating Expenditure	An accounting term used to classify money spent on items necessary for running a system and business. This is not depreciated as it is deemed consumable within a financial year. Maintenance and Route Control are opex.
ORR	Office of Rail and Road	The economic and safety regulator for Network Rail
OTM	On Track Machine	Equipment used for inspection, maintenance and renewal infrastructure work with the ability to access track – often fitted with rail wheels
PA	Public Address	System for making announcements to passengers at stations.
PAVA	Public Address and Voice Alarm	PA system incorporating a voice alarm, such as a station "help point".

PPM	Public Performance Measure	Current industry standard measurement of performance combining punctuality and reliability into one figure. It shows the percentage of trains which arrive at their terminating station within 5 minutes (London, South east and regional services) or 10 minutes for long distance
PSP	Principal Strategic Planner	The route-based lead for the System Operator
PSP	Principal Supply Point	Main electricity supply to lineside equipment
RAM	Route Asset Managers	The post responsible for the safe and reliable management of particular rail sub-systems such as Track RAM, Signalling RAM, Buildings RAM. In CP6 the route owners of the renewals budgets and remits to deliverers.
RBDD	Route Business Development Director	Organisational lead for developing third-party investment to the route
RDG	Rail Delivery Group	Organisation which brings together Network Rail and the train operators into a single team to deliver a better railway
RFD	Route Finance Director	Organisational lead for the management of the route's finances
ROSCO	Rolling Stock Leasing Company	The companies regulated by ORR and created for the purpose of leasing coaches, locomotives and freight vehicles to train and freight operating companies for the services they wish to operate. Many also provide maintenance and overhaul support to rolling stock
RPD(C)	Route Programme Director (Change)	Organisational lead for change programmes on the route
Route Supervisory Board		An independently chaired Board formed in 2017 of managing directors of Western route, GWR and HEx as well as Transport Focus, to bring track and train operations and long term planning closer together and minimise impacts on rail users.
RSSB	Rail Safety and Standards Board	The independent not-for-profit company established to support members and stakeholders to deliver a safer, more efficient and sustainable rail system. Network Rail is a member.
SoAR	Sale of Access Rights	The railway process, managed through a network wide governance panel, through which the negotiation and sale of train paths and access to the network is agreed for inclusion in Track Access Contracts.
SCADA	Supervisory Control and Data Acquisition	An established acronym for any system which gathers data for the purposes of system control and management. In the route context the term is relevant to the Electrical Control Room operation and the OLE system.
SCO	Supply Chain Operations	The organisation in Network Rail which provides engineering trains (including ballast and rail delivery trains), and on-track machines
SFN	Strategic Freight Network	The trunk freight network across Great Britain.
SISS	Station Information Security System	The portfolio of station information and security assets, including CCTV, CIS and PA systems.
SO	System Operator	The organisation within Network Rail responsible for the creation, planning and allocation of capacity on the network from current timetable through future control periods considering the needs of multiple operators, funders and routes.
SP&C	Signalling, Power and Control	A team within Investment Projects with expertise in delivering projects in signalling, power and control applications – the main deliverer of signalling mid-life refurbishment schemes
SPAD	Signal Passed at Danger	A safety incident where a train does not respond as required to the signal aspect. All SPADs are investigated to understand cause as part of improving safety. SPAD risk and history are important to informing decisions in operational and asset management.
SRFI	Strategic Rail Freight Initiative	An improvement initiative on the strategic freight network

SRFM	Senior Route Freight Manager	The organisational lead for freight services on each route, working for FNPO but embedded within the route leadership team
STE	Safety, Technical and Engineering	Part of Network Rail's central service as Technical Authority
STEM	Science, Technology Engineering and Mathematics	An initiative supported by Network Rail to encourage school pupil interest in Science, Technology Engineering and Mathematics and raise standards
SWOT	Strengths, Weaknesses, Opportunities and Threats	A form of analysis or assessment of qualitative data
TOC	Train Operating Company	A company awarded a franchise by DfT to run passenger train services under a Track Access Contract
Track Category		A classification of track governed by legislation and based on speed required, tonnage and type of traffic. The output is an index which governs the type of track installed, the maintenance regime and the charges applied to train operators for use of the track.
TWA	Transport and Works Act	The Transport and Works Act 1992 is the usual means through which an Order is made authorising a new railway or tramway scheme in England and Wales. Other schemes can be authorised under the Act.
Transport Focus		The independent passenger watchdog set up by government to represent the interests of rail passengers in Britain, bus and tram passengers (outside of London) and passengers on scheduled domestic coach services in England.
TVSC	Thames Valley Signalling Centre	The main signalling centre for the route based in Didcot. Resignalling of the electrified routes in CP5 included transfer of signalling control from a number of locations to this centre, which also accommodates the Electrical Control Room Operations.
UTC	University Technical College	Schools for 14-19 year olds which combine academic education with technical and practical applications. Each UTC is linked with a sponsor university and employer with a special focus on STEM subjects. Network Rail supports UTCs.
WD	Works Delivery	Route organisation for delivery of smaller infrastructure renewals
WRLTH	Western Rail Link To Heathrow	A project currently in public consultation to connect Heathrow Airport through Terminal 5 to the Great Western Main line west of Heathrow allowing passengers to reach Heathrow terminals without going to :London Paddington
XC	Cross Country	One of the national passenger train operators and a key customer of Western route on north - south services in particular

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