

# South East Route Strategic Plan



*Issue 5.0 9<sup>th</sup> February 2018*

For many people, the South East route provides the only practical means of transport, be it for commuting into London or travelling around the South East region. The performance of South East route therefore dictates, on a daily basis, the ability of these people to get to and from work, impacts their employers and businesses and, as a consequence, directly and significantly influences the economic performance of the South East of England and the UK.

Extraordinary levels of growth over the last decade means that the route now delivers over 510 million passengers journeys per annum, almost a third of the national total. Most of the route's passengers are commuting or travelling to airports, making their journeys 'high social and economic value', and the forecast is that passenger numbers will continue to grow. Additionally, freight demand on the route is projected to increase throughout CP6 – on top of the 23% growth experienced since 2014 – driven by the booming construction industry and supporting businesses and economic performance across the region. In this regard, our railway is one of the network's great success stories – but it also means that when the South East route is not running as it should, the impact on the economy is significant.

It is now clear that historical funding levels have not matched the economic or social significance of the route. As a result, it has been necessary for the route to prioritise investment based on asset condition, with limited recognition of the need to increase asset availability to compensate for the inherent complexity of the network and growing demand. This has led to a steady deterioration of railway system resilience and dependability.

Furthermore, while the operational resilience of the network is eroded by introducing necessarily busier timetables (including the very significant metro-style service increases as a result of the Thameslink Programme<sup>1</sup>) and more complex stock and crew diagrams, critical assets have also aged and the system has become less reliable<sup>2</sup>. Opportunities offered by new technologies have not been exploited and some of the basics such as vegetation management and trespass mitigation have not

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<sup>1</sup> In trains per hour terms this service will be similar to London Underground's Victoria line.

<sup>2</sup> This has been mitigated as far as practical by increasing opex to fund maintenance activities. However, this is not a long term or sustainable solution.

been fully delivered.

The result is a railway on which passengers and stakeholders cannot consistently depend. Although we have been encouraged by recent improvements, train performance in CP5 has been the worst in the country<sup>3</sup> and there is an ongoing risk of sudden deterioration in performance due to asset restrictions. Passenger satisfaction on South East route is among the lowest in the country.

Control Period 6 represents an opportunity to start to put this right. It provides an opportunity to give passengers the service which they expect and deserve. It provides an opportunity to deliver huge benefits to the regional and national economy.



In consultation with stakeholders and customers, we have agreed a route vision around which our CP6 plans have been developed. This vision is “**proud to be running the UK's most successful metro-style railway**”. It reflects the changing nature of the route, with the introduction of Thameslink high frequency services and Automatic Train Operation in central London – a UK mainline first. Delivering this vision will efficiently support a level of long term sustainability and dependability that meets our customers' expectations and reflects the social and economic importance of this railway. Due to deliverability constraints and our current position, it is targeted for delivery in CP7 – but in order to achieve this, the work to get there must start now.

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<sup>3</sup> South East route has the lowest PPM figures over the last complete financial year (16/17): [http://orr.gov.uk/\\_data/assets/pdf\\_file/0006/24756/passenger-freight-performance-2016-17-q4.pdf](http://orr.gov.uk/_data/assets/pdf_file/0006/24756/passenger-freight-performance-2016-17-q4.pdf)

Recognising the significant increase in expenditure that is needed to meet our vision, this CP6 plan is presented in two parts: a constrained base plan and a set of vision schemes.

The **constrained base plan** consists of the optimally balanced workbank to manage the risk of critical asset failure within the proportion of funding initially allocated to the route from the total funding made available by government for the network as a whole. It would deliver incremental improvements to four of our vision metrics – dependability, punctuality, frequency and safety – and allow us to better manage declining asset sustainability despite a forecast 15.5% uplift in traffic (EMGPTA). This plan incorporates a significant increase in expenditure compared to CP5 and is, I believe, the best possible plan within that funding envelope. However, it will not fully deliver what our customers and stakeholders have asked for and will not be whole-life cost efficient due to the need for short-term asset management decisions at the expense of longer-term sustainability.

It is the **vision schemes** which if funded through the CP6 settlement, will allow us to improve performance, safety, efficiency and sustainability of the route and put us on a trajectory towards delivering our customers' requirements.

In a devolved business it is for the route to make the case, on behalf of its customers and stakeholders, for the best possible settlement to deliver a sustainable railway that meets their needs for today and the future. I believe that in CP6 we have the opportunity to put in place the foundation for a fundamentally different railway in the years ahead – a railway that is safer, more reliable, more efficient and delivers the full potential of financial and economic benefits to the region and the country.

However, I need to be clear about the limits of what can be achieved through delivery of the constrained base plan alone and the inherent risk associated with this position.

Whatever the CP6 settlement for the South East route, my team and I are committed to providing the best possible railway service with the funding made available to the route.

**John Halsall, Route Managing Director**



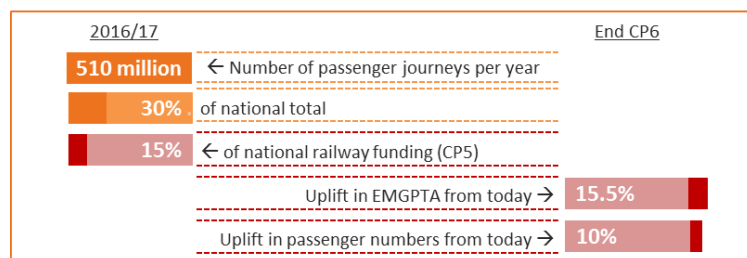
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# 1. Summary

The South East route network is complex, extremely busy and vital to the UK's economy<sup>4</sup>. It carries more passengers than any other route, being relied on every day by those passengers for getting to and from work, and travelling around this congested part of the country. Additionally, the route has seen a 23% increase in freight traffic volume since 2014 with continued growth projections throughout CP6. In early CP6, expansion of the Thameslink network will introduce another step change in passenger demand, and introduce further complexity to the railway's operation<sup>5</sup>. Despite studies indicating a decline in recent passenger growth, this coincides with the worst period of performance in the South East route at the peak of the industrial relations tensions and long term passenger numbers are expected to increase by over 10% by the end of CP6<sup>6</sup>.

**£4bn** Approximate annual contribution to the UK's economy from Sussex parts of South East route



Despite the route's vital importance to the country's economy, it has experienced years of under-investment<sup>7</sup>; in CP5, the route was allocated 15% of

<sup>4</sup> The Sussex parts of the route contribute approximately £11m of benefit every day to the UK economy through provision of passenger services.

<sup>5</sup> By the end of CP6, vehicle mileage will be 19% higher than current levels.

<sup>6</sup> Data from NR Economics Analysis Team provides a forecast of 11% passenger growth between 2017/18 and the end of CP6.

<sup>7</sup> Asset age is well above the national average, and CP4 and CP5 funding levels per passenger were well below the national average.

the national OPEX and CAPEX budgets but carried 25% of passengers. This has led to a deterioration in performance, exacerbated by a continuing increase in demand with an increasingly complex timetable, greater infrastructure usage (train km and tonnage), and increasing passenger numbers, as well as climbing passenger expectations.

## 1.1 Context

The service provided on this route is not meeting passengers' or customers' expectations<sup>8</sup>. This is primarily due to poor train performance, with too many trains running late, or not at all. Whilst operator performance has contributed to this position, it has also been heavily influenced by:

- **Asset age and condition** – The infrastructure on South East route (outside of the central Thameslink areas) is amongst the oldest in the country, a position which has been worsened by deferral of CP5 renewals. As a result, the route's asset base is incredibly fragile with an ongoing potential for low frequency, high impact failures, which are hugely detrimental to performance and damaging to the railway's reputation. Improvements have been made to the asset in CP5, but on the journey to a high capacity railway these are insufficient to compensate for the increases in train journeys, tonnage and passenger numbers. To make matters worse, a number of critical assets are degrading beyond a condition which can be addressed by preventative interventions and will soon require significant repairs or premature replacement.
- **Network complexity** – 12 of Britain's 15 busiest flat junctions are on South East route; this means that small delays have a far-reaching impact.
- **Growth** – Passenger and freight demand has grown significantly over the past 10 years, and expectations are for this trend to continue<sup>9</sup>. This puts

<sup>8</sup> Autumn 2016 National Passenger Survey Scores: 70% GTR (weighted average of Southern, Gatwick Express and Thameslink) and 77% Southeastern, compared to national average score of 84.5%.

<sup>9</sup> There will be a 15.5% increase in Equivalent Million Gross Tonnes Per Annum (EMGPTA) by the end of CP6. (EMGPTA is the industry recognised traffic measure capturing increased train length and tonnage change).

further pressure on the infrastructure and services, which are amongst the heaviest used - and of the highest criticality - in the country.

- Deteriorating railway system resilience – The timetable and stock and crew diagrams are increasingly strained and complex, reducing the system’s operational resilience (i.e. ability to recover the service when something goes wrong).
- Limited investment in technology – Opportunities offered by new forms of technology have not been exploited, with many important parts of the route still running on old, antiquated and inefficient systems.
- Neglecting the basics – Simple activities such as vegetation clearance and trespass mitigation have not been funded or delivered in sufficient quantity to protect the railway service.

It is now clear that years of under-investment sits behind these factors<sup>10</sup>. In CP5, for each passenger kilometre, South East route experienced the lowest levels of renewals expenditure (54% below the national average) and amongst the lowest levels of maintenance expenditure (21% below national average). As a result, the railway has been stretched to its limit, assets are ageing, and it is therefore unsurprising that performance levels are unsatisfactory<sup>11</sup>.

In the short term, some of the adverse impact of these decisions has been mitigated by increases to operational expenditure, providing the additional asset maintenance necessary to protect performance<sup>12</sup>. The increase in traffic following completion of Thameslink will require the route to up-size its maintenance organisation further, and whilst the magnitude of opex will be

<sup>10</sup> While there has been significant investment on the Thameslink Programme, the surrounding infrastructure, vital to performance of the Thameslink service, has in some areas been allowed to deteriorate. Furthermore, reductions to CP5 renewals funding throughout the control period, while necessary at the time, have exacerbated the position. The proposed increase in civils renewals through the Civils Adjustment Mechanism (CAM) was also not implemented.

<sup>11</sup> 16/17 Quarter 4 PPM figures: 78.8% GTR (worst of all TOCs) and 86.2% Southeastern.

<sup>12</sup> The increased in opex towards the end of CP5 is already delivering improved performance levels and reducing Schedule 8 payments.

higher in CP6 than in CP5, the unit cost falls. However, this approach is reaching the extent of its effectiveness given the available access, and in any case is no substitute for a high quality asset.

The poor performance levels are damaging the railway reputationally and financially, as demonstrated by very low levels of passenger satisfaction and significant Schedule 8 payments<sup>13</sup>. The fact that the route is still experiencing high levels of growth is testament to the sector’s importance, but this serves to exacerbate the problems further, as will the introduction of the new timetable in 2019 following completion of the Thameslink Programme.

## 1.2 The Vision

Our vision is that by the end of CP7, we will be “*Proud to be running the UK’s most successful metro-style railway*”. This is based primarily on views and feedback from customers, stakeholders, passengers and freight customers. The vision means provision of a service which is:

- **sustainable;**
- **dependable;**
- **punctual;**
- **frequent;** and
- **safe.**

**Proud to be running the UK’s most successful metro-style railway**

These elements, or metrics, of metro-style operation are underpinned by measurable outcomes and targets, and will be delivered efficiently to ensure value for money and continued provision for future generations.

Dependability	Punctuality
An <u>available service</u> , trusted by passengers. Cancellations = <b>1%</b> and Average Passenger Lateness = <b>1.5 minutes</b>	Delivery of a <u>right time railway</u> at every station. On-time arrivals (at all stations) = <b>72%</b> and PPM = <b>94%</b>
Frequency	Safety
A <u>service that meets reasonable expectations</u> Delivery of 24 trains per hour through the Thameslink central London core (a 50% increase from the current 16 trains per hour).	<u>Lowest possible risk of injury</u> to passengers, public and workforce. <b>0</b> workforce fatalities and no more than <b>one</b> lost time injuries for every <b>1,000,000</b> hours worked.

<sup>13</sup> South East route schedule 8 payments make up approximately 50% of the 16/17 national total.

Efficiency	Sustainability
Minimised whole-life cost, investing to deliver efficiencies in future control periods and providing socio-economic benefits.	Maintaining asset condition and capability at steady state in the medium to long term.  Returning to at least CP4 exit position on used life or condition indicators for all assets.

In order to support a route-wide metro-style operation, every service running on the network is required to be dependable and punctual. This includes services which run to, from or through London (approximately 80% of route traffic), regional services, freight trains, and all long distance, high speed and stopping services. The network is so complex and constrained that the right time departure of a train from Dover or Eastbourne is every bit as important as one from London Bridge.

### 1.3 The CP6 Plan

In order to meet national funding constraints applied to the route<sup>14</sup>, as well as provide additional value adding interventions, the plan has been structured in two key parts:

- **“The Constrained Base Plan”** – This plan minimises risk to the route (performance, asset sustainability, safety and reputation) within the corporately imposed funding envelope of £3.529bn<sup>15</sup>, set by the national prioritisation and allocated from the wider funding envelope available to Network Rail.
- **“Vision Schemes”** – Further initiatives to improve outcomes, move the route towards delivery of the vision<sup>16</sup>, put the route back on trajectory towards lowest whole life cost asset management, and meet the needs of customers and stakeholders. Summary detail of these schemes is presented in

<sup>14</sup> A figure of £3.529bn has been allocated to South East route as the funding envelope. £3.529bn does not include Digital Railway which is delivered alongside the constrained base plan. Renewals volumes for Digital Railway are included within this Route Strategic Plan.

<sup>15</sup> Further allocations of £109m route headroom and £56.9m Electrical Safety Delivery (ESD) funding take this figure to £3.695bn.

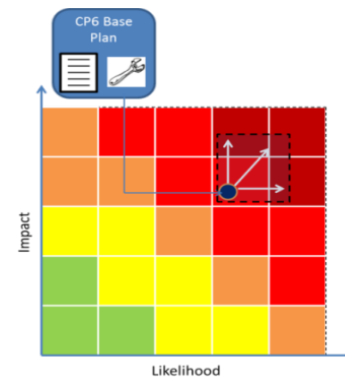
<sup>16</sup> If all vision schemes are progressed, the route will move towards delivery of the vision outcomes. However, due to deliverability constraints, the vision won’t be fully achieved until CP7 at the earliest.

Appendix D of this document. Separate standalone business cases for each Vision Scheme with full financial and economic benefits assessments are available and should be read in conjunction with this Route Strategic Plan.

In order to mitigate business performance risk, “route headroom” of £109m has been allocated to South East route. This is not allocated to any specific capex or opex activity, and is not included in the £3.529bn figure quoted above.

The route recognises the need to live within the limits of the Statement of Funds Available (SoFA), and therefore the need for a constrained base plan. However, it is for the route to advocate on behalf of its customers and stakeholders the best possible route settlement to deliver a sustainable railway that meets their needs for today and the future.

It has been necessary to prioritise investment in order to establish the optimal contents of the constrained base plan within the allocated funding. The vision schemes have then been assessed and selected to move the route towards the vision as efficiently as possible.



This graphic shows combined risk across all areas (safety, value, performance, reputation). The position shown here is purely indicative.

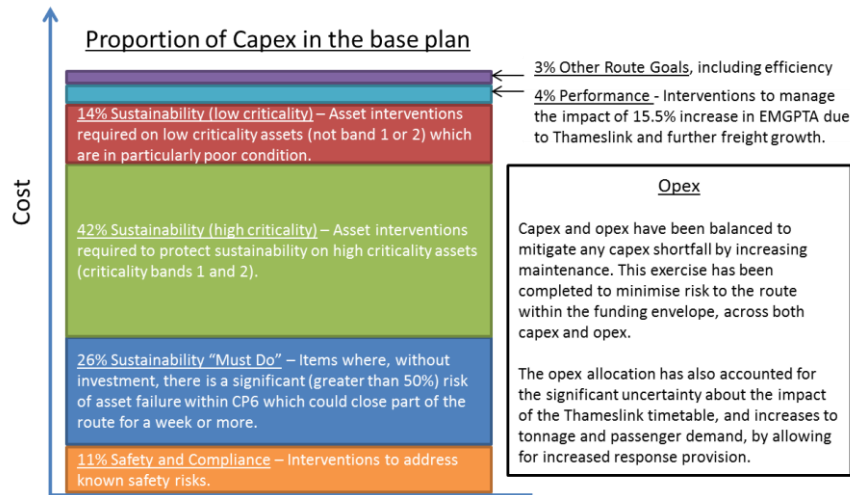
If any item is removed from the constrained base plan, or substituted for another option (within the funding envelope), the route’s risk position worsens, as shown by the white arrows.

Efficiency is a core component of the CP6 strategy. Whilst funding constraints prevent delivery of minimal whole life costs in the constrained base plan, improvements are still possible across the route’s operating model. An efficiency programme has been developed bottom-up and top-down, which has been tested for completeness against the Institute of Asset Management operating

model framework. Delivery programmes for these efficiencies have started already as part of the route’s change programme, Framework 42.

**1.3.1 The Constrained Base Plan**

The content of the constrained base plan has been developed to minimise the route’s overall risk position within the funding envelope whilst meeting the increased demand<sup>17</sup>. This has been driven by considering safety, critical sustainability, protection of performance following introduction of the Thameslink timetable and continued passenger growth. This has resulted in a constrained base plan built up as follows:



Traffic Management and Connected-Driver’s Advisory System (C-DAS) have also been included in the constrained base plan. These are Digital Railway interventions, as set out in the Strategic Outline Business Case (SOBC). The assumed funding source for 100% of the South East Route investment is the National Productivity Investment Fund. This is expected to provide significant performance benefit and aligns with the route’s vision operation strategy. To tie

<sup>17</sup> All plans account for the South East route boundary as at 1st December 2017. No allowance has been made for any changes to the route boundary.

in with this exciting step forward, some signalling schemes in the constrained base plan include performance focussed investment above that required for sustainability. See section 5.1.5 for further information.

**1.3.2 Constrained Base Plan Outcomes: Sustainability**

Over 80% of interventions in the constrained base plan are sustainability-driven. However, due to the current age and condition of the route’s assets, the constrained base plan’s outcome will still be a deterioration in sustainability indicators across all asset types. This moves the route further away from delivery of the vision and increases medium to longer term risk exposure<sup>18</sup> and performance degradation.

Asset	Sustainability Indicator	Exit CP5	Exit CP6	Change CP5 to CP6 exit	Bow Wave in CP7?	Options proposed
Track	Service Affecting Failures	471	483	↓	Y	Y
	Track average used life	59%	61%	↑	(ballast)	(ballast)
Structures	% poor PLBE* overbridges	8.7%	7.6%	↑	Y	Y
	% poor PLBE* underbridges	6.0%	6.1%	↓	(underbridges)	(underbridges)
Buildings	Stations PARL** on critical features	47%	46%	↓	Y	Y (safety, Vic Roof)
Signalling	Signalling Infrastructure Condition Assessments (remaining life)	14.7	11.6	↓	N	N (performance only)
Earthworks	Condition score	1.94	1.98	↓	N	N
E&P	Conductor rail remaining life (%)	65%	62%	↓	Y	N

\*PLBE = Principal Load Bearing Element  
 \*\*PARL = Percentage Asset Remaining Life

↓ Down is deteriorating, Up improving

Sustainability measures are the truest long term indicators of performance; in their base form all other measures are surrogates for the current manifestation of sustainability related decisions, many of which have been taken decades before. To maintain performance for now and future control periods, the route needs to be in a position where there is no further erosion of assets’ ability to deliver performance. This is the target set by the vision, but one which – despite the high proportion of funding allocated to sustainability-driven initiatives – is not achieved by the constrained base plan alone. Our Track, Metallic

<sup>18</sup> Specifically, condition of track ballast and metallic underbridge stock will deteriorate to such a poor position by the end of CP6 that there would be significant risk of failure, unplanned access requirements and higher cost of intervention without investment in the vision schemes.



Underbridges, Charring Cross River Bridge and Victoria Station Roof Vision Schemes have been developed to address the most significant sustainability risks not addressed within our constrained base plan.



Oxted Viaduct is in a poor condition and without intervention in CP6 there is a significant chance of critical asset failure resulting in closure of the line for a week or more. It therefore sits in the route’s sustainability “must do” section of the constrained base plan.

A study has been completed in conjunction with Transport Focus to establish passengers’ views on sustainability. This revealed that, while most media coverage relates to short term performance, there is a good understanding and appreciation amongst passengers for the need to protect the long term condition and performance of the railway by investing in sustainability-driven renewals. There is therefore likely to be an adverse reputational impact of having key route assets in such poor condition, particularly following completion of the Thameslink Programme works.

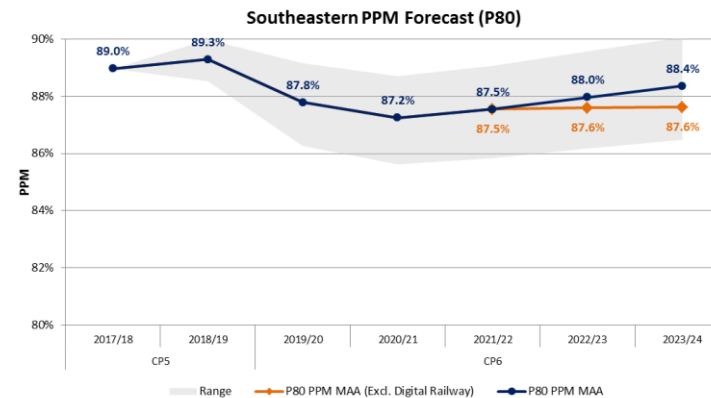
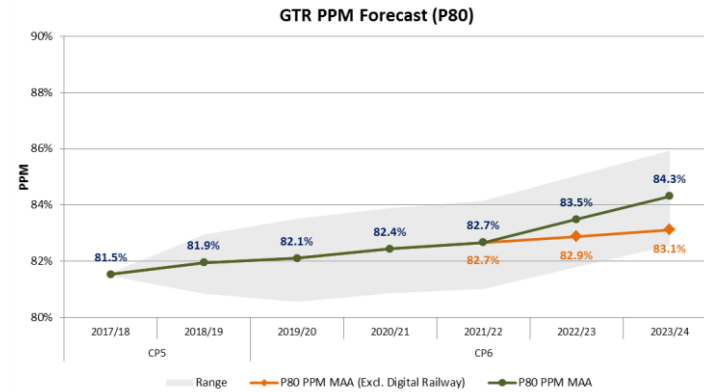
**Sustainability:** Network Rail’s sustainability strategy is to provide a railway fit for the future, and to deliver outstanding value for money to taxpayers, customers and funders.

For our assets locally, this means:

- Managing short-term performance risks arising from asset age and condition, while
- maintaining asset condition and capability at steady state in the medium to long term, and
- avoiding future bow waves in cost or volume delivery

### 1.3.3 Constrained Base Plan Outcomes: Dependability and Punctuality

Under the constrained base plan, dependability and punctuality measures, aggregated across the route, will be slightly higher at the end of CP6 than at CP5 exit<sup>19</sup>, but this would not be sustainable into CP7. Furthermore, the trajectory would not support delivery of the vision in CP7.



Towards the end of CP5, the route will continue to reap the benefits of performance initiatives introduced as part of the Thameslink Programme and

<sup>19</sup> This increase is not split equally between the two main operating companies, with GTR seeing performance improvement and Southeastern seeing a small performance drop.

associated resilience works<sup>20</sup>. Then, on introduction of the Thameslink timetable, Southeastern service performance is expected to decline, while the improving trajectory of GTR service performance will flatten out due to introduction of more services and greater interaction between service patterns. From this point to the end of the control period, performance begins to recover based on interventions in the route’s constrained base plan, particularly introduction of Traffic Management and C-DAS<sup>21</sup>. These performance figures are negatively influenced throughout by continued passenger growth on the route.

All performance figures have been calculated as a range with the mid-point of that range shown on the graphs. Furthermore, several measures of performance have been calculated, including Consistent Route Measure – Performance (CRM-P), against which it is proposed that the route is regulated as it is directly controllable by Network Rail. A full summary of how performance figures have been calculated is included in Section 3.

**1.3.4 Constrained Base Plan Outcomes: Other**

The other metro-style metrics are safety, frequency and efficiency. Under the constrained base plan:

- Safety – Modest safety improvements and compliance to standards for public and passenger safety. Through focus on cultural improvements, a step change will be delivered to achieve the current industry-leading 0.17 LTIFR target for workforce safety.
- Frequency outcomes will meet the vision, providing a service that meets reasonable expectations at every location across the route, meeting demand and enabling passengers to board the service of their choosing.
- Long term efficiency will be compromised as it has been necessary to prioritise works within CP6 in order to keep costs within the funding envelope.

<sup>20</sup> Also known as “The Big Plan”.

<sup>21</sup> These performance projections are dependent on progression of the Digital Railway interventions. If funding is not made available for these schemes, then performance will be worse than those figures shown above. This has been modelled by the route’s performance team, and is shown on the graph above in orange. All performance modelling is based on traffic growth forecasts provided by the central Asset Management team.

A key part of this efficiency outcome is increased opex spend, which is required in preparation for Thameslink implementation. It is necessary to firstly “right size” the organisation to deliver an increased level of output to support growth; this has started though the Thameslink Resilience Programme which is building up O&M staff capacity to prepare for and support Thameslink’s implementation. It’s also been necessary to increase the organisation’s size to address the ageing condition of the asset. Unit cost then falls over CP6 as the route delivers with increased efficiency. Looking into CP7, greater operational efficiency is expected as the Victoria re-control and other schemes are commissioned.

**1.3.5 Constrained Base Plan Outcomes: Summary**

The overall position of the route under the constrained base plan is summarised below<sup>22</sup>.

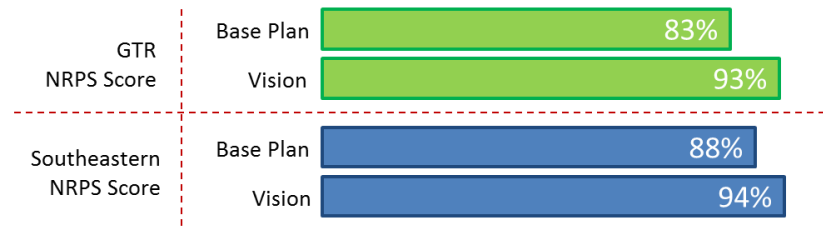


Scenario	Dependability	Punctuality	Sustainability	Trajectory
Today				
Constrained Base Plan (2024)				
The vision (CP7)*				

\* Only possible in CP7 if vision schemes are delivered in CP6

Within the £3.529bn constrained base plan funding envelope, this is the best plan for the route. However, it does not deliver a sustainable set of outcomes into CP7, and does not move the route towards delivery of the vision. It will not meet customers’ and stakeholders’ expectations; anticipated National Rail Passenger Survey (NRPS) outcomes under the constrained base plan are shown below.

<sup>22</sup> Dependability = average of PPM cancellations and APL, Punctuality = average of PPM and On Time, Sustainability = view of DRSAM and RASIM based on assessments and asset knowledge.



### 1.4 Vision Schemes

The route’s ambition, supported by the views of stakeholders and customers, is to deliver the vision in CP7. This will only be possible if all vision schemes are progressed in CP6<sup>23</sup> Each of the vision schemes delivers improvements to the metro-style metrics, and provides tangible benefits to the route throughout CP6 and beyond. The schemes have been costed, tested for deliverability<sup>24</sup> and assessed for outcomes. The vision schemes are:




Vision Scheme	Cost	Summary, Outcome and Benefits
<b>Performance Improvement</b>	£166m	Further renewals, operations and maintenance spend to deliver performance improvements of: <ul style="list-style-type: none"> <li>- 1.4% PPM for GTR; and</li> <li>- 0.8% PPM for Southeastern</li> </ul> This has a BCR of >20 (30 years) and 2.6 (5 years), generating £2.36bn in net benefits (NPV) over a 30 year assessment period.

<sup>23</sup> While these schemes have been developed as part of the Operations, Maintenance and Renewal plan, delivering the vision will also be reliant on the Brighton Main Line (BML) Upgrade and some of the other enhancement schemes discussed in the Enhancements section of this document (section 5.1.4). This is primarily to account for anticipated passenger growth.

<sup>24</sup> It has been shown that the plan is deliverable should any combination of schemes be progressed. See Section 7 for further information.

Vision Scheme	Cost	Summary, Outcome and Benefits
<b>Electrical Safety</b> (NSCDs: improving productivity and safety)	£63.0m	Delivering maintenance efficiencies and significant safety improvements (reduction to LTIFR) by installing Negative Short Circuiting Devices (NSCDs) and other electrical safety equipment. This will almost entirely remove the need to apply short circuiting straps and operate hook switches as part of taking isolations for maintenance access, and will deliver efficiencies across the whole CP6 plan. This additional £63.0m (on top of the £64.6m <sup>25</sup> in the constrained base plan) will deliver full route coverage, with a BCR of 6.1, and improve compliance with Electricity at Works regulations. <div style="text-align: center;"> <p>Equipment carried by a strapman</p> </div>
<b>Metallic Structures Sustainability</b>	£39m	Undertaking proactive interventions on metallic underbridges over primary routes (Brighton Main Line and Charing Cross to Dover). This will avoid future costs, reduce disruption, reduce whole life cost and avoid a future bow wave of full renewal works. Asset analysis shows a positive case for investment. <div style="text-align: right;"> </div>
<b>Charing Cross Hungerford Bridge</b>	£41m OR £27m	Sustainably managing this major structure through right time intervention, refurbishing and repainting the entire structure (£41m option) or the four river spans (£27m option). This will avoid future cost and disruption, and reduce whole life cost. Asset analysis shows a positive case for investment. <div style="text-align: left;"> </div>

<sup>25</sup> £16.8m in South East route constrained base plan and £47.8m in the STE Electrical Safety Delivery (ESD) programme allocated to South East route for NSCD roll-out (of £56.9m total ESD funding allocated to South East route).

Vision Scheme	Cost	Summary, Outcome and Benefits
<b>Victoria Station – Sussex Concourse Roof</b>	£49m	Renewal of the Sussex-side concourse roof at London Victoria. This will improve passenger satisfaction and workforce safety, and will avoid future cost and disruption. Asset analysis shows a positive case for investment. 
<b>Track Sustainability</b>	£181m	High Output Ballast Cleaning, TRS track renewals and CAT2 re-railing to avoid the risk of an un-maintainable asset stock, an undeliverable bow wave of renewals, and likely performance restrictions on critical routes in CP7. This scheme would reduce track service affecting failures by 4%, avoid 36,000 delay minutes in CP6 alone and reduce FWI by 5%. It will also avoid maintenance and inefficient access otherwise required to address track faults. Asset analysis shows a positive case for investment. 
<b>Improving Safety</b>	£64m	Creating a safer railway for passengers, workforce and the public through a wide range of initiatives including investment at level crossings, addressing platform defects, and carrying out works to walking routes and access points. This scheme will reduce FWI by 3.6% at level crossings, reduce slips, trips and falls at platforms by 5%, improve workforce safety by 27% and reduce LTIFR by 8% for manual handling equipment. 

### 1.4.1 Vision Scheme Outcomes

Delivery of these vision schemes will enable the route to significantly improve all vision metrics, supporting full delivery of the vision in CP7 and meeting our

customers’ and stakeholders’ requirements.

All vision schemes are supported by business cases which make a clear case for progression within CP6 in order to deliver performance improvements, cost savings or avoid much higher costs in future. These also potentially enable further unit rate efficiencies at the end of CP6 and into CP7. Further details of these vision schemes are set out in Appendix D.

### 1.5 South East Route Position

Within the timescales under consideration and the constraints of operations, maintenance and renewals, progression of all the vision schemes alongside the constrained base plan is the most whole life cost efficient plan for South East route and the only option which prevents a significant deterioration in outcomes beyond the end of CP6. It will support delivery of the vision by the end of CP7 (subject to funding in CP7), offering huge benefits to the UK’s economy, meeting customers’ requirements and improving sustainability in order to ensure the route’s outcomes are protected for future generations.

The constrained base plan alone evidentially comes at a lower immediate cost, but:

- does not fully redress deferred CP5 renewals (making up 25% of capital funding). Route sustainability will fall, posing a significant performance risk to the service, building up a bow wave of renewals for future control periods; and
- does not deliver customer and passenger expectations specifically with respect to punctuality, frequency and dependability.

It should be noted that there is a great deal of supporting evidence, particularly around costing and deliverability, which is not included in this document. This information is held by South East route and can be made available on request.

In order to provide a suitable degree of consistency with other routes’ CP6 plans, the main body of this document has been written around the constrained base plan. The vision schemes are summarised in Appendix D, but as stated above, South East route’s position is that the delivery of these schemes is the correct plan for the route, its stakeholders and customers, and the country.

## 2. Stakeholder priorities

We want our stakeholders and customers to have full confidence in South East route and its railway service and are aiming to embed a full understanding and common ownership of the vision and CP6 plan across the wider South East route community. From the outset, we have engaged with all stakeholders and customers so we can fully understand their requirements and, as far as possible, develop our plans to meet them. This is the best way to identify, develop, and then deliver, the most efficient and effective plan which will deliver the right results for our customers.



A critical test of success for the CP6 plan will be how closely it’s outputs address and align with the requirements and priorities of the route’s customers and stakeholders.

### 2.1 Stakeholders

The CP6 plans have been developed in consultation with 88 organisations<sup>26</sup> including rail industry bodies, transport user groups, freight customer organisations, county and local councils and local enterprise partnerships. A full list of responses has been collated and a record of key items is available.

Requirements, feedback and priorities have been gathered through direct meetings, workshops, exhibitions, presentations and questionnaires. These have

<sup>26</sup> 39 of these organisations responded.

been recorded and used to develop the vision, workbanks, vision schemes operations and maintenance strategies, with continual feedback provided to stakeholders and customers. An exercise has also been commissioned, in conjunction with Transport Focus, specifically to establish passengers’ views on sustainability<sup>27</sup>.

A list of all requirements has been generated and resultant actions recorded to provide clear line of sight for all stakeholders as to how their requirements and priorities have informed the plans for CP6.

It has been necessary to prioritise stakeholders’ needs, and in some cases reach a compromise between conflicting requirements. We have taken an open and transparent approach to this, making it clear in our conversations and record of resultant activities what decisions have been made, the logic behind them, and how this has informed the vision and CP6 plan. A summary record of this process for selected key items is included in the stakeholder log (Appendix C), and the consideration of stakeholder requirements is referenced in the route asset strategy, discussed in section 5.2.

### 2.2 Outcomes

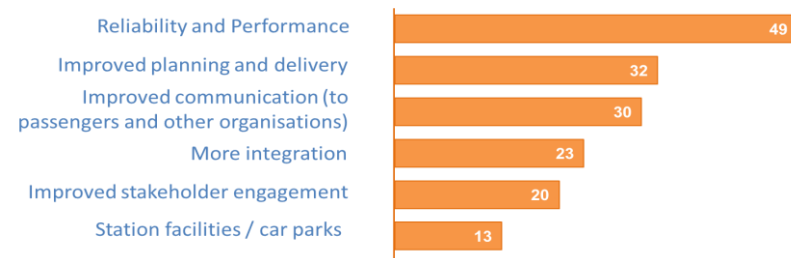


Figure 2.1: Key themes raised through stakeholder consultation (number shows how often this theme was brought up). These have directly driven development of the vision.

<sup>27</sup> This was the only area of the vision where passengers’ views were unclear following the workshops. The results of the exercise, gathered through focus groups and surveys, demonstrated a good appreciation of the importance of sustainability and a recognition of its importance to long term performance.

The outcomes of this stakeholder engagement process have informed the vision, constrained base plan and route objectives. Key themes emerging from the consultation and open discussions are shown in Figure 2.1. These themes can be clearly linked to the vision.



Figure 2.2: Area-specific requirements shown on a map of the route (in green and blue). Red lines show key performance areas.

Geographically specific requirements are shown in Figure 2.2, and some further specific requirements, linking through to inclusion of items in the constrained base plan and vision schemes, are shown in the table below.

Requirement	Constrained Base Plan	Vision Schemes
Use engineering access more efficiently	£64.6m included for installation of NSCDs (£16.8m in route’s constrained base plan, £47.8m in STE’s Electrical Safety Delivery plan), which will provide up to one hour of more productive time per isolation.	Further £63.0m included, for full route coverage.
Improve the capability of the asset as part of its renewal	Included for some signalling schemes in order to integrate future Digital Railway capability. Not included elsewhere.	Inclusion of performance improvements as part of the performance vision scheme.
Improve platform / train interface	Funding included for the worst sites.	Additional funding included to address key locations.
Carry out more vegetation clearance works	£14m (all opex) included for vegetation clearance works to improve <sup>28</sup> .	A further £7m funding included to drive towards increased compliance
Do not let the asset age further	A deterioration in the route’s sustainability metrics.	Improvement to the route’s sustainability measures.

<sup>28</sup> This increase is related to the ORR’s expectation for 6.5 metres clear of vegetation each side of the track in order to reduce leaf fall adhesion problems.

The route’s short and long term objectives, against which delivery of the plans and vision will be measured, have also been developed with input from key stakeholders and customers. This is discussed further in Section 3.

During the later rounds of events and meetings, details of the route’s vision have been shared, including the target metrics. There is a high level of support for this vision, which reflects how crucial the views and requirements gathered from stakeholders and customers has been to the vision’s development.

‘The tone was collaborative and working towards a joint purpose [...]. It was highlighted that stakeholder support was key to making the case for investment’ – Rail Delivery Group, following February workshop

‘The vision is just what we need to run the reliable and dependable service which our passengers deserve.’ – Senior Manager, GTR

‘The vision is spot on.’ – Senior Manager, Southeastern

Requirements from freight operators and customers have been gathered directly by the route. Ongoing discussions have also been held with the Freight & National Passenger Operator (FNPO) function, which has carried out its own stakeholder exercise, results of which are attached at Appendix H.

### 2.2.1 Future Stakeholder Engagement

The route continues to keep stakeholders and customers informed at every stage throughout the development of the CP6 plan. The following activities are planned for the next two months:

- Detailed discussion of the workbank with Southeastern and GTR: *opportunity for these TOCs to speak directly with the Route Asset Managers and Maintenance leads about the workbanks and strategies and ask any important questions (responses to which will be made available to all stakeholders)*
- Presentation of final route submission to all stakeholders: *Presentation and exhibition of the plans contained in this document. To be held in early 2018, this event will be open to all stakeholders and customers. It is proposed that key partners, including GTR, Southeastern and Transport Focus will also present their views on the plans for CP6 and how the route has worked with their organisations over the last few months.*

After this time, and throughout CP6, the route will continue to meet with stakeholders, holding further workshops and events in order to monitor and record the views of our stakeholders and customers. This will allow us to keep the vision up to date and make sure that it continues to meet stakeholder requirements. It will also allow us to openly discuss the route's ongoing workstreams and performance.

### 2.2.2 The Constrained Base Plan

Scenarios falling short of the vision, including the constrained base plan, will not meet customer and stakeholder expectations. It is crucial that the full suite of vision schemes is progressed if the route is to meet its customers' requirements.

## 2.3 Requirements for Significant Enhancements

While it was explained at every opportunity that uncommitted and unfunded significant enhancements are to be planned and funded separately from this CP6 planning process, a number of requests were made by stakeholders and customers for schemes which would sit outside of the operations, maintenance and renewals remit. These requests, and responses, are recorded alongside all other input as part of the stakeholder log.



## 3. Route objectives

The measures and targets set out in this section are based on the [constrained base plan](#). Please refer to Appendix D for a discussion of the vision schemes and their impact on the route's outcomes.

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

South East route is working closely with its customers to develop a joint approach to improving train performance, safety and other key performance areas. To support this, a suite of measures has been developed which defines the combined needs of the route and its primary customers. The measures will be a mixture of customer, Network Rail and shared goals that define success and align the wider route and customer teams. Many of the metrics are shared and dependent on inputs from outside of Network Rail and so will need to be updated annually to align with the emerging plans of key stakeholders<sup>29</sup>.

To incentivise maximum improvements these targets will be stretching. The route will agree train performance targets in the knowledge that achieving them will be challenging. For example, a train performance target with a 50% confidence level would mean the route is as likely to miss the target as achieve it. On the other hand, train performance targets set for regulatory purposes should be at a level that the route is confident of achieving,

The route's projection for train performance in CP6 is based on extensive modelling and monte-carlo analysis. The joint performance measures such as

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<sup>29</sup> Importantly, measures are aligned with customers' obligations (for example, franchise agreements), which serves to give common long term objectives.

PPM, On Time and Time to 3<sup>30</sup> are based on Network Rail interventions, key assumptions such as the impact of new Thameslink infrastructure and timetable (which is a fundamental change from the current timetable), growth in passenger numbers and also performance improvements by our customers. The assumptions, inputs and modelling approach are agreed with the route's customers, having been developed collaboratively with the Route and customer Joint Heads of Performance (although it should be noted that this agreement does not mean our customers are satisfied with the outcomes).

Using this model, performance targets in the Long Term Scorecard have been set at an 80% confidence level to reflect the limitations of the model and uncertainty on assumptions around the impact of the new Thameslink facilitated timetable. The measure that will be used to track South East route's commitment on train performance is Consistent Route Measure – Performance (CRM-P), which focusses on the contribution that is within the route's control (as opposed to joint measures).

Due to the inherent uncertainty in forecasting performance for the effects of the Thameslink timetable, we consider it likely that it will be necessary to re-open the performance forecast for GTR, Southeastern and other affected TOCs. Consequentially, given the associated level of potential risk to NR and our customers, and the current challenges with the recalibration of Schedule 8 for the timetable in CP5, a recalibration of Schedule 8 is also likely to be required in CP6. Based on the revised plan to introduce the full 24 Thameslink trains per hour in December 2019, it is likely that forecasts will need to be re-opened in early CP6.

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<sup>30</sup> It should be noted that On Time and Time to 3 forecasts are calculated using regression formula that are based on historical relationships with PPM. The principles behind these relationships are fundamentally affected by the introduction of Thameslink and therefore there is a high likelihood that these forecasts will contain an error.



### 3.1 Targeted Key Outcomes (constrained base plan scenario)

Under the constrained base plan, the key outcomes with respect to the six vision metrics are shown on the right hand side of this page. Colour scales are shown below.

Worsening from today – moving away from the vision	Maintaining current outcomes under increased demand	Moving towards the vision
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This constrained base plan has been designed to minimise the route’s overall risk position<sup>31</sup> within the funding envelope, accounting for the uplift in traffic and operational complexity following introduction of the Thameslink timetable. The dependability and punctuality figures achieved by this plan are consequently a long way from the vision targets. The plan is the best possible within the funding envelope, but it will not meet customer and stakeholder requirements.

<u>Dependability</u> <sup>32</sup> Cancellations = 2.2% (Southeastern) and 3.3% (GTR) Average Passenger Lateness = 2.2 mins (Southeastern) and 3.0 minutes (GTR)	<u>Punctuality</u> On-time arrivals (all stations) = 67.6% (Southeastern) and 62.8% (GTR) PPM = 88.4% (Southeastern) and 84.3% (GTR) CRM-P = tbc
<u>Frequency</u> Delivery of 24 trains per hour through the Thameslink central core. 15.5% increase in route EMGPTA.	<u>Safety</u> 0 workforce fatalities 1.7 lost time injuries per 1,000,000 hours worked

<sup>31</sup> This position accounts for performance, safety and reputation in the short and long term.

<sup>32</sup> Figures for dependability and punctuality are the average of GTR and Southeastern. See scorecard section for a breakdown by TOC.

<u>Efficiency</u> Delivery of short-term efficiencies building on CP5 efficiency plans. Constrained from delivering minimum whole-life cost on asset interventions due to affordability.	<u>Sustainability</u> Worsening sustainability position.
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The dependability and punctuality position is partially mitigated by introduction and continuation of increased opex levels, without which the outcomes would be far worse (reflecting the increases in service and passenger numbers). However, this is not a sustainable or long-term efficient approach to management of the route.

It is only through delivery of the vision schemes that the route moves towards delivery of the vision. If all vision schemes were delivered, all metrics would be ‘green’ or ‘amber’.

### 3.1.1 Scorecard for 17/18

This is the route’s customer-balanced scorecard for 2017/18. It is agreed on a year-by-year basis with the route’s customers in order to focus attention on key, and often evolving, elements of railway performance. The process to agree the 2018/19 scorecard is currently underway, with targets expected to be confirmed in early 2018.

Safety	AIP % WEIGHTING	WORSE THAN TARGET	TARGET	BETTER THAN TARGET	
Lost Time Injury Frequency Rate (LTIFR)	20%	5%	0.477	0.454	0.432
Close calls raised		2%	4,875	6,500	8,125
YTD close calls closed within 90 days		3%	80%	85%	90%
Passenger train accident risk reduction measures		5%	60%	80%	100%
Top 10 Milestones to reduce level crossing risk		5%	6	8	10
Financial Performance	AIP % WEIGHTING	WORSE THAN TARGET	TARGET	BETTER THAN TARGET	
Financial Performance Measure (FPM) - Gross excl. enhancements (£m)	20%	10%	£(26.7)m	£0m	£26.7m
Financial Performance Measure (FPM) - Gross enhancements only (£m)		5%	£(49.8)m	£0m	£49.8m
Cash Compliance – Income & Expenditure		5%	£(5.7)m	£0m	£28.7m
Investment	AIP % WEIGHTING	WORSE THAN TARGET	TARGET	BETTER THAN TARGET	
Top Investment Milestones	10%	10%	60%	80%	100%
Asset Management	AIP % WEIGHTING	WORSE THAN TARGET	TARGET	BETTER THAN TARGET	
Reduction in service affecting failures	10%	5%	3%	4%	6%
7 Key Volumes		5%	90%	95%	100%
Train Performance Measures	AIP % WEIGHTING	WORSE THAN TARGET	TARGET	BETTER THAN TARGET	
Govia Thameslink Railway Right Time MAA (final destination only)	20%	4%	52%	54%	56%
Southeastern Right Time MAA (final destination only)		4%	59%	61%	63%
Network Rail contribution to Govia Thameslink Railway CaSL MAA		2.5%	3.2%	2.9%	2.6%
Network Rail contribution to Southeastern CaSL MAA		2.5%	2.4%	2.2%	2.0%
Delay minutes affecting GTR (NR caused, TOC on TOC & FOC on TOC-not including TOC-on-Self)		2%	1,590,000	1,460,000	1,330,000
Delay minutes affecting Southeastern (NR caused, TOC on TOC & FOC on TOC-not including TOC-on-Self)		2%	730,000	663,000	608,000
Freight Delivery Metric (FDM)		3%	85.7%	89.0%	90.1%
Locally Driven Customer Measures	AIP % WEIGHTING	WORSE THAN TARGET	TARGET	BETTER THAN TARGET	
People Measure -2 formal performance and development conversations per year for Bands 1-8 staff.	20%	3%	80%	90%	100%
NRPS Overall score (GTR)		1.5%	76.5%	78%	79.5%
NRPS Overall score (Southeastern)		1.5%	83.5%	85%	86.5%
Reduction in Railway Work Complaints		1.5%	810	760	710
Number of Unplanned Temporary Speed Restrictions - MAA		5%	33	30	27
% Completion of Maintenance Plan		1%	60%	70%	80%
Incidents of possession overruns		1.5%	5%	3%	1%
Govia Thameslink Railway/ NR Top Team Satisfaction Score		2.5%	3.56	3.78	4.00
Southeastern/NR Top Team Satisfaction Score		2.5%	3.84	4	4.16
		100%			

### 3.1.2 Long term scorecard

As discussed above, the long term scorecard consists of:

1. Measures within South East route’s control, against which it will be possible to directly monitor the route’s performance against the plan. These are marked with an asterix (\*) in the below scorecard table.
2. Measures which will be significantly influenced by external factors, performance of third parties and political or economic events.

Those measures in the second category give a wider indication of the route’s performance and will provide a useful set of targets against which to ensure alignment of objectives between the route and its key customers, and to monitor customers’ experience of the railway service. However, given that they are not directly in South East route’s control, it is not considered appropriate to use these as regulatory targets for Network Rail. The route has projected forward figures for all measures based on the content of the constrained base plan and a set of assumptions clearly set out in supporting documentation.

Safety	Targets	18/19 <sup>33</sup>	19/20	20/21	21/22	22/23	23/24	24/25	Achievability
Lost Time Injury Frequency Rate (LTIFR)* <sup>34</sup>	Worse than Target	0.634	0.548	0.462	0.376	0.290	0.204	0.204	
	Target	0.528	0.457	0.385	0.313	0.242	0.170	0.170	
	Better than Target	0.422	0.366	0.308	0.250	0.194	0.160	0.160	
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*	Worse than Target	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Target	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Better than Target	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Train Performance	Targets	18/19	19/20	20/21	21/22	22/23	23/24	24/25	Achievability
CRM-P*	Worse than Target	3.08	3.29	3.31	3.28	3.19	3.10	3.10	
	Target	2.92	3.03	3.04	3.00	2.90	2.79	2.79	
	Better than Target	2.78	2.80	2.80	2.75	2.63	2.51	2.51	

<sup>33</sup> 18/19 measures are currently under review with customers and stakeholders as part of the ongoing scorecard discussions. There may be amendments from those figures shown here once the scorecard is finalised.

<sup>34</sup> The LTIFR targets are set to reflect Network Rail’s national aspiration to benchmark ourselves against other industries which lead on safety. However, the criteria used by these industries varies 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 Network Rail’s LTIFR, which will require changes to the definition of what incidents are counted as LTIs in Network Rail.

<b>Freight Delivery Metric (FDM-R)</b>	Worse than Target	88.8%	88.8%	88.8%	88.8%	88.8%	88.8%	88.8%	
	Target	91.0%	91.0%	91.0%	91.0%	91.0%	91.0%	91.0%	
	Better than Target	91.7%	91.7%	91.7%	91.7%	91.7%	91.7%	91.7%	
<b>Time to 3 - South Eastern</b>	Worse than Target	86.3%	83.4%	82.6%	82.8%	83.3%	83.7%	83.7%	
	Target	87.2%	85.3%	84.6%	85.0%	85.6%	86.1%	86.1%	
	Better than Target	88.1%	87.1%	86.5%	87.0%	87.6%	88.2%	88.2%	
<b>On time - GTR</b>	Worse than Target	59.7%	59.4%	59.7%	59.8%	60.5%	61.2%	61.2%	
	Target	60.7%	60.8%	61.1%	61.3%	62.1%	62.8%	62.8%	
	Better than Target	61.6%	62.1%	62.4%	62.7%	63.5%	64.3%	64.3%	
<b>Level of Cancellations CaSL - SE</b>	Worse than Target	2.10%	2.60%	2.70%	2.60%	2.60%	2.50%	2.50%	
	Target	2.00%	2.30%	2.40%	2.30%	2.20%	2.20%	2.20%	
	Better than Target	1.90%	2.00%	2.10%	2.10%	2.00%	1.90%	1.90%	
<b>Level of Cancellations CaSL - GTR</b>	Worse than Target	3.50%	3.60%	3.50%	3.50%	3.40%	3.20%	3.20%	
	Target	4.10%	4.00%	3.90%	3.80%	3.60%	3.30%	3.30%	
	Better than Target	3.10%	3.00%	3.00%	2.90%	2.80%	2.60%	2.60%	
<b>Average Passenger Lateness - SE</b>	Worse than Target	2.4	2.8	2.9	2.8	2.8	2.7	2.7	
	Target	2.2	2.5	2.6	2.5	2.5	2.4	2.4	
	Better than Target	2.1	2.2	2.3	2.3	2.2	2.1	2.1	
<b>Average Passenger Lateness - GTR</b>	Worse than Target	3.6	3.7	3.6	3.6	3.5	3.3	3.3	
	Target	3.4	3.4	3.3	3.3	3.2	3	3	
	Better than Target	3.3	3.2	3.1	3	2.9	2.7	2.7	
<b>Customer</b>	<b>Targets</b>	<b>18/19</b>	<b>19/20</b>	<b>20/21</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>Achievability</b>
<b>NRPS<sup>35</sup></b>	Worse than Target	81.0%	81.0%	81.5%	82.0%	83.0%	83.5%	84.0%	
	Target	83.0%	83.0%	83.5%	84.0%	85.0%	85.5%	86.0%	
	Better than Target	84.5%	84.5%	85.5%	86.0%	87.0%	87.5%	88.0%	
<b>Locally driven measures</b>	Worse than Target	Additional locally driven measures will be agreed yearly with stakeholders and customers throughout CP6. This will allow the route to respond to local concerns and priorities by reflecting these in the scorecard. Targets will be agreed as part of this process.							
	Target								
	Better than Target								
<b>Sustainability / Asset Management</b>	<b>Targets</b>	<b>18/19</b>	<b>19/20</b>	<b>20/21</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>Achievability</b>
<b>Reduction in Service Affecting Failures*</b>	Worse than Target	0.0%	-1.0%	-2.0%	-2.0%	-2.0%	-2.0%	TBC	
	Target	2.0%	1.0%	0.0%	0.0%	0.0%	0.0%	TBC	
	Better than Target	4.0%	3.0%	2.0%	2.0%	2.0%	2.0%	TBC	

<sup>35</sup> NRPS targets may be amended depending on the outcome of the current South East re-franchising process. NRPS improvements will be driven by the train performance metrics and other initiatives (working with the TOCs and Transport Focus) to improve communication.

<b>7 key volumes*</b>	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%	
<b>Top Investment Milestones</b>	Worse than Target	60%	60%	60%	60%	60%	60%	TBC	
	Target	80%	80%	80%	80%	80%	80%	TBC	
	Better than Target	100%	100%	100%	100%	100%	100%	TBC	
<b>CRI*</b>	Worse than Target	25%	-3%	-5%	-7%	-9%	-12%	TBC	
	Target	26%	1%	1%	1%	1%	1%	TBC	
	Better than Target	28%	5%	7%	9%	11%	12%	TBC	
<b>Network Sustainability*</b>	Worse than Target	TBC	To be measured at control period exit only				TBC	TBC	
	Target	-2.0%					-4.0%	TBC	
	Better than Target	TBC					TBC	TBC	
<b>Financial Performance</b>	<b>Targets</b>	<b>18/19</b>	<b>19/20</b>	<b>20/21</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>Achievability</b>
<b>Financial Performance Measure – gross excl. enhancements (£m)*</b>	Worse than Target	(26.7)	(26.7)	(26.7)	(26.7)	(26.7)	(26.7)	(26.7)	
	Target	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Better than Target	26.7	26.7	26.7	26.7	26.7	26.7	26.7	
<b>Financial Performance Measure – gross enhancements only (£m)*</b>	Worse than Target	(49.8)	(49.8)	(49.8)	(49.8)	(49.8)	(49.8)	(49.8)	
	Target	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Better than Target	49.8	49.8	49.8	49.8	49.8	49.8	49.8	
<b>Cash compliance – income &amp; expenditure*</b>	Worse than Target	(5.7)	(5.7)	(5.7)	(5.7)	(5.7)	(5.7)	(5.7)	
	Target	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Better than Target	28.7	28.7	28.7	28.7	28.7	28.7	28.7	

**Achievability definitions (applies to “target” value)**

<b>RED</b>	Very challenging, likely to require substantial organisational and cultural change to achieve and/or highly dependent on third party involvement
<b>AMBER</b>	Challenging, likely to require moderate organisational and cultural change to achieve and/or dependent on third party involvement
<b>GREEN</b>	Achievable, builds on existing organisational and cultural capabilities and little or no dependency on third parties for delivery

The performance projections<sup>36</sup> are based on detailed modelling and analysis. However, other measures are challenging to predict over the duration of the control period, particularly where factors outside of South East route’s control have an impact on the outcomes. This has been reflected in the achievability scores.

The scorecard objectives are based on the constrained base plan. Should vision plans be progressed, these will have a positive impact on the outcomes.

<sup>36</sup> Performance modelling is based on traffic growth forecasts provided by the central Asset Management teams.

There will be ongoing review and refinement of targets throughout the control period, with yearly targets agreed with our customers to reflect any emerging issues or concerns. A key element in successfully achieving these objectives will be continued close working with GTR and Southeastern. A full list of assumptions is included at Appendix B.

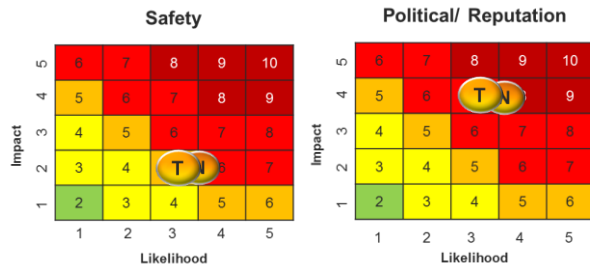
### **3.1.3 Regulatory Floors**

In order to give greater clarity on the minimum levels of performance and sustainability expected by the regulator (ORR), our plan includes regulatory floors for the key metrics in these areas. These floors, set out in the following tables, 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 J.

<b>Regulatory floors</b>	<b>19/20</b>	<b>20/21</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>
<b>Consistent Route Measure – Performance (CRM-P)</b>	3.99	4.00	3.96	3.86	3.75
<b>Freight Delivery Metric (FDM-R)</b>	88.2%	88.2%	88.2%	88.2%	88.2%
<b>Network Sustainability</b>	90%	90%	90%	90%	90%

## 4. Activity Prioritisation on a Page

Safety Summary of objectives		Safety means a service with the lowest possible risk of injury to passengers, members of the public, and the railway industry workforce. Those using the railway will do so with the confidence that their personal safety is guaranteed, demonstrated by further reductions to Train Accident Risk and the Lost Time Injury Frequency Rate. Those working on the railway will be safer than ever before, and the public's safety will also be improved by minimising level crossing safety risk.		
No.	Key constraints, risks and opportunities	What we plan to do	Owner	Timescale
1	R: There is a risk of incidents occurring at Level crossings due to numerous causes which could result in material damage to infrastructure or third party assets, or result in injury /fatality to public and/or workforce.	i. The plan is to achieve a 28% FWI reduction at level crossings in CP5 and a further 6% in CP6. ii. Undertake risk mitigation work such as closures/upgrades of level crossing as a result of periodic operational risk assessment in accordance with NR operations manual, subject to local authority support and public consultation. iii. Continue to carry out inspections to NR standards and support the national audit programme to monitor compliance to standards and identify actions to address non-compliance iv. Condition led renewals and refurbishment in CP6, which will introduce modern technology bringing safety benefit	DRSAM	Ongoing through CP5 and CP6
2	R: There is risk of a Train Accident due to failure to manage asset condition and operations processes, resulting in injury/fatality to the public or workforce	i. Reduce the risk of a train derailment and/or collision through renewals, predict and prevent approach, and the operations & maintenance strategy (better asset information & remote condition monitoring) ii. Improve workforce competency through training and safety frameworks/standards	DRSAM	Ongoing through CP5 and CP6
3a	R: There is a risk that the LTIFR rate continues to be above the Network Rail norm due to factors including levels of safety competence that are below our ideal and poor fleet vehicle driving resulting in RTAs, injuries and/or fatalities	<b>For RTAs:</b> i. Improve road driving behaviour via telematics and annual checks, reducing breaches of Life Saving Rules ii. Providing driver training and having improved fleet safety specification. iii. All driving LSR breaches to be investigated using fair culture process and outcomes to be widely communicated <b>For all causes:</b> i. Implement and embed re-issued O19 standard for planning and delivering safe work. ii. Support to the roll out the National Home Safe plan alongside key local initiatives. iii. Drive a step change in safety culture and leadership through safety workshops, behavioural program and continued engagement with the frontline, trade union and executive safety board. iv. Utilise new technologies and procedures to reduce the need for 'boots on ballast' as far as possible through extended usage of mobile maintenance trains and roll-out of Negative Short Circuiting Devices (NSCDs).	COO/HoRS HE/RMD/ DRSAM	Ongoing through CP5 and CP6
3b	O: Further reduction in injury and operational risk to the workforce	Further reductions in LTIFR are envisaged in our "Improving Safety" vision scheme		
3c	C: Funding for full roll out of NSCDs is constrained			
4	O: Improve Workforce Health & Wellbeing	i. Reduce occupation induced ill-health through initiatives such as HAVS meters, fatigue management and mental health awareness training. ii. Improvements in on site well fare facilities.	COO/HoRS HE	Start CP5, into CP6
5	O: Safety Leadership, Cultures and Behaviours	i. Programme to support the senior leadership of the organisation to take safety performance to a new level of excellence and a supervisor & front line worker programme which engages individuals to take personal safety responsibility.	COO/HoRS HE	Start CP5, into CP6



**Summary of risk outcome**

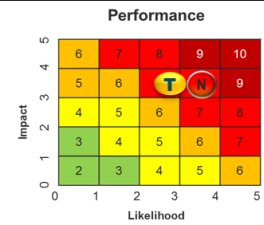
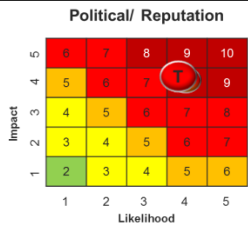
We anticipate achieving a marginal improvement in aggregated safety performance. We will focus on delivering key activities which have the most significant impact on safety risks such as negative short circuiting devices, asset interventions to reduce train accident risk, continued route safety workshops and level crossing safety improvements.

The scores shown have been aggregated across train accident, public and workforce safety, heavily weighted by our train accident risk position.

Train Performance Summary of objectives		Our vision for the South East Route is a dependable, punctual and frequent service. This relies on continued improvement in asset reliability, better management of the network and quicker response and recovery. In the constrained base plan scenario, passenger growth and other reliability factors broadly offset the performance improvements from traffic management, enhanced maintenance and response, meaning performance remains unacceptable.			
No	Key constraints, risks and opportunities	What we plan to do	Owner	Customers impacted	Timescale
1	R: There is a risk that the resilience of the operational performance plans is undermined by a large amounts of sub threshold delay which could result in not achieving performance targets.	<ul style="list-style-type: none"> <li>i. An independent study into sub-threshold delay will be completed in CP5, the results of this study will be addressed during the end of CP5 and the beginning of CP6</li> <li>ii. Work with operators to draw up joint action plans to help manage the causes of sub-threshold delays</li> <li>iii. Strengthen our planning processes to ensure that future delays are minimised</li> <li>iv. Continued investment in Digital Railway to improve operational performance</li> </ul>	RPM	GTR, Se, ARL	Nov 2017 and into CP6
2	C: There is a large portion of un-attributed delay	<ul style="list-style-type: none"> <li>i. Implement Joint Performance teams with GTR &amp; Southeastern (Se).</li> <li>ii. Provide additional Delay Attribution and Delay Resolution staff</li> <li>iii. Implementation of ARS technology. Streamlined and clarified processes for route measurement team</li> </ul>	RPM	GTR, Se	Dec 17
3	R: There is a risk that the running of 24 trains per hour through the Thameslink core is unachievable by the planned date due to the difficulties in reaching this level of service and the condition of assets outside of the core. This risk could have a significant impact on national performance (PPM) and lead to loss of corporate reputation O: Thameslink Resilience programme (TRP) and CP6 plan improves ability to meet this challenge	<ul style="list-style-type: none"> <li>i. Implement the Thameslink Readiness Programme, tactically aligning with other industry partners.</li> <li>ii. Develop and deliver the Thameslink Resilience Programme to improve performance to the required level to support 24 tph (north and south of the core), through Targeted interventions to address reliability hot spots in the feeder routes, eg, Balcombe Tunnel. Sustain this capability going into CP6</li> <li>iii. Trials with different working methods in the core are already underway</li> <li>iv. Additional support and integration across SE &amp; LNE teams taking place, to ensure alignment with GTR as programme moves to output based, phased implementation of readiness</li> <li>v. Revised governance structure, working groups, and reporting being prepared with DfT</li> </ul>	RMD / T'link Dir.	GTR, Se	End CP5 and into CP6
4	R: There is a risk that asset reliability is worse than expected due to poor condition, increased asset wear & failure rates due to increased tonnage (15.5% higher than 17/18 levels) which could result in not achieving performance targets.	<ul style="list-style-type: none"> <li>i. Part of the Southern Performance Picture (asset Resilience) - Route Asset Management plans to provide a framework for asset management to maintain and improve asset reliability</li> <li>ii. Shift to preventative maintenance and deliver targeted asset renewals to reduce number of incidents.</li> <li>iii. Increased maintenance to restore and sustain compliance, reducing defect rectification timescales and hence temporary speed restrictions</li> <li>iv. Increasing maintenance in second order assets affecting performance, eg, Drainage and Vegetation.</li> <li>v. Increase Grinding in the Core Thameslink section to mitigate Rail Defects resulting from Automatic Train Operation and increased tonnage</li> </ul>	HoMD	GTR, Se, ARL	End CP5 and into CP6
5	C: Not enough dedicated response teams in place / Lineside Spares. Delay per incident on the route is increasing and negating the impact of improved asset reliability.	<ul style="list-style-type: none"> <li>i. Provide additional response teams, particularly S&amp;T, Plant &amp; Distribution and new Telecoms capability.</li> <li>ii. Localised lineside stores to improve response and fix times.</li> <li>iii. Implement joint control at TBROC to improve service recovery.</li> </ul>	HoMD	GTR, Se, ARL	End CP5 and into CP6
6	O: Traffic Management and further improvements through Digital Railway technology present a real opportunity to sustainably improve performance on the Route.	<ul style="list-style-type: none"> <li>i. Deploy TM in the core and across a significant proportion of the wider Thameslink network, including further C-DAS and TM roll-out.</li> <li>ii. Use Incident Management System to aid workflow and mobilisation during incident response.</li> </ul>	T'link Dir	GTR, Se, ARL	End CP5 Ongoing CP6
7	O: Move to a data driven decision making and preventative maintenance	<ul style="list-style-type: none"> <li>i. Improve collection, management and analysis of asset condition and performance data to enable better decision making and targeted preventative maintenance.</li> <li>ii. Exploit further Remote Condition Monitoring, using alarms to address defects pre service affecting failures, earlier mobilisation of response and to identify /mitigate locations with repeat failure counts.</li> </ul>	RPM HoMD	GTR, Se, ARL	End CP5 Ongoing CP6



8	R: There is a risk that the poor performance in CP5 due to continued passenger growth could continue in CP6, resulting in an inability to meet customer expectations, increased boarding and alighting times (resulting in not achieving performance targets) and/or increased costs/financial penalties	<ul style="list-style-type: none"> <li>i. The Thameslink programme will enable increased train capacity on many routes.</li> <li>ii. Support TOCs in their rolling stock solutions to increase capacity</li> <li>iii. Support NSO to investigate and develop enhancement schemes to accommodate growth.</li> <li>iv. Potential collaboration with TfL on increasing the capacity of the East London Line..</li> </ul>	T'link RMD	GTR, Se	End CP5 Ongoing CP6
9	C: Performance is constrained by operational complexity	i. Work to ensure a high performing timetable. Collaborate with the TOC to tackle operational complexity in train/crew resourcing and with the NSO to develop proposals for solving network constraints e.g. grade separation at key flat junctions, notably in the Croydon area.	RPM NSO	GTR, ARL	Ongoing CP6 and CP7

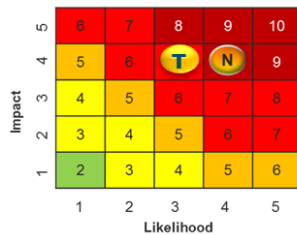


**Summary of risk outcome**

In the constrained base plan scenario, any performance improvements will be broadly offset by the impact of passenger growth and increased tonnage. Performance risk remains high, with an ongoing potential for high impact, low frequency events, with direct implication for political and reputation risk. Political / reputation risk will increase slightly due to increased passenger numbers and raised expectations following completion of the Thameslink Programme.

Locally driven customer measures Summary of objectives		Our customers’ primary requirement is for a high performing and reliable service. The vision meets this goal, in addition to ensuring other requirements such as improved communication and delivery are met; the vision schemes also move us towards these targets. Under the constrained base plan, it will not be possible to meet customer and passenger expectations and requirements, primarily due to the resultant poor dependability and punctuality.			
No.	Key constraints, risks and opportunities	What we plan to do	Owner	Customers impacted	Timescale (start/finish)
1	R: There is a risk of declining passenger satisfaction at stations on the route due to increased expectations, lack of investment and lack of maintenance. This could result in reputational damage and additional costs to ensure that the stations are fit for purpose.	i. Investment in passenger facilities is currently planned across the GTR and Southeastern franchise stations, funded through the National Stations Improvement Programme and Access for All Programme and managed via NSIP Local Delivery Groups. The intention is to implement further similar work once these schemes are completed. ii. Our vision scheme ‘Victoria Station – Sussex Concourse Roof’ would if funded, as well as having considerable safety benefits, help mitigate the risk of increased expectations at one of our managed stations.	Scheme Sponsors	GTR / Southeastern	CP5 and continuing in CP6
2	O: Improve Customer Satisfaction Scores for GTR and Southeastern (both lower than the national average)  R: There is a risk of low Customer Satisfaction Scores and poor performance for GTR and Southeastern due to funding constraints, resulting in reputational damage and political scrutiny	i. In the constrained base plan we broadly protected performance to account for the increase in passenger numbers and service levels. However, keeping performance at the same level will not improve NRPS scores. ii. An NRPS plan is in place for our managed stations, based on past survey results and areas highlighted for focus. This includes enhanced cleaning, an increase in the number of seats and litter bins, improved signage and communication, and improvements in staff availability, visibility and training. We have also removed charges for using toilets at our managed stations.	Route Stations Manager	GTR / Southeastern	CP5 and continuing in CP6
3	O: Reduce Railway Work Complaints.	i. A CP5 initiative/control measure has been implemented and work has commenced to reduce the number of complaints. This is embedded into how we plan and perform maintenance and other work on the railway.	COO	All	CP5 and continuing in CP6
4	R: There is a risk that Customer Satisfaction Scores for GTR and Southeastern are negatively impacted due to factors outside of the route’s control e.g. industrial relation issues, increase to rail fares and disruption on other transport systems. This may result in political scrutiny and reputational damage	i. Closer collaboration between the TOCs and South East route, and a continuation of the in-depth stakeholder engagement set up during the CP6 planning process, will allow us to develop a better understanding of upcoming and current issues and work together with other parties to resolve them more effectively.	Route Sponsorship Team	All stakeholders	CP5 and continuing in CP6

Political/ Reputation

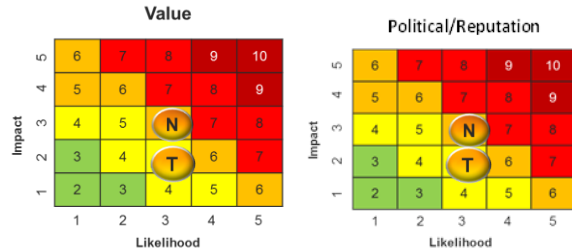


**Summary of risk outcome**

Current risk score reflects a period of industrial action and disruption from Thameslink despite some significant recent improvements. There is a strong link between performance and customer satisfaction. Under the constrained base plan scenario, though we have protected short term performance, the political and reputational risk impact does not improve significantly from today.

Sustainability and Asset Management Capability Summary of objectives		Our objective is a safe and sustainable asset plan that slows the degradation of asset life and condition over CP6 and enables a return to CP4 exit levels of sustainability during CP7/8. Within this we will prioritise investment in critical assets and lines of route to underpin performance and invest in our maintenance and operations strategies and safety improvements. To support this we will continue to strengthen our asset management competencies, building capabilities in data analytics, data driven decision making, improve our planning capability and transition to predict and prevent maintenance regimes.		
	Key constraints, risks and opportunities	What we plan to do	Owner	Timescale
1	R: There is a risk that the access required to deliver our renewals and maintenance plans is not available due to new timetables, inability to gain TOC agreement and/or existing access agreements, resulting in additional schedule 4 costs or under-delivery. O: Renewals planning and contracting strategy	i. Create a workbank that is stable and deliverable, planning in much greater detail, further ahead, to understand access demands. ii. Develop and embed technology to visualise and integrate the asset workbanks. iii. Work closely with the train operators to agree access. iv. Seek opportunities to improve our delivery strategy to bring the route deliverers and supply chain closer together, to align objectives and enable efficiencies.	RMD / DRSAM	CP5 and ongoing into CP6
2	R: There is a risk that we are unable to recruit and train sufficient technical resource for the increased core maintenance and response due to the expansion of the Thameslink service, resulting in an inability to maintain the asset effectively during the Control Period (with the consequential impact on performance etc)	i. The organisation is in the process of being right-sized and a recruitment plan is in place. ii. A specific Project team has been set up within the Thameslink Resilience Programme covering both SE & LNE Routes to drive the recruitment programme, support by the Heads of Maintenance. This team have developed a plan that is looking alternative approaches to recruit in the scarce skills areas and accelerate training and competence assurance process, targeting translatable skills from other industries. Contract staff are being used to enable early mobilisation where appropriate.	COO / DRSAM	Now – CP6
3	R: There is a risk of an extended period of operational difficulties due to unexpected asset failure and/or asset not performing as designed and/or design issues following introduction of new ATO/ETCS/Traffic Management technology. This may result in reputational damage, poor performance and/or additional costs in the interim whilst the issues are resolved.	i. The programme is undertaking significant pre use testing and the ATO/ETCS/TM are planned for early implementation, allowing some contingency time to fix emerging issues. ii. 2nd & 3 <sup>rd</sup> line support requirements are being developed with the key systems suppliers.	DRS	2018 – 2019
4	R: There is a risk that funding needs to be diverted from planned renewals to repair significant damage to the network due Extreme Weather events which would result in loss of renewals volumes and could result in loss of asset sustainability and/or performance.	i. Network Rail has insurance for large scale Extreme Weather events which the route will be able to draw upon ii. Creation of headroom at route and portfolio level.	DRSAM/ RFD	CP6
5	R: There is a risk of increased asset failure due to planned renewals volumes not being at ‘sustainable’ levels and lower minimum levels (STE) which may result in reputational damage, poor performance and/or additional costs.	i. Our base plan includes increased maintenance and response capability to provide short term mitigation on our most critical routes. This will continue our investment in increased maintenance through the Thameslink Resilience Programme (Big Plan) during CP5.	DRSAM	Now – CP6
6	R: There is a risk of suboptimal asset interventions due to unreliable and untimely data, leading to reduced benefits and increased costs. O: Move towards a ‘predict and prevent’ approach for maintenance C: Funding constraint limits investment in RCM and train monitoring technology	i. Identify and monitor quality of ellipse data, increase the frequency of condition data and manage the quality of asset data capture while on site. ii. Expand use of existing remote condition monitoring technology and work with train operators to develop train-based monitoring. Use enhanced data analytics to intervene at the optimum time iii. More engineering support into delivery unit teams to manage risk and design solutions for recurring faults/failures. iv. Drive innovation to identify more efficient interventions (eg, Rail milling to address moderate rolling contact fatigue instead of needing to re-rail)	DRSAM /COO	Now- CP6

7	<p>R: There is a risk that we are unable to recruit and train sufficient technical resource for the increased core maintenance and response due to the expansion of the Thameslink service, resulting in an inability to maintain the asset effectively during the Control Period (with the consequential impact on performance etc)</p>	<p>i. Identify competency gaps across all route roles involved in planning and delivery of the asset lifecycle and implement training where required.                  ii. In early CP6 we will achieve ISO55001 accreditation and continue to implement and build on this in CP6, ensuring line of sight from corporate objectives and organisational accountability.</p>	DRSAM	Now-CP6
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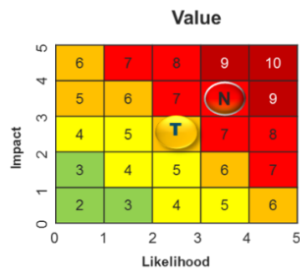


**Summary of risk outcome**

Our approach to asset management will focus on delivering sustainability while managing safety and performance risks. We will prioritise our asset interventions on the lines of routes and the assets that are critical to timetable operation, to uphold safety and minimise asset incidents and performance risk as far as possible within the funding available. To support this we will build capabilities in data analytics and data driven decision making, improve our planning capability and transition to predict and prevent maintenance regimes.

Financial Performance Summary of objectives		We will have a robust understanding of costs with clear headwind mitigation and efficiency plans. This is underpinned by a bottom up set of validated unit rate and a deliverability assessment. We will deliver efficiencies across our organisation, increasing productivity and ensuring we deliver value for money through: maximising time on tools, better planning (both workbank and access) and optimising our contracting and procurement strategy. We will also use new and existing technologies to deliver efficiencies. However, our ability to achieve long term efficiencies are limited by funding constraints.		
No.	Key constraints, risks and opportunities	What we plan to do	Owner	Timescale
1	C: Ability to deliver long-term efficiencies through minimising whole life cost has been reduced due to financial constraints	i. We have proposed a constrained base plan that has been developed to minimise the route’s overall risk position within the funding envelope and we will maximise possible efficiencies within this funding envelope.	DRAM/FD	CP6
2	R: There is a risk that the scope of the CP6 plan has not been accurately developed due to poor planning, asset knowledge and other issues leading to an inability to achieve the desired outcomes with the funding available	i. Our CP6 plan has been developed bottom-up by the RAMs and DUs using the ABP Model (for Maintenance). These organisations have a detailed understanding of scope requirements and lessons learned from CP5 plan development and delivery. ii. We will regularly monitor progress and manage scope changes to ensure we are able to minimise the financial consequences of changes to the plan	RAMs/DUs	CP5 (i.e. during the preparation of CP6)
3	R: There is a risk that CP6 costs have not been accurately estimated through poor planning, workbank knowledge and optimism bias, leading to cost overruns impacting financial performance	i. We have developed CP6 unit rates by basing them on current delivery, before applying headwinds and efficiencies to generate robust, deliverable post-efficient unit rates. Our RAMs have confidence in the robustness of the rates we have used to estimate our CP6 costs. ii. We will regularly monitor our financial performance and ensure that budget holders have accountability for spend and differences from the rates used during the planning of CP6	RAMs	CP5 (i.e. during the preparation of CP6)
4	R: There is a risk that the CP6 plan is not deliverable due to poor planning-of projects, insufficient resources or poor integration of other routes works etc resulting in cash flow and delivery constraints – impacting on costs and volumes delivered	i. We will work with our delivery partners to further develop the CP6 plan and procurement and contracting strategies. This will consider lessons learned from CP5 and agree how best to address other factors affecting availability of the labour market and access to new technologies and equipment.	DRAM/FD	CP5 and continuing into CP6
5	O: Costs on projects and Opex spend are reduced through tighter controls and better contract management	i. We have started work on improving our controls in CP5 and will continue to improve management of this throughout CP6. ii. There will be a closer working relationship between RAMs, IP and deliverers to ensure contracts are better managed.	FD/RAMs	CP5 and into CP6
6	R: There is a risk that asset condition is either substantially worse than expected, or deteriorates faster than expected due to poor asset information resulting in a need for a greater number of expensive interventions.	i. The shift to preventative maintenance should help mitigate the chance of asset condition being worse than expected ii. Through right-sizing our organisation we will ensure that we are flexible enough to react to any changes to priorities iii. We will continue to use and invest in technology to improve our asset knowledge and to ensure that we can plan for changes to reduce the cost of interventions.	RAMs/COO	CP5 and continuing into CP6
7	R: There is a risk that the forecast performance trajectory is not met due to NR related ‘failures’, resulting in an increase in Schedule 8 payments and reputational damage	i. Our plan has been developed to invest in increased maintenance and response capacity and capability to address system resilience and minimise Schedule 8 payments in CP6. The decision to increase maintenance relative to Capex in CP6 is required as we are changing the operating model with a focus on response, critical asset maintenance and the significant issue in both ops and maintenance due to the change of scope because of TLP and managing the impact of CP5 deferrals. Capex in the short term does not deliver the required enhancement in performance given it improves a smaller % of assets each year, as compared to maintenance.	COO	CP6

8	R: There is a risk that the operation and maintenance of Thameslink assets is substantially more expensive than budgeted due to poor planning and/or poor asset information, resulting in a requirement for additional funding to sustain the Thameslink assets and a reduction in the available funds to maintain asset condition elsewhere on the network	<ul style="list-style-type: none"> <li>i. The Thameslink Resilience Programme implemented at the end of CP5 should mitigate some of the risk of excessive cost overruns for Thameslink.</li> <li>ii. The provision of response teams and preventative maintenance should help avoid expensive remedial action.</li> <li>iii. We will work closely with all stakeholders to ensure the handover is smooth and that we are proactively tackling potential issues</li> </ul>	COO	CP5 and into CP6
9	R: There is a risk that staff costs are significantly higher than expected due to Fatigue Management policies and/or union action, resulting in a reduction in delivery and consequent impact on CP6 outputs.	<ul style="list-style-type: none"> <li>i. Headwinds have been included in the submission to cover some of the impact of Fatigue Management standards.</li> <li>ii. We will work with staff representatives to ensure that any solution works for both sides</li> <li>iii. We will ensure that we hold consultations with the unions when we implement a change that may affect staff and employee terms and conditions</li> </ul>	FD/COO	CP5 and into CP6
10	R: There is a risk that Schedule 4 compensation exceeds the supplemental charge due to poor planning, resulting in additional costs and/or a reduction in delivery and consequent impact on CP6 outputs.	<ul style="list-style-type: none"> <li>i. Through working with TOCs as well as better access and workbank planning we will mitigate the chance of Schedule 4 compensation exceeding the supplemental access charge</li> <li>ii. We will utilise our access windows more efficiently to mitigate avoidable costs</li> </ul>	DRAM/FD/COO	CP5 and into CP6
11	O: Headwinds do not materialise and we are able to gain efficiencies through an improved overall contracting strategy, increased time on tools and a stable, well scoped workbank	<ul style="list-style-type: none"> <li>i. We will ensure that we are involved in the contract renewal process to ensure that it provides benefits to the route. We will use new technologies and lessons learned from CP5 to manage the workbanks effectively.</li> <li>ii. New technologies such as NSCDs, alongside improved working methods, will also be used to increase time on tools</li> </ul>	IP/RAMs/COO	CP6



**Summary of risk outcome**

Financial performance is currently outside corporate risk appetite as we have had numerous challenges with cost overruns and under delivery of volumes in CP5. We anticipate being able to improve financial performance in CP6 through tightening controls and implementing lessons learned in key areas such as procurement strategy and responding to emergent work. At a constrained base plan funding level there is significant risk around schedule 8, linked to performance. This is limited by performance mitigation initiatives in the plan. However there are financial implications associated with potential asset failure and need for costly intervention or increased maintenance e.g. earthworks and major structures as condition deteriorates. Our ability to deliver long term efficiencies through investment in technology and operational consolidation is also limited.

## 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.

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, our strategic plan includes **£109m** 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.

#### 5.1.1 RENEWALS COSTS (post headwinds and efficiencies in 17/18 prices)

	Unit of Measure	Funded by	CP5 (£m)						CP6 (£m)					CP7 (£m)	
			14/15	15/16	16/17	17/18	18/19	CP5	19/20	20/21	21/22	22/23	23/24	CP6	24/25
Track	£m	Renewals	73.7	93.1	105.8	102.2	72.8	<b>447.6</b>	126.8	108.9	107.6	79.9	71.0	<b>494.1</b>	127.8
Conventional Signalling	£m	Renewals	96.4	79.7	65.3	63.2	86.0	<b>390.6</b>	60.9	110.9	99.0	86.4	110.6	<b>467.8</b>	152.1
Structures	£m	Renewals	45.9	56.3	70.7	39.8	20.6	<b>233.3</b>	37.0	66.0	56.7	58.6	36.6	<b>255.0</b>	50.3
Earthworks	£m	Renewals	20.7	24.6	12.7	10.4	5.6	<b>74.0</b>	25.7	31.7	26.6	21.3	11.7	<b>117.0</b>	23.4
Drainage	£m	Renewals	1.9	8.4	8.1	9.8	2.8	<b>31.0</b>	7.7	8.0	8.0	7.0	6.5	<b>37.2</b>	7.4
Buildings	£m	Renewals	51.6	57.5	25.2	11.7	2.8	<b>148.8</b>	35.8	38.4	30.8	26.8	27.0	<b>158.8</b>	35.8
Electrification & Fixed Plant	£m	Renewals	30.5	48.3	41.2	31.0	35.2	<b>186.2</b>	43.9	67.1	65.4	57.9	32.3	<b>266.6</b>	71.6
Other	£m	Renewals												-	
<b>Total Renewals</b>	<b>£m</b>	<b>Renewals</b>	<b>320.7</b>	<b>367.9</b>	<b>329.0</b>	<b>268.1</b>	<b>225.9</b>	<b>1,511.6</b>	<b>337.9</b>	<b>431.0</b>	<b>394.0</b>	<b>337.9</b>	<b>295.6</b>	<b>1,796.5</b>	<b>468.3</b>
Digital Railway	£m	DR Programme							27.3	44.1	62.8	50.5	25.0	<b>209.7</b>	24.5
<b>Total Renewals + Digital Railway</b>	<b>£m</b>	<b>All</b>	<b>320.7</b>	<b>367.9</b>	<b>329.0</b>	<b>268.1</b>	<b>225.9</b>	<b>1,511.6</b>	<b>365.2</b>	<b>475.1</b>	<b>456.8</b>	<b>388.4</b>	<b>320.6</b>	<b>2,006.13</b>	<b>492.8</b>

5.1.2 KEY VOLUMES

	Unit of Measure	Funded by	CP5						CP6						CP7
			14/15	15/16	16/17	17/18	18/19	CP5	19/20	20/21	21/22	22/23	23/24	CP6	24/25
Plain Line	Linear track m	Renewals	70,198	104,065	120,032	101,067	95,707	<b>491,069</b>	151,692	128,598	165,113	104,452	100,745	<b>650,600</b>	181,200
S&C	No. of S&C units	Renewals	122	182	134	123	174	<b>735</b>	160	166	162	137	129	<b>754</b>	121
Conventional Signalling	SEU	Renewals	70	276	93	2	167	<b>608</b>	88	98	367	103	20	<b>676</b>	517
Digital Railway	SEU	DR Programme	-	-	-	-	-	-	-	6	93	6	-	<b>105</b>	6
Embank/Soil Cut/Rock Cut	No. of	Renewals	100	395	244	108	50	<b>897</b>	460	596	580	458	338	<b>2,432</b>	185
Underbridges	Number of assets intervened on	Renewals	-	-	-	-	-	-	23	34	48	28	8	<b>141</b>	24
Underbridges	m2 plan deck area worked on	Renewals	2,340	6,462	8,440	7,986	791	<b>26,019</b>	4,889	6,196	8,981	6,052	2,082	<b>28,198</b>	3,750
Wire runs	No. of	Renewals	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductor Rail renewal	Km	Renewals	17	28	15	1	6	<b>67</b>	-	23	6	-	-	<b>29</b>	30



**5.1.3 OPEX COSTS (post headwinds and efficiencies in 17/18 prices)**

	CP5 (£m)						CP6 (£m)						CP7 (£m)	
	14/15	15/16	16/17	17/18	18/19	CP5	19/20	20/21	21/22	22/23	23/24	CP6	24/25	
Track	-	-	-	-	-	-	72	72	72	71	71	358	71	
Off track	-	-	-	-	-	-	11	12	12	12	11	59	11	
S&T	-	-	-	-	-	-	30	29	28	28	28	142	28	
E&P	-	-	-	-	-	-	17	16	15	15	14	77	14	
DU HQ	-	-	-	-	-	-	12	12	12	12	13	61	13	
DU/WD Maintenance Non DU Maintenance	excl. B&C	125	136	138	148	152	699	142	140	139	138	137	697	137
Civils: Buildings Maintenance	-	-	-	19	19	16	53	22	22	22	22	109	22	
Civils: Structures Maintenance	-	-	-	4	4	3	11	15	15	15	15	75	15	
Civils: Earthworks Maintenance	-	-	-	2	3	2	6	2	2	2	2	10	2	
<b>Total Maintenance Costs</b>		125	125	136	162	174	173	206	204	203	201	201	1015	201
Operations	96	107	129	120	120	135	135	133	130	129	127	654	127	
Support	5	7	8	12	12	13	13	13	13	13	13	64	13	
<b>Operations &amp; Support Costs</b>		101	101	114	137	132	132	148	146	143	142	140	718	140
<b>Total Controllable Costs</b>		226	250	300	306	305	1386	354	350	345	343	340	1733	340
<b>Non-Controllable Costs</b>														
<b>Headcount</b>														
Permanent	2857	2960	3116	3348	3599	3599	3681	3691	3685	3664	3637	3637	3637	
Agency	31	20	52	32	30	30	30	30	30	30	30	30	30	

#### 5.1.3.1 Headcount

By the start of CP6, the route will have recruited the bulk of the workforce needed to deliver the CP6 plans. Throughout CP6, overall headcount remains relatively stable and our exit position is a net reduction of just over 40 staff.

There may potentially be a small number of areas (e.g. electrical control) where workforce reductions are likely and where, given the combination of skills and location, there be a need for a small number of redundancies. The route's assumption at this stage is that the numbers this could apply to will be small and could be managed on a voluntary basis.

It is assumed that any other workforce change required in CP6 can be managed through natural turnover and/or redeployment.

#### 5.1.4 Enhancement Costs

In line with CP6 guidance<sup>37</sup>, the tables below show:

- enhancements planned for completion during CP5; and
- enhancements listed in the Hendy Report which were past Final Investment Decision (FID) by April 2017 (and are scheduled to be completed by the end of CP6).

The final elements of the Thameslink Programme (which is post-FID) is the only project which sits in the second of these categories.

No development funding has been made available in CP5 for the London Victoria Station Capacity Improvements (not post-FID, and therefore not funded in this plan); delivery is therefore unlikely in the early years of CP6. It will also be necessary to undertake a review once funding is confirmed to check that the identified scope still delivers the required outputs against any changes to passenger flows during the time since the project was paused.

In addition to the schemes set out in the below tables, South East route is working with System Operator to develop and support a number of critical enhancements projects; these are summarised in Figure 5.1. These schemes, which could be delivered by the end of CP7, are considered necessary to provide sufficient capacity to meet forecast demand and enable delivery of the route's vision.

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<sup>37</sup> Enhancements Guidance and Schemes RF2

**ENHANCEMENTS COSTS (in 17/18 prices)<sup>38</sup>**

Programme Name	Project Name	Scheme category	CP5 £m					Total	CP6 £m					Total
			14/15	15/16	16/17	17/18	18/19		19/20	20/21	21/22	22/23	23/24	
Crossrail Programme	Crossrail Programme (Abbey Wood area)		47.44	37.57	63.37	34.94	0.47	183.79	-	-	-	-	-	
Thameslink Programme	Thameslink Programme	1	483.99	484.96	426.40	396.62	276.22	2,068.18	98.89	1.94	-	-	-	100.83
	Redhill additional platform	0	1.42	4.54	18.60	31.58	-	56.13	-	-	-	-	-	-
	Kent Traction PSU	0	2.74	7.71	7.69	12.40	1.25	31.80	-	-	-	-	-	-
	East Kent Resignalling P2	0	27.40	18.21	9.95	-	-	55.56	-	-	-	-	-	-
	New Cross Grid	0	2.32	1.43	1.81	8.13	3.28	16.97	-	-	-	-	-	-
	Sussex traction power supply upgrade	0	1.43	3.64	27.67	49.86	33.70	116.31	-	-	-	-	-	-
	Uckfield line train lengthening	0	1.22	13.82	4.62	0.07	-	19.73	-	-	-	-	-	-
	Balcombe to Copyhold bi-di sig upgrade	0	6.10	2.43	0.07	0.00	-	8.60	-	-	-	-	-	-
	Kent power supply upgrade (CP4)	0	0.00	0.11	0.05	-	-	0.05	-	-	-	-	-	-
	Southern Capacity	0	5.88	0.26	0.44	0.03	-	6.60	-	-	-	-	-	-
	Route 1 Power Supply Upgrade		39.70	17.42	7.26	2.92	0.59	67.88	-	-	-	-	-	-
<b>Total</b>			<b>620.22</b>	<b>592.34</b>	<b>567.83</b>	<b>536.54</b>	<b>315.51</b>	<b>2,632.43</b>	<b>98.89</b>	<b>1.94</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>100.83</b>

<sup>38</sup> Table shows only expenditure reported in South East for both Crossrail and Thameslink programmes. The CP6 numbers in the table are funded.

Whilst the considerations for CP6 planning recognise the potential option for delivery of these enhancement schemes, due to them not being agreed and uncertainty around their timing, the South East plan does not include any capital expenditure for these schemes or any associated OMR expenditure.

Scheme	Summary
London Victoria Improvements (Masterplan)	<p>It is essential that passengers can pass quickly, efficiently and safely through the route’s stations (supporting the route’s vision metrics of dependability, punctuality, frequency and safety). London Victoria currently suffers from congestion and a poor quality passenger experience.</p> <p>The proposed improvement work will reconfigure the existing station concourse layout to provide a more modern station in order to alleviate crowding, improve facilities for passengers, improve interchange with other transport modes, reduce unplanned closures and generate increased rental income for the industry.</p>
Brighton Main Line Upgrade – Croydon Area Remodelling Scheme	<p>The plans for CP6 have been developed using existing capacity (including the Thameslink Programme). However, in order to provide capacity to meet growing demand – particularly on the Brighton Main Line (BML) – there will be a need for further enhancement.</p> <p>The biggest element of this proposed work – by far – would be the Croydon Area Remodelling Scheme. This would comprise the expansion of East Croydon station from six to eight platforms (with additional concourse space and potential development above), the remodelling of the track layout at Norwood Junction to reduce timetabling constraints and the grade separation of multiple operationally restrictive flat junctions in the Selhurst triangle. This work is being developed in conjunction with key stakeholders including London Borough of Croydon, Department for Transport, Govia Thameslink Railway, Transport for London and Coast to Capital Local Enterprise Partnership.</p> <p>The work funded at present, through direct grant from DfT, is feasibility design (GRIP3A), development of an Outline Business Case and preparation (but not submission) of documents for a Transport and Works Act application.</p>
Brighton Main Line Upgrade – Other proposed works	<p>In addition to the proposed Croydon Area Remodelling Scheme there are a number of other, much more minor, changes required to increase the capacity of the route. These are principally track layout changes at Gatwick Airport, Haywards Heath and Wallington, an extra platform and associated power supply works at Reigate, changes in the Bermondsey and Battersea areas to improve “between the peaks” stabling near London terminals, other power supply works and potentially additional stabling elsewhere.</p> <p>Route capacity is also dependent on other works to provide robust levels of performance, notably asset resilience and traffic management.</p> <p>Once completed and performance is at acceptable levels the BML Upgrade Programme would enable the operation of up to 18 fast trains towards Victoria (measured at Norbury) and up to 24 trains on the fast lines towards London Bridge (measured at Sydenham). This is 6 more fast line trains overall than at CP6 entry<sup>39</sup>, with the upper limit on the train service at that point being the capacity of London terminals. The works would also potentially facilitate a subsequent suburban service increase on the East London Line to 24 trains per hour by removing the Croydon area as a constraint. The Strategic Outline Business Case for these works was endorsed by DfT in November 2016.</p>

<sup>39</sup> Alternatively, this additional capacity could be used to improve performance at the existing service level.

<p>Gatwick Airport Station Improvements</p>	<p>Gatwick Airport Station suffers from over-crowding (particularly due to uneven distribution along the platforms) and extended dwell times. This impacts on punctuality and safety.</p> <p>The proposed work would provide additional concourse capacity, improve vertical circulation and widen some platforms. A funding package for implementation is currently under development.</p>
<p>Inner &amp; Outer Kent Train Lengthening</p>	<p>Inner Kent Services - To enable the lengthening of further services into London Bridge to 12-car it would require platform extensions (or Selective Door Opening) at Woolwich Dockyard, and signal moves may be required at Erith Triangle, Crayford Triangle, Grove Park Sidings, Gillingham and Waterloo East.</p> <p>Outer Kent Services - provision of a 12-car berthing siding on the Cannon Street Curve could potentially enable an additional train per hour to operate.</p>
<p>High Speed Capacity Enhancements</p>	<p>All peak services should be formed of 12-car trains including an additional 12-car train operated to Ashford International, and this requires a platform extension at Maidstone West, possible power supply enhancements and timetable alterations on HS1.</p>
<p>Clapham Junction Congestion Relief</p>	<p>Clapham Junction is the UK's busiest interchange station. As passenger demand continues to grow, the already significant risk to performance (both punctuality and dependability), and safety will also increase.</p> <p>This scheme, currently funded for early design only through the Hendy review, will provide an additional overbridge in order to alleviate crowding, providing more space for passengers to wait and change trains.</p> <p>Longer term options for Clapham Junction are also under consideration, <b>in collaboration with colleagues in Wessex route.</b></p>
<p>Other Congestion Relief schemes</p>	<p>There are also several other stations on South East route where customers have identified congestion relief as necessary to deliver faster end-to-end journeys. The locations identified are Denmark Hill, Peckham Rye, Lewisham, Tulse Hill, Bromley South, Brockley, Forest Hill, Sydenham and Tonbridge. There is currently no funding for development of these schemes.</p>

Figure 5.1: Summary of potential enhancement schemes on South East route in CP6 and CP7<sup>40</sup>.

<sup>40</sup> CP5 enhancement schemes are not included in this table.

### 5.1.5 DIGITAL RAILWAY (in 17/18 prices)

Network Rail is committed to delivering a digital railway, and five SOBCs have been developed (with certain Routes and other stakeholders) for digital upgrade schemes. These SOBCs represent an early stage of the investment decision framework (HMT’s ‘Green Book’) as required in the memorandum of understanding agreed between Network Rail and the DfT signed on 23 March 2016.

#### Digital Railway in the South East Route

The South East Route SOBC has been integrated into this plan, reflecting the decision of ExCom Plus on 4 July 2017 that the company’s CP6 plans should demonstrate its commitment to digital railway. The net funding position shown for digital railway is additional to the conventional renewals contained in this plan and is in addition to any committed supporting enhancements.

In September 2017, DfT approved an initial development budget to progress the South East SOBC for Traffic Management to Outline Business Case, funded from the NPIF funds<sup>41</sup>. The assumed funding source for 100% of the South East Route investment is the NPIF. This assumption is shown clearly in the table below.

Traffic Management on Sussex and Kent branches of the South East Route					Development stage:	SOBC	BCR	Kent >10 Sussex >10	
					Expected delivery year	2021-2024	Appraisal period	30 years	
<p><b>Problem Statement:</b> South East Route currently experiences the highest number of delay minutes of any route, in part from the reactionary delays caused by flat junctions and from the high volume of traffic operating on the route. Delays are quickly transferred across the network and impact a high number of passengers.</p> <p><b>Scheme:</b> Integrated Traffic Management for the area controlled by Three Bridges Rail Operating Centre, primarily the Brighton Main Line, a mixture of interfaced and isolated Traffic Management for the remainder of the route, with the option for C-DAS. This continues to grow the area of Traffic Management delivered by Thameslink Programme in CP5.</p>									
Implementation cost (£m)					Assumed funding source (£m)				
	CP5	CP6	CP7 & beyond	Total		CP5	CP6	CP7 & beyond	Total
Digital Infrastructure	30.6	198.4	63.8	292.8	Core Route Budget (OMR)	0.0	0.0	-	0.0
Business Change	1.3	11.3	0.7	13.3	National Productivity Investment Fund	31.9	209.7	-	241.6
Freight National Passenger Operator	0.0	0.0	0.0	0.0	Finance to address up-front affordability	0.0	0.0	0.0	0.0
OTMs in-cab fitment	0.0	0.0	0.0	0.0					
<b>Sub-Total (assumed core NR funded)</b>	<b>31.9</b>	<b>209.7</b>	<b>64.5</b>	<b>306.1</b>	<b>Sub-Total (assumed core NR funded)</b>	<b>31.9</b>	<b>209.7</b>	<b>-</b>	<b>241.6</b>
Passenger in-cab fitment	2.0	13.6	2.7	18.3	Franchise in-cab fitment	2.0	13.6	2.7	18.3
Civil Engineering Enhancements	0.0	0.0	0.0	0.0	Enhancements (MoU)	0.0	0.0	-	0.0

<sup>41</sup> Approval was also given to proceed on an East London Line capacity proposal, part funded by TfL, however the proposal is outside the scope of this RSP as an uncommitted enhancement.

<b>TOTAL</b>	<b>33.9</b>	<b>223.2</b>	<b>67.2</b>	<b>324.3</b>	<b>TOTAL</b>	<b>33.9</b>	<b>223.2</b>	<b>2.7</b>	<b>259.8</b>
<b>Scheme benefits<sup>42</sup></b>									
<u>Quantified output benefits:</u> Delay minute reduction of up to 4% for isolated Traffic Management, 6% for Interfaced Traffic Management and 7% for integrated Traffic Management.									
<u>Financial benefits (£m CP6)</u> TOC revenue benefits: 11.8 Reductions in NR OMR: 0.0 Net benefits to consumers and private sector: 29.6 <b>TOTAL: 41.1</b>					<u>Financial benefits (£m NPV over 60 years)</u> TOC revenue benefits: 209 Reductions in NR OMR: 0.0 Net benefits to consumers and private sector: 511 <b>TOTAL: 720</b>				
<u>Other qualitative benefits:</u> Enables part of the safer trackside working strategy, providing the traffic management protection system in the integrated traffic management areas.									
<u>Other dependencies</u> Successful completion of Thameslink Programme Traffic Management by December 2018, including proving of design, supporting operational changes and performance benefits.									

Thameslink represents a starting point for Digital Railway in the South East, presenting an opportunity to build on the knowledge, skills and supply chain relationships to move quickly towards further rollout in CP6 and CP7. This opportunity is strengthened by the high capacity utilisation expected as demand grows in the South East over the coming years, with a Strategic Outline Business Case (SOBC) for investing in greater reliability:

- Extending TMS planning route-wide in the South East (Isolated TMS), exploiting alignment with the Signalling Renewal workbank where possible to facilitate automation capabilities (Interfaced or Integrated TMS) – notably for Victoria and Ashford areas in CP6, and the Brighton Mainline in CP7<sup>43</sup>.
- Rolling out C-DAS capability, both for Class 700s and potentially other rolling stock through relatively cost-efficient retro-fitting and new rolling stock procurement specification.
- Exploiting development of TOC Traincrew and Rolling Stock ('Stock & Crew') planning and management systems, to enhance the capability of the TMS to identify and resolve potential train service conflicts.
- Working with Transport for London to extend TMS onto the East London Line (to Highbury & Islington) and align ELL operations with South East Route.

It should be noted that further rollout of ETCS across most of the South East route is expected, subject to associated business cases, but current planned renewals of Signalling Interlocking and Control Systems will be specified as ETCS ready. In part this is due to physical constraints on the network such as London Termini capacity and complex flat junctions at key nodes.

<sup>42</sup> Benefits quoted for schemes may be subject to delivery of other enhancement schemes not yet integrated into this plan

<sup>43</sup> Part of the Brighton Mainline scope (around Norwood Junction, Selhurst and East Croydon) will be aligned with the proposed Brighton Mainline Upgrade Programme and physical works to remodel the area, currently forecast for commencement in CP6.

**Digital Railway ready specifications**

Having reviewed the potential opportunities presented by the CP6 signalling renewals plan and the emerging proposals for the Brighton Main Line Upgrade, no active provision was proposed for the CP6 workbank. Passive provision is being made within conventional re-signalling schemes in CP6.

**The range of funding options**

DfT funding via the CP6 determination or NPIF is the preferred funding source for the final scheme, although third party funding may also present an opportunity to progress where government funding is not available. Additionally, there may be options for private finance, although this will still require the identification of a funding source for the repayment of capital and finance charges. The table below outlines the financing spectrum and provides an evaluation.

An option for the South Eastern Franchise to design, procure and support Traffic Management, Stock and Crew and C-DAS deployment on the franchise area is being progressed by the DfT as part of the refranchising process, with tender returns anticipated in March 2018.

Outcome projections, including performance figures, stated in this document assume funding and implementation of Traffic Management, Stock and Crew and C-DAS in full.

Type	Strong Points	Weak Points
<b>Publicly Financed</b>	VfM through low finance costs, assets remain public, flexibility in operations, legislation exists	No new funds, potential loss of efficiency through no private sector skills introduced, limited risk transfer, no whole life cost fixing
<b>Build - Operate - Transfer (BOT)</b>	Aligns design, construction and operating risk, Introduction of private sector skills so more efficient delivery, no asset transfer	Approval required as novel/contentious, only limited risk transfer, public ownership, so no reduction of funding burden, no revenue stream from outset; assets will need to be ring-fenced and risks appropriately allocated
<b>Design - Build - Finance - Operate (DBFO)</b>	Increased risk transfer (design, construction, finance and operating) which promotes whole life cost approach, attracts private finance	Novel/contentious, more complex and therefore time consuming to set up, contract management required, might lead to issues with operational flexibility and integration with other parts of the network
<b>Design - Build - Operate - Transfer (DBOT)</b>	Increased risk transfer; private finance, availability payment incentivises quality	Novel/contentious, more complex and therefore time consuming to set up, contract management required, no existing legislation, might lead to issues with operational flexibility and integration with other parts of the network
<b>Design - Build - Maintain - Finance (DBMF)</b>	Full risk transfer, reduced funding burden to government, efficient delivery through private sector skills, potentially off-balance sheet	Novel/contentious, complex arrangement with many interfaces, assets no longer public, may not be politically acceptable, requires new legislation, might lead to issues with operational flexibility and integration with other parts of the network



## 5.2 Asset intervention strategy – Balancing maintenance and renewals

In order to remain within the funding envelope of the constrained base plan, it has been necessary to carefully prioritise the asset strategy across both opex and capex, minimising risk to the route by focussing on delivery of safe railway operation and sustainability for today and tomorrow<sup>44</sup>. For the route's assets, this means:

- Managing short-term performance risks arising from asset age and condition, while
- Maintaining asset condition and capability at steady state in the medium to long term, and
- Avoiding future bow waves in cost or volume delivery

Underlying asset condition must be addressed as the first priority to manage short term performance under growth demands and introduction of Thameslink. However, given the poor condition of the route's assets, it is not possible to achieve this through renewals alone in CP6 as:

- Renewals cannot be delivered quick enough;
- It would not be affordable;
- It will not contain the risk of short term temporary performance restrictions; and
- There would be insufficient flexibility to manage emerging risks.

Therefore, an increase in maintenance is the only way to manage the impact of deferred renewals, traffic growth and the short term performance risk as Thameslink is introduced.

As well as an increase in planned maintenance volumes, it has been necessary to increase reactive maintenance expenditure in those areas where renewals items

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<sup>44</sup> As discussed at the start of this document, it is not possible for the constrained base plan to deliver the vision, or meet stakeholder and customer requirements.

have been deferred due to unavailability of funding (most notably in buildings, structures and earthworks). Increased reactive volumes for track have also been included through the activity based volumes.

Mechanised maintenance (i.e. tamping, stoneblowing and grinding) will be increased in cyclical access, timed to control defect propagation and minimise reactive maintenance. In particular, cyclical grinding in the Thameslink core is being targeted in order to mitigate the impact of Automatic Train Operation (ATO), where the potential for increased rail defects is increased through the acceleration and braking characteristics of the rolling stock.

The number of maintenance teams on the route will be increased as part of this asset strategy, to address the underlying poor asset condition, increase in requirements following Thameslink completion and to facilitate a shift to preventative maintenance, enabling a reduction in the proportion of reactive maintenance and delivering increasing efficiency benefits to the route during CP6.

Further efficiencies will be enabled as the route move towards a data driven asset management operation with asset information at the foundation of operations, maintenance and renewals strategies. This will enable improved decision making to deliver the best performance possible for the most efficient cost. Maintenance delivery will be focussed around an 'on time' approach with tighter controls around planned work to manage the development of a volume backlog.

### 5.2.1 Route Asset Strategy

#### Development process and cross asset prioritisation:

**Step 1:** Development of a per asset maintenance strategy to manage short term asset condition and capability under CP6 passenger, traffic and tonnage demands.

**Step 2:** Development of bottom-up workbanks for each asset aligned with its maintenance strategy to deliver asset specific vision outcomes. These were developed accounting for asset condition and risk, route criticality, stakeholder and route-specific priorities.

**Step 3:** Prioritisation of renewals expenditure based on South East Route prioritisation categories. These categories were linked to the CRAM and provided a basis for between asset trade-offs to ensure overall risk is minimised. For instance category 2 *“Investing in the sustainability of high criticality assets: Targeted interventions to address asset failure that presents a high risk to the running of the railway in CP6/CP7. High risk means reducing capacity on freight or passenger services by 50% for a week or more on any route. Sustainability is defined as a combination of any of the following criteria: alignment with a minimum WLC approach, avoiding a future bow wave of renewals, avoiding future performance risk. High criticality assets are defined as those on the route critical asset list (selected for impact on train service) or similar cost of failure as track criticality 1-3 average (as defined by the CP6 track criticality).”*

**Step 4:** Review to cross asset alignment and alignment with key route strategies such as buildings signalling and E&P workbanks with route operations strategy and aligning track and signalling major interventions.

**Step 5:** Sensitivity analysis conducted by assessing the risk impact of removing £30m from any asset type using CRAM criteria to standardise impact. This was used to cross-check the outcomes of our prioritisation process.

Through this process, the route has developed the most effective workbank possible within the funding envelope, in order to minimise the route’s risk position. However, this workbank worsens the route’s sustainability position over the control period, as within the constrained funding it is not possible to both address the backlog of renewals carried forward from previous control periods and keep ahead of the degradation forecast in CP6. This will leave a bow wave of renewals for future control periods and in the meantime poses a risk to the anticipated route performance outcomes<sup>45</sup>. This will necessitate additional operational expenditure for increased maintenance to mitigate that performance risk. Furthermore, it will restrict the route’s ability to provide additional capacity for meeting growing demand.

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<sup>45</sup> The route’s sustainability position is improved if the vision schemes are progressed, moving it towards the vision (sustainability indicators at or better than CP4 exit) and leaving it in a positive trajectory at the end of CP6.

Asset area	Intervention strategy (constrained base plan)
Track	<p><b><u>Current asset performance:</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability: Asset used life is currently the highest nationally for all track assets, including S&amp;C, and will deteriorate further to 59.1% by CP5 exit, thereby increasing the risk of asset failure.</li> <li>• Performance: In CP5, we have not delivered the required renewals volumes and to mitigate this we have increased investment in targeted maintenance interventions on critical lines of route. We have unacceptable levels of TSRs and service affecting track faults in key areas.</li> <li>• Safety: The safety indicators of rolling contact fatigue, high risk Pre 1978 rail and the unprecedented levels of deferred renewals have necessitated increased maintenance costs and an increase in TSRs to maintain safety.</li> </ul> <p><b><u>Asset performance at the end of CP6 under the constrained base plan:</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability will deteriorate further from today's unacceptable position and, at the projected rate of deterioration, track used life will increase to 60.5% under the additional traffic, increased tonnage and further reduced access forecast in CP6 and beyond.</li> <li>• To make the best use of the total expenditure available to contain asset sustainability and performance, we have taken the decision to increase preventative maintenance activity to the detriment of CAPEX investment to support the step change in train service frequency and reliability associated with Thameslink. This exacerbates the bow wave of renewals to be delivered in CP7 and beyond. Asset performance will improve in the targeted critical routes and deteriorate on less strategic routes.</li> <li>• Within the funding available we will not address the underlying poor ballast condition evident throughout the South East. Ballast remains the poorest condition in the country, with a higher proportion beyond 100% of used life.</li> <li>• Therefore the number of TSRs on less critical routes will increase in order to preserve safety.</li> <li>• If the <u>Track Sustainability Vision Scheme</u> were progressed, the risk of an un-maintainable asset stock in CP7 would be avoided. The bow wave of renewals and performance restrictions listed above would also be avoided<sup>46</sup>, with a reduction of 4% (from CP5 levels) of track service affecting failures (as opposed to the 4% <i>increase</i> under the constrained base plan), and a further 5% FWI reduction.</li> </ul> <p><b><u>Summary of interventions (including balance between maintenance and renewals):</u></b></p> <ul style="list-style-type: none"> <li>• To reduce the risk of asset failures, the plan allows us to intervene and repair earlier when track assets begin to wear. Additional response teams will be available on high-criticality routes to reduce delays when failures do occur.</li> <li>• Heavy and severe rolling contact fatigue will be managed with eddy current testing and targeted re-railing, grinding and milling.</li> <li>• Pre 1978 rail will be targeted for re-railing on higher criticality lines.</li> <li>• Allowance has also been made for increased maintenance volumes as a result of the additional Thameslink services.</li> <li>• An integrated tunnel management strategy is being developed to reduce rail breaks in tunnels through better understanding of the asset system</li> </ul>

<sup>46</sup> It has not proved possible to include the contents of the Track Sustainability Vision Scheme in the constrained base plan due to the requirement to minimise risk to the route within the funding constraint. The route has the oldest track assets across all parameters (not just ballast) and in order to keep abreast of safety issues and maintain the best possible levels of performance, it has been necessary to exclude any high output ballast cleaning in the constrained base plan so that other critical activities can be progressed (including removal of obsolete componentry, pre-1976 rail, managing a significant spread of localised wet bed locations, renewals of life expired S&C units, and refurbishing plain line and S&C assets in order to keep them going until CP7).

	<p>interactions, better management of water ingress.</p> <p><b>Balance between intervention types:</b></p> <ul style="list-style-type: none"> <li>• Prioritisation is given to renewals on track criticality 1 and 2 routes with refurbishment and maintenance interventions planned on track criticality 3, 4 and 5.</li> <li>• Between intervention types, priority has been given to plain line track renewals, S&amp;C renewals, high output track renewals (not including ballast cleaning) and re-railing in order to contain both performance and sustainability impact within the CP6 funding envelope.</li> </ul>
<p><b>Signalling</b></p>	<p><b>Current asset performance</b></p> <ul style="list-style-type: none"> <li>• Sustainability: Despite our signalling assets being comparable overall to other routes from a remaining life (SICA) perspective, we have legacy signalling infrastructure in the most critical Victoria and London Bridge areas that are life expired. This carries an increasing level of performance and safety risk.</li> <li>• Performance: Whilst asset reliability has improved through targeted renewals and maintenance interventions, delays per incident are increasing in the critical corridors. Performance affecting hotspots remain that we have not been able to address with available funding in CP5.</li> <li>• Safety: legacy technology such as wire degradation associated with 1980s vintage relay interlockings continues to pose an increasing risk of wrong side failures that is taking an increased level of maintenance to contain.</li> </ul> <p><b>Asset performance at the end of CP6 under the constrained base plan</b></p> <ul style="list-style-type: none"> <li>• Sustainability: remaining life (SICA) sustainability is expected to continue deteriorating slowly through CP6.</li> <li>• Performance: To enable our Operations strategy we will initiate migration from Three Bridges ASC to Three Bridges Route Operating Centre (TBROC) providing advanced ARS prior to eventual migration with full Traffic Management Systems. This will enable automation, flexibility and diagnostics for operations as well as the completion of a critical path in the overall route migration strategy. However, we will not be able to afford the maximum performance benefiting investments to mitigate track circuit failures and emergency route releases.</li> <li>• Digital Railway: Our plans, subject to development of the Outline Business Case with DfT, will extend traffic management to cover all of the South East route, building on the systems delivered by Thameslink Programme in CP5 to improve timetable performance and reduce reactionary delays. There will be a mixture of interfaced and isolated traffic management aligned with the signalling renewal plans (the plan and estimate has been developed by the Digital Railway programme).</li> <li>• Safety: We will address the most critical 1980s vintage relay interlockings constrained by access and resources.</li> <li>• If the <u>Performance Improvement</u> vision scheme were progressed, this would include an upgrade of signalling assets (which cause approximately 50% of asset delay minutes), improving asset reliability and train performance. This would also improve the sustainability position compared to the constrained base plan.</li> <li>• The CP6 asset performance could be further affected by any changes in to the Thameslink Resilience Plan.</li> </ul> <p><b>Summary of interventions (including balance between maintenance and renewals)</b></p> <ul style="list-style-type: none"> <li>• Renewals on Angerstein and Hither Green commence in CP5 and complete in early CP6.</li> <li>• Further full signalling renewals to address safety and condition risk are focused in the London Victoria Signalling area. As part of the Victoria</li> </ul>

	<p>renewals we plan to complete transfer of signalling control from London Victoria to TBROC and introduce interfaced traffic management.</p> <ul style="list-style-type: none"> <li>• We plan to take the same approach to renewals on the London Bridge signalling area where not already renewed by the Thameslink Programme. Work will start in CP6, with commissioning in CP7. Ashford IECC will be also renewed due to equipment obsolescence and will introduce interfaced traffic management as part of the renewal.</li> <li>• We are seeking to maximise use of remote condition monitoring, with full coverage on critical assets, and expanded use of earth leakage monitoring on signalling power supplies. Maintenance intervention requirements are reducing with the introduction of axle counters, replacement of relay based interlockings with computer based and use of LED type signal heads, freeing maintenance teams to focus on preventative maintenance.</li> </ul> <p><b><u>Balance between intervention types</u></b></p> <ul style="list-style-type: none"> <li>• Full renewals equate to 12% of the workbank for CP6, with 88% partial interventions. The starting assumption is partial renewal, where asset condition allows, which is in line with signalling policy.</li> <li>• Our plans include extended refurbishment of signalling at level crossings as well as full renewal and safety enhancements.</li> </ul> <p><b><u>Application of policy</u></b></p> <p>Smaller, site-specific replacement and upgrade of lineside apparatus will be targeted to address performance issues with particular focus on the Brighton Main Line and other priority routes. This includes replacement of life-expired and obsolescent apparatus such as reed track circuits. Where we can within funding constraints, we will invest in higher specification for our signalling renewals where they support performance, including for example remote condition monitoring and reconfigurable power supplies. We are developing solutions that limit the amount of cabling and provide system diversity, particularly on remote control systems and in tunnels.</p>
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<p><b>Level Crossings</b></p>	<p><b><u>Current asset performance</u></b></p> <ul style="list-style-type: none"> <li>• South East route has 573 level crossings, of 29 different types ranging from Manually Controlled Barrier Crossings with Obstacle Detection to footpaths.</li> <li>• Level crossings represent 5% of the Route’s annual asset incident count and has improved by 12% in CP5, despite significant challenges associated with deployment of new types of technology that are ongoing.</li> <li>• We are closing 11 crossings in CP5 as part of the national programme, with 8 completed to date, and remain on target to achieve a 28% reduction in FWI. The SE FWI reduction from the end of CP4 to current is 13.23%. The SE route is the second best performing route in FWI reduction (behind LNE at 23%) and is in a position to reduce FWI further if funds become available from national level crossing fund.</li> </ul> <p><b><u>Performance at end of CP6 under the constrained base plan</u></b></p> <ul style="list-style-type: none"> <li>• Full conventional renewal is proposed on 18 level crossings as part of the signalling renewals work-bank with a further two de-commissioning’s and three re-controls and we are confident that the lessons learnt during CP5 in respect of initial teething problems with asset innovations will lead to improved reliability, e.g. the modifications to MCB-OD Radar and Lidar detection and upgrades to User Operated equipment. We also have an improved confidence to the unit rates going into CP6 as the project actuals have been assessed nationally and embedded in the national estimating tools.</li> <li>• The planned Minor Works and Partial Renewals will sustain Asset Remaining Life as we progress through CP6 and CP7.</li> <li>• As no further closures are considered viable, we have prioritised other safety improvements on the higher risk crossings, with plans to install 5 red light enforcement cameras, 70 automatic warning devices and 60 minor work improvements in CP6 to continue to reduce level crossing risk, with a FWI reduction of 6%.</li> <li>• If the <u>Improving Safety</u> vision scheme were progressed, a further 3.6% FWI reduction would be achieved at level crossings.</li> </ul> <p><b><u>Summary of interventions and application of Policy</u></b></p> <p>Our planned interventions in CP6 will meet the national safety strategy 2019-2040 objectives for level crossings</p> <ul style="list-style-type: none"> <li>• Asset management plans: All of our level crossings are regularly risk assessed and have a narrative that determines the future approach and has informed our CP6 plans</li> <li>• Whistle boarded crossings: mitigations are in place for night-time quiet periods</li> <li>• Automatic Full Barrier crossing design with OD: will be implemented in CP7 crossing renewals if trials are successful</li> <li>• Road traffic lights: the programme for conversion to LED type design will be completed by 2024</li> </ul>
<p><b>E&amp;P</b></p>	<p><b><u>Current asset performance</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability: Due to the intensive roll out of DC electrification in the 1950s, we are faced with a large amount of equipment such as oil filled cables and DC circuit breakers that are beyond their design life and we are seeing a significant increase in failure of obsolete equipment that is no longer available.</li> <li>• Performance: Following a long period of consistently low investment and high level of deferrals in CP4 and 5, the risk of high impact incidents occurring as a result of multiple faults on the HV system is increasingly likely. Multiple failures have already been experienced in CP5 resulting in service restrictions. E&amp;P Asset traction supply failures have increased by 2% and signalling power supply failures by 16% to date in CP5. Failure of</li> </ul>

	<p>conductor rail cable lugs has increased significantly and we have these across our entire route.</p> <ul style="list-style-type: none"> <li>• Safety: We are currently non-compliant with electricity at work regulations for a large proportion of our legacy electrical equipment. This presents a safety risk to our workforce, our customers at depots as well as an ongoing risk of prosecution.</li> </ul> <p><b><u>Asset performance at the end of CP6 under the constrained base plan</u></b></p> <ul style="list-style-type: none"> <li>• Performance: Despite targeting investment to replace conductor rail cable lugs to address the most widely spread failure mechanism currently, only a 2% reduction in E&amp;P performance failures will be achieved, not enough to address the current performance situation. This low level of improvement reflects the increasing risk of asset failure as more assets reach their maximum technical life with issues on condition and obsolescence.</li> <li>• Sustainability: With an increased investment in electrical safety requirements in CP6 that continues to reduce core renewals, asset used life and condition will not be sustained during CP6 and increases the likelihood of a renewals bow wave beyond CP6.</li> <li>• Safety: We will not achieve full compliance with the electricity at work regulations by the end of CP6.</li> <li>• If the <u>Electrical Safety (NSCD)</u> vision scheme were progressed, further improvements to the route’s compliance with the electricity at works regulations would be achieved; this scheme would also enable significant safety benefits to the workforce and significant productivity benefits enabling more work to be completed in each access window due to a shorter time required to take and give back isolations. This scheme is a key enabler for the route’s long term maintenance strategies, and is supported by customers and stakeholders.</li> <li>• If the <u>Improving Safety</u> vision scheme were progressed, this would also improve the route’s compliance with the electricity at works regulations. Significant improvements would also be made to workforce safety (through additional works at depots, which have been requested by customers and stakeholders) and public safety (by conductor rail cut-backs at level crossings).</li> </ul> <p><b><u>Summary of interventions (including balance between maintenance and renewals) and application of policy</u></b></p> <ul style="list-style-type: none"> <li>• Route policy: Safety and performance on critical routes are prioritised while addressing key condition and obsolescence risks and legislative requirements.</li> <li>• Renewal interventions have been based on assessed asset condition and allow for the majority of assets to extend to maximum technical life. The increased risk of asset ‘burn out’ is managed through an increased provision for reactive maintenance which will not reduce the amount of service affecting failures.</li> <li>• Maintenance headcount is also increasing to manage a growing E&amp;P asset base, mitigate performance risk, support design and planning of maintenance interventions and to continue improving asset data quality. A headwind has been included in maintenance for obsolescence.</li> <li>• Improving safety through investment in signalling power supplies, Negative Short Circuiting Devices and depot and sidings electrical safety in priority areas only.</li> </ul>
<p><b>Structures</b></p>	<p><b><u>Current asset performance</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability: Due to decades of underinvestment the asset condition is at a point where we are now faced with an increasing number of service affecting defects. Furthermore, the South East Route has disproportionately high numbers of substandard bridges compared to other routes, around 30% of the national count of substandard bridges from 10% of the national stock. We also have the highest proportion of metallic underbridge decks which now require significant capex funding due to their condition. We have had to defer planned activities to accommodate reactive works</li> </ul>

	<p>from major defects such as at Lewisham Flyover. Failure to secure the incremental funding through the Civils Adjustment Mechanism has compounded the situation.</p> <ul style="list-style-type: none"> <li>• Performance: Due to the increasing number of defects occurring in CP5, like Dover Sea Wall and Lewisham flyover, there has been a corresponding impact on passenger and freight performance as a result of operational restrictions applied. A number of significant defects to underbridge structures have been and continue to be identified – requiring traffic restrictions prior to urgent repairs being undertaken.</li> <li>• Safety – We are currently managing the safety risk exposure through the application of performance affecting operational restrictions, for example TSRs or heavy axle prohibitions.</li> </ul> <p><b><u>Asset performance at the end of CP6 under the constrained base plan</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability: We will not arrest the rate of deterioration in asset condition and the rate of defect identification will correspondingly increase. The renewals backlog will worsen across the portfolio. We have had to budget for increased reactive work.</li> <li>• Performance: Incidences of traffic restrictions and TSRs will increase as we experience more service affecting defects.</li> <li>• Safety: We will continue to manage safety risks with increasing numbers of performance impacting operational restrictions.</li> <li>• If the <u>Metallic Structures Sustainability</u> vision scheme were progressed, this would enable the route to achieve steady state sustainability for the next 25-40 years, avoiding a future bow-wave of renewals and reducing whole life cost. This would also reduce the performance and safety risks discussed above.</li> <li>• If the <u>Charing Cross Hungerford Bridge</u> vision scheme were progressed, this would avoid significant future disruption costs and reduce whole life cost on that asset.</li> </ul> <p><b><u>Summary of interventions (including balance between maintenance and renewals) and application of policy</u></b></p> <p>Our asset plans are based on strengthening or replacement of poor condition assets, additional intrusive examinations to improve our understanding of asset condition and strength, removal of vegetation from structures. Plans include for refurbishment of Cannon Street bridge, a major bridge structure spanning the river Thames. We have factored in the need for greater reactive works to account for the increasing amount of defects arising.</p>
<p><b>Buildings</b></p>	<p><b><u>Current asset performance</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability: South East Route has the second worst asset remaining life nationally (47.4% versus a national average of 54.9%). Sustainability indicators have shown a further deteriorate of 4% since the start of CP5.</li> <li>• Safety: Safety related fault volumes have increased by 20% since the start of CP5, particularly on station platforms and electrical circuits leading to high volumes of reactive fault response. Our CP5 accelerated structural assessment programme has identified extensive footbridge and canopy repair/strengthening intervention required to mitigate a loss of capacity, address safety and performance risks.</li> <li>• Performance: Lineside buildings have been upgraded in CP5 to protect critical signalling, telecoms and electrical equipment to avoid service disruption, we continue to monitor through a robust inspection regime.</li> </ul> <p><b><u>Asset performance at the end of CP6 under the constrained base plan</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability: Sustainability will continue to decline, predicted to fall by a further 1% by the end of CP6. This will impact on our contractual obligation of maintaining the franchise estate at ‘steady state’ with a potential of DfT penalties being applied.</li> </ul>



	<ul style="list-style-type: none"> <li>• Safety: Safety related platform and electrical defects are forecast to increase by a further 20% during the control period, we plan to increase planned preventative maintenance interventions to mitigate this risk in support of reversing the current adverse trend.</li> <li>• Performance: Our CP5 accelerated structural assessment programme identified a high volume of poor condition footbridge structures that have been prioritised for intervention to support improved performance at our high value locations.</li> <li>• If the <u>Improving Safety</u> vision scheme were progressed, improvements would be made to passenger safety on platforms and to workforce safety by improving wiring condition at stations.</li> <li>• If the <u>Victoria Station Roof</u> vision scheme were progressed, this would deliver a safety improvement and improve passenger satisfaction at the nation’s second busiest station (which is beyond 100% of used life); it would also reduce whole life cost on that asset.</li> </ul> <p><b><u>Summary of interventions and application of Policy</u></b>          Through a risk based maintenance and inspection regime we will mitigate for the predicted fall in asset condition and related increase in passenger and performance risk. An enhanced SFG 20 standardised planned preventative maintenance programme will ensure compliance with statutory and regulatory requirements. We have targeted our highest risk structures for renewal intervention based on asset condition, structural capacity and high value locations.</p>
<p><b>Earthworks</b></p>	<p><b><u>Current asset performance</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability: We are still recovering from the wettest winter on record (13/14). Resulting failures necessitated emergency interventions in unplanned areas resulting in a deferral of planned renewals within the control period. Geology in the south east, on which the railway is constructed, is susceptible to significant ground movements under seasonal weather. This requires frequent intervention to maintain track quality which has not occurred due to the high levels of deferrals.</li> <li>• Performance: In CP5, the South East route has experienced the highest count of delay minutes nationally attributed to earthworks failures. Flooding and Earthslip delays have accumulated over 90k mins delay and cost over £7M in years 1-3 of CP5. Failures during wet weather continue to cause significant disruption to train services. We are mitigating the impact of earthwork condition risk through the application TSRs.</li> <li>• Safety: We have deployed RCM to aid detection of earthwork movement due to the high volatility of our geology and effects of weather, however, this is only to a very small number of sites. The exposure to Train Accident Risk remains under severe weather.</li> </ul> <p><b><u>Asset performance at the end of CP6 under the constrained base plan</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability. Overall sustainability will decline as available funding is directed to a high volume of smaller intentions focused on immediate safety and performance related risk. This further compounds the deferrals of larger interventions.</li> <li>• Performance: Due to the significant performance risk today, earthworks investment has been prioritised over other asset types. We will address approximately 300 sites, 30%, from our worst condition scoring assets. This will reduce the risk of ESRs and TSRs, however due to 70% remaining we would still expect performance impacting events to occur.</li> <li>• Safety: We will invest in further RCM as mitigation to the interventions that we cannot afford and to mitigate the impact of the larger rectification activities.</li> </ul> <p><b><u>Summary of interventions and application of Policy</u></b></p> <ul style="list-style-type: none"> <li>• Target earthworks based on assessed condition, safety risk and location, focusing on criticality 1 and 2 routes where the consequence of failure is</li> </ul>

	<p>high.</p> <ul style="list-style-type: none"> <li>• Improve asset data, increase monitoring and intervene before the asset fails, using technology such as remote condition monitoring and remote sensing.</li> <li>• Reduce the likelihood of outside parties causing unexpected failures through drainage condition inspections and introducing more proactive maintenance.</li> </ul>
<b>Drainage</b>	<p><b><u>Current asset performance</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability: Following the wettest winter on record (2013/14) we have deferred three years of drainage work, which adds to a long period of underinvestment in drainage assets in the route. We also have a backlog of drainage maintenance resulting in low resilience to flooding.</li> <li>• Performance: We have TSRs due to poor drainage leading to repeat wetbeds, failure of earthwork cuttings and rapid degradation of track and other assets due to the presence of water, especially in tunnels.</li> <li>• Safety: We are managing the Train Accident Risk caused by our poor drainage by the application of TSRs. We have an ORR improvement notice related to drainage on cuttings which we must address in CP6.</li> </ul> <p><b><u>Asset performance at the end of CP6 under the constrained base plan</u></b></p> <ul style="list-style-type: none"> <li>• Sustainability. Overall sustainability will decline as available funding is directed to address CP5 deferrals and other high priority interventions focusing on safety and performance risk.</li> <li>• Performance: Through targeted renewal and maintenance we will have removed all current TSRs caused by poor drainage and we are targeting priority tunnel drainage informed by the surveys completed in CP5.</li> </ul> <p><b><u>Summary of interventions and application of Policy</u></b></p> <ul style="list-style-type: none"> <li>• Recover the priority backlog of drainage interventions from CP5 and address high risk drainage systems in Tunnels and repeat wetbeds to reduce the effects of flooding.</li> <li>• Establish compliant inspections for all assets to allow predict and prevent asset management</li> <li>• Increase the focus on proactive maintenance</li> <li>• We will address all high risk drainage on cuttings agreed as part of the ORR improvement notice</li> </ul>
<b>Telecoms</b>	<p><b><u>Asset performance</u></b></p> <p>Telecoms incident counts are currently double the CP4 exit levels following the upgrade from cab secure radio to GSMR. Having peaked at much higher levels, incident counts are stabilising, having resolved many technical and operational issues. Risk remains that public mobile operator 4G systems will start to interfere and cause incidents to rise again through CP5 into CP6.</p> <p>Sustainability, measured as remaining life, has declined from an average 56.6% to 38.7% in during CP5 following significant deferrals, particularly in Station Information and Surveillance Systems and telecoms equipment. Performance of our legacy systems has continued to decline as a result.</p> <p>Having introduced Digital Railway ATO, ETCS and traffic management in CP5, with plans to expand the traffic management coverage and migrate more signalling data onto the national fixed telecoms network in CP6, the reliability and resilience of the telecoms network becomes paramount for</p>

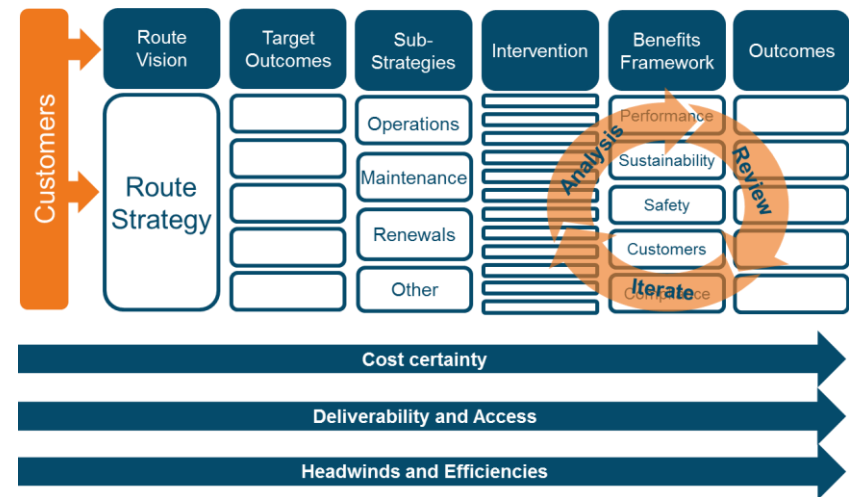
	<p>performance. Our plans through CP5 and CP6 have included for additional technical roles and new competencies to support future maintenance and response and manage performance risk working closely with National Telecoms.</p> <p><b><u>Summary of interventions</u></b></p> <p>Renewal interventions in South East route target ageing and obsolescent telecoms equipment and power supplies to support asset sustainability and performance in the following areas</p> <ul style="list-style-type: none"> <li>• all Station Information and Surveillance System asset types, following significant deferrals from CP5, including PA/PAVA, CIS and CCTV</li> <li>• A reactive minor works budget for cable and route renewals</li> <li>• level crossing improvements (including migrations to Network Rail services to suit performance), telephone concentrators and voice recorders.</li> <li>• Targeted DDO assets</li> </ul>
<p><b>Asset Data</b></p>	<p><b><u>Asset data performance</u></b></p> <p>We have deployed the Asset Data Governance Framework and achieved the 95% data quality target set by the ORR in 2017. The priorities to the end of CP5 are to have defined measures and data requirements that are for ‘fit for purpose’ supported by defined asset data governance and resource in the route. Our asset decision making improves as the quality of data improves for both maintenance and renewal interventions, and this is reflected in an improving asset reliability and performance despite significant deferral of renewals in CP5.</p> <p>An asset data community has been established with the maintenance teams in South East route to share knowledge and embed the new business processes introduced as part of Asset Data Governance.</p> <p><b><u>Asset Knowledge Enablers</u></b></p> <p>In CP6, we will continue to enhance asset data quality and harness the power of better data driven decision making across the asset lifecycle for maintenance, renewals and safety. We will formalise the management and assurance of asset-related data, giving it the status of an asset category. We will optimise processes, have the right controls, technology, clearer roles and responsibilities, and increase data related training to ensure that efficient data management behaviour is at the heart of our business.</p> <p>Our plan supports professionalising and making best use of the functionality of our systems to improve decisions through data, risk and the use of decision support tools. There remain opportunities with the systems implemented under the ORBIS Programme which are still not fully utilised: Mobile Works APP, Fault Reporting, various Asset Decision Support Tools, and we will optimise Ellipse functionality which is currently underutilised.</p> <p>We will improve our operational data management so that we integrate data collected from operations (faults and root cause) and technical measurement (Track recording, Remote condition monitoring) to ensure our delivery plans are targeted to maximum effect.</p>

5.2.2 Research & development

In support of the vision, the route is driving innovation across the asset lifecycle. The following examples show where innovation is being delivered to the maximum extent practicable within the constrained base plan:

- Digital Railway – South East will be the first route to operate Traffic Management; re-control renewals have been re-aligned to meet a long term Route Operational Strategy for Traffic Management and improved ways of operating the railway based on good practice from other industries (for example Pod working as used by the National Air Traffic Service).
- Improving asset management capability by aligning renewals and maintenance organisations. This allows the route to make better and more efficient decisions.
- Expanding RCM to support a predict and prevent organisation, improving data analytics capability to prevent failures and optimise asset interventions.
- Improving productivity and safety for our workforce through investment in technology such as Negative Short Circuit Devices.
- Driving for a more collaborative delivery strategy to bring the route, its deliverers, the supply chain and the route customers together using alliancing principles.

- Use of visualisation technology whilst planning renewals to align possessions and cross asset interventions to deliver the workbank in the most efficient manner possible.
- Clear line of sight between the vision objectives and de-constructed metrics and route strategies to interventions and outcomes. This supports the ability to balance and prioritise, based on risk, asset data and modelled performance outcomes.



### 5.2.3 Weather resilience

For South East route to be dependable, punctual, sustainable and safe it is crucial that its infrastructure is resilient. The ability to minimise the impact of weather on performance, and to recover quickly from weather-related incidents, will be critical to the route's success.

A number of interventions from the route's Weather Resilience and Climate Change Adaptation Plan (WRCCAP) have been included in the constrained base plan. These interventions, which improve our ability to adapt to varying weather conditions, are outlined in the table below. Our standard renewals will also select asset components suitable for the expected conditions and located to avoid potential flooding sites.

Weather Type	Sch 8 (£m) impact (2006/7 to 2016/17)	Primary Impacts	Interventions in the constrained base plan to address
<b>Snow</b>	£2.8m	Snow build up on trees causing vegetation to fall onto the line.	Vegetation plan and operation response for removing objects blocking the line
<b>Wind</b>	£2.4m	Fallen trees blocking line	Vegetation removal campaign
<b>Adhesion</b>	£1.7m	Leaf fall causing track short circuits	Removal of vegetation Improvements to track formation Track circuits replaced with axle counters
<b>Cold weather</b>	£1.3m	Freezing temperatures causing track issues	Maintaining and monitoring conductor rail heating (425 sites) and points heating
<b>Flood</b>	£1.5m	Damage to earthworks and buildings	Improvement of sea defences between Folkestone and Dover Tunnel drainage renewals in known flooding locations Completion of drainage condition assessments in CP5 to target maintenance and renewal interventions in CP6
<b>Earthslip</b>	£1.1m	Earth slip impacting track and/or causing public safety issue (eg at stations)	Mitigations (eg pumping) to prevent earthslips related to weather incidents. Monitoring of high risk soil/rock cutting sites and renewal of high risk crest drains. CP6 earthworks expenditure has been increased over CP5 and targets interventions by condition and risk.
<b>Lightning</b>	£0.4m	Signalling equipment impacted when Ashford telecoms tower gets struck by lightning	Ashford telecoms tower in use by mobile phone company, solution to be investigated.
<b>Hot weather</b>	£0.3m	Unstressed track with potential to buckle	Track buckling hot spots addressed
<b>Fog</b>	Minimal	-	-

## 5.3 Operational plan

### 5.3.2 Train performance strategy (linked to plans in Appendix A)

The South East route vision is to deliver a punctual, dependable and frequent service. The performance strategy relies on:

- An operations strategy to improve management of the network, utilising the new Digital Railway technology to improve our management of incidents and reduce delay per incident.
- Renewals and maintenance for resilience: targeted renewals, predict and prevent maintenance and enhanced response to reduce incidents and their impact.

In the constrained base plan, focus is given to mitigating the impact of increased tonnage and passenger numbers in order to protect short-term performance and minimise the overall risk to the route within the funding envelope. However, given the funding constraints in that plan, passenger growth and other reliability factors broadly offset the performance improvements enabled by Digital Railway deployments and enhanced maintenance and response capabilities.

### 5.3.3 Route operations strategy

The operations strategy for CP6 forms part of a longer term journey over a number of control periods; it is inherently linked to long term signalling renewals and re-control strategies, which started with the Thameslink Programme in CP5. Today's mix of technologies and locations leaves a risk to performance as signallers need to manually operate the busy network of complex flat junctions and train service patterns. The final stage of the 25 year operational strategy (by the end of CP9) will consist of:

- Integrated working with TOCs and other routes;
- Maximising automated operation through acceleration of Digital Railway deployments in the South East, building on the legacy from Thameslink in CP5 and Traffic Management and C-DAS implementation proposed for CP6;

- Full availability of real time information, asset data and performance data to support preventative analysis;
- Improved operational response and contingency planning, using more transparent data to provide evidence-based decisions on continuous improvement of processes and plans; and
- Professional focused incident management and service through the Senior Incident Officer organisation supported by the first deployment of situational Incident Management technology in the UK rail industry.

This will enable the following outcomes:

- Minimised cancellations and maximised right time arrivals, ensuring the capacity commitments for major London termini and the Thameslink Core are met during the high peak periods;
- Passengers informed accurately and immediately about service disruption;
- Operations staff able to use automation and system data to operate the railway as efficiently as possible, particularly during perturbation;
- Improved incident management and a reduction in incident recovery time, as well as communications between Control Centres and response staff on the ground;
- Freeing up of operator capacity, enabling them to work more effectively and reducing the chance of human error; and
- A full understanding of performance drivers, enabling data driven decision making and a predict and prevent regime.

The constrained base plan builds towards this operational strategy by delivering the following during CP6:

- Extending the life of major signalling centres at Ashford and Gillingham;
- Extending the life of electrical control rooms at Paddock Wood and Brighton;
- Re-locating the Kent Integrated Control Centre; and
- Implementation of Traffic Management and C-DAS as set out in the SOBC discussed earlier in this document

These are in part necessary due to the gap between capacity of Three Bridges ROC and the overall long-term footprint of operations on the route. This capacity

gap also means that a more conventional separation of roles between signalling, route control and electrical control is retained<sup>47</sup>.

With our asset and technology led CP6 Operations Strategy it is critical that we support our people. Whilst funding does not allow the route to go to full pod working across signalling, route and electrical control, we will move to pod working within our satellite operational model to enable better decision making in a complex environment.

We will also continue to work closely with customers, both those in our route control centres and those based remotely to enable the principle of a single controlling mind in operational command and control.

Furthermore, we will engage with Trade Union representatives through a working group format to discuss improved approaches to people resource planning. We will work with the central operations team to enhance our use of the competence framework to manage the competencies of our people as we transition to new technologies. We will focus on the non-technical skills of our people as well as the technical competencies. We will conduct succession planning and will seek to maximise the benefit of apprenticeship regimes for operational roles. We will review the case for multi skilling and targeting of first responders to manage a wider variety of incident.

### 5.2.3 Approach to resilience

We will improve resilience through our renewals and maintenance strategy<sup>48</sup> to reduce customer affecting failures, and their impact. This will include:

- Targeted renewals to improve asset reliability and resilience;
- On time preventative maintenance strategy to reduce incidents; and
- Enhanced response capability to decrease recovery time.

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<sup>47</sup> Compared to that planned at the start of the 25 year journey.

<sup>48</sup> If the [Performance Improvement](#) vision scheme were progressed, this maintenance strategy would be strengthened by ensuring rapid response to failures and installing further remote monitoring to better predict incidents before they occur.

This will be supported by enhanced data capture, asset management system and analysis capabilities. It is essential that we ensure focused and efficient use of resources where there will be most benefit.

South East route is leading the first deployment of the national Incident Management System (IMS). This will allow us to identify and respond to delays in real time and conduct better analysis of the underlying causes of incidents. These can be reviewed with customers to continuously improve response strategies.

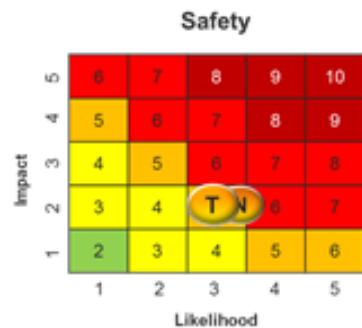
We will improve our approach to resilience, including business continuity, information governance and cyber security, through the adoption and implementation of a business continuity framework. We are also investing in our operational accommodation to improve security.

## 5.4 Output summary

### 5.4.1 Risk

Output risk assessments for the four risk areas have been developed through aggregated assessment of the risk ratings in each objective area<sup>49</sup>.

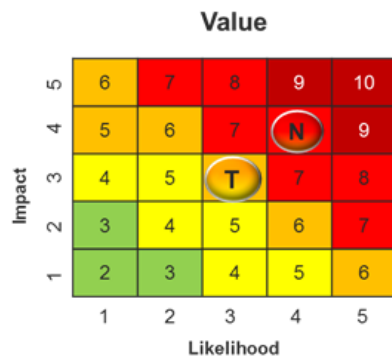
Risk assessments are based on two scenarios: N (Now) = current risk position and T (Target) = risk at end of CP6 based on the constrained base plan.



#### Summary of risk outcome

Under the constrained base plan scenario, we anticipate a marginal improvement in safety performance. We will focus on delivering key activities which have the most significant impact on safety risks such as negative short circuiting devices, asset interventions to reduce train accident risk and continued route safety workshops.

Funding constraints means that there are residual risks and opportunities not addressed in the plan, e.g. due to limitations on our NSCD roll out and investment in level crossings. These are addressed in our vision schemes set out in Appendix D.



#### Summary of risk outcome

We anticipate being able to improve financial performance in CP6 through tightening controls and making efficiencies based on lessons learned in key areas such as contracting and procurement strategies and better planning, as well as new technologies and productivity improvements.

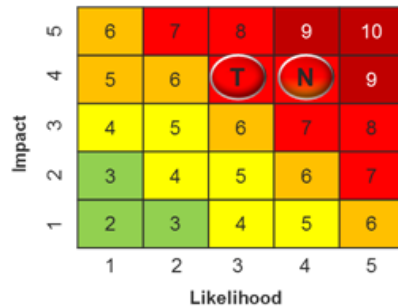
We have included some headwinds in our submission, however there are significant risks around new Thameslink assets, future staff costs and schedule 8 (linked to performance). There are financial implications associated with uncertain asset conditions and need for costly intervention or increased maintenance, if the condition deteriorates.

Our ability to deliver long term efficiencies through investment in technology and operational consolidation is also limited.

<sup>49</sup> See Section 4.



**Performance**

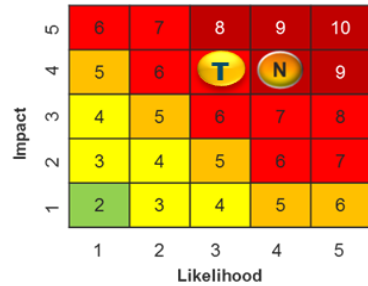


Summary of risk outcome

In the constrained base plan scenario, performance improvements will be broadly offset by the impact of passenger growth, despite prioritising performance improvements over sustainability and future performance risk. Performance risk remains high, with direct implication for political and reputation risk.

There are residual opportunities not realised in this plan due to funding constraints. The vision schemes address this, improving performance to drive a dependable and punctual service.

**Political/ Reputation**

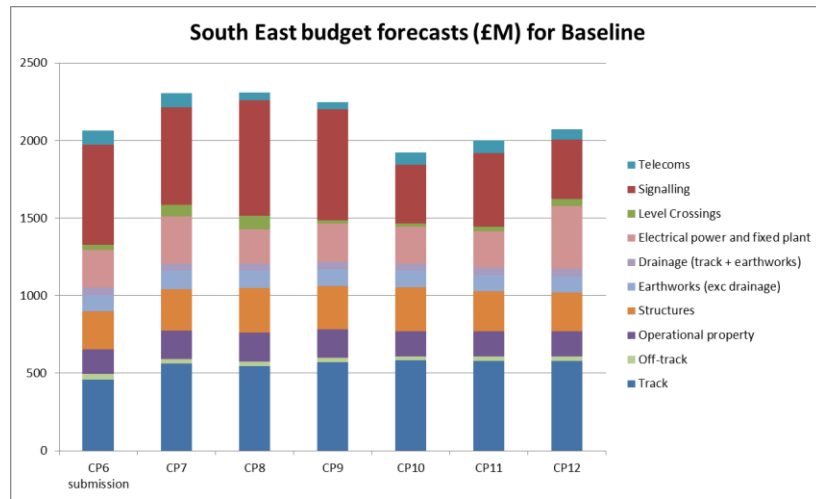


Summary of risk outcome

Political and reputational risk is high under the constrained base plan scenario. This is driven predominantly by continued unacceptable performance, notably for GTR. Our passengers and stakeholders have high expectations following the delivery of Thameslink and a constrained level of funding will not deliver the punctual and dependable service they anticipate. The level of renewals is not sustainable increasing the risk of asset failure.

The residual risks and opportunities in the constrained base plan are addressed by the vision schemes, where we would expect to see political and reputational risk fall.

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 the constrained base plan.

Beyond the end of CP6, the assumed level of investment is that required to retain the character (condition and performance) of the asset at CP6 levels.

Individual asset condition and long term output trajectories for this long term level of spend can be found in Appendix F.

Expenditure and implications	Mitigations
<p>In CP5, South East route’s sustainability scores are in the bottom two routes nationally for all assets except signalling, and these scores are continuing to decline. The route vision aims to reverse this trend, targeting a return to at least CP4 exit levels of sustainability by the end of CP7. The vision will maintain safety, improve asset condition, and reduce performance risk.</p> <p>As they are based on the constrained base plan (i.e. no vision schemes), both of the long run forecast scenarios fall short of the route vision. Two scenarios have been modelled:</p> <ol style="list-style-type: none"> <li><b>Constrained:</b> Maintains renewals expenditure at CP6 levels over the longer term, with sustainability continuing to decline but at a slowing rate.</li> <li><b>Baseline:</b> Builds on the CP6 investment with a further 10% increase in South East route renewals spend for CP7, CP8 and CP9. This halts the declining trend in sustainability.</li> </ol>	<p>In both scenarios, renewals would continue to target critical assets and lines of route, with increasing levels of refurbishment and maintenance over full renewal, as funding decreases. Despite this, performance risk will increase under the constrained scenario (it will remain roughly the same under the baseline scenario).</p> <p>With an increasing focus on asset data quality, supported by enhanced maintenance and response, the route will see improvements to its predict and prevent capability during CP7. This will support better asset decision making and mitigation of performance risk.</p>

## 6 Customer focus & capacity strategy

### 6.1 Capacity & timetabling

A high performing timetable and maximisation of capacity is crucial to the successful and efficient operation of the route.

#### 6.1.1 Developing the optimal timetable

The System Operator (SO) team is an integral part of South East route, working across functions and with key stakeholders to plan for the longer term future and to build a timetable that delivers the optimum balance between performance, journey time, connectivity, and opportunity for maintenance access. These plans will drive towards maximising the route’s railway system resilience.

The timetable can only contain trains which can operate safely and in compliance with the Network Code; they must also be in line with customer aspirations, and take cognisance of franchise commitments.

The metro-style railway metrics of dependability, punctuality and frequency are underpinned by the timetable. We will invest both in our system capability and work closely with the SO team to continue the development of an optimal timetable for the route.

#### 6.1.2 Improving analysis of timetable performance

Owing to the current and historic poor quality of delay attribution in the South East, it is not possible to achieve a robust understanding of the underlying working timetable. Instead, the following more generic approaches are planned:

1. Assurable Database (ADB) – An enhanced use of assurance systems to identify and assess the compliance of the timetable with the Timetable Planning Rules (TPRs).
2. Timetable Rules Improvement Programme – Implementation of revised TPRs based on extensive analysis of infrastructure capability, and bespoke analysis

using the Observed Data Analytics tool to support a ‘go look see’ approach in routes to determine improvement opportunities.

3. 502a Performance Analysis – Whilst complicated specifically in the South East, we seek to improve our capability in analysing performance data (and its relationship with our ADB output) to determine opportunities to improve the timetable.
4. System Operator Fit For Future – We have looked to strengthen our capacity for undertaking analysis work to help identify opportunities to change the way capacity is utilised and increase use.

Accurate TPRs and a compliant timetable are just one part of having an operationally resilient railway. As discussed in Section 1 and Appendix C, South East route’s operational resilience has been in decline for some time. Solutions to improve overall railway system resilience include continuing to improve asset availability and improved resourcing of stock and crew<sup>50</sup> in the route area.

### 6.2 Future capacity & growth

The constrained base plan focuses on delivering committed capacity with the highest possible levels of dependability and punctuality under that funding constraint.

#### 6.2.1 Increasing demand

Passenger and freight demand is expected to grow significantly through a combination of economic activity in central London, an increasing population, and increased commuting due to the shortage of housing in the London area.

On South East route, there are a number of ‘growth areas’, which have above-average levels of demand growth due to local development activity. Housing growth is also expected in the Ebbsfleet area driving high passenger growth on

<sup>50</sup> It will be necessary to work with TOCs to make improvements in this area.

HS1 domestic services. There are no areas on South East route with significant decreases in demand forecast.

### 6.2.2 A need for further capacity

As demand continues to grow, there will be a need for increased capacity. The Brighton Mainline, in particular, is forecast to experience the joint highest overall levels of crowding of all London commuter routes<sup>51</sup>. If action is not taken, this is forecast to lead to regular standing extending as far as the Sussex coast. Whilst this is outside the scope of this RSP, a series of proposed enhancements are discussed in Section 5.1 which would meet these requirements.

'The South East Area: Sussex Route Study'<sup>52</sup>, published in 2015, sets out infrastructure proposals to provide capacity to alleviate crowding and enable forecast growth to be met as part of NR's Long Term Planning Process.

'The South East Route: Kent area Route Study'<sup>53</sup> was published in draft for consultation in March 2017. In the Kent area, growth in passenger numbers up to 2024 can largely be met through extending existing services to their maximum length. There is little capacity for any additional services into London and when train lengthening options have been exhausted, there are no straightforward solutions.

## 6.3 Digital Railway

Digital Railway interventions have been built into the constrained base plan following confirmation of the SOBC for Traffic Management and C-DAS on the route. This is discussed in Section 5.1.5.

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<sup>51</sup> Alongside the South West Mainline.

<sup>52</sup> Sussex Area Route Study: <https://www.networkrail.co.uk/wp-content/uploads/2016/11/South-East-Route-Sussex-Area-Route-Study-FINAL.pdf>

<sup>53</sup> Kent Area Route Study (draft for consultation): <https://www.networkrail.co.uk/wp-content/uploads/2016/12/Kent-Route-Study-Draft-for-Consultation.pdf>

## 6.4 Communications

Wherever possible, CP6 plans have been based on the priorities of South East route's customers and stakeholders. Strong, positive relationships have been built with these parties throughout CP5 and a number of workshops have been held during the CP6 planning process to understand and articulate those priorities. We are committed to building on and improving these relationships as the CP6 plans are developed and implemented over the coming years.

Almost all departments within the route have some responsibility for stakeholder, customer or client engagement. Devolution has allowed South East route to develop a clearly defined vision which sets out a consistent and understandable strategy as a basis for future communication and planning. This vision has been developed in partnership with stakeholders so is a well understood foundation for these further conversations.

As an example, we have sought to understand the views of passengers regarding disruptive maintenance and upgrade work and have commissioned Transport Focus to carry out a series of focus groups and workshops to ensure that our work is planned and communicated with passengers at its heart.

More recently, the August 2017 Thameslink Programme blockade – which resulted in significant planned changes to service for tens of thousands of Southeastern passengers over the course of a working week – was a positive example of how joined up planning and communication can deliver for passengers.

Specific schemes and initiatives will, of course, involve detailed engagement with the relevant partners and stakeholders. This will be managed through the route's Communication and the strengthened Sponsorship teams.

## 6.5 Property

Network Rail Property and South East route will work collaboratively on the following key strategic themes:

- Providing strategic property and town planning advice to support the delivery of operational, maintenance, renewals and enhancements plans for the route. A good understanding of proposed schemes will be developed at an early stage to ensure efficient delivery of property requirements, exploring delivery of schemes by a Transport & Works Act Order or Development Consent Order where appropriate;
- Developing land strategies that help inform the route on the optimum use of land; and
- Optimising the contribution from property assets towards the funding of the railway over the course of the control period as separately highlighted in the Property CP6 plan. This will include the release of surplus land for housing in line with wider government objectives, revenue maximisation from the Commercial, Retail and Freight portfolios (where such income streams have not been divested by the CP5 Property Strategic Projects programme) and capital receipts in relation to station enhancement schemes, developments (including shared value) and land sales.

## 7 Cost competitiveness & delivery strategy

### 7.1 Summary route deliverability statement

There were fundamental flaws in the planning for CP5<sup>54</sup>. Unit rates were not robust, volumes were underestimated and the delivery run-rate was too slow in the early years of the control period. The route has learnt valuable lessons from CP5 and has factored these into the CP6 plan. This has included:

- development of a robust costing methodology to define unit rates;
- conducting a bottom-up deliverability assessment of the all proposed works, including those in the vision schemes<sup>55</sup>, including consideration of resourcing, tools and equipment, supply chain and access;
- conducting a top-down comparison by cost and volume against CP5 peak outputs (including enhancement activity); and
- commissioning of an independent review of IP, Works Delivery and other delivery bodies to identify efficiency opportunities within the route's delivery strategy.

The route is therefore confident in its capacity and capability to deliver the constrained base plan and all vision schemes.

### 7.2 Access

The access strategy consists of three primary themes: obtaining the appropriate level of access, using the access most efficiently, and minimising disruptive access wherever possible<sup>56</sup>. By focussing on these areas, and working with TOCs and FOCs<sup>57</sup>, the route will make sure that the necessary access is available for

<sup>54</sup> 25% of CP5 renewals were deferred

<sup>55</sup> The constrained base plan contains a lower quantity of work and will be deliverable if the entire plan including vision schemes is tested.

<sup>56</sup> For example, by packaging multiple works for delivery under one possession.

<sup>57</sup> The route has already engaged with Route Access Planning and the TOCs to agree the initial CP6 access strategy.

implementation of the CP6 plans and that it will be used as effectively as possible. Most crucially, access must be available in strategic locations to support delivery of the route's renewals and maintenance plans. The proposed access approach is to:

- Minimise access requirements by packaging works: The route's performance-driven strategy means that many interventions are focused on the same key parts of the network; this allows work to be combined into one possession to maximise efficiency<sup>58</sup>.
- Maximise opportunities: At present, midweek night access is agreed around long plain line sections, with two track options available where there is flexibility to divert onto other sections. The opportunity is being explored to negotiate longer midweek access to undertake preparatory and follow-up work in the same possession<sup>59</sup>.
- Identify regular access opportunities in key locations: the access strategy for maintenance works in each area will be cyclic, with most locations seeing regular access on a 6-weekly or 12-weekly basis. Central London areas which directly affect the Thameslink network will require access on a weekly basis in order to eliminate issues before they escalate to affect service operation. These access windows will be built into the timetable.
- Build on current collaborative relationships with TOCs: the route will continue to explore opportunities, with TOCs and FOCs, for longer duration closures to maximise efficient delivery.

The most significant material change from the CP5 access strategy will be the introduction of longer midweek nights; this will release significant efficiencies,

<sup>58</sup> For example, track renewals work between Haywards Heath and Brighton will be completed simultaneously with tunnel and maintenance works between Three Bridges and Haywards Heath. This creates a single instance of disruption rather than two between London and the South Coast.

<sup>59</sup> From 2018, it has been agreed that, for certain overnight periods, services will run over two rather than four lines between London Victoria and Three Bridges. Access requirements for longer midweek possessions in Kent will be built into the new Southeastern franchise data room.

increasing the productive work time for maintenance activities<sup>60</sup>. Accounting for the above plans and strategies, the constrained base plan is deliverable within the known access constraints<sup>61</sup>. However, no contingency has been built into the access assumptions.

### 7.3 Maintenance delivery

The access strategy has been developed to account for delivery of the maintenance plan through:

- Cyclical maintenance access, which will allow delivery of ‘on-time maintenance’ both mechanised interventions (tamping, grinding, etc) and fixed block maintenance windows where improvements are targeted to address identified performance risks. This will reduce backlog and the requirement for temporary variations to manage defects outside of normal compliance timescales. It also enables the planned rectification of defects before they become ‘actionable’ and require time bound intervention or service affecting faults. This improves Dependability and Sustainability;
- Prevention of possession overruns to enable right time start-up and on time metrics. This will be achieved through the use of improved planning tools, standardised possessions and isolations, improved possession management processes and better risk management. This will increase Punctuality;
- Maximising productivity “time on task” through Safer, faster electrical isolations and improvements in possession working times using automated devices such as Negative Short Circuiting Devices. This element of the maintenance strategy is reliant on provision of the £56.9m Electrical Safety Delivery (ESD) funding to South East route from STE, as set out in the STE Business Plan (on top of the £16.8m funded directly by South East route in the constrained base plan). This will increase Safety and Efficiency, and benefits will be far greater if the NSCD (electrical safety) vision scheme is

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<sup>60</sup> Based on current access time for the Brighton Main Line, this change in strategy will increase productive time within a possession by up to 25%. It will be necessary to work closely with all TOCs to deliver this initiative.

<sup>61</sup> Some of the vision schemes will require some additional access; this would require negotiations with TOCs and FOCs and is discussed within the vision scheme documents at Appendix D.

progressed; and

- Maximising opportunities and possession working times with longer midweek night possessions, and packaging up work so allowing more to be done in the same possession to increase Efficiency.

The current mix of permanent staff, labour suppliers and contractors will be retained at the start of CP6 to enable early mobilisation. However, permanent maintenance staffing will be increased in key areas<sup>62</sup>, supplemented by sub-contract capability. The enhanced maintenance and response capability will be at its peak in years one and two of CP6, but will then reduce as other parts of the maintenance, Remote Condition Monitoring and access strategies yield benefits.

### 7.4 Project Delivery

The route is confident in its capacity and capability to deliver the plan for the following reasons:

- The plans have been validated bottom-up with IP (supported by Works Delivery), who have confirmed that the work bank is deliverable;
- A top-down review of volumes by asset group has been completed, validating the plans with CP5 outturn work. This includes accounting for anticipated differences in access, workforce capacity/ resource, and workforce capability;
- The plans are phased realistically and integrated to avoid delivery failure in early years of the control period;
- The route has reviewed and is supportive of IP Southern and IP Track’s procurement strategy for CP6<sup>63</sup>;
- CP5 renewal deferrals have been built this into deliverability assessments and asset sustainability plans; and
- The plans include investment in technology and data analytics to ensure there is one version of the truth.

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<sup>62</sup> Track, E&P and S&T

<sup>63</sup> IP Signalling’s procurement strategy is still under development; the route is involved in this process.

### 7.4.1 Delivery Review

A dedicated Delivery Strategy Review Group was established to identify and consider the various options available for the delivery of the CP6 workbank. A wide range of key stakeholders, including Train Operators, Supply Chain organisations, DfT, ORR and Network Rail functional departments, have been consulted. The review's findings identified opportunities for improvement in the following areas:

- alignment of the delivery organisation's objectives with the Route Vision and Train Operators' requirements;
- an integrated and collaborative one team approach to planning and delivery between Network Rail, Train and Freight Operators, and the extended supply chain;
- flexibility built in to absorb the turbulence that can be created by changing internal and external factors;
- a culture where the whole delivery organisation considers itself part of the Route team is a vital enabler to meeting the Route Regulatory obligations and aligns well with our devolved organisation; and
- best for industry data driven decision making.

The independent review identified significant complexities and duplication in the current operating regime, which represents significant opportunities in CP6. However, the route needs to act now to realise the potential benefits.

### 7.5 Supply chain

We have a well-established supply chain for all work bank items and we understand the supply chain contractual landscape. However, it is recognised that there are opportunities to generate efficiencies or improve certainties of outcomes in CP6, as existing framework contracts expire, through improvements in supply chain management.

The Supply Chain Strategy being developed will provide the capability and capacity to deliver a larger more complex multi asset workbank, whilst competing for resources in a buoyant infrastructure market. It will address the

following considerations:

#### Securing the necessary level of skilled resources

A fixed, stable workbank, coupled with the ability to flex supply across organisational boundaries will allow effective resource planning to smooth out demand and to optimise the utilisation of constrained resources. Early engagement with the supply chain will enable mobilisation in readiness for the start of CP6. Providing commitment throughout the duration of CP6 will allow further investment in and development of capacity and capability.

#### Integration of Supply Chain for Efficient Delivery

Collaboration, balanced risk sharing and incentivisation will extend throughout all tiers of the supply chain. The creation of a genuinely integrated supply chain will reduce the current level of non-value added transactions and will allow for a more efficient management structure, with no duplication of roles. This will enable the adoption of leaner processes, particularly with regards to design development and assurance, which in turn, will minimise the risk of additional cost being incurred through the delay and disruption of site operations. A whole industry approach to planning and access will allow better productivity within possessions, with increased deliverability assurance.

#### A consistent understanding of success

Embedding the right behaviours and culture throughout the supply chain, together with objectives aligned to the Route vision and required strategic outcomes will be central to our supply chain approach. A framework of appropriate performance metrics, informed by real time data and linked to incentivisation, will engender a culture of continuous improvement and will inform effective and targeted management interventions.

#### Safety culture and performance

Clearly defined scope, detailed integrated planning and a strategically aligned supply chain are all enablers to continuous improvement in safety performance. A collaborative, integrated and stable supply chain will enable clear and unambiguous communications, effective embedding of safety behaviours and culture and a consistent approach to lessons learnt.



## 7.6 Costing approach

A costing methodology has been developed to make sure that the estimated CP6 renewals costs are as robust as possible such that they can be delivered after the application of headwinds and efficiencies. Unit rates have been developed by first taking into account the cost of delivery in CP5. Where current cost of delivery is available it has been used as the pre-efficient unit rate. Where current cost of delivery was not available RAM-derived, national or book rates have been used. These rates were chosen with reference to all available information and the job type’s stage of development.

Headwinds and efficiencies that are likely to affect the unit rate of delivery in CP6 were then identified and quantified by RAM teams, IP and Works Delivery. The headwinds and efficiencies were applied to the pre-efficient rates to generate post-efficient unit rates.

To confirm deliverability of the efficiencies, for each Key Volume Line (KVL), we then sense-checked the post-efficient unit rates against a range formed of four costing points:

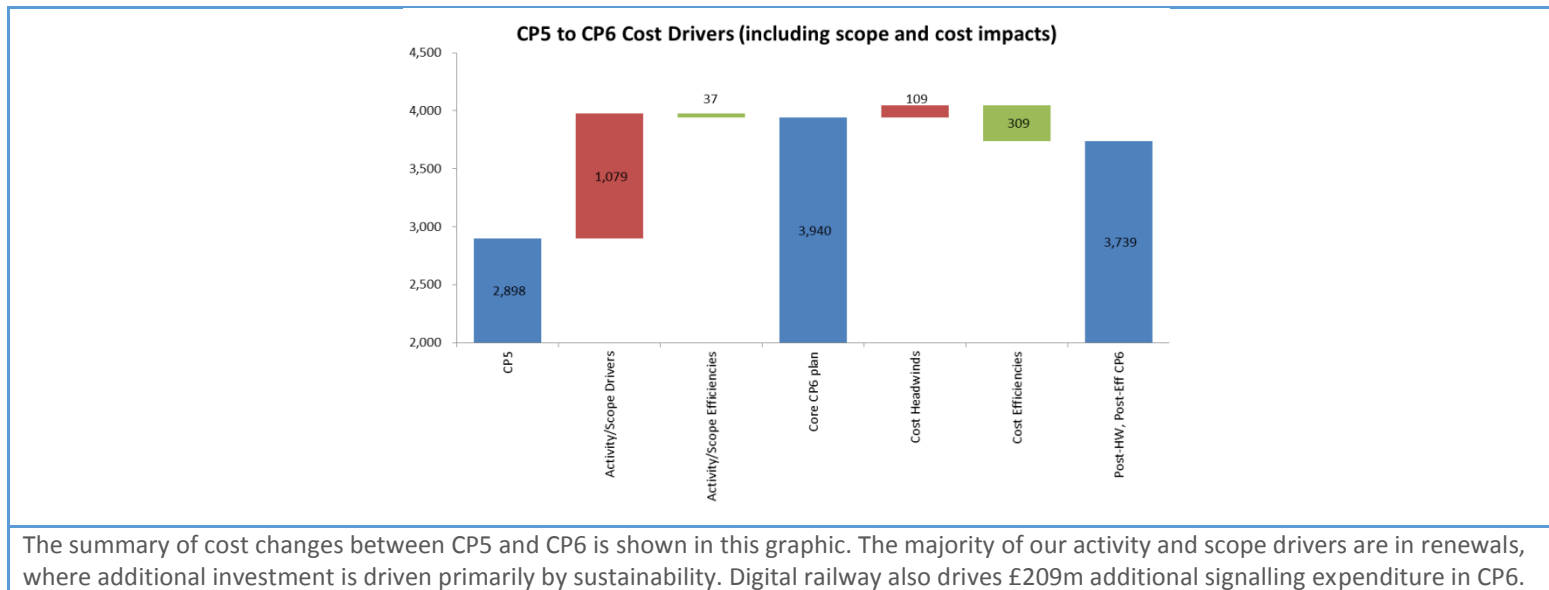
- National “Book” Rates – the rate provided by Infrastructure Projects or Business Review Team which were advised to Routes to use for the CP6 submission
- Historical / CP5 Actual Rates – calculation based on actual spend and volume delivered on Projects completed within South East Route in the first 3 years of CP5.
- Benchmarking – calculation based on actual spend and volume delivered on projects within other routes in the first 3 years of CP5.
- CP6 RAM forecast – rates forecasted by South East Route RAM team using models and/or engineering expertise and experience of similar jobs cost delivered in the past.

Bespoke IP cost estimates have been developed for selected renewals (appropriate to the GRIP stage of development and accounting for specific requirements and location of the projects proposed in CP6). These were then benchmarked back to the cost ranges in order to validate the chosen unit rate.

Asset	Supplier of cost	Basis of cost	% of asset covered
Track (Plain Line)	IP Track (replace – full)	Full replace: Average unit rate based on current cost of delivery in 2016/17 provided by IP Track for Kent and Sussex.	27%
	Works Delivery (replace – partial)	Partial replace: all tasks completed in 2016/17 have been divided into several groups depending on volume delivered. Unit rates calculated for each volume range have been applied to comparable volumes in the CP6 workbank to obtain an overall cost for each KVL. Final average unit rate for each KVL equals overall cost divided by CP6 volume.	17%
Track (S&C)	IP Track (replace – full)	Full replace: Unit rate based on current cost of delivery in 2016/17 provided by IP Track	32%
	Works Delivery (other items)	Partial replace: tasks in 2016/17 with similar complexity to the CP6 workbank scope have been divided into several groups depending on the volume delivered. Unit rates calculated for each volume range have been applied to comparable volumes in the CP6 workbank to obtain an overall cost for each KVL. Final average unit rate for each KVL equals overall cost divided by CP6 volume.	9%

Track (Other)	IP Track (Re-Rail, Re-Sleeper High Output) Works Delivery (other items)	Re-Rail, Re-Sleeper High Output unit rate derived from national rates.	4%
		Unit rates for other items in the Track workbank are derived from current delivery rates in CP5.	11%
Signalling (Conventional)	ICM model IP Signalling Current delivery rates	The ICM model is the main source of unit rates with the following exceptions: latest AFC reflected in Investment Papers were used to price projects where major part of spending took place in CP5, IP Signalling bottom up estimates based on previous signalling projects delivered in CP5 were applied to the complex Victoria projects in Central London (which suffer from limited access).	13% (ICM) 8% (AFC) 36% (IP Signalling)
		Level crossings unit rates are national rates based on CP5 projects delivered	4%
		Minor works costs are based current cost of delivery	10%
Signalling (Digital Rail)	Digital Railway Team	The estimated cost of delivering DR schemes for the South East has been provided by the central Digital Railway Team and is based on their business case.	29%
E&P	Current delivery rates IP estimates	Current delivery rates are sourced from completed and on-going projects in CP5 and applied to matching KVLs in CP6 workbank. IP bottom up detailed estimates based on current project delivered were used to reflect CP6 scope of work and additional requirements.	53% (current delivery rates) 28% (IP estimates)
	National Rates RAM-Derived Rates	National unit rates were applied if there we insufficient local comparable projects carried out in CP5 to enable us to challenge the National unit rate. National unit rates were adjusted by local factors when CP6 scope of work differed or there were additional requirements.	4% (national rates) 15% (national rates adjusted)
Structures	Current delivery rates	Multiple unit rate sets have been developed by grouping all completed projects from CP5 business plan depending on structure type (Underbridge, Overbridge etc.) and work type (Replace, Repair etc.) and volume range (0-50m2, 50-100m2 etc.). CP6 projects have been based on the relevant current delivery unit rates.	94%
	IP estimates	Some CP6 projects based on current delivery rates were adjusted to reflect additional scope of work in CP6 compared to similar projects in CP5. These estimates have been tested against IP bottom up estimates to refine the cost of projects where necessary.	6%
Buildings	Current delivery rates	Multiple unit rate sets have been developed by grouping and considering each asset site individually based on location, asset type and type of intervention (policy option). All unit rates are based on previous jobs delivered in the past by two main contractors. An average rate for delivery was derived by taking into account volumes delivered by each contractor in CP5.	100%
	IP/contractor estimates		
Earthworks	Current delivery rates	Unit rates curves have been derived based on cost of delivery in CP5. For each KVL all of relevant projects have been plotted on a graph with spend against volume. The unit rate curve is the line of best fit. Average unit rate for one 5-chain length were used to price the CP6 workbank. National unit rates were applied to Earthworks maintenance as limited information about current delivery is available.	88% (current delivery rates)
	National Unit rates		12% (national rates)
Drainage	Current delivery rates National Unit rates	Drainage unit rates have been developed by looking at similar projects completed in CP5. For specific schemes which are ongoing in CP5, the current rates based on latest AFCs from Investment Papers have been used.	100%

## 7.7 Cost drivers, headwinds and efficiency



### A challenging operating environment

Without further investment our asset condition will continue to deteriorate in CP6. Thameslink will drive a metro-style frequency in the core. Delivering 24tph (or a train every 2.5 minutes in the peak), equivalent to some underground services in terms of vehicles per hour.

To deliver increasing service frequency and capacity and improve train performance, our capability to manage the network must improve. The cost of running the railway therefore increases short to medium term. This has started though the Thameslink Resilience Programme to build up our O&M staff to prepare for and support Thameslink implementation. Increased maintenance and operations focus is already showing benefits in reduced incidents and Schedule 8 payments in 2017/18.

### Operating cost drivers

Our pre-efficient operating costs increase in CP6 driven by:

- **Safety, legislative and policy requirements** (+9%)
- **Deteriorating asset condition**, requiring an increase in maintenance to offset asset failure risk (+3%)
- **Thameslink and traffic growth**, (15.5% increase in EMGPTA) driving further cost into our business (+8%), with additional operations and maintenance as the only solution to manage short term performance risk (+6%). This is partly offset by increases in VTA income.

### Driving efficiency over CP6 and beyond

On top of our core plan we have an ambitious efficiency programme (-7.9%) which focuses on improving planning, access and contracting to deliver operational and maintenance improvements.

Unit cost then falls over CP6 as we deliver increasingly efficiently. In CP7 we expect to realise greater operational efficiency as the Victoria re-control and other schemes are commissioned.<sup>64</sup>

### 7.7.1 Summary of route efficiency

Our efficiency plans have been developed bottom up and top down, building on our existing CP5 efficiency plans. An extensive exercise to identify and quantify efficiencies for our plan has been undertaken. To test completeness we have referenced the well-recognised IAM asset management model. Learning our lessons from the past, our efficiency programme cannot simply be a list of efficiency initiatives. Our programme is a combination of initiatives and actions that together directly and indirectly deliver efficiency. It is recognised that to achieve efficiencies there is the requirement to invest in enablers. For instance our Opex includes an increase in training costs to help cultivate a culture of efficient operation and delivery.

Lessons learned have been taken into account when developing our efficiencies plan. For instance, CP5 so far has shown the importance of having a well-defined and developed workbank. For all assets the workbank planning has already begun and will continue to be refined prior to CP6. This should help us deliver projects more efficiently in CP6 as efficiency projects are phased in.

Our CP6 efficiency programme started in February 2017 when we launched our Route Change Programme called Framework 42 (F42). F42 is designed to support change and ultimately deliver our end vision in CP7. This programme has begun the process of reviewing and challenging the ways in which we work – from planning to our organisational structure.

Following this submission, the next steps are to build the efficiency plans for CP6 into our existing F42 plans to create one single plan and to strengthen our ability to deliver our vision.

A large proportion of efficiencies identified during the bottom up process are things that we are able to deliver ourselves, within the route. However, it is recognised that there are a number of dependencies on other areas of Network Rail. For instance, some of the efficiencies in delivery and commercial can only be delivered through IP or Route Services.

The table in 7.7.2 (route headwinds and efficiency by theme) shows the quantifiable efficiencies by theme based on the CP6 Headwind and Efficiencies Fishbone.

Totex (O,M,R)	Year			Year					CP6 total
	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	
<b>Pre-efficient plan<sup>65</sup> (£m)</b>	<b>629</b>	<b>585</b>	<b>571</b>	<b>746</b>	<b>868</b>	<b>850</b>	<b>773</b>	<b>741</b>	<b>3,977</b>
Activity/scope efficiencies (%)	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-4.6%	-0.9%
<b>Core plan (£m)</b>	<b>629</b>	<b>585</b>	<b>571</b>	<b>745</b>	<b>867</b>	<b>849</b>	<b>772</b>	<b>707</b>	<b>3,940</b>
Head winds (%)	0.0%	0.0%	0.2%	2.5%	2.9%	2.9%	2.7%	2.7%	2.8%
Efficiency (%)	0.0%	-2.5%	-3.1%	-4.6%	-7.1%	-8.7%	-8.8%	-	-7.9%
Tailwinds (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Inefficiency (%)	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Post-HW, post-Eff spend (£m)</b>	<b>629</b>	<b>574</b>	<b>555</b>	<b>729</b>	<b>830</b>	<b>800</b>	<b>725</b>	<b>654</b>	<b>3,739</b>

<sup>64</sup> Due to forecast uncertainty 18/19 is assumed constant unit cost from 17/18. CP6 cost excludes tenanted arch facilitation works, safety and environmental requirements as this is non traffic related scope increase

<sup>65</sup> Note that pre-efficient plan is equivalent to core CP6 plan + 2a (activity/scope efficiencies) in the waterfall

7.7.2 Route headwinds and efficiency by theme

Theme	Area	Description	Net % change
Access (3)	Efficiency (3a)	<p><b>Optimisation of access (use, agreement, planning)</b></p> <p>Through better access agreements and optimised access planning we will look to get the right access, in the right places, at the right time. We will look to implement cyclical access where possible, which allows us to carry out risk-based preventative activities e.g. grinding and tamping. The use of the Long Term Planning Status from the outset of CP6 will focus the delivery teams on seeking access in a timely manner which enables conflicts to be identified early and de-conflicted where possible. We have already begun talks with TOCs regarding the optimal access for the railway as a whole, minimising disruption and maximising the benefits to the network in the long run.</p> <p>Our renewals engineers will work closely with access planning to ensure that the access required is booked in the correct timescales to enable projects to be delivered efficiently. Across assets we will look to strike the optimal balance of blockades vs multi-night/weekend work where relevant, maximising work per site mobilisation. Additionally, it will be assessed whether it is better for assets which traditionally "piggy back" on other possessions to be given their own possessions or whether shared access is best in a given situation.</p>	-0.7%
	Tailwind (3b)		
	Inefficiency (3c)		
	Headwind (3d)	<p><b>Increased cost of Third Party Land Access</b></p> <p>For certain assets it is believed that the cost of third party land access will rise in the future. This impact is partially mitigated by the geography of the railway in the South East. We will also look to mitigate this through the use of Transport &amp; Works Act orders, where there is sufficient time to do so.</p> <p><b>Franchise Impact of Increased Traffic</b></p> <p>There will be a significant increase in traffic at the end of CP5/beginning of CP6 due to the introduction of Thameslink and up to 24 tph through the core. The impact of this increase in traffic will affect assets to different degrees. For instance, it is likely to have a significant impact on maintenance (partly offset by the increase in maintenance spend) but less impact on Signalling where several of the key schemes are centred on Victoria.</p> <p>It is also expected that there will be an increase in freight and passenger traffic on other routes, including from the new South Eastern franchise. Through working with DfT throughout the re-franchising process we can influence the access available, although levels of traffic assumed within the SE re-franchise could be greater than is currently assumed.</p>	

Workbank planning (4)	Efficiency (4a)	<p><b>Stable workbank</b></p> <p>Earlier workbank development has already started. For each asset the developed workbank has been analysed for deliverability. For those assets which have less visibility of the asset condition and therefore interventions in CP6, surveys and site inspections have been and will be carried out to identify the type and extent of intervention required. Alongside better management of the workbank during the Control Period this should help deliver stability and avoid additional costs which are often incurred when the workbank changes.</p> <p>Through better planning we reduce/ avoid job cancellations and prevent revisiting sites. With the new workbank we have already begun work on detailed and stable work specifications which should help ensure that the most appropriate work is completed and rework is prevented. We will use improved working practices to ensure that designs and plans are vigorously reviewed ensuring right first time delivery. Lessons learnt workshops and sharing best practise will become commonplace.</p> <p>To ensure that the workbank development is not wasted, we need to have a stabilised and consistent workbank along with robust unit rates to reduce the potential of alterations in scope and abortive costs. This will be achieved through keeping key personnel in post and through new and refined technological solutions such as the Activity Based Planning (ABP) tool, Powerpack and the Infrastructure Cost Model (ICM).</p> <p>The new workbank will help avoid missed commissionings in signalling which have significant economic and reputational costs. Innovative delivery techniques like lightweight troughing will reduce the unit rate of work.</p>	-0.6%
	Tailwind (4b)		
	Inefficiency (4c)		
	Headwind (4d)		

<p>Technology (5)</p>	<p>Efficiency (5a)</p>	<p><b>Electrical Safety Delivery (ESD) Benefits</b>                  Negative Short Circuiting Devices (NSCDs) will cover 20% of the network by the end of CP5, the coverage will increase during CP6 and will allow us to make better use of the access we are granted through increased time on tools. This will allow us to reduce the levels of corrective maintenance. Should the Electrical Safety (NSCD) vision scheme be progressed, it will be possible to deliver further efficiencies in this area (full detail is set out in Appendix D).</p> <p><b>Intelligent Infrastructure benefits</b>                  There is a significant investment in technologies by NR in CP6, primarily through STE. The benefits included in our plan reflect our latest estimate of benefits from the investment in the Intelligent Infrastructure programme.</p> <p>The use of technologies such as Eddy current and the S&amp;C trains should help target maintenance and renewals more accurately. Plain Line Pattern Recognition should reduce the number of patrols, reducing contractor numbers and should, in the long-run, help shape an efficient maintenance organisation. Better asset knowledge (such as through Remote Condition Monitoring (RCM)) will help us make the right decisions and deliver a more sustainable outcome. We will look to use monitoring across a wider range of locations and asset types during CP6. Overall improvement in our analytics capability across Track assets as well as signalling and telecoms will also help us in our decision making and prioritisation.</p> <p>Some benefits shown elsewhere in our efficiency plans are also underpinned by further advances in technology in CP6, however the benefits due to Intelligent Infrastructure are just one of a number of enablers and it was therefore deemed inappropriate to separate out the benefits.</p> <p><b>Other innovation and technology benefits</b>                  We are looking to exploit and maximise the potential efficiencies from the Mobile Maintenance Train (MMT), which during CP5 has been expensive to operate and underutilised. We will be more decisive, using the MMT only where it makes sense to use it (e.g. utilising it for a significant portion of a possession rather than a small amount of time and then leaving it idle).                  We will also leverage assets invested in by other parts of NR. For example, signalling will use Fixed Telecom Network NeXt Generation (FTNx) where sensible to do so. Other technologies from STE etc. should enable us to manage our workbanks (as outlined above). We will use these technologies more extensively in a cost-effective manner.                  We expect continued investment in some assets (e.g. signalling) to provide further benefits in CP6, as has been seen in CP4 and CP5. Other new technologies, such as under sleeperpads will reduce the number of expensive interventions.</p>	<p>-1.0%</p>
	<p>Tailwind (5b)</p>		
	<p>Inefficiency (5c)</p>		
	<p>Headwind (5d)</p>		

<p>Delivery (6)</p>	<p>Efficiency (6a)</p>	<p><b>Development of Delivery Capabilities</b>                  To support greater efficiency in delivering our projects, we are exploring alternative delivery models as well as developing existing delivery mechanisms.</p> <p><b>LEAN, Right First Time delivery, Better Every Day, Structured Continuous Improvement</b>                  We will make maintenance savings from reduction in protection costs due to NSCDs. We will review the cost of possession management in its current form and look to minimise this cost where safe and effective to do so. Using Lean techniques we will minimise unproductive working time and increase the time on tools during access windows and across our business. We also plan to increase the effectiveness of supervision and front line management, particularly on nights. This improved productivity, combined with better access planning will reduce job cancellations and prevent revisiting sites. It is also possible that by combining Track and S&amp;T teams (for example) we will be able to deliver more in the limited time we are given.</p> <p><b>Collaborative and Improved Working Methods</b>                  We will look to improve our working methods based on the experience within our asset teams and we will look to target other improvements through such things as further surveys, the Civil Strategic Asset Management Solution (CSAMS) programme and internal/external benchmarking. We will put in place an optimised training plan to get the best out of our people, providing them with the right skills to enable them to deliver efficiently and effectively.</p> <p><b>Operations Efficiencies (including ROC Migration)</b>                  We will drive efficiencies in our Operations through continued Electrical control consolidation and by migrating signallers. This should provide headcount reductions which will produce efficiencies in CP6 and create a new baseline for CP7.</p> <p><b>Organisation Restructure</b>                  We have begun reviewing our current maintenance organisation, including evaluating the benefits of restructuring of the maintenance organisation and assessing the best Delivery Unit (DU) structure. We will look to create centres of excellence for specific asset work activities (e.g. track mechanised maintenance) which will support the DUs by bringing detailed knowledge of assets and processes. In the short term we will maximise the staff flexibility and rostering provisions in current agreements and review potential changes to terms and conditions in the future. Through an increase in Opex over CP6 (offset by efficiencies) we will reduce the levels of overtime worked by our operations and maintenance staff through corporate rostering.</p> <p>There has been some collaboration with TOCs in CP5 but we must improve on this in CP6. This would create additional efficiencies through combining work and working together to get better access and shared possessions, as well as additional work facilities which will help NR can save on set up costs.</p>	<p>-1.7%</p>
	<p>Tailwind (6b)</p>		
	<p>Inefficiency (6c)</p>		



	Headwind (6d)	<p><b>Increased Task Complexity</b>                  New standards or policies, external or internal to NR, may increase the cost of delivery for our projects and operations. There have been several examples of safety standards coming in during CP5 and therefore there is a good chance similar standards will impact delivery in CP6. Design standards may also drive up the costs of assets, for instance signalling assets.                  With Thameslink assets becoming part of the Route, there is a risk that there is insufficient provision for modifications to optimise the signalling, this is a common cost overrun on other large projects.                  Further there is a risk regarding obsolescence of assets in the control period. A significant number of E&amp;P assets are life-expiring in the period and the risk is that they must be replaced with a more expensive, comprehensive asset because the existing asset is no longer produced.</p>	
Design (7)	Efficiency (7a)	<p><b>Early Contractor Involvement, Early Scope Definition, and Use of Minimum Specification Solutions</b>                  In CP5, using design houses not experienced in delivering works resulted in an initial cheaper outline design costs, but with significant increases in revisited detailed design and delivery costs. We will ensure the appropriate contractor is involved in the process early on (in CP5, where appropriate) such that the contractors input is built into the design to ensure buildability, reducing amount of redesign and ensuring a cost-effective solution.</p> <p>We will review early specification of options to minimise abortive designer work and we will look to maximise use of standard details. During scoping for CP5 some remits lacked clarity. Early scope definition will allow us to maximise the length of design phase to optimise the design to minimise costs. We will also ensure that there is better communication between the RAM team and the deliverer.</p> <p>The Works Delivery workbank has been developed 2.5 years ahead compared to a 6 month time frame in CP5. Planned interventions assume longer lead times to achieve better unit rates and detailed scope definition should avoid the risk of incorrect work remits</p> <p>Often our solutions are over engineered, for instance in signalling many assets have reduced design life as they will eventually be replaced by digital railway. Building structures that will last for an appropriate amount of time (rather than far beyond the required asset life) will help us implement more appropriate cost effective solutions. The Renewals Engineer will ensure concise remits with the minimum specification required are issued to ensure work are delivered efficiently.</p> <p>We will also look to bring in contractors earlier where they may be able to drive down costs across disciplines. For instance, we would look to use IP Track to bring in a contractor to deliver Conductor rail renewals as they can deliver at a lower unit rate than splitting the conductor rail across deliverers as in CP5.</p> <p>Where contracts are tendered in the route we will improve scrutiny and governance of specifications to ensure contracts are better specified with full buy in of management. Improved contract management plans will be implemented within the Commercial and Procurement team becoming less transactional and more strategic.</p>	-0.9%
	Tailwind (7b)		
	Inefficiency (7c)		
	Headwind (7d) <sup>66</sup>		

<sup>66</sup> The Signalling Financial Template was submitted with a Headwind under the theme of Design. This headwind should have been Increased Task Complexity under Delivery and the narrative in this table reflects the

Commercial (8)	Efficiency (8a)	<p><b>Improved Contracting Strategies (including improved rates, work packaging and better management of contracts)</b>                  Improved framework rates are expected by IP to generate increased savings. Initial estimates of savings have been provided by some areas of IP, for instance IP Signalling is expecting savings of 5% by the end of CP6. The Framework for Works Delivery is currently going through a retendering process and better rates are anticipated. Should revised Multi Function Framework strategies not result in the opportunity to deliver expected improvements, we will seek to develop alternative delivery and procurement strategies. The route will also refine our Minor Works contracting strategy. Overall, increased competitive tendering as well as improved frameworks should implement a competitive tension driving down costs however it is recognised that contract rates may increase and therefore a headwind has been included which is tied to this efficiency.</p> <p>Better contract management and dispute avoidance will help avoid excess costs. We must learn from our mistakes in CP5 and ensure that if a contractor is underperforming that they are forced to improve, or removed. We will also look at how we let contracts, for instance in some circumstance it may be better to contract a project in 2 stages - GRIP 1-4 and 5-8, allowing the construction risk to be minimised.</p> <p>We will review and challenge who is best placed to deliver asset renewals in CP6, whether it is IP, Works Delivery or alternative models.</p> <p>The intention is to bring CEFA inspections in-house, if possible, to reduce overheads and to manage the workload.</p> <p>When carrying out maintenance activities we will look to ensure that other minor works can be carried out at the same time if an efficient use of time. For renewals, further optimisation of workbank packaging should result in lower unit rates and the bottom up workbank developed during CP5 should allow better packaging in order to achieve greater efficiencies in delivery. The lower unit rates will come from better rates from subcontractors (through both IP and Works Delivery) and from completing initial works for large, but related projects (e.g. Victoria Resignalling 3-5), in parallel across the projects.</p> <p><b>Supply Chain Organisation initiatives</b>                  In collaboration with Route Services, better forward planning and procurement process management should lead to efficiencies in the procurement of materials and haulage. Contracts for Sleepers, OTM, Haulage contracts are being retendered March 2018 and it is believed that savings can be generated. Additionally, Route Services are introducing a new sleeper factory and a new warehousing and logistics strategy which should help further drive efficiencies in the supply chain. Other efficiency savings made in Route Services and in their operating model will be passed on to the route.</p> <p><b>Accommodation</b>                  The route is reviewing options for key accommodation expenditure including the route headquarters.</p>	-1.4%
	Tailwind (8b)		
	Inefficiency (8c)		

correct allocation.

	Headwind (8d)	<p><b>Increased Contract Rates Driven by Market Pressures</b>                  Linked to the potential contracting strategy efficiency there is a headwind that the new contracts will cost more in the next Control Period. This applies to both subcontractors as well as materials and other areas of the supply chain. Generally in the South East labour rates are inflated compared to the rest of the UK and it is difficult to compete with the private sector employers. There will be increased pressure on rates from large infrastructure projects such as HS2 which may drive up prices, although this may be mitigated slightly by the end of other projects such as Crossrail and Thameslink.</p> <p><b>Re-Mobilisation Costs Following End of CP5 Ramp-Down</b>                  There has been a marked ramp-down in activity in several assets towards the end of CP5 due to budget constraints. There could be additional costs incurred (through additional cost pressures on suppliers and the need to supplement our own staff) as we re-mobilise the market for increased volumes in the first 1 to 2 years of the new Control Period.</p>	
Other (9)	Efficiency (9a)		1.0%
	Tailwind (9b)		
	Inefficiency (9c)		
	Headwind (9d)	<p><b>Fatigue Management Policy</b>                  There is significant uncertainty regarding the new Fatigue Management policy which is due to come into force before the start of CP6. It has been estimated that for Operations staff alone this could cost an additional £16.6m during CP6. This has been included as a headwind in Operations. Additionally, £3.6m has been included for Maintenance. It is hoped that some of the impact can be mitigated through a reduction of overtime and better rostering, however in recognition of the difficulty in accurately estimating the cost, the uncertainty range around Opex has been widened.</p> <p><b>Costs Funded Elsewhere in CP5</b>                  Compared to the current cost of delivery, there has been an increase in Kent’s share of the national IP Track management charge.</p> <p><b>Holiday Pay and Apprentice Levy</b>                  The route’s Holiday Pay liability has been estimated as an 8.5% uplift on overtime rates in FY17, resulting in a £13m additional headwind across CP6. The apprentice levy headwind has been calculated as 0.5% of total payroll.</p>	

### 7.8 Risk and uncertainty in the CP6 plan

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 current CP5 unit rates to develop our capital expenditure forecasts and the 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.

Current unit rates are likely to include some risks that were not originally included in CP5 plans but that have materialised during the current control period. As a result of this approach, it is likely that some risk and uncertainty is already included in our core CP6 plan, as we have not sought to remove the full impact of these unplanned events from our unit rate estimates. Over estimation of efficiencies or the under estimation of headwinds introduces an element of risk, however this is mitigated by our approach to the development of our unit rates.

Whilst it is difficult to precisely estimate the likelihood of delivering our plan in CP6, it seems reasonable to suggest that, overall, there is a 45% to 55% likelihood of the outputs in the plan being delivered for the forecast cost in our CP6 plan. This means that approximately half of the time, we will be able to deliver our plan for the forecast cost. However, this uncertainty varies between expenditure categories. The main drivers of uncertainty in our plan are identified in the table below.

**Uncertainty ranges for CP6:** The information in the table, below, presents our estimate of the overall range of uncertainty across our expenditure and income for CP6. We have also identified the main drivers of the uncertainty ranges. The information in this table is based on the detailed inputs provided in our opex, renewals and income.

Area (S, O, M, R, Income)	Potential range (low – spot – high)	Summary of key drivers of the uncertainty range	
		Driver of range	% of range
Renewals		All assets –Uncertainty around the ability to get the required access and the potential for the scope of work to be higher than estimated.	25%
		All assets - The risk that the supply market is unable to provide the necessary resources or the cost of those resources will be substantially higher than forecast.	20%
		Track -Track asset deteriorates at a different rate to expectations, through unforeseen changes in traffic, or impact of enhancement schemes allowing a change in use.	20%
		Signalling - The Digital Railway business case states that there is an uncertainty range of +/- 30% around the costs of implementation, this uncertainty has been fed into the Route Plans.	15%
		E&P - Lack of scope clarity, emerging issues and variability of unit cost rates for E&P projects.	10%

Maintenance	<p>Low (-£73m) Spot (£1,015m) High (+£184m)</p>	Uncertainty around activity required to deliver performance and safety outcomes due to uncertain impact on Thameslink.	30%
		Deterioration of asset condition will have an impact on the required level of maintenance spend.	25%
		Uncertainty around the cost of staff due to the new fatigue management standard, the inability to influence existing employee terms and conditions, the actions of unions and the potential new employment terms and conditions.	15%
		CP5 cash constraints introduce additional uncertainty around the CP6 entry point and base outcomes.	10%
		Scale of efficiencies enabled by technologies and Commercial contracting and procurement strategy may vary from current assumptions.	10%
Support and operations	<p>Low (-£53m) Spot (£718m) High (+£223m)</p>	Additional operations cost due to Thameslink programme. Some uncertainty around the activity in operations required to deliver performance and safety outcomes due to Thameslink.	40%
		Uncertainty around the cost of staff due to the new fatigue management standard, the inability to influence existing employee terms and conditions, the actions of unions and the potential new employment terms and conditions.	30%
		CP5 cash constraints introduce additional uncertainty around the CP6 entry point and base outcomes.	10%
Total expenditure	<p>Low (-£346m) Spot (£3,739m) High (+£977m)</p>		
Income	<p>Low (-£93m) Spot (£624m) High (+£31m)</p>	Schedule 4 costs may exceed the offsetting income leading to a negative net position.	50%
		VTAC and EAUC are dependent on traffic. Current forecasts include uplifts for increased traffic due to Thameslink and South Eastern. If Thameslink are unable to run a full timetable then the income will fall. The South Eastern timetable has not yet been agreed or contracted with the future franchisee but an increase in mileage is assumed in plans. .	25%
		The fixed settlement from QX is not sufficient under current agreements.	15%

## 8 Culture strategy

### 8.1 Safety

The route's documented safety strategy is based on the RM3 structure for safety maturity. The Plan, Do, Check, Act cycle ensures structured continuous improvement in all areas of Health and Safety for the passengers, the public and workforce. It facilitates the aspects of the 'Homesafe' plan while still linking to the route's Framework 42 and it's proposed that funding in the constrained base plan is to ensure compliance to standards and modest improvements.

Rules, processes and procedures have limitations and although we have sophisticated systems in place, compliance is discretionary, especially if other factors such as time, cost and the environment are driving non-compliance. Great safety culture requires an embedded set of general day to day behaviours that will also seep into environment, health, quality and productivity.

The route's CP6 programme powerfully supports the senior leadership to take the organisation performance to a new level of excellence and a supervisor and frontline worker programme that engages individuals to take personal safety responsibility. The culture of the business has a direct bearing, day to day, on the behaviours and the results of the organisation. To change culture, and as a consequence the behaviours of the people in the organisation, requires the willingness of those in senior positions to challenge their own current leadership and be committed to change.

Our current plans include but are not limited to: -

- Safety leadership training
- Safety maturity surveys and action planning
- Safety workshops - engaging with all the workforce allowing collaboration and interaction between frontline, supervisors, managers, stakeholders, unions and leaders within the business
- Structured safety tours designed to engage, get honest feedback and verify compliance. (visible leadership)

- Cognitive behavioural training centre designed to repeat desired behaviours in a realistic environment
- Improved close call feedback and closure designed to incentivise the raising of issue and concerns
- Awards and recognitions for positive safety behaviours
- Enhanced, succinct safety communication (little and often)
- Behaviour change plans based on logical outcomes taking in all the antecedents and consequences – leading to actions that will achieve predictable behaviours
- Health surveillance programmes for Hand Arm Vibration (HAVs), Respiratory and general health issues
- Improved Manual handling processes at access points and depots
- Mental health awareness and first aid training
- Improved planning to reduce open line working and better technology in the vision plan
- An improvement in Level Crossing Safety
- A tidier railway including better walking routes in our option plan to reduce slips trips and falls
- The route will also work with Network Rail's Safety, Technical and Engineering Department to identify technology and other opportunities to improve safety in trackside working. Schemes will be progressed as business cases mature

Specific improvements will be developed through the Strategy by having clear lines of communication, escalation processes, accountability, an inclusive meeting structure and improved learning from past experiences.

An Improving Safety vision scheme has also been developed, which further improves safety at Level Crossings (3.6% FWI reduction), reduces risk of suicide and trespass (avoiding loss of life for 18 at risk individuals), improves passenger safety and provides further workforce safety improvements.

## 8.2 Change

South East route has developed a change model, “Framework 42” (F42), to support delivery of our vision. There are seven workstreams in our transformation journey, each led by a member of the exec team:

- **Everyone home safe every day**
- **A great place to work, where our people feel valued**
- **Well organised, with robust assurance**
- **One performance problem, one plan**
- **Excellent asset management**
- **Proud to be more efficient**
- **Highly regarded by our customers & stakeholders**

Each workstream has agreed goals, milestone plans, critical success factors and KPIs. To date, the route has:

- Rolled out Framework 42 across the whole route, which included a hard launch at the Route Leadership Event. Focus us being maintained through regular communications, workshops, senior leadership events and a monthly SE route round up newsletter.
- All functional areas now have complete F42 plans in place, and teams further in the reporting line are also developing their own plans for improvement.
- Developed mechanisms for the governance and tracking of Framework 42 plans. These have been implemented at an Exec level.



We will continue to develop, agree and monitor milestone plans for each F42 workstream. This will support getting ‘brilliant at the basics’ by the end of CP5, and driving toward delivery of the vision through the course of CP6 and into CP7,

drawing on continuous improvement through LEAN efficiency, people leadership and good practice.

Specific items which will be delivered through Framework 42 include:

- The Planning Improvement Project
- Organisational review, testing indirect costs and business functionality
- Our frontline productivity review
- Optimising system usage of Ellipse
- Achievement of ISO 55000 certification
- Continued governance and control of spend.

Furthermore, in our change plans we have included for developing technical competence given the challenges of increasing resources to manage the impact of the Thameslink and other service increases. This builds on the Big Plan where we have looked at increasing the training capability / alternative approaches particularly for S&T resources. We also recognise that change needs to be adopted and embedded so we will build the necessary steps into our change initiatives to ensure wider engagement.

## 8.3 Organisational capability

**Our people vision is to make the South East route a great place to work, where our people feel valued.**

People are fundamental to our success they are key to delivering the vision and transformed culture.

In 2016, we implemented a new people strategy intended to see the route through to at least the end of CP6. It aims to create an environment where people feel included, listened to and valued, so that they are proud to say they work for the South East route.

The strategy, entitled ‘a great place to work where our people feel valued’ comprises a range of workstreams covering the full spectrum of people-related activities that enable a strong, capable organisation. CP5 is about putting in place

and embedding the basics of each of these workstreams. CP6 will be about delivering top class people initiatives that support delivery of the route vision to deliver an efficient metro-style railway. This strategy and the underpinning plans are what enable us to build the organisational capability and the best asset management organisation we need through CP6 and beyond.

This work will continue to be governed and monitored by a business-led People Board, which ensures that our people plans are business-driven and delivered on time and on budget.

Workstreams include:

### **1. Trusted leadership and management**

Having confident and capable leaders enables everyone in the route to have trust and confidence. We know that this will be key to having a highly engaged, motivated and well managed workforce.

By the end of CP5, all of the route's frontline managers will have completed a management programme designed to equip them with the skills and knowledge they need to manage their teams well. In return, we expect to see substantial reductions in our key HR metrics, including sickness levels, grievance numbers and the time taken to address employee relations issues.

In CP6, we will extend the training programme to our senior bands, focusing on both their management and leadership skills and knowledge.

We will also establish a stronger link between this training and our talent and succession planning, ensuring that those identified for the next level and beyond are supported to realise their potential. This will prioritise identifying potential future frontline leaders and providing them with the training and support they need to be successful in their roles from day one.

### **2. A more resilient route through better quality performance, development, career conversations and planning for everyone**

By CP6 we will have embedded all the basics that enable the route to manage performance, talent and succession planning well. Critical roles will be increasingly filled internally through effective use of talent management and succession planning and development.

We will continue to grow and develop the route's talent programme. Having established the first talent programme for potential future leaders in CP5, we will expand this in CP6, ensuring we have talent pipelines in place from the most junior to the most senior roles in the route.

We will invest more in attracting and recruiting apprentices and graduates, ensuring that we increase the number of graduate placements in the route and that we achieve the target to have 2.3% of our headcount as apprentices (from a current baseline of 1.2%). In parallel, we will develop robust plans for all our apprentices and graduates, enabling us to increase retention rates.

Finally, in order to promote a culture of development from within the organisation, and to improve retention and engagement, we will support the performance and development of everyone by supporting everyone to have objectives linked to the route vision and by ensuring that everyone in the route continues to have regular performance and development conversations with their manager.

### **3. Fit for purpose recruitment and well planned training for everyone**

By the end of CP5, we will have completed the work already begun to put in place a fit for purpose operating model and organisational structure that enables the delivery of our CP6 commitments. We will enter CP6 with a clear view of our headcount, funding and skills requirements for the entire five years and we will ensure that throughout CP6 we have in place a robust change control process, should increases or decreases to workforce size or shape be required.

In CP6, our focus will be on further developing a robust and strategic workforce plan that takes account of our workforce demographics (including age) and enables us to recruit, train and develop a high performing workforce that meets both current and future needs.

These foundations will enable us to improve our approach to recruitment, prioritise the right areas, and be more creative in the way we attract people to the route. Alongside this, and within the national framework, we will undertake a review of our pay, terms and conditions to ensure that our reward structure and ways of working support our ability to recruit.

We will focus on all aspects of training specifically ensuring that our teams have all the competencies they require for their roles to do their best every day.



#### 4. Collaborative industrial relations

In CP6, we will continue to adopt the approach established in CP5. We will work in collaboration with our trade union partners, engaging early, encouraging open dialogue and ensuring that everyone will have had the training and/or education to do this successfully.

We will increasingly promote informal dialogue as a way of resolving issues, but will also ensure that we have the right formal forums in place at all levels.

#### 5. A culture that enables high performance

By the end of 2017, our route Executive will have invested time in defining the culture we aspire to, the behaviours that underpin this and the things we need to keep, change or improve in order to be a great place to work, where our people feel valued. This will be tested and refined through focus groups of staff from across the route, to ensure we are tackling the right things.

We will continue to make use of regular staff engagement surveys to monitor our progress and by the end of CP5 will have supplemented these with more frequent 'pulse checks' to test the temperature and to enable us to respond in a more timely and agile way. We will embed and sustain this approach throughout CP6. We will also explore developing more engagement tools and activities in collaboration with our train operating companies. This will begin before the end of CP5 within our stations organisation.

In CP6 we will develop a high quality induction process that underpins our culture and ensures that from the point of entry everyone understands and buys into our culture, behaviours and ways of working.

### 8.4 Social & Environmental Performance

As discussed in Chapter 2, stakeholders and customers are at the heart of our route and have been directly involved in driving development of the vision and CP6 plans.

Throughout CP6, we will work in partnership with TOCs and FOCs to continually improve the services provided to passengers and freight customers. We will be recognised as considerate lineside neighbours and proactive agents for change

and improvement in the community served by the railway.

Social and environmental performance is key to our vision. Good management of our economic, social and environmental impacts are fundamental to maintaining a strong and prosperous Route Business. Our CP6 strategy aims to improve our environmental performance and leave a positive legacy for future generations by:

- taking a strong lead on sustainability and taking opportunities to engage our workforce, customers and public;
- better management of our environmental impacts and improved action to prevent pollution to air, water and land which may occur as a result of our operations;
- becoming more energy efficient and reducing carbon emissions;
- developing our employees so that the right level of competency is achieved within environment and social areas;
- making positive impacts on quality of life for those using our railway and those affected by it;
- increasing the resilience of our part of the infrastructure to environmental and societal change; and
- innovating and continuously improving the economic, environmental and social outcomes that our services deliver.

This strategy focusses the route on making sure that everything we build, manage, maintain or develop today leaves a positive legacy for future generations tomorrow.

In our CP6 plan we have allowed for a programme of Environment and Sustainable Development activity to build on what we have started in CP5. These are:

- Environmental and Sustainable Development Management Maturity, including working towards ISO14001 and ISO50001 certification;
- Environmental Protection, focussing on pollution incident management, environmental nuisance mitigation and the effective management of natural resources and waste;
- Energy and Carbon, establishing and maintaining an effective energy management system so that we meet regulatory, financial and carbon

targets;

- Natural Capital, looking after our green infrastructure, its flora and fauna, and working more ‘with the grain of nature’ to sustainably harness beneficial services, such as flood protection and natural trespass deterrence;
- Climate Adaptation, creating a safer and more resilient network to the effects of weather now and in the future; and
- Culture and Community, which involves being a caring neighbour and creating engaged employees and positive community partnerships.

## 8.5 Diversity & Inclusion

Becoming an inclusive and diverse route is a key part of our making the South East route a great place to work and delivering the route vision.

In 2017, we put in place a new diversity and inclusion strategy for the route and trained all members of our executive team in the Network Rail ‘Inclusive Leadership’ training.

We will enter CP6 with all staff having received education and/or training in what it means to be a diverse and inclusive employer. We will have the best possible understanding of the diversity of our workforce as a result of specific initiatives to drive up declaration rates their current levels.

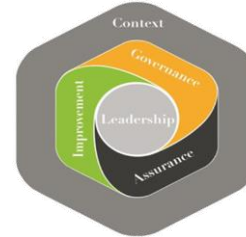
We aim to have achieved an increase of our female workforce to 20% from a current baseline of 16% by 2020 and to increase this further throughout CP6.

By the end of CP6 we will have a workforce more representative of the community we serve and a culture where different ways of working and different opinions are encouraged. This will be achieved by:

- continually delivering education and training programmes at all levels across the business;
- building strong internal diversity networks;
- ensuring our workplace, accommodation and environment support an inclusive workforce;
- continually monitoring and reviewing our core processes, including recruitment methods, to ensure biases are eliminated;
- identifying and celebrating diverse role models;
- forming networks and partnerships with other organisations and other sectors; and

- greater engagement with local communities and schools.

## 8.6 Quality



Whilst the South East route is one of the most operationally complex routes in the UK, it is committed to delivering a high quality service to its customers. In order to do this, a systematic approach is being adopted, which aligns with Network Rail’s Quality Strategy under the headings of Governance, Assurance and Improvement.

### 8.6.1 Governance

Governance outlines how the route will achieve the benefits of a systematic approach through management systems, standards and controls. On South East route, this is being achieved through:

- Delivering an Integrated Management System (IMS), as part of the company-wide programme. The IMS will make it easier for employees to understand what is expected of them, and make sure that content is current, well-managed and compliant with applicable standards and legislation.
- A drive to acquire and sustain ISO9001 (Quality), ISO14001 (Environment), ISO50001 (Energy management), OHSAS18001 (occupational Health & Safety) and ISO55001 (Asset management) standards. It is planned to be ISO55001 compliant by December 2020 at the latest.
- The refinement of standardised tasks, optimisation of the planning processes and productivity from each possession, the planning and delivery of safe work and the ethos of getting work right first time.

### 8.6.2 Assurance

Assurance verifies the effectiveness of the route’s governance arrangements. The route has a risk based integrated assurance programme, which has clear targets and reflects activities from Network Rail’s 3 lines of defence assurance model<sup>67</sup>.

<sup>67</sup> The first line of defence (supervisory assurance) focuses on management of day-to-day operational risk and control activities (“self-assurance”). The second line of defence focuses on overall

With increasing levels of devolution, South East route will review and enhance its route assurance arrangements, so that route leadership is confident that the three lines of assurance are operating effectively. This will be achieved through:

- Clarifying roles and responsibilities;
- Reviewing assurance reporting, key measures and their effectiveness;
- Building an assurance community within the route to share best practice and learn from the areas which are not working well; and
- Mapping out key processes and making sure appropriate systems are in place.

The route is also using the rail industry framework risk management maturity model (RM3) to assess itself against 26 quality management components. The results will be used to benchmark the route within Network Rail and the wider industry. This will drive structured continuous improvement and improve business performance within the route.



### 8.6.3 Improvement

South East route has a clear vision for improvement which is in line with the Network Rail Better Every Day programme. The route has committed to the company-wide objective of training 50% of its staff with business improvement skills. This training is underpinned by improvement frameworks that will capture proposed initiatives, managing their delivery in a structured manner.

### 8.7 Information Technology

South East route is fully aligned with the national IT Strategy, and plans to use the central IT function (Route Services Information Technology, RSIT) to deliver IT requirements. Consequently, all the route’s IT investments are catered for through central organisations’ submissions and no additional provision for local IT investment has been included in the South East route plan.

Key areas of information technology focus for South East route in CP6 are in the areas of Remote Condition Monitoring (RCM) and Digital Railway.

This table summarises the route’s Quality Management Strategy				
Leadership	Governance		Assurance	Improvement
	Integrated Management System	Rules, Standards & Controls		
Outlining & embedding the <b>Quality Strategy and priorities</b> for the South East Route.	Introducing a <b>“1 Stop Shop”</b> which brings together all route information in a single system.	Establishing <b>risk based decision making</b> with appropriate controls in place.	Developing risk based <b>methodologies</b> for 1 <sup>st</sup> Line of Assurance.	Developing a <b>“right first time”</b> and <b>“better every day”</b> culture.
Building <b>communities of practise</b> within the route to encourage structured continuous learning.	Achieving clear, mapped compliance to a range of agreed <b>core standards</b> e.g. ISO 55001.	Increasing <b>clarity, simplicity</b> and understanding of route requirements.	Linking assurance activities to <b>control owners</b> to support control development.	Efficiently <b>delivering the benefits</b> of route improvement programmes.
Defining the <b>governance and benefits</b> of Quality Management in South East Route- KPIs, priorities and strategic alignment.	Delivering clarity of <b>accountability</b> of process owners.	Improving route governance and <b>compliance</b> to our standards.	Delivering a <b>certification strategy</b> for management systems compliance.	Demonstrating <b>route excellence</b> via the Rail industry model- <b>Risk Management Maturity Model (RM3)</b> .

effectiveness of individual functional policy and controls. The third line of defence is a fully independent assurance of the overall control frameworks.

## 9 Strategy for commercial focus – 3<sup>rd</sup> party funding contributions

### 9.1 Current and planned third party funding

The South East’s third party strategy for CP6 will aim to achieve around a 150% increase in third party funding from CP5. South East route’s plan focusses on:

**Strategic Relationships:** Building on existing relationships with County Councils, Unitary Authorities and private sector partners to identify complementary objectives, align policy and, where a business case exists, progress a joint investment / funding bid.

**Tactical Engagement:** Developing relationships with specific local authorities and London Boroughs where it is possible to generate business cases for additional investment to supplement NR funded projects, or where a planned third party investment (e.g. new housing) triggers the need for an improvement to NR infrastructure.

**Influencing:** Establishing a rapport with organisations which have political or economic influence or a role in setting and executing planning policy<sup>68</sup>.

In CP5, the following schemes have attracted third party funding:

Project	3rd Party Funding secured	Source	Project status
West London Line 8 car	£10m	Section 106	Complete

<sup>68</sup> For example, Local enterprise Partnerships (LEPs), Environment Agency, Highways England, Transport Focus and Rail Freight Group.

Project	3rd Party Funding secured	Source	Project status
Kent Journey Time Improvement	£5m	Regional Growth Fund Grant via Kent County Council	Due to complete July 17
Ashford International Signalling Upgrade	£10m	Regional Growth Fund Grant via Kent County Council	Due to complete April 18
Station Improvement Programme	£20m	Contributions from local authorities and property developers to supplement CP5 National Stations Improvement Plan across 20 managed stations.	Due to complete April 18
Gatwick Station Capacity	£5m	Gatwick Airport Lid in joint funding package with NR and DfT	Funded to complete Option selection

### 9.2 Capability and business development

South East route covers three County Councils, one Unitary Authority, numerous local authorities and London Boroughs and two Local Enterprise Partnerships (LEPs). There are also six train companies operating in the South East<sup>69</sup>. The recently published Route Studies for the Kent and Sussex Areas required extensive consultation with all external stakeholders, and consequently existing relationships are strong.

South East route also engages with the Greater London Authority and Transport for London where our jurisdictions overlap. This provides opportunities in

<sup>69</sup> Thameslink Railway; Southern Railway; Southeastern; Gatwick Express; Eurostar; London Overground

partnering with the GLA and the Mayor of London, to increase the profile of certain projects; and to gain advantages from TfL's significant experience in third party funding. During CP6, we are looking to partner with the GLA and TfL on various projects, including proposals for a major upgrade at Victoria station.

South East route will build on these relationships to advocate investment in railway related projects, making the benefits clear to external stakeholders and providing a helpful, open and transparent funding environment. This will be carried out in partnership with NSO and NR Property, culminating in execution of a strategy<sup>70</sup> to build and develop existing relationships and maximise opportunities for further third party funding.

These opportunities are likely to include:

- Social and economic regeneration plans developed by Local Authorities and LEAs, which include transport improvements to enhance local areas;
- Housing and commercial development, which is expected to be a major stimulus for economic growth in the region. The route will work with property developers and business leaders to develop joint investment proposals;
- Establishment of a regional transport body for the South East, 'Transport for the South East'. This organisation is expected to have authority for setting transport policy and for funding capital and revenue projects<sup>71</sup>;
- Working with ports along the Thames (and Medway) estuary. The route will work with port authorities and freight carriers to develop proposals enabling increased rail freight traffic and associated network capacity improvement;

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<sup>70</sup> This strategy will be continually reviewed to test plans and account for any changes in the political and economic environment

<sup>71</sup>With similar powers to Passenger Transport Executives in the Midlands and North of England. We have met Transport for the South East to discuss the vision and CP6 planning process.

- Network Rail commercial property opportunities, working with the NR Property team who hold key relationships with property developers; exploring station retail and commercial opportunities; and working with the station capacity team on future station requirements;
- Working with TOCs to develop opportunities at stations and also to help support them lever funding through the franchising process, which may lead to further efficiencies in renewals/maintenance.
- Seeking to maximise opportunities from accommodation and land owned by the Route such as Brighton and Orpington Delivery Units.

In support of these opportunities, the key strategy within the route is to focus on:

- 1) A priority list of projects with greatest third party funding potential
- 2) Create a single point of contact for Community Infrastructure Levy Consultations to improve our response to these
- 3) Create a more attractive business environment for third party funders to spend their money by introducing third party friendly commercial agreements and better allocation of risk
- 4) Bring Asset Protection closer to business development through its professional service to third parties and;
- 5) Actively seek business opportunities that would otherwise be missed, forming a better Research and Development process to track these.

The South East Route will approach the implementation of the Business Development organisation in two phases.

- 1) In the initial phase the Director of Route Business Development shall report into the Director of Route Sponsorship with a cost neutral team created from existing roles within the route.

2) As the portfolio grows to a large figure of incoming third party funding, an assessment shall be undertaken to identify the number of new roles that can be sustained.

### 9.3 Governance

The Business Development team plans to create a multi discipline panel in agreement with Corporate Commercial, to authorise Principal Agreements.

A key objective is to expedite the Route's ability to make agreements with third parties. As with all third party works and services commitments, projects are subject to the authority requirements set out in the Delegated Authority Policy and the supporting regulations, policies and procedures. The Delegated Authority Policy sets out the scope and level of key financial and nonfinancial authorities for business activities.

### 9.4 Risk Management

The Business Development team shall seek to improve the current method that Network Rail uses to approach risk, creating a business that third party funders find easy to work with and actively want to do business with.

The approach to risk can be understood in two ways within Business Development:

1) Systematic risk – Risks that are outside of the business such as market conditions / characteristics of a specific asset class. These are generally outside Network Rail's control.

2) Unsystematic risk – Risks that are unique to Network Rail such as poor processes, lack of resources and limiting innovation. These are in Network Rails control.

The Business Development team shall aim to mitigate the number/severity of the unsystematic risks that currently exist within the organisation. This will be achieved through the following methods:

- Introduction of third party friendly agreements – third party investors will be attracted to agreements that share risk and that allow clear identification of their requirements. This will be achieved through replacing the existing contribution agreements with a new "Funding to Network Rail Agreement". This change has been made by Corporate Commercial.
- Risk Assessment Tool to calculate % Network Rail risk fund fee – the new "funding to Network Rail agreement" shall be supported by a risk assessment tool used to identify the risk to Network Rail of a contributor's requirement. Each requirement shall be valued by severity and risks that are too great for Network Rail to take will be rejected. The tool will provide a % risk fund fee to apply to third party agreements.
- New Third Party Funding Route Governance Panel with delegated authority – the route level panel shall be accountable for making go/no-go decisions on third party funding aspirations. The panel shall also sign off the "Funding to Network Rail" contribution agreements. The right representation and expertise from various functions (Sponsorship, Finance, Operations, Delivery, and Business Development) shall discuss the risks involved and make the ultimate decision on taking on risks.

### 9.5 Focus for third party involvement

The route has identified the following schemes which could potentially attract third party investment in CP6:

Project	Business Rationale	Project Status	Source	Additional comments
Gatwick Airport Station Capacity Improvement	Significant additional capacity required to alleviate existing overcrowding and cater for future growth.	GRIP 3	DfT and Gatwick Airport Ltd (GAL)	GAL contribution of £30m.
Brighton Main Line Upgrade	Opportunities for redevelopment of East Croydon station including significant commercial development.	GRIP 2 SOBC approved by DfT	Local Authorities / Property Developer	Identified in BML upgrade, being developed in partnership with Property.
Thanet Parkway new station	Kent County Council (KCC) sponsored new station to support new housing and enterprise park.	GRIP 4	KCC funding and bid submitted for New Stations Fund	To be delivered alongside journey time improvement programme.
Franchised Stations Capacity Programme	Improvements to safety, accessibility and punctuality through reduction in despatch delays. Potential to fund via commercial opportunities for development due to high footfall.	Target outputs agreed, negotiation underway on funding agreement and alignment of risk.	Property Developers/Crowd funding	Identified in Kent & Sussex Route Studies, Bakerloo Line Extension, Local Plans. Potential opportunity for land value share.
Hastings to London Journey time improvement	Stakeholder's aspiration to improve connectivity and journey times. Work ongoing to build a supporting business case.	Concept stage – Business case & scope under review with the third party.	Local Enterprise Partnership/ Local Authorities	Identified in Kent Route Study
Ebbsfleet southern link	Major housing developments and potential new theme park.	Concept stage – Business case & scope under review with the third party.	London Resort Theme Park/Housing Developers	Identified in Kent Route Study. Potential opportunity for land value share.
Maidstone West platform extension	Required for turn back of longer trains required on HS1 domestic services. No standalone case.	Concept stage – Business case & scope under review with the third party.	Potential property deal	Identified in Kent Route Study
Otterpool Park Garden City	Upgrade of Westenhanger station due to planned major housing development (15000 homes)	Concept stage – Business case and scope under review with the third party.	Local Authorities / Developer	Identified in Sussex and Kent Route Studies. Significant commercial opportunity.
Victoria Station	Masterplan includes major redevelopment	Very early design	Property	Victoria requires a new roof whatever

Redevelopment of Victoria, to ease passenger flows and increase commercial income		Developers GLA/TfL Westminster Council Local businesses TOCs Gatwick Airport	happens. The Masterplan seeks to take advantage of the commercial possibilities of the station.
Battersea Park Station AFA	Battersea Park is becoming heavily congested and forecast to get worse, with new developments in the local area	Pre-GRIP LB of Wandsworth	We are in discussions with Wandsworth over how to fund the development work

Should funding be made available for these schemes, South East route will work with the Corporate & Commercial team to make sure that the level of funding secured reflects any additional risk to the route’s operation or financial position. However, the intent is not to add any additional risk in this area. This will include working with delivery, sponsorship and estimating teams to ensure that outputs, cost and risks are fully understood and that a plan is in place for managing the projects before entering into firm agreement with a funding body.



## 10 CP6 regulatory framework

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

### 10.1 Expenditure forecast

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

Table 10.1: CP6 forecast of route expenditure

<i>£m in 2017/18 prices</i>	18/19	19/20	20/21	21/22	22/23	23/24	CP6
<b>Route expenditure</b>							
Support	10	13	13	13	13	13	<b>64</b>
Operations	103	135	133	130	129	127	<b>654</b>
Maintenance	165	207	204	203	201	201	<b>1,015</b>
Renewals*	309	348	436	392	331	289	<b>1,796</b>
Enhancements	531	99	2	0	0	0	<b>101</b>
Schedule 4 & 8	77	41	46	48	40	33	<b>208</b>
<b>Allocated / attributed expenditure</b>							
Traction electricity	86	108	114	114	115	116	<b>566</b>
Industry costs and rates	26	26	26	26	35	34	<b>147</b>
System Operator	0	9	10	11	10	9	<b>48</b>
Support and operations	53	60	63	58	43	58	<b>282</b>
Schedule 4 & 8	6	10	10	10	10	10	<b>50</b>
Renewals	153	103	126	124	109	118	<b>579</b>
Group Portfolio Fund	0	48	60	90	90	111	<b>399</b>
<b>Non-SoFA expenditure</b>							
BT Police costs	12	17	17	17	17	17	<b>86</b>
Financing costs	258	230	193	164	134	116	<b>836</b>
Corporation tax	0	14	58	41	21	42	<b>177</b>
<b>Total expenditure</b>	<b>1,790</b>	<b>1,467</b>	<b>1,512</b>	<b>1,439</b>	<b>1,298</b>	<b>1,294</b>	<b>7,009</b>

### 10.2 Income forecast

The expenditure set out in Table 10.1 needs to be paid for. In Table 10.2 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

<i>£m in 2017/18 prices</i>	18/19	19/20	20/21	21/22	22/23	23/24	CP6
Variable and station charges	(131)	(63)	(64)	(64)	(64)	(64)	<b>(319)</b>
EC4T	(84)	(104)	(110)	(110)	(111)	(112)	<b>(546)</b>
Schedule 4 ACS	(36)	(49)	(55)	(56)	(48)	(41)	<b>(250)</b>
FTAC / Network Grant (SOMR)	(356)	(741)	(857)	(837)	(752)	(747)	<b>(3,935)</b>
Grant for tax, financing and BTP	(270)	(261)	(268)	(222)	(173)	(175)	<b>(1,100)</b>
Income from FNPO	0	(42)	(47)	(47)	(45)	(47)	<b>(229)</b>
Other single till income	(172)	(107)	(109)	(102)	(105)	(107)	<b>(530)</b>
<b>Subtotal (gross revenue requirement)</b>	<b>(1,049)</b>	<b>(1,368)</b>	<b>(1,510)</b>	<b>(1,439)</b>	<b>(1,298)</b>	<b>(1,294)</b>	<b>(6,908)</b>
Capital grant for enhancements	(191)	(99)	(2)	0	0	0	<b>(101)</b>
<b>Total income</b>	<b>(1,240)</b>	<b>(1,467)</b>	<b>(1,512)</b>	<b>(1,439)</b>	<b>(1,298)</b>	<b>(1,294)</b>	<b>(7,009)</b>

**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

<i>£m in 2017/18 prices</i>	19/20	20/21	21/22	22/23	23/24	CP6
Route support, operations and maintenance	279	354	350	345	343	340
Allocated support and operations	53	60	63	58	43	58
Traction electricity, industry costs and rates (including BTP)	123	151	157	157	167	168
Schedule 4 & 8	30	51	56	58	50	43
System Operator	0	9	10	11	10	9
Group Portfolio Fund	0	48	60	90	90	111
Allowed return	249	230	193	164	134	116
Amortisation	378	451	562	515	440	408
Tax	0	14	58	41	21	42
<b>Gross revenue requirement</b>	<b>1,113</b>	<b>1,368</b>	<b>1,510</b>	<b>1,439</b>	<b>1,298</b>	<b>1,294</b>
Other single till income	(236)	(107)	(109)	(102)	(105)	(107)
Income from FNPO route	0	(42)	(47)	(47)	(45)	(47)
<b>Net revenue requirement</b>	<b>877</b>	<b>1,218</b>	<b>1,354</b>	<b>1,289</b>	<b>1,148</b>	<b>1,140</b>

**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

<i>£m in 2017/18 prices</i>	18/19	19/20	20/21	21/22	22/23	23/24	CP6
Closing net debt	(8,129)	(6,465)	(5,486)	(4,423)	(3,978)	(3,543)	<b>(3,543)</b>
Closing RAB	10,222	10,173	10,173	10,173	10,173	10,173	<b>10,173</b>
Average net debt / RAB	80%	64%	54%	43%	39%	35%	<b>35%</b>
Group Portfolio Fund		48	60	90	90	111	<b>399</b>
Route		22	22	22	22	22	<b>109</b>
Portfolio		27	38	68	68	89	<b>290</b>
Maturing debt		1,527	896	985	410	409	<b>4,227</b>
Working capital		25	(48)	(2)	(1)	(7)	<b>(33)</b>
Cash requirement (incl. working capital and external debt repayment)		1,524	1,630	1,474	1,308	1,442	<b>7,379</b>


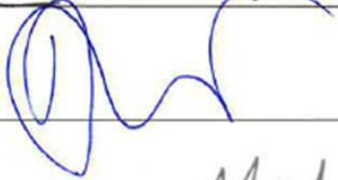


## 11 Sign-off

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:

	<b>John Halsall</b> Route Managing Director
	<b>Duncan Rimmer</b> Route Financial Director
	<b>Mark Morris</b> Director of Route Safety and Asset Management
	<b>Janice Crawford</b> Regional Director, Infrastructure Projects

## Appendix A Joint performance activity prioritisation by lead route TOC

Partnership alliance board meetings are held weekly to review the effectiveness of the actions planning improvements and agree next steps to further improve performance. Galaxy Plan and Glide Path tools are used to evaluate the performance progress.

Train Performance		Route	Current		Lower	Expected	Upper	Achievability	Timeframe
GTR On-Time (at all stations)		South East				60.7%		AMBER	End CP5
					61.2%	62.8%	64.3%	RED	End CP6
No.	Key constraints, risks and opportunities	What we plan to do					Owner	Timescale	
1	<p>C: The large proportion of sub-threshold delay on the route makes identifying the root causes of delay and poor performance challenging. Understanding these factors is crucial if the vision is to be delivered.</p> <p>O: Through an improved understanding of the factors that drive sub-threshold delay and the usage of berthing level data, with further continuous focus, there are now a range of possibilities around driving reductions in this area.</p>	<p>Sub-Threshold action plans:</p> <ul style="list-style-type: none"> <li>Analyses and observations for termini stations focussed on right time turnaround, crew changes and unit swaps with actions in place to drive reductions.</li> <li>Supporting scoping of replacement RA/TRTS, clocks, CIS screens and addition of new staff across key stations.</li> <li>Develop joint working with TOCs to interpret data, cross working groups, and improving how TOC staffs feel they are heard and relate to Network Rail. Roll out dashboards to allow station managers and platform team leaders to drive sub-threshold reductions at stations.</li> </ul>					RPM	<p>Oct 17</p> <p>Dec 17</p> <p>Jan 18</p>	
2	<p>R: The Signalling - wrong routing accounted for 111,023 delay minutes in 2016/17 financial year, which is 8.3% of Network Management delay minutes. Signaller-caused delay is the highest NR cause of delay for GTR services; this needs to be reduced</p> <p>O: To reduce signalling –wrong routing delay minutes with the appropriate actions to address the issues.</p>	<p>Network Management action plans to improved signalling practices:</p> <ul style="list-style-type: none"> <li>Implement Simplified Train Regulation Policy</li> <li>Provide real time running information to signal boxes</li> <li>Addition of ARS technology to TBASC</li> <li>Additional Train Service Controllers at TBASC</li> </ul>					<p>DRAM</p> <p>COO</p>	<p>Complete</p> <p>Jul 17</p> <p>End 18/19</p> <p>Jul 17</p>	
3	<p>R: Delay per incident on the route (DPI) is increasing (negating the positive impact of improved asset condition).</p> <p>O: To reduce DPI through dedicated response teams in place, line side spares and other actions.</p>	<p>Dedicated response teams in place, line side spares and other action plans:</p> <ul style="list-style-type: none"> <li>Additional response teams and localised stores (PODs) in strategic locations, as set out in the CP6 plan, will improve response and fix times.</li> <li>Joint control at TBROC with rigorous processes and service recovery guidelines to minimise the effect duration of an incident.</li> <li>Working with BTP to identify and improve protections such as Platform Ends at critical locations where high DPI incidents are occurring.</li> <li>Deployment of additional S&amp;T Resource at critical locations.</li> <li>Peak time teams in place.</li> </ul>					HoMD	<p>On-going (to end CP5 and into CP6)</p> <p>July 17</p> <p>Sept 17</p>	
4	R: Unknown delays root cause - a significant number of	Network Management action plans:							

	<p>delays do not have a root cause attributed making it difficult to identify what needs to be done to improve performance and deliver the vision.</p> <p>O: Improve data quality and processes to identify and eliminate delays' root cause.</p>	<ul style="list-style-type: none"> <li>Improve data quality, contractual compliance and financial accountability of the route measurement team.</li> <li>Streamline process that are clearly defined, documented, briefed, and complied with by all team members.</li> <li>Implement a right-sized, fully manned, appropriately trained and resilient organisational structure that meets the demands of the route's attribution processes</li> </ul> <p><b>Benefits:</b> Improves the delay resolution process and also benefits Network Rail performance assurance KPIs</p>	<p>RPM</p> <p>RPM</p> <p>RPM</p>	<p>Aug 17</p> <p>Sept 17</p> <p>Oct 17</p>
5	<p>R: Traffic growth will make the network busier and increase the chance of reactionary delay (i.e. a train seeing a restrictive aspect signal). It is forecasted that GTR will have a 7.2% increase in Train Km. (Source: Growth impact on Performance in CP6 presentation from the NR Central Team).</p> <p>O: Digital railway programme provides an opportunity to improve performance.</p> <p>O: It is possible to minimise the performance risk by sacrificing other features of the timetable such as connectivity/journey time/etc. Therefore, Timetable fit for purpose, Strategic Maintenance approach and the Big Plan are deemed to mitigate the impact of increasing train capacity in the network.</p>	<p>Digital Railway programme includes:</p> <ul style="list-style-type: none"> <li>Traffic Management to be deployed in the Thameslink core.</li> <li>Further plans to roll-out Traffic Management across the route are being developed for delivery during CP6.</li> </ul> <p><b>Benefits:</b> Reduction of <b>29,745</b> delays minutes per period.</p> <p>Galaxy (Action Plans) &amp; Big Plan:</p> <ul style="list-style-type: none"> <li>A Thameslink Readiness team is in place to develop and deliver introduction of the Thameslink timetable onto the route. Funding has been secured for the 'Big Plan' and the Galaxy schemes which will support introduction of 24 trains per hour, north and south of the core.</li> </ul>	<p>Thameslink Dir DRAM</p> <p>Thameslink Dir RMD / DRAM</p>	<p>End CP5 On-going</p> <p>End CP5 End CP5</p>
6	<p>R: Increased passenger demand throughout CP6. This will translate in crowding, and pose a risk to performance (increased dwell times) and delivery of the vision.</p> <p>O: The introduction of Thameslink timetable entails increased number of vehicles and trains. This will enhance the train capacity which will reduce the impact of passenger growth.</p>	<p>Timetable fit for purpose actions plans:</p> <ul style="list-style-type: none"> <li>Introduction of Thameslink timetable will increase train capacity on some routes.</li> <li>Long Term Planning Process analyses expected increases in passenger numbers and offers choices to funders.</li> </ul> <p><b>Benefits:</b> The passenger growth is partly mitigated by an increase in the number of vehicles.</p>	<p>Thameslink Dir PSP</p>	<p>End CP5 Ongoing</p>

**TOC sign off:**

**NR sign off:**

Train Performance		Route	Current	Lower	Expected	Upper	Achievability	Timeframe
Southeastern Time to 3		South East			87.2%		AMBER	End CP5
				83.7%	86.1%	88.2%	RED	End CP6
No.	Key constraints, risks and opportunities	What we plan to do				Owner	Timescale	
1	<p>C: The large proportion of sub-threshold delay on the route makes identifying the root causes of delay and poor performance challenging. Understanding these factors is crucial if the vision is to be delivered.</p> <p>O: Through an improved understanding of the factors that drive sub-threshold delay and the usage of berthing level data, with further continuous focus, there are now a range of possibilities around driving reductions in this area.</p>	<p>Sub-Threshold action plans:</p> <ul style="list-style-type: none"> <li>Analyses and observations for termini stations focussed on right time turnaround, crew changes and unit swaps with actions in place to drive reductions.</li> <li>Supporting scoping of replacement RA/TRTS, clocks, CIS screens and addition of new staff across key stations.</li> <li>Develop joint working with TOCs to interpret data, cross working groups, and improving how TOC staffs feel they are heard and relate to Network Rail. Roll out dashboards to allow station managers and platform team leaders to drive sub-threshold reductions at stations.</li> </ul>					<p>Oct 17</p> <p>Dec 17</p> <p>Jan 18</p>	
2	<p>R: The Signalling - wrong routing accounted for 111,023 delay minutes in 2016/17 financial year, which is 8.3% of Network Management delay minutes.</p> <p>O: To reduce signalling –wrong routing delay minutes with the appropriate actions to address the issues.</p>	<p>Network Management action plans to improved signalling practices:</p> <ul style="list-style-type: none"> <li>Implement Simplified Train Regulation Policy</li> <li>Provide real time running information to signal boxes</li> <li>Addition of ARS technology to TBASC</li> <li>Additional Train Service Controllers at TBASC</li> </ul>				<p>DRAM</p> <p>COO</p>	<p>Complete</p> <p>Jul 17</p> <p>End 18/19</p> <p>Jul 17</p>	
3	<p>R: Delay per incident on the route (DPI) is increasing (negating the positive impact of improved asset condition).</p> <p>O: To reduce DPI through dedicated response teams in place, line side spares and other actions.</p>	<p>Dedicated response teams in place, line side spares and other action plans:</p> <ul style="list-style-type: none"> <li>Additional response teams and localised stores (PODs) in strategic locations, as set out in the CP6 plan, will improve response and fix times.</li> <li>Joint control at TBROC with rigorous processes and service recovery guidelines to minimise the effect duration of an incident.</li> <li>Working with BTP to identify and improve protections such as Platform Ends at critical locations where high DPI incidents are occurring.</li> <li>Deployment of additional S&amp;T Resource at critical locations.</li> <li>Peak time teams in place.</li> </ul>				HoMD	<p>Ongoing (to end CP5 and into CP6)</p> <p>July 17</p> <p>Sept 17</p>	
4	<p>R: Unknown delays root cause - a significant number of delays do not have a root cause attributed making it difficult to identify what needs to be done to improve performance and deliver the vision.</p> <p>O: Improve data quality and processes to identify and eliminate delays' root cause.</p>	<p>Network Management action plans:</p> <ul style="list-style-type: none"> <li>Improve data quality, contractual compliance and financial accountability of the route measurement team.</li> <li>Streamline process that are clearly defined, documented, briefed, and complied with by all team members.</li> <li>Implement a right-sized, fully manned, appropriately trained and resilient organisational structure that meets the demands of the route's attribution processes</li> </ul>				<p>RPM</p> <p>RPM</p> <p>RPM</p>	<p>Aug 17</p> <p>Sept 17</p> <p>Oct 17</p>	

		<b>Benefits:</b> Improves the delay resolution process and also benefits Network Rail performance assurance KPIs		
5	<p>R: Traffic growth will make the network busier and increase the chance of reactionary delay (i.e. a train seeing a restrictive aspect signal). It is forecasted that <b>Southeastern will have a 4.7% increase in Train Km.</b> (Source: Growth impact on Performance in CP6 presentation from the NR Central Team).</p> <p>O: Digital railway programme provides an opportunity to improve performance.</p> <p>O: It is possible to minimise the performance risk by sacrificing other features of the timetable such as connectivity/journey time/etc. Therefore, Timetable fit for purpose, Strategic Maintenance approach and the Big Plan are deemed to mitigate the impact of increasing train capacity in the network.</p>	<p>Digital Railway programme includes:</p> <ul style="list-style-type: none"> <li>Traffic Management to be deployed in the Thameslink core.</li> <li>Further plans to roll-out Traffic Management across the route are being developed for delivery during CP6.</li> </ul> <p>Galaxy (Action Plans):</p> <ul style="list-style-type: none"> <li>A Thameslink Readiness team is in place to develop and deliver introduction of the Thameslink timetable onto the route. Funding has been secured for the Galaxy schemes which will support introduction of 24 trains per hour, north and south of the core.</li> </ul>	<p>Thameslink Dir DRAM</p> <p>Thameslink Dir RMD / DRAM</p>	<p>End CP5 On-going</p> <p>End CP5</p> <p>End CP5</p>
6	<p>R: Increased passenger demand throughout CP6. This will translate in crowding, and pose a risk to performance (increased dwell times) and delivery of the vision.</p> <p>O: The introduction of Thameslink timetable entails increased number of vehicles and trains. This will enhance the train capacity which will reduce the impact of passenger growth.</p>	<p>Timetable fit for purpose actions plans:</p> <ul style="list-style-type: none"> <li>Introduction of Thameslink timetable will increase train capacity on some routes.</li> <li>Long Term Planning Process analyses expected increases in passenger numbers and offers choices to funders.</li> </ul> <p><b>Benefits:</b> The passenger growth is partly mitigated by an increase in the number of vehicles.</p>	<p>Thameslink Dir</p> <p>PSP</p>	<p>End CP5</p> <p>On-going</p>

**TOC sign off:**

**NR sign off:**

## Appendix B Key assumptions

Ref no.	Topic	Assumption	Areas of spend impacted (e.g. all opex, track renewals, all spend etc.)
1	Route Boundary	The South East CP6 plan is based on the South East route boundary as at 1st December 2017. Any future boundary change will need to be accompanied with appropriate funding to account for the transfer of assets and operational responsibilities	All
2	Organisation	No externally required change to Route structure or organisation (other than the impact of Thameslink). Any future externally required change (e.g. area boundary change) will be reflected in an equivalent change in costs and budget. External here refers to external to the Route.	All
3	Digital Railway	Operating costs for Digital Rail, including training will be covered by the additional funding in CP6. This is not included in the Route CP6 OMR plan. The performance impact of DR will reflect the current assessment by the Central Economics Analysis team. Any changes will result in a change to our CP6 performance trajectory.	Opex
4	Weather resilience and climate change	Projects due to extreme weather events are not included in our plan.	Asset renewals, Maintenance
5	Access	Delivery of our planned efficiencies relies on the availability of additional access in CP6. In maintenance it is assumed cyclical maintenance access will be agreed so that heavy and mechanised maintenance (eg, tamping and grinding) are delivered that minimise degradation.	Asset renewals
6	Contingency	No specified funding has been embedded in Route Plans for unforeseen circumstances (e.g. new SINs, including SIN 137-133, emergency works, legislative policy or statutory requirements, additional security requirements, business continuity requirements, requirements at depots and sidings including due to a change of franchise etc.). The route will hold a headroom which will be managed in conjunction with Group functions.	Renewals, Maintenance Opex
7	3 <sup>rd</sup> Party consents	It is assumed that third party consents and permissions can be obtained for works with similar constraints / costs currently being experienced in CP5. E.g. – access across lands, river bridge span closures, highway closures etc.	Renewals
8	Asset maintenance	West London Line OLE transfers to LNW South by the end of CP5.	LNW South E&P renewals and maintenance



Ref no.	Topic	Assumption	Areas of spend impacted (e.g. all opex, track renewals, all spend etc.)
9	Maintenance- arches	Cost of tenanted arches cladding removal is covered up to £55m in route plan at the expense of other expenditure. It is assumed that this will be delivered through commercial property. Compensation for lost income is paid for by Commercial Property.	Structures maintenance
10	Rolling stock	There are no unanticipated additional costs from the introduction of new rolling stock or new technology on board.	All
11	Refranchising	Refranchise terms and conditions will match agreed CP6 objective outcomes and performance levels.	All
12	Central funding	There will be a central small plant fund. No route allowance has been made.	All
13	Electrical Safety Delivery Funding	£56.9m funding will be provided to South East route by STE for NSCD (and other electrical safety equipment) installation, as set out in the STE Business Plan. £47.8m of this is allocated to NSCD and other electrical safety equipment installation.	All
14	Thameslink Implementation- Timetable	All major infrastructure works are completed by January 2018 followed by major timetable changes in May 2018 with 20 trains per hour through the Thameslink core and December 2018 when this will increase to 24 trains per hour.	Performance
15	Thameslink Implementation – Opex	Additional costs incurred due to the implementation of Thameslink e.g. systems support costs will be in line with the costs currently within our plan.	Opex
16	Traffic Growth	The CP6 performance forecast is based on the traffic growth figures file dates 11 <sup>th</sup> September provided to the central performance team by the central Asset Management team <sup>72</sup> .	Performance
17	GTR Traincrew	GTR traincrew industrial relations and staff shortage issues are fully resolved by the end of CP5 with no continuing performance impact.	Performance

<sup>72</sup>Traff\_v41Feb16\_420\_Pass\_Forecast\_xCTS\_xSG\_xYr\_Perf\_SCR summary.xlsx, Author: Robert Bauling, Date: 11 Sept 2017

## Appendix C Route context

In 2016/17 South East route delivered over 500 million passenger journeys, the highest – by far – of any route at over 25% of the national total. For many of those passengers, the railway offers the only practical means of getting to and from their place of work and consequently the route’s contribution to London’s economic performance is very significant<sup>73</sup>.

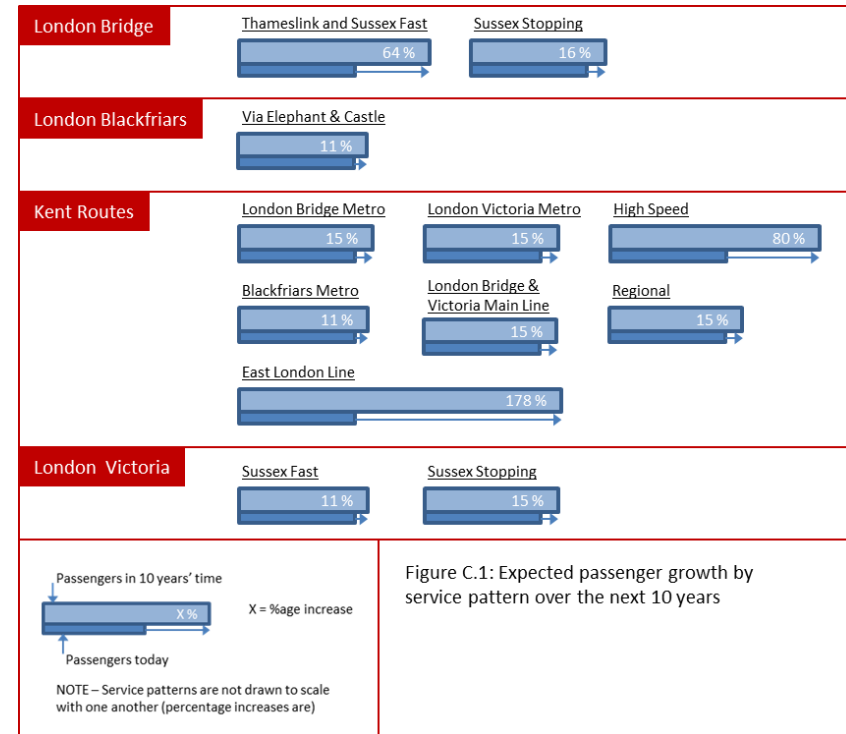
	SE	LNW	Anglia	Wessex	LNE & EM	Western Scotland	Wales	
Passenger journeys (m) 14/15	427	267	263	252	207	101	101	36
Increase in passenger journeys (11/12-14/15)	5.1%	3.3%	5.3%	3.5%	4.4%	2.6%	4.6%	2.8%

Passenger numbers have also grown at the second highest rate of all routes over the past few years, further increasing the gap between South East route and other parts of the network.

This situation will be accentuated further as yet more significant passenger growth is forecast over the coming 10 years<sup>74</sup>, and a 5 to 10% growth in freight traffic is also anticipated. Passenger growth forecasts are shown in Figure C.1. In the immediate term, this will be driven by introduction of the Thameslink timetable, which will lead to an EMGPTA increase of 15.5% by the end of CP6.

<sup>73</sup> Passenger services on the Sussex part of South East route alone generate approximately £11m of benefit to the UK economy every day. Total contribution to the UK economy is estimated at £4bn per annum.

<sup>74</sup> Please refer to the Kent and Sussex Area Route Studies for further information.



These figures clearly show that the importance of South East route to the UK’s economy - and the reputation of the railway - will continue to grow from what is already a very high base.

Consequently, it is increasingly important that the South East route delivers a high performing railway service which meets the needs of its customers. South East route has developed its vision, “proud to be running the UK’s most successful metro-style railway’ on this basis.

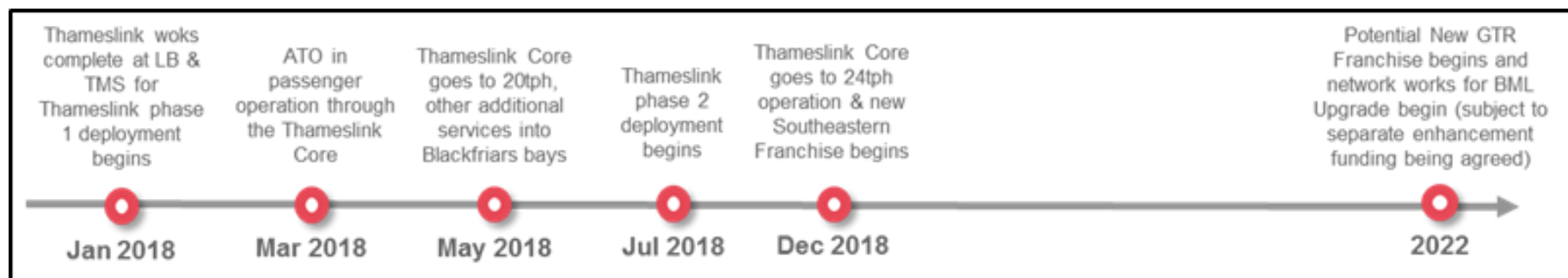


Figure C.2: Key milestones between 2018 and the end of CP6.

It will be necessary to overcome significant challenges and harness all opportunities in order to deliver this vision. As discussed earlier in this document, the constrained base plan does not move the route towards this position.

Figure C.2 summarises the key events that will impact the route in the remainder of CP5, into CP6 and beyond. Key events include completion of Thameslink<sup>75</sup> and letting of the South Eastern franchise<sup>76</sup>.

Following introduction of the full Thameslink service, an increase in opex will be required (and is included in the CP6 plans) to protect performance levels. The box below explains the build-up of that opex in comparison to CP5 opex spend.

<sup>75</sup> The Thameslink Programme will be complete by the end of 2018 and is expected to deliver journey time and passenger experience benefits worth £9.7bn. The challenge between now and the commencement of full Thameslink services is the successful completion of the works. Thereafter an unprecedented level of infrastructure reliability will be required to deliver the step change in dependability, punctuality, and frequency (and thus demand) that the programme enables. Recent funding for the Thameslink Critical Route Resilience Programme is a welcome first step in ensuring benefits are felt beyond the core.

<sup>76</sup> **South Eastern refranchise.** Government’s timetable for re-letting the South Eastern franchise is to award the contract in August 2018 with the operations commencing in December 2018. The award date is 12 months after the CP6 submission. Our RSP anticipates the new contract including increases in both service provision and operational performance, however, there is a risk that the new franchisee makes commitments that go beyond the assumptions that we have made.

Our pre-efficient operating costs increase in CP6 driven by:

- **Safety, legislative and policy requirements** (+9%)
- **Deteriorating asset condition**, requiring an increase in maintenance to offset asset failure risk (+3%)
- **Thameslink and traffic growth**, (15.5% increase in EMGPTA) driving further cost into our business (+8%), with additional operations and maintenance as the only solution to manage short term performance risk (+6%). This is partly offset by increases in VTA income.

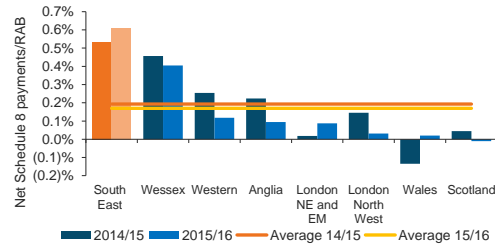
While this appears to be a significant increase, this is a short-term necessity to contain performance at the levels set out in the constrained base plan outcomes; even so, when accounting for vehicle mileage, the unit cost of maintenance is actually lower than in CP5. It is only through delivery of the vision schemes that the longer term opex can potentially be reduced as the quality of the asset is brought up to the necessary level to deliver performance targets set out in the vision.

Figure C.3 summarises the current constraints, challenges and risks around the operational and asset resilience of South East route.

**Today’s dependability and punctuality is unacceptable for our customers and is damaging the reputation of the route and our partners**

Despite recent improvements, train service punctuality on the route is the lowest nationally.

The South East route schedule 8 payments account for approximately 50% of the national total. As a proportion of its asset base, these payments are the highest of all routes (3.6x the 2015/16 national average).



Poor dependability and punctuality has had a measurable reduction on local economies and is the subject of national newspaper headlines.

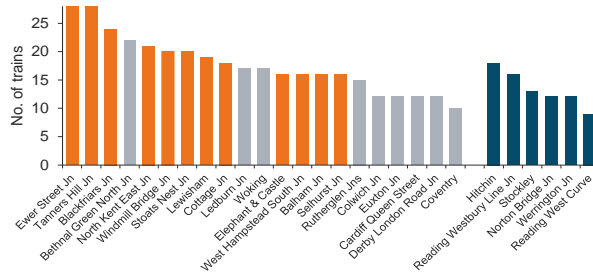
**Our route is physically and operationally complex and operational resilience is being continually eroded**

Timetables are no longer compliant with realistic planning rules.

Stock and Crew capacity and responsiveness have been reduced.

The route has 12 of the 15 busiest flat junctions in the country. Flat junctions with a large number of timetabled crossing moves are an intrinsic cause of secondary delays as train more likely to be passed on to other trains.

**Junctions- No. of trains in the busiest hour sharing the same infrastructure and potentially conflicting**



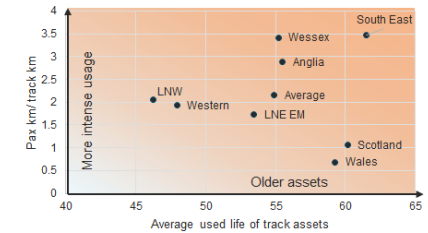
A 50% increase in Thameslink services and a new South Eastern franchise will create significant system instability.

**Improving Asset Management capability is helping to manage asset availability and resilience in the short term but renewal deferrals threaten the sustainability of key assets**

The South East route delivers an increasingly intense service on some of the oldest assets in the network, particularly on the Sussex route.

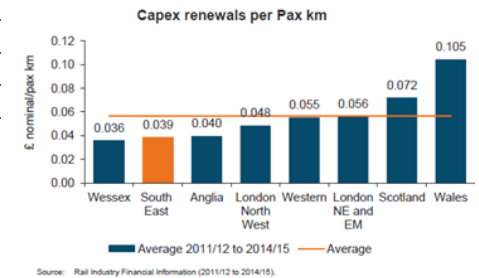
Our track has the highest expired life and greatest usage intensity of all routes. We have the second highest frequency of rail breaks and immediate action defects per 100km of any route (after Scotland).

A number of CP5 renewals have been deferred; further deferrals put dependability, punctuality and safety at risk and increase whole life costs.



**On a per passenger basis, the South East route ranks 7<sup>th</sup> lowest of the 8 routes for investment in capital renewals and maintenance expenditure**

The average per passenger km on Capex renewals across all routes is 45% higher than South East’s between 2011/12 and 2014/15 (64% higher per passenger journey).



Historic and current renewals investment has, at best, been based on maintaining safety and meeting essential legislative compliance.

We have underinvested in our maintenance capability, with a maintenance expenditure per pax km that is 21% lower than the average.

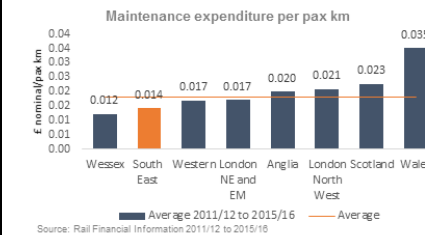


Figure C.3: Summary of South East route’s operational and asset resilience.

To provide some further route context and background, some examples of stakeholder requirements are listed in the table below. The rating denotes whether the requirement has been included in the vision schemes or constrained base plan, couldn't be included in the CP6 plans (red) or is under consideration (amber). In order to prioritise requirements, consideration was given to how well the requirements correlated with legal and safety requirements, and how those specific requirements aligned with the vision (which was developed based on wider themes of customer and stakeholder requirements).

Outline prioritisation			
Customer Group	Requirement / Priority	How this is being addressed	Rating
Level 1 (lead TOCs)	Improved isolation arrangements at depots	Depot isolation improvement works have been included in the vision schemes.	●
	More capacity at depots	This would require enhancements; further discussions are required between the DfT and the TOC.	●
	More removal of lineside vegetation	A large quantity of vegetation clearance work is in the constrained base plan, and further work is in the vision schemes. Specific routes of concern have been identified and agreed with TOCs.	●
	More efficient access (i.e. more work done per possession)	Roll-out of negative short circuit devices is included in the constrained base plan (8% additional coverage) and vision schemes (taking to 100% coverage). This facilitates the faster taking of isolations and allows more work per possession.	●
	Culture shift to drive operational urgency	Operations and Maintenance strategy to introduce metro-style operation.	●
	Increased linespeed to improve resilience	Opportunities to increase linespeeds are to be explored as part of CP6 plans. Significant linespeed increases are discussed in the Kent and Sussex route studies.	●
Level 2 (rail industry)	Improve industry communication	Increased capability and resources are being made available, specifically, within the South East route to improve communication.	●
	Early visibility of works	All stakeholders are to be involved in CP6 planning and development. This is to be continued throughout CP6.	●
	Inter-route services mustn't be adversely effected by greater devolution	South East route plans are focused primarily on the route, but a new function (FNPO) and the System Operator have been set up to protect cross-route operation. We, on South East route, will also engage closely with our neighbouring routes and national functions to ensure a co-ordinated approach to cross-route operations. In order to realise our vision, it is just as important for trains with origins or destinations outside the route to run reliably as it is for those that operate within the route boundaries.	●
	Better data analysis to identify pinch-points and important assets	CP6 operations and maintenance strategy include for a significant improvement in data gathering and analysis to focus resource appropriately.	●
	Co-ordination to ensure diversionary routes are available when main routes closed	The CP6 plan includes grouping of interventions by service area. This will include planning of diversionary route availability during times of planned disruption.	●

## Appendix D Scenario planning

### Part (1): Tactical scenario planning for CP5

- 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	183.7	1.4	A	A	G	<ul style="list-style-type: none"> <li>Minor works to produce FWI improvements to a number of level crossing.</li> <li>Various Access Points - Steps &amp; RRV Access</li> </ul>
Signalling	158.4	5.3	G	G	A	<ul style="list-style-type: none"> <li>FDM replacement</li> <li>Installation of remote condition monitoring</li> <li>Replacement of life expired ERSE</li> </ul>
Structures	62.7	2.0	G	G	G	<ul style="list-style-type: none"> <li>Large number of small value maintenance and refurbishment activity</li> </ul>
Earthworks	16.4	10.2	G	G	G	<ul style="list-style-type: none"> <li>Monitoring and slope renewals.</li> <li>Development activity</li> </ul>
Buildings	14.6	22.4	A	G	G	<ul style="list-style-type: none"> <li>Various canopies, platform repairs and rewire schemes</li> <li>Suicide prevention measures</li> </ul>
Electrification & Fixed Plant	69.6	6.7	G	G	A	<ul style="list-style-type: none"> <li>DC cables</li> <li>Points Heating</li> <li>Signalling power supplies</li> </ul>
Drainage	13	-				
<b>Total</b>	<b>518.6</b>	<b>47.9</b>				

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			<p>A 20% reduction in total remaining expenditure in CP5, would potentially render the Route unable to meet Network Rail's license commitments.</p> <p>The Route's approach to reducing expenditure, given previous challenges, would be a further substantive deferral of the renewals workbank, and a reduction in Structures and Geotechnical reactive maintenance budgets. This deferral would need to be greater in value in order to provide for additional maintenance in lieu of renewals, and to cater for likely contractual losses claims on framework and other contracts which have already been awarded.</p> <p>In terms of any substantive reductions to operational expenditure consideration would need to be given to redundancy programmes.</p> <p>Alongside damage to performance, sustainability and reputation, the ability to deliver CP6 plans would be severely impaired.</p> <p>The risk on performance would be significant which would lead to increased schedule 8 outflows, and also could lead to action by the ORR.</p> <p>Further, more detailed, analysis can be undertaken if required.</p>			
Signalling						
Structures						
Earthworks						
Buildings						
Electrification & Fixed Plant						
Drainage						
<b>Total</b>						

Key to risk colours

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

**Part 2: CP6 strategic investment: vision schemes**

The route’s ambition is to deliver the vision in CP7. The only way to achieve this is through progression of vision schemes in CP6, each of which delivers improvements to the metro-style metrics, and provides tangible benefits to the route throughout CP6 and beyond. In line with the route vision we propose 7 additional vision schemes. A separate detailed business case document is available for each scheme.

VISION SCHEME	COST (£m)	DESCRIPTION	OUTCOME / BENEFITS
<b>1. Performance Improvement</b>	166	<p>Targeted package of renewals, operations and maintenance spend to deliver performance improvement.</p> <ul style="list-style-type: none"> <li>• Further investment is needed to deliver our vision levels of dependability and punctuality in CP7</li> <li>• Reliability and performance is the most frequently raised concern of our stakeholders</li> <li>• We believe we could do more to improve performance towards our Vision</li> </ul> <p>Our proposed investment will improve performance through:</p> <ul style="list-style-type: none"> <li>• Ensuring rapid response to failures (£25.3m)</li> <li>• Installing remote monitoring to better predict incidents before they occur (£19.7m)</li> <li>• Investing in performance hot spots to reduce failures on critical routes (£62.9m)</li> <li>• Upgrading signalling assets which cause ~50% of asset delay minutes (£51.3m)</li> </ul>	<p><b>BCR (30 year): &gt;20</b> (Very high value for money as per DfT criteria)  <b>BCR (5 year): 2.6</b> (High value for money as per DfT criteria)</p> <p>Our proposed investment will generate <b>£2.36bn in net benefits (NPV)</b> over a 30 year assessment period, including:</p> <ul style="list-style-type: none"> <li>• £803m benefits of industry revenue and schedule 8 benefits</li> <li>• £1.73bn of passenger journey time and reliability benefits</li> <li>• £274m of other benefits including indirect benefits from road decongestion</li> </ul> <p><b>Performance (figures shown at P50 confidence level):</b>  1.4% PPM improvement for GTR by the end of CP6  0.8% PPM improvement for Southeastern</p>
<b>2. NSCDs: Improving Productivity and Safety</b>	63.0	<p>Unlocking maintenance efficiencies and safety benefits through faster and safer isolations enabled by NSCDs and other electrical equipment.</p> <p>This funding will build further on:</p> <ul style="list-style-type: none"> <li>• the CP5 roll-out, delivering 20% route coverage by March 2019; and</li> <li>• constrained base plan funding, which will deliver a further 40% (taking the route to 60% coverage) in CP6 – this funding is made up from £16.8m South East route funding, and the majority of the £56.9m STE Electrical Safety Delivery (ESD) funding which has been allocated to South East route</li> </ul>	<p><b>BCR (30 year): 6.1</b> (Very high value for money); generates NPV of £39.3m</p> <p><b>Workforce safety</b> – 1.2% FWI reduction</p> <p><b>Annual savings</b> on completion (including Contractor costs, Schedule 4 and 8 costs, Productivity benefits) = <b>£2.2m</b></p> <p>Improved compliance with Electricity at Works Regulations (1989).</p>
<b>3. Metallic Structures Sustainability</b>	39	<p>Reversing the declining trend of our metallic structures stock condition and maximising the whole life value through proactive maintenance</p> <p>Funding to undertake proactive interventions on primary route metallic underbridges covering: Victoria/London Bridge to Brighton</p>	<p><b>Economically positive case for investment from asset analysis (equivalent to +ve BCR).</b> Analysis indicates ~£113m of avoided cost and disruption if investment made in CP6</p> <p><b>Whole life cost:</b> Replacement works in CP8 and CP9 will cost twice or thrice of the current cost of preventative works</p>



VISION SCHEME	COST (£m)	DESCRIPTION	OUTCOME / BENEFITS
		Mainline (VTB) and Charing cross to Dover (XTD)	<p><b>Sustainability:</b> steady state for 25-40 years and avoidance of future bow wave</p> <p><b>Other risks:</b> Performance, Safety and Reputational risk mitigation</p>
<b>4. Charing Cross Hungerford Bridge (Major Structure)</b>	Option A:27 Option B:41	<p>Sustainably managing our major structure through right time intervention. Funding to:</p> <ul style="list-style-type: none"> <li>• refurbish and repaint the four <b>river spans</b> and address severe corrosion of the structure ~ <b>£27m</b> (Option A); OR</li> <li>• address the <b>entire structure</b> (including land spans) ~ <b>£41m</b> (Option B)</li> </ul>	<p><b>Economically positive case for investment from asset analysis (equivalent to +ve BCR).</b> Analysis indicates ~<b>£28m-40m</b> of avoided cost and disruption if investment made in CP6</p> <p><b>Performance:</b> Avoidance of <b>£20m - £48m</b> worth of disruption costs (in addition to ~<b>£31m - £50m</b> of socio-economic impact leading to an overall disruption cost of ~ <b>£51m - £98m</b>)</p> <p><b>Whole life cost:</b> Avoid expensive strengthening costs (and associated disruption) that could be up to 200% higher than the cost of preventative works</p> <p><b>Reputation:</b> Avoidance of passenger/watchdog, ORR and DfT scrutiny particularly in the backdrop of the disruption of the Thameslink Programme</p>
<b>5. Victoria Station – Sussex Concourse Roof</b>	49	<p>A renewed roof for Victoria Station Sussex Concourse – dry and safe at the UK’s second busiest station. Funding to fully refurbish and update the roof, including:</p> <ul style="list-style-type: none"> <li>• Stripping and replacement of all roof coverings</li> <li>• Repair and strengthening of structural elements (e.g. lattice, girders)</li> <li>• Installing a new access system</li> </ul>	<p><b>Economically positive case for investment from asset analysis (equivalent to +ve BCR).</b> Analysis indicates ~<b>£45m</b> of avoided cost and disruption if investment made in CP6</p> <p><b>Safety:</b> Improved passenger satisfaction and workforce safety</p> <p><b>Reputation:</b> Avoid potential enforcement notice from the Heritage and potential ORR/DfT scrutiny in the event of a safety incident</p>
<b>6. Track Sustainability</b>	181.2	<p>Avoiding the risk of un-maintainable asset stock in CP7 and consequent undeliverable bow wave of renewals, performance restrictions on critical routes in CP7 and additional maintenance requirements.</p> <p>Funding covers:</p> <ul style="list-style-type: none"> <li>• <b>£156.2m for High Output Ballast Cleaning (HOBC).</b> This covers 246Km with a 70/30% split on criticality 1 track and supporting criticality 3 feeder routes.</li> <li>• <b>£17.3m for CAT2 Re Railing (77Km),</b> address hidden defects in pre 1978 rail</li> <li>• <b>£7.7m for TRS track renewals (9.5km)</b> to mitigate risks from Alkali silica reactivity (also known as “concrete cancer”)</li> </ul>	<p><b>Economically positive case for investment from asset analysis (equivalent to +ve BCR).</b> Analysis indicates a total financial saving of ~<b>£163m</b> and an additional <b>£84m</b> of passenger benefits over the assessment period.</p> <p><b>Sustainability:</b> avoids further deterioration in track condition and improves ballast used life by 3% (57% to 54%) thus closing the gap against national average.</p> <p><b>Performance:</b> 4% reduction from CP5 levels of track service affecting failures (base plan +4%), avoidance of 36,000 delay minutes in CP6 alone by removing TSRs from key locations and associated delay costs (financial and economic)</p> <p><b>Safety:</b>5% additional reduction in FWI over CP6 base plan and mitigation of TAR risk</p> <p><b>Financial efficiency:</b> Avoided maintenance and inefficient access use otherwise required to address track faults, ensuring efficient use of HOBC</p>

VISION SCHEME	COST (£m)	DESCRIPTION	OUTCOME / BENEFITS
			machines which will otherwise be under-utilised in CP6
7. Improving Safety	64	<p>Creating a safer railway for our passengers, workforce and public. Funding includes:</p> <ul style="list-style-type: none"> <li>• <b>£21.2m</b> for <b>Level crossings</b> – red light enforcement cameras, advance warning systems , minor works and conductor rail cut backs</li> <li>• <b>£2.3m</b> for <b>Trespass and suicide mitigation</b> including platform ends, hotspot management, safety films, etc.</li> <li>• <b>£15.9m</b> for addressing life expired station wires and achieving <b>compliance</b> against Electricity at work act</li> <li>• <b>£14.1m</b> for <b>Passenger safety</b>- addressing severe platform defects and installing insulated mobility ramps</li> <li>• <b>£10m</b> for <b>Workforce safety</b> - Walking route, access points, lighting and provision of handling equipment</li> </ul>	<ul style="list-style-type: none"> <li>• 3.6% <b>FWI</b> reduction at level crossings</li> <li>• 5% reduction in slips, trips and falls at platforms.</li> <li>• Avoiding loss of life for 18 at risk individuals through suicide reduction measures</li> <li>• Workforce safety improved by 27%</li> <li>• Slipping and tripping – 16% reduction in LTIFR</li> <li>• Manual Handling equipment – 8% reduction in LTIFR</li> </ul>

## Appendix E CP6 regulatory framework – 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

<i>£m in 2017/18 prices</i>	18/19	19/20	20/21	21/22	22/23	23/24	CP6
<b>Route charging income</b>							
Variable Usage Charge	(23)	(24)	(25)	(25)	(25)	(25)	<b>(125)</b>
Electrification Asset Usage Charge	(3)	(3)	(3)	(3)	(3)	(3)	<b>(15)</b>
Schedule 4 Access Charge Supplement	(36)	(49)	(55)	(56)	(48)	(41)	<b>(250)</b>
FTAC / Grant (SOMR)	(626)	(741)	(857)	(837)	(752)	(747)	<b>(3,935)</b>
Station Long Term Charge	(39)	(36)	(36)	(36)	(36)	(36)	<b>(179)</b>
FNPO income	0	(42)	(47)	(47)	(45)	(47)	<b>(229)</b>
<b>Charging income allocated to routes</b>							
Electric Current for Traction	(84)	(104)	(110)	(110)	(111)	(112)	<b>(546)</b>
<b>Total charging income</b>	<b>(811)</b>	<b>(1,000)</b>	<b>(1,133)</b>	<b>(1,115)</b>	<b>(1,020)</b>	<b>(1,012)</b>	<b>(5,279)</b>

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

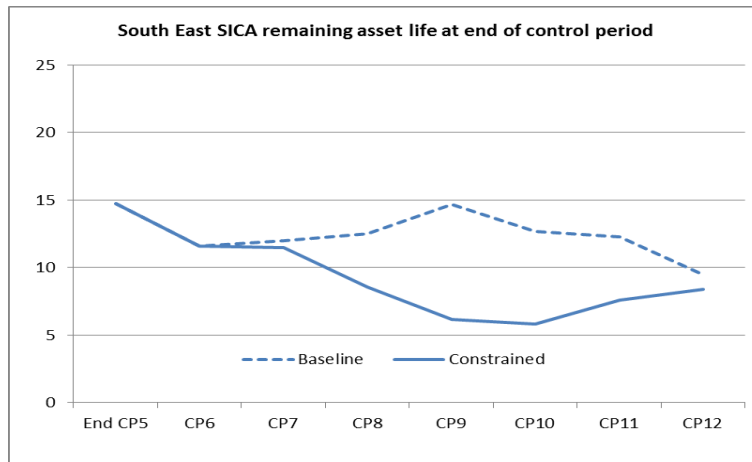
<i>£m in 2017/18 prices</i>	18/19	19/20	20/21	21/22	22/23	23/24	CP6
<b>Route income</b>							
Managed station QX	(15)	(15)	(15)	(15)	(15)	(15)	<b>(76)</b>
Franchised station lease income	(13)	(13)	(13)	(13)	(13)	(13)	<b>(65)</b>
Open access fixed contractual contribution	(0)	0	0	0	0	0	<b>0</b>
Depots	(20)	(20)	(20)	(20)	(20)	(20)	<b>(99)</b>
Finance charges (e.g. Crossrail)	0	0	0	0	0	0	<b>0</b>
Facility charges	0	(3)	(3)	(3)	(3)	(3)	<b>(17)</b>
Other route income	(16)	(1)	(1)	(1)	(1)	(1)	<b>(6)</b>
<b>Income allocated to routes</b>							
Property rental	(50)	(48)	(48)	(44)	(47)	(47)	<b>(234)</b>
Property sales	(58)	(7)	(8)	(5)	(6)	(7)	<b>(33)</b>
<b>Total other single till income</b>	<b>(172)</b>	<b>(107)</b>	<b>(109)</b>	<b>(102)</b>	<b>(105)</b>	<b>(107)</b>	<b>(530)</b>

**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																																																																																																																			
<p><b>Track</b></p>	<p><b>South East track used lives at end of control period</b></p> <table border="1"> <caption>Estimated Used Lives (%)</caption> <thead> <tr> <th>Asset</th> <th>Scenario</th> <th>End CP5</th> <th>CP6</th> <th>CP7</th> <th>CP8</th> <th>CP9</th> <th>CP10</th> <th>CP11</th> <th>CP12</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Ballast</td> <td>Baseline</td> <td>55</td> <td>50</td> <td>48</td> <td>47</td> <td>46</td> <td>45</td> <td>44</td> <td>43</td> </tr> <tr> <td>Constrained</td> <td>55</td> <td>60</td> <td>62</td> <td>63</td> <td>64</td> <td>65</td> <td>66</td> <td>67</td> </tr> <tr> <td rowspan="2">Sleeper</td> <td>Baseline</td> <td>68</td> <td>72</td> <td>75</td> <td>78</td> <td>80</td> <td>81</td> <td>82</td> <td>83</td> </tr> <tr> <td>Constrained</td> <td>68</td> <td>75</td> <td>78</td> <td>80</td> <td>82</td> <td>83</td> <td>84</td> <td>85</td> </tr> <tr> <td rowspan="2">Rail</td> <td>Baseline</td> <td>58</td> <td>58</td> <td>58</td> <td>58</td> <td>58</td> <td>58</td> <td>58</td> <td>58</td> </tr> <tr> <td>Constrained</td> <td>58</td> <td>60</td> <td>61</td> <td>62</td> <td>63</td> <td>64</td> <td>65</td> <td>66</td> </tr> </tbody> </table> <p><b>South East track outputs pa at end of control period</b></p> <table border="1"> <caption>Estimated Outputs (pa)</caption> <thead> <tr> <th>Output</th> <th>Scenario</th> <th>End CP5</th> <th>CP6</th> <th>CP7</th> <th>CP8</th> <th>CP9</th> <th>CP10</th> <th>CP11</th> <th>CP12</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Track SAF</td> <td>Baseline</td> <td>0.050</td> <td>0.048</td> <td>0.045</td> <td>0.043</td> <td>0.041</td> <td>0.040</td> <td>0.039</td> <td>0.038</td> </tr> <tr> <td>Constrained</td> <td>0.050</td> <td>0.050</td> <td>0.050</td> <td>0.050</td> <td>0.050</td> <td>0.050</td> <td>0.050</td> <td>0.050</td> </tr> <tr> <td rowspan="2">Track FWI</td> <td>Baseline</td> <td>500</td> <td>480</td> <td>460</td> <td>450</td> <td>440</td> <td>430</td> <td>420</td> <td>410</td> </tr> <tr> <td>Constrained</td> <td>500</td> <td>500</td> <td>500</td> <td>500</td> <td>500</td> <td>500</td> <td>500</td> <td>500</td> </tr> </tbody> </table>	Asset	Scenario	End CP5	CP6	CP7	CP8	CP9	CP10	CP11	CP12	Ballast	Baseline	55	50	48	47	46	45	44	43	Constrained	55	60	62	63	64	65	66	67	Sleeper	Baseline	68	72	75	78	80	81	82	83	Constrained	68	75	78	80	82	83	84	85	Rail	Baseline	58	58	58	58	58	58	58	58	Constrained	58	60	61	62	63	64	65	66	Output	Scenario	End CP5	CP6	CP7	CP8	CP9	CP10	CP11	CP12	Track SAF	Baseline	0.050	0.048	0.045	0.043	0.041	0.040	0.039	0.038	Constrained	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	Track FWI	Baseline	500	480	460	450	440	430	420	410	Constrained	500	500	500	500	500	500	500	500	<p>Asset Used Life increases steeply over CP5 and CP6 following:</p> <ul style="list-style-type: none"> <li>• removal of High Output Ballast Cleaning and Full Track Renewals in CP5 to meet cost challenges; and</li> <li>• constrained funding in CP6 (the constrained base plan)</li> </ul> <p>This declining trend is on assets already at highest levels of used life and poorest condition nationally. This is exacerbated by exclusion of High Output Ballast cleaning from the CP6 track submission due to cost constraints.</p> <p>Under the <b>baseline scenario</b>, even with increased funding in future control periods, the used life, condition and performance of the track asset will continue to deteriorate, largely due to the expected growth in tonnage in CP6. The level of maintenance and renewal activity required to reverse this trend will start to become undeliverable over the course of CP7.</p>
Asset	Scenario	End CP5	CP6	CP7	CP8	CP9	CP10	CP11	CP12																																																																																																												
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Output	Scenario	End CP5	CP6	CP7	CP8	CP9	CP10	CP11	CP12																																																																																																												
Track SAF	Baseline	0.050	0.048	0.045	0.043	0.041	0.040	0.039	0.038																																																																																																												
	Constrained	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050																																																																																																												
Track FWI	Baseline	500	480	460	450	440	430	420	410																																																																																																												
	Constrained	500	500	500	500	500	500	500	500																																																																																																												

Signalling



The difference in output of the **Baseline and Constrained scenario** levels of expenditure is in the types of intervention and therefore the time it takes asset remaining life to recover.

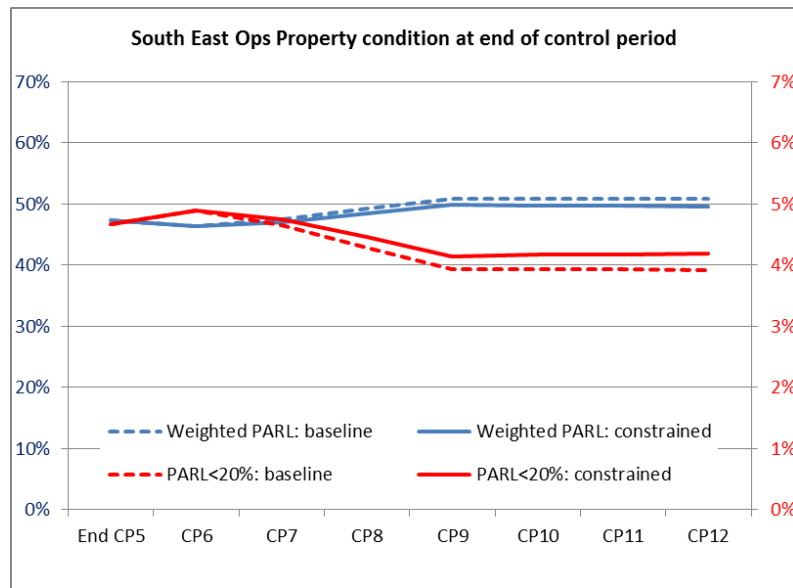
In the **constrained scenario**, we will undertake more partial targeted renewal, but Asset Remaining Life (ARL) will reduce consistently between CP6 and CP10, before improving slightly across CP11 and CP12. **The baseline scenario** allows for more Type-2 (full renewal), which improves ARL and whole life cost in the medium term and performance risk in the short term.

Possession access and resource constrain the amount of signalling renewal that can be delivered in a Control Period. The workbank is scoped and smoothed over a 2 to 3 control period window and will continue to be updated as asset condition surveys are completed during CP6 and CP7.

The decline in ARL between CP5 and CP6 reflects a lower renewals spend while access was limited during Thameslink Programme construction, however the enhancements benefits have been modelled in ARL.

The Digital Railway funding in CP6 introduces new Traffic Management systems, adding to the exiting asset base, and therefore does not contribute to ARL.

**Operational Property**



**Baseline scenario:** To maintain or marginally improve asset condition, the baseline forecast indicates that a long-term sustained increase in expenditure of at least 20% is required in the South East route. Expenditure peaks in CP6 and CP7 to address condition led renewals not funded in previous control periods. As a result the number of poor condition assets improves and asset remaining life increases above 50%.

**Constrained scenario:** Expenditure in the constrained scenario peaks in CP7 and CP8 before returning to a similar level of long-term spend as CP5, reflecting the current condition of station assets and footbridges to be addressed. At this level of expenditure it is not clear that significant managed stations renewals, such as Victoria Station Roof, are included in the forecasts. Whilst South East route already holds the oldest operational property portfolio nationally, the number of poor condition assets and average remaining life continue to deteriorate in this scenario leading to an increased safety risk to station users.

The long range forecasts have made allowance for works identified through the accelerated structural assessment programme; however they do not currently reflect the impact of Electrical Testing and Inspection or platform gauging surveys that have significantly influenced renewal volumes in CP6.

<p><b>Structures</b></p>		<p>The modelled <b>baseline and constrained scenarios</b> are the same for South East Route. The asset condition at these levels of intervention will decline as assets are not being managed at steady state.</p> <p>The decline of the metallic underbridge stock is a particular concern with traffic restrictions, temporary speed restriction and even line closures expected in the long term, continuing the trend we are observing now in CP5.</p> <p>The condition of the metallic overline bridge stock will also decline, which will result in weight and/or lane restrictions to highway bridges in the long term and ultimately closure to vehicular traffic.</p>
<p><b>E&amp;P</b></p>		<p>For E&amp;P assets, sustainability continues to decline due to historic underfunding and the level of safety improvements prioritised in CP6. Renewal volumes continue to be lower than steady state in CP6 as a result, with risk of failure increasing. A reactive fund is has been included to provide for fix on failure. For conductor rail there is no difference between the <b>baseline and constrained scenarios</b>. Conductor rail condition will continue to degrade, increasing the risk of failure and impact on performance.</p> <p>Signalling Power supplies show improvement in remaining life following increased OPEX and renewal funding, together with improved systems and standards starting in CP5.</p> <p>Sussex shows the biggest improvement as funding will be prioritised for route criticality, condition and obsolescence.</p> <p>Expenditure peaks for both plans in CP7 to manage the obsolescence risk and to address assets beyond their technical life.</p>

<p><b>Earthworks and Drainage</b></p>		<p><b>Baseline scenario:</b> The earthworks baseline forecast is for a steady state expenditure 20% higher than CP5. A small increase in drainage expenditure is forecast beyond CP6, and the true extent of this will be understood once condition surveys have been completed. The rate of decline in condition scores slows and remains above CP5 levels; risk will be managed through increased and targeted monitoring regimes.</p> <p><b>Constrained scenario:</b> Expenditure in this scenario returns to CP5 levels of spend from CP7. As a result condition scores steadily decline. Risk would be managed through targeted renewals, refurbishment and maintenance alongside increased monitoring regimes. As a result, the likelihood of performance disruption increases in this scenario.</p>
<p><b>All Assets (Sustainability Index)</b></p>		<p>In CP5, South East Route has sustainability scores in the bottom two of all routes nationally for all assets except signalling. Our vision targets a return to at least CP4 exit levels of sustainability by the end of CP7 to halt declining condition and performance.</p> <p>Both of the forecast scenarios fall short of the route ambition. However the modelled <b>baseline scenario</b> halts the declining trend. To achieve this, renewal expenditure in South East Route would need to increase by a further 10% on the planned CP6 levels for the next two control periods.</p> <p>The <b>constrained scenario</b> recognises the need to maintain renewals expenditure at the planned CP6 levels over the long term, with sustainability continuing to decline at a slowing rate. To manage this scenario, renewals would continue to target critical assets and lines of routes, with increasing levels of refurbishment and maintenance. Performance risk will increase in this scenario.</p>



## Appendix G Glossary of terms

ABP	Activity Based Planning	F42	Framework 42	RAM	Route Asset Manager
ADB	Assurable Database	FOC	Freight Operating Company	RCM	Remote Condition Monitoring
AFC	Anticipated Final Cost	FNPO	Freight and National Passenger Operators	RFD	Route Financial Director
ARL	Arriva Rail London	FPM	Financial Performance Measure	RM3	Rail Maturity Model (3)
ARS	Automatic Route Setting	FTN	Fixed Telecoms Network	RMD	Route Managing Director
ASC	Area Signalling Centre	FWI	Fatality Weighted Injuries	ROC	Rail Operating Centre
ATO	Automatic Train Operation	GRIP	Governance of Railway Investment Projects	RPM	Route Performance Manager
BTP	British Transport Police	GTR	Govia Thameslink Railway	RSP	Route Strategic Plan
C-DAS	Controlled-Driver's Advisory System	HoRSHE	Head of Route Safety, Health and Environment	S&C	Switches and Crossings
CAPEX	Capital Expenditure	HV	High Voltage	S&T	Signalling & Telecomms
CCTV	Closed Circuit Television	IECC	Integrated Electronic Control Centre	S-DAS	Standalone-Driver's Advisory System
CIS	Customer Information System	ICM	Infrastructure Cost Model	Se	Southeastern
COO	Chief Operating Officer	IMS	Incident Management System	SIN	Safety Improvement Notice
CP	Control Period	IP	Infrastructure Projects	SICA	Signalling Infrastructure Condition Assessment
CRI	Composite Reliability Index	KPI	Key Performance Indicator	SO	System Operator
CRM-P	Consistent Route Measure - Performance	KVL	Key Volume Line	SOBC	Strategic Outline Business Case
CSI	Composite Sustainability Index	LED	Light Emitting Diode	STE	Safety, Technical and Engineering
DC	Direct Current	LEP	Local Enterprise Partnership	TBROC	Three Bridges Rail Operating Centre
DfT	Department for Transport	LTIFR	Lost Time Injury Frequency Rate	TfL	Transport for London
DPI	Delay Per Incident	MMT	Mobile Maintenance Train	T'link	Thameslink
DR	Digital Railway	NR	Network Rail	TMS	Traffic Management System
DRSAM	Director, Route Safety and Asset Management	NRPS	National Rail Passenger Survey	tph	Trains per hour
DU	Delivery Unit	NRT	Network Rail Telecomms	TPR	Timetable Planning Rules
EAUC	Electricity Access Usage Charge	NSCD	Negative Short Circuiting Device	TOC	Train Operating Company
E&P	Electrification & Plant	O&M	Operations & Maintenance	TSR	Temporary Speed Restriction
ELL	East London Line	OD	Obstacle Detection	VfM	Value for Money
EMGPTA	Equivalent Million Gross Tonnes Per Annum	OPEX	Operational Expenditure	VTAC	Variable Track Access Charge
ETCS	European Train Control System	ORR	Office of Rail and Road	WD	Works Delivery
FDM	Freight Delivery Metric	PPM	Public Performance Measure		

# Appendix H Freight and National Passenger Operator (FNPO) Summary

The following document has been created by the FNPO function.

## South East Route Freight & National Passenger Operators (FNPO) Route

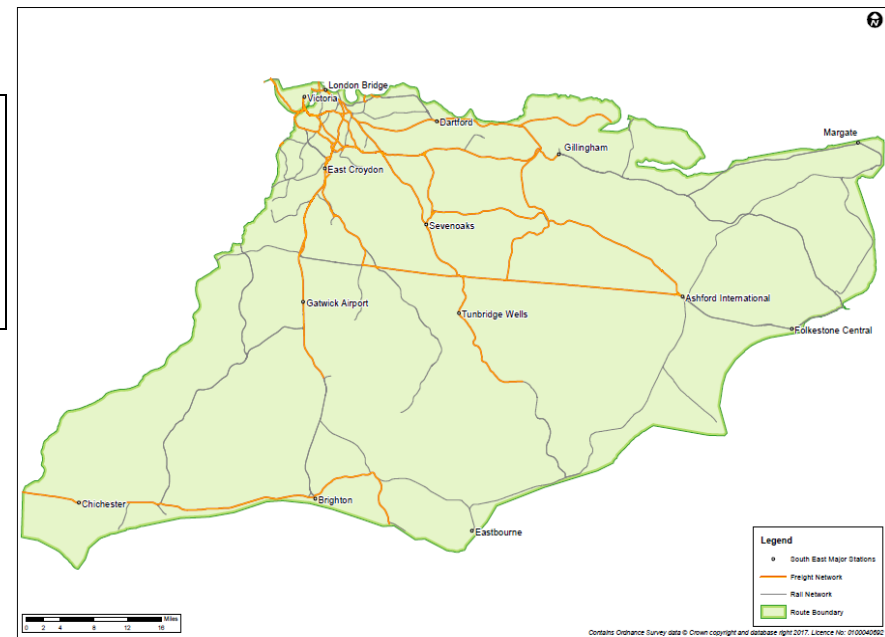
This summary sets out how the South East and FNPO routes will work together to deliver the Route Strategic Plan for South East. It outlines existing FNPO activity, and then describes the impact of the plans and aspirations of FNPO customers to grow and develop their businesses. It summarises what Network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

It should be noted that, unless stated otherwise, no funding is included in the South East route constrained base plan or vision schemes for any works stated in this document. The “what we plan to do” section refers to FNPO activities, although South East route, working with all industry partners (including all other TOCs and FOCs), will support FNPO as far as possible.

### **National Passenger Operators:**

No national passenger operators use South East route infrastructure

Charter trains also operate across South East 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.



## Challenges and Opportunities

No	Key Challenges, Risks and Opportunities	What FNPO plan to do
1	<p><b>Aggregate Growth</b>                      O: Volume growth from locations off SE Route to end terminals on the route                      R: Capacity and capability. Infrastructure not able to cope with traffic demand.</p>	<ul style="list-style-type: none"> <li>• Explore opportunities for longer and heavier trains maximising loco capability</li> <li>• Support introduction of new wagons that maximise payload/length ratio</li> <li>• Support Terminal and Yard developments and other locations required for sector growth.</li> <li>• Support introduction of 'pop-up' terminals, bringing out of use infrastructure back into use and increased use of lineside loading</li> <li>• Explore opportunities for new capacity – e.g. including trial longer trains</li> </ul>
2	<p><b>Gauge establishment</b>                      C: Establishment of recognised diversionary routes for gauge critical traffic</p>	<ul style="list-style-type: none"> <li>• Explore gauge clearance on key corridors, e.g. (Ashford/Maidstone East/Sevenoaks Line, West London Line and North Kent), and provision of diversionary capability</li> <li>• Explore funding opportunities, including Third Party</li> <li>• Documented diversionary routes for core intermodal flows</li> <li>• Review of RT3973 provision to more closely align with traffic flows – reduced duplication</li> </ul>
3	<p><b>Other Commodity Traffic Growth</b>                      O: Steel &amp; other scrap metals                      O: Automotive                      O: Forest Products                      O: Bulk                      O: Aviation Fuel &amp; other Petro-chemicals</p>	<ul style="list-style-type: none"> <li>• Work with customers to maximise opportunities for longer and heavier trains maximising loco capability</li> <li>• Support Terminal / Yard developments to facilitate growth</li> <li>• Support introduction of 'pop-up' terminals, bringing out of use infrastructure back into use and increased use of lineside loading. Promotion of and assisting customers to set up new automotive flows from Queenborough on the Isle of Sheppey.</li> <li>• 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 including Newhaven Marine.</li> </ul>
4	<p><b>Franchise changes / Crossrail</b>                      R: Refranchising of Southeastern seeks greater capacity on shared lines</p>	<ul style="list-style-type: none"> <li>• Retain adequate capacity, capability and flexibility for existing and forecast freight</li> <li>• Review Impact on possession strategy from new flows</li> <li>• Review stabling plans for new rolling stock / change of locations including the introduction of a potential new depot for Southeastern in the inner London area</li> </ul>
5	<p><b>Infrastructure enhancements / electrification</b>                      R: Loss of Capacity following timetable change. Southeastern on the Southeast Route.</p>	<ul style="list-style-type: none"> <li>• Support Route forums (RSPG etc.) to influence scope and secure freight benefit following scheme delivery</li> <li>• FNPO, FOCs and Freight End Users to provide appropriate input into the decision making process</li> <li>• Work with Route Business development team to identify potential Third Party funding sources</li> </ul>
6	<p><b>Construction projects / HS2</b>                      O: Opportunity for spoil and waste out and aggregate and other commodities in to support construction                      R: Capacity for new aggregate and spoil flows in the Southeast from HS2 project</p>	<ul style="list-style-type: none"> <li>• Work with DfT, HS2 Ltd, FOCs and End-customers to offer solutions to demands of major projects</li> <li>• Work with customers to manage the impact of major projects on their business (HS2)</li> <li>• Terminal / Yard developments ('pop-up' terminals / lineside loading potential)</li> <li>• Should funding be available for enabling schemes, work with FOCs and Freight End Users to deliver new network connections and necessary capacity, or bring out of use infrastructure back into use</li> </ul>
7	<p><b>SRFI Terminal Development</b>                      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</p>	<ul style="list-style-type: none"> <li>• Work with Developers to understand SRFI proposals progression through planning</li> <li>• Offer NR support to proposals when adequate strategic fit and capacity</li> <li>• Work with System Operator to support funded early stage timetable work for SRFI developers. Southeast Route is hoping to see the establishment and development of Howbury Park as a major intermodal logistics hub</li> </ul>

8	<p><b>End User-customer service</b>                  O: Closer working with FEU's enables greater understanding of customer priorities for future (e.g. Tarmac, Aggregate Industries, Brett, Days Group, Hanson)</p>	<ul style="list-style-type: none"> <li>• Work with end user -customers to develop business growth and support modal shift to rail</li> <li>• Work with end user -customers to strengthen service delivery and support</li> </ul>
9	<p><b>Review of redundant and unused assets:</b>                  O: Following traffic changes in CP5, opportunity exists to review size and organisation of non-passenger network                  R: FOC objection to supporting Network Changes</p>	<ul style="list-style-type: none"> <li>• Identify opportunities to reduce maintenance costs and remove unneeded infrastructure</li> <li>• Regularise the status of freight assets and other assets including gauge, S&amp;C (actual v published capability)</li> <li>• Explore potential to transfer ownership of redundant lines / assets to secure better opportunities for redevelopment</li> </ul>
10	<p><b>Yards and sidings infrastructure</b>                  R: Yard and Siding Infrastructure asset condition is critical to avoid derailment events and customer LTI's</p>	<ul style="list-style-type: none"> <li>• Working with Routes and customers to review asset condition on regular basis. Keeping up emphasis on maintaining and enhancing major terminal infrastructure including Angerstein.</li> <li>• Working with Routes and customers to establish and benchmark walking route use and condition</li> </ul>
11	<p><b>Timetable Review</b>                  O/R: Timetable Improvements to closely reflect capability of trains and capacity of network required on busier network</p>	<ul style="list-style-type: none"> <li>• Continuation of CP5 work to review path usage and remove unused paths and agree strategic capacity</li> <li>• Work with FOCs to more closely align Train Slots in the Timetable with Access Rights in the TAC, and remove unused rights where there is no corresponding Train Slot</li> <li>• Work with the Route, System Operator and FOC's/TOCs where in upcoming major timetable re-casts the available capacity may be less than contracted rights, the new Thameslink/GTR and Southeastern timetables for the South East Route</li> <li>• Work with System Operator and customers to review opportunities to improve average speed origin-destination</li> <li>• Review with System Operator and customers suitability of current systems to capture network constraints and traction capability (Loads Book, Timing Loads, Lengths)</li> </ul>
12	<p><b>Digital Railway</b>                  O: Successful introduction of Digital Railway offers potential for growth on busiest corridors</p>	<ul style="list-style-type: none"> <li>• Act as internal client on behalf of Freight to build sympathetic capability for freight traffic needs.</li> </ul>
13	<p><b>Upgrades and Disruptive Possessions</b>                  R: Major upgrade and S&amp;C renewals including High Output will require significant disruptive access</p>	<ul style="list-style-type: none"> <li>• Champion requirements of FOCs and Freight End Users so that services can operate as required during disruptive possessions including availability of diversionary routes and timely provision of capacity studies to identify train service capability</li> </ul>

CP6 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.	<ul style="list-style-type: none"> <li>Published rolling programme of joint health and safety visits with customers (FOCs/TOCs) to agreed sites</li> <li>Complete review of authorised walking routes/crew change locations per customer</li> <li>Subject to funding, a programme of improvements will be specified and implemented</li> <li>'Go Look See' with customer within two weeks of any reportable customer LTI event on network infrastructure</li> </ul>	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.	<ul style="list-style-type: none"> <li>Published rolling programme of joint health and safety visits with customers to agreed sites</li> <li>End Customer Forum to be implemented to share issues of concern around connection points and maintenance either side of boundary point</li> <li>Subject to funding, a programme of improvements will be specified and implemented</li> </ul>	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	<ul style="list-style-type: none"> <li>SPAD Forum to be implemented with FOCs to share learning and best practice</li> </ul>	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	<ul style="list-style-type: none"> <li>Local Working Groups</li> <li>Use of Control Rooms and Visualisation at major sites</li> <li>Re-brief Freight Strategy – 'Freight Delivery Matters' and linkage between RTD and FDM delivery</li> </ul>	SRFM/ FNPO Performance Manager	Existing Working Groups to continue into CP6. Quarterly FNPO review of terminal engagement
	Measuring FDM and FDM-R	Focus on defined key routes: <ul style="list-style-type: none"> <li>- Asset Performance</li> <li>- Asset Resilience</li> <li>- Effective contingency plans</li> </ul>	<ul style="list-style-type: none"> <li>Target FDM-R Route target for end CP6 of 91.7%</li> <li>Input to Route CP's for consistent application of freight contingency arrangements</li> <li>FSDM input to incident recovery real-time to build consistency</li> <li>Asset Reviews with Route Asset teams to share traffic forecasts and asset challenges with SRFM</li> <li>Influence at RSPG to define future asset strategy in terms of renewals to support freight growth</li> </ul>	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	<ul style="list-style-type: none"> <li>Complete plan annually with each FOC concentrating on primary delay categories</li> <li>Agreed industry information share</li> <li>Regular reviews against plan with each Route and FOC customer</li> </ul>	FNPO Performance Manager/CRE	Joint Strategy Plan per Operator to be published annually during CP6 and reviewed quarterly

<b>Capacity &amp; Capability</b>	Identifying future capacity and capability needs.	Bring together all freight capacity plans: <ul style="list-style-type: none"> <li>Route Studies</li> <li>SFN</li> <li>Customer specific</li> </ul>	<ul style="list-style-type: none"> <li>All future project specifications to include a specific output level for freight services, reflecting the SFN specifications and forecast future traffic requirements.</li> <li>Future Capability needs assessment to be undertaken – RA, Gauge, HAW – future plans for improvement to meet capacity requirements</li> <li>Interactive maps for Gauge, RA to be created and maintained</li> <li>Continued support for longer, heavier trains programme</li> </ul>	Project Sponsor/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	<ul style="list-style-type: none"> <li>Improved gauge and operational flexibility on key freight corridors</li> <li>Robust gauge cleared diversionary routes</li> <li>Transparent network capability per route for customers</li> </ul>	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	<ul style="list-style-type: none"> <li>Establish framework for average speed measurement and improvement</li> <li>Work with Stakeholders to target specific flows and services</li> <li>Annual plan in connection with annual timetable change</li> </ul>	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	<ul style="list-style-type: none"> <li>Work with FOC's, Freight End Users and Developers to identify potential new connections, including development of SRFI's</li> <li>Information share of prospective sites via RSPG</li> <li>Facilitate new network connections</li> <li>Identify potential sites (new connections, bringing out of use infrastructure back into use and increased use of lineside loading) to facilitate growth</li> <li>Advice to System Operator of future sites and flows to understand timetable and capacity impact</li> <li>Timetable studies for major terminal developments, e.g. SRFI's</li> </ul>	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	<ul style="list-style-type: none"> <li>Promotion of potential freight projects and enhancement schemes</li> <li>Prioritise funding to best meet demand and facilitate growth</li> <li>Align SFN proposals with Route and National proposals to deliver a coherent forward strategy which best meets overall requirements</li> </ul>	FNPO Head of Freight Development/ System Operator	Ongoing
	Consideration of incremental freight improvements in all schemes	Structured review process with Route planners and Sponsors	<ul style="list-style-type: none"> <li>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.</li> <li>Defined and consistent engagement process to be agreed with Route Planning team and Sponsors</li> </ul>	SRFM/ System Operator	Defined engagement process and inputs to be in place with Route Strategy by April 2018

<b>Network Availability</b>	Engineering plans that meet both FNPO customer and Route needs.	Regular and co-ordinated freight input into <ul style="list-style-type: none"> <li>Engineering Access Statements</li> <li>Access Planning Requests</li> </ul>	<ul style="list-style-type: none"> <li>Engineering plans that are; <ul style="list-style-type: none"> <li>Transparent</li> <li>co-ordinated</li> <li>consistent across Routes</li> <li>planned well in advance and</li> <li>take into consideration contingency arrangements for long distance services</li> </ul> </li> </ul>	SRFM/ FNPO Capability and Planning Manager	Annual review of process/requirements between FNPO and Engineering Planning from March 2018 incorporating end to end Engineering Access process
<b>Freight Asset Management Plans</b>	Effective asset management arrangements for yards and sidings infrastructure	Create a joint understanding of maintenance responsibility, traffic level changes and asset condition	<ul style="list-style-type: none"> <li>Enable Asset Management and Engineering teams to plan the targeted maintenance and renewals requirement of each site.</li> <li>Ensure appropriate standards in use at each location.</li> </ul>	SRFM/ Route COO/ RAM	Biannual review of yard and sidings maintenance priorities / traffic flows commencing 2018
	Review of Locomotive and Heavy Axle Weight (HAW) track and structure restrictions	Establish potential/cost for removal of restrictions	<ul style="list-style-type: none"> <li>Input into track/structures renewals and maintenance plans</li> </ul>	SRFM/ Route COO/ RAM	Review definition and programme issued by April 2018. Delivery per strategic route to be programmed
	Review Freight Only lines and other infrastructure	Understand the potential to reduce Operations Maintenance & Renewals costs	<ul style="list-style-type: none"> <li>Review based on existing &amp; predicted future use</li> <li>Input into track/structures/maintenance plans</li> <li>Outputs to be agreed with customers/ORR</li> </ul>	SRFM/ Route COO/ RAM	Definition of Review by Dec 2017. Delivery of initial opportunities report by July 2018. Agreed Action Plan through CP6 per Route
	Removal of TSRs / PSRs in timely fashion	Establish removal plan recognising freight impact	<ul style="list-style-type: none"> <li>Work with the Route teams to identify the impact of speed restrictions on freight services and work collaboratively to remove them</li> </ul>	SRFM/ Route COO/ RAM	Ongoing periodic review of performance impact of TSRs to be agreed per Route

## Appendix J Regulatory Floor Methodology and Definition of CRM-P

### 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.

$(\text{Total attributed delay to the NR Route}) / (\text{train kms in the route}) * 100$  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.

The regulatory floor for CRM-P 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.

## FDM-R

The regulatory floor for this measure 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

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.