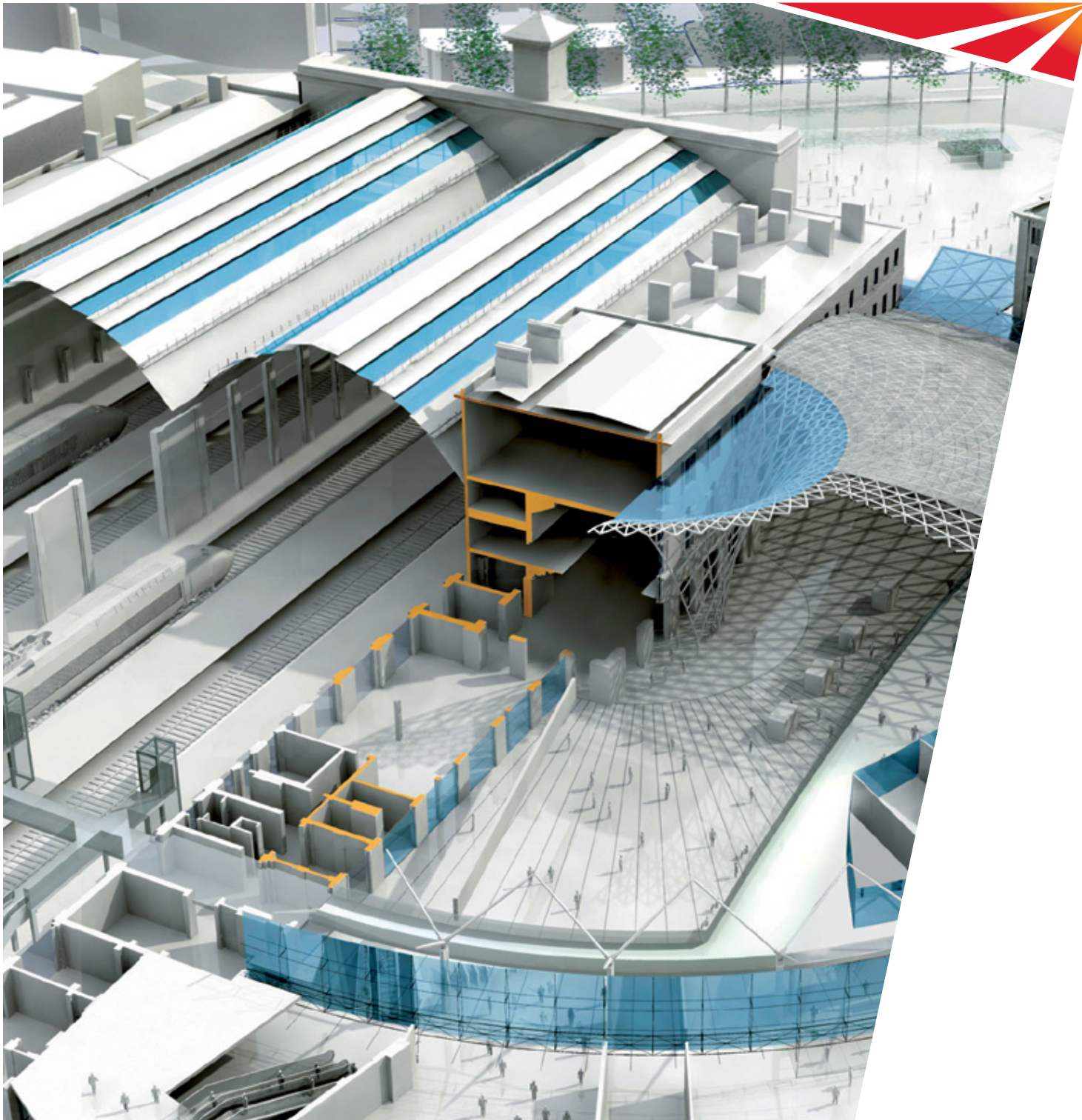


*Moving ahead
Planning tomorrow's railways*

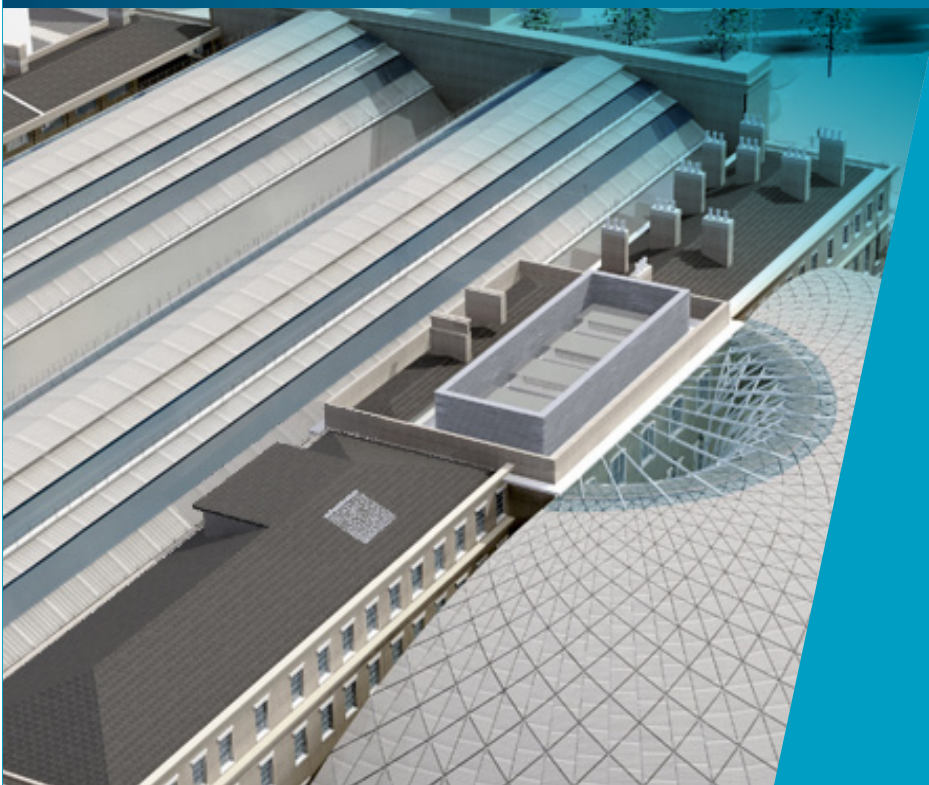
NetworkRail



*Our railways play a vital role
in building Britain's future*

Planning tomorrow's railways

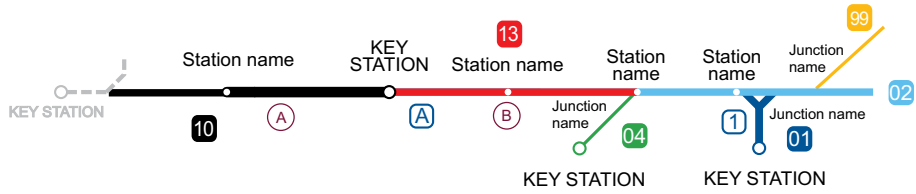
Our £500 million investment in King's Cross station will transform the experience of passengers using the station. We are delivering hundreds of projects across the network to build a bigger, better railway for passengers, freight and the whole of Britain.



Route Plan B
Sussex



Key to route diagrams



A Capacity and operational constraints
Location: capacity or operational constraint

1 Issues on the route
Location: issue on the route

A Key planned projects
Location: planned project on the route

01 Strategic route sections
Listed in the appendix of the route plan

Other symbols

	Key station location
KEY STATION	Key station on this route
	Key station on another route
	Other station location
Station name	Other station on this route
Junction name	Junction / other landmark

Track descriptions

The colour of the line denotes the route classification	
	Primary
	London and South East commuter
	Secondary
	Rural
	Freight only

The line shading indicates strategic route sections which are numbered on the map

The width of the line denotes the number of tracks	
	Multiple track
	Double track
	Single track

Other lines are shown as follows:

	Line on other route
	Non Network Rail infrastructure
	Non operational line

Section 1: Today's railway

Route context

The Sussex route also provides an extensive suburban overground network throughout much of South London, providing frequent metro services to a large part of the capital which is not served by the underground system.

The majority of passenger services on the Sussex route are provided by Southern including the dedicated, premium, non-stop Gatwick to Victoria services branded as 'Gatwick Express'.

The other main operators are First Capital Connect (who operate cross London services to Brighton and Wimbledon) and First Great Western (who operate services from Reading to Redhill/Gatwick and Wales/South West to Brighton).

There are significant overcrowding issues on both main line and suburban services. Resolving peak overcrowding by adding additional on-train capacity is therefore the main priority for future development of the route.

Implementation of the Department for Transport's (DfT's) Brighton Main Line Route Utilisation Strategy (RUS) in December 2008 involved extending morning and evening peak Gatwick Express services to start back from and extend to Brighton respectively. This has provided a significant number of additional high peak seats for main line commuters.

Construction of the East London Line (ELL) extension to Crystal Palace and Croydon is progressing well with work at an advanced stage along most of the affected route. Services are planned to commence in May 2010.

The operation of the ELL services will require a major timetable recast, affecting suburban and main line services.

The High Level Output Specification (HLOS) included Government commitment to funding the implementation of the Thameslink Programme, which has now commenced. This will provide significant additional capacity in the Central London area when work is completed, however, major construction works will be required in the London Bridge area which will reduce the available capacity for an extended period during late Control Period 4 (CP4) and CP5.

In addition to the Thameslink Programme (TLP) Network Rail's Delivery Plan for CP4 contains a

programme of train and platform lengthening for suburban stopping services via Norbury, Gypsy Hill and Hackbridge into Victoria from 8-car to 10-car in Control Period 4 (CP4). Schemes to allow 10-car operations on the slow lines into London Bridge via Sydenham and 12-car operation on the East Grinstead route for services to Victoria and London Bridge will also be delivered in CP4.

Distinct from the key radial commuter routes, the West London Line (WLL) is experiencing significant overcrowding at peak times as growth in commuter numbers has continued and been supplemented by additional demand stimulated by the opening of the Westfield shopping complex at Shepherd's Bush, and Imperial Wharf station.

The WLL is also a vital north-south freight route and the most significant freight corridor on the Sussex Route. Freight operations elsewhere on the route consist predominantly of flows to aggregates terminals situated on the Brighton Main Line (BML).

The Sussex RUS was published in January 2010. The RUS covers all routes and services in the Route B area with the exception of those suburban routes already covered in the South London (SL) RUS. Key recommendations include further train lengthening in CP5 on Tattenham Corner/Caterham, Redhill Corridor, Uckfield and BML (shoulder peak) services.

The RUS also recommends a range of small infrastructure schemes and some timetable changes including insertion of Clapham Junction stops in high peak Gatwick Express services.

Today's route

The principal elements of the Sussex route are described below. The relevant Strategic Route Section is shown in brackets:

- the main line from London to Brighton via Gatwick Airport. This comprises separate multi-track routes from Victoria (B.01) and London Bridge (B.03), joining together in the Croydon area to Brighton (B.02), reducing to two tracks at Balcombe Tunnel Jn
- branches off the main line forming routes to East Grinstead/Uckfield (B.12, B.10), Caterham/Tattenham Corner (B.11), Tonbridge (B.15), Reigate (C.08), the Arun Valley (B.04), Eastbourne (B.06), Worthing (B.05) and beyond. Services joining from these routes make the main line increasingly busy closer to London
- the lines leading west and east from Brighton providing links along the coast (B.05, B.06)
- a complex network of suburban lines throughout south London (B.07, B.08). This is characterised by multiple connections between the different lines so that most stations have services to both Victoria and London Bridge
- the Dorking to Horsham line (B.09)
- the WLL, providing an orbital north-south link around London (B.13)
- the Thameslink route, running in tunnels beneath the City of London, which connects radial routes north and south of the Thames (B.14).

The boundaries of the Sussex route with adjacent routes are particularly complex. There are a number of boundaries with Route A and Route C in particular, and also north of the Thames on the WLL and Thameslink routes.

In 2009, one new station was opened on the Sussex route:

Imperial Wharf station (B.13) is located on the West London Line between West Brompton and Clapham Junction and serves new and existing housing in the Chelsea Harbour area.

Current passenger and freight demand

Passenger demand predominates on the whole of the Brighton Main Line (BML), plus most of the branches off it. Peak demand is largely commuter flows from the main population centres with the notable exception of Gatwick Airport, which generates significant passenger numbers throughout the day.

Main line services generally compete with the parallel A23/M23 highway. This narrows from a six lane motorway to a single carriageway as soon as the Greater London boundary is reached, making the railway the only viable option for the majority of commuters.

A significant portion of demand is for the sizeable short distance commuting flow on both main line and outer suburban services between East Croydon and London. Developments in Croydon town centre and the Croydon Tramlink system have contributed to this significant feature in recent years.

With regard to the London suburban network, demand is also high, again leading to widespread peak period overcrowding and, in some cases, passengers not being able to board trains at certain locations. The SL RUS identified that many routes have demand which is significantly suppressed by current capacity and service patterns, leading to extra pressure on the alternative transport options and reduced economic activity.

Many of the current travel patterns require passengers to interchange onto other rail, underground, tram or bus routes to complete their journey. Many of these also have limited capacity, suppressing demand on certain routes. Key interchanges are Victoria (Victoria, District and Circle lines), Clapham Jn (South West Trains and London Overground), London Bridge (Jubilee, Northern lines and Southeastern) and Balham (Northern line).

Aside from radial journeys into London, passenger demand on the WLL is also growing significantly. The growth is driven by commuter journeys between the South Central and South Western suburban area and the WLL, and new demand to/from the Westfield shopping centre at Shepherd's Bush. Short hop journeys predominate rather than inter-regional travel.

Demand on the coastal lines is generally focussed on the major urban centres, especially Brighton, Chichester and Portsmouth. These services compete with the parallel A27 highway.

There is some freight demand on the BML (mainly to aggregates terminals) but the main freight corridor on the route is the WLL which has a high number of cross London freight services, primarily aggregates to and from southeast terminals and international trains running between the West Coast/Great Western Main Lines and the Channel Tunnel.

As the WLL is the most easterly Thames crossing for freight and links into the Great Western Main Line, West Coast Main Line, East Coast Main Line, Anglia and Kent Routes it is key to cross-boundary freight traffic.

At the southern end of the WLL services to the Channel Tunnel are normally routed via Catford and Maidstone East (on Channel Tunnel Freight Route 2). The line via Redhill is the only alternative to this for W9 gauge freight traffic, though it requires diesel haulage due to the incompatibility of track circuits and power supply on the route with Class 92 traction.

Current services

The main operators on the route are Southern and First Capital Connect (FCC). Passenger services are also operated on the route by First Great Western (FGW), South West Trains (SWT) and London Overground. Freight services are operated by DB Schenker, Freightliner Ltd, Freightliner Heavy Haul Ltd, First GBRf, Direct Rail Services (DRS) and Colas Rail.

The main line passenger service structure is complicated by the number of separate branches off the Brighton main line, the different stopping patterns on it and the existence of more than one London terminal.

Main line services to Victoria generally remain at a high level throughout the day, reflective of the spread of demand to leisure and shopping destinations in the West End. Services run to a variety of destinations in Sussex, Surrey and the south coast at regular frequencies. There are some peak period additional services to certain destinations.

Southern's Gatwick Express branded premium services consist of a non-stop train between the airport and London Victoria every 15 minutes. During the peaks, these services are extended to Brighton.

Southern Railway operate non-premium services to Three Bridges from Victoria at least every half an

hour, all day, every day, to serve Gatwick Airport's 24 hour operations.

Main line services to London Bridge have a very intensive peak period with services terminating in the nine low level platforms. The off peak service is significantly lower, much of it being made up of four Bedford to Brighton through trains per hour. These services cannot generally operate via London Bridge during peak hours due to the lack of capacity in the area.

The London area passenger suburban service is governed by the complex nature of the network and by interaction with main line and First Capital Connect services, particularly during the peaks.

Outside the London suburban network, Brighton is the largest and busiest station with its own peak being served by trains from London, Bedford and the East & West Coastway lines.

The East and West Coastway lines from Brighton are served by a mixture of local stopping services and semi-fast services providing faster links between the main towns. The East Coastway links Brighton to Lewes, Eastbourne, Hastings and Ashford, in Kent whilst the West Coastway links it with Hove, Worthing, Littlehampton, Bognor Regis, Chichester, Havant, Portsmouth and Southampton. The few FGW West Coastway services go further, to the South West.

The WLL is currently served by a combination of through services Southern Railway's East Croydon to Milton Keynes (calls all stations to Wembley Central then semi-fast) and London Overground's Clapham Jn to Willesden Jn all stations shuttle (with some peak trains extended to Stratford).

In addition there are typically 20-30 freight trains per day in operation each way on this line.

Southern Railway has taken over the operation of Tonbridge to Redhill line from Southeastern and operates direct services to London Bridge.

Figure 1 and Figure 2 show the current level of service to London from principal stations. Peak arrivals are trains arriving at London Bridge, Blackfriars or Victoria between 08:00 and 08:59. Off peak trains arriving between 12:00 and 12:59.

Figure 1 Current main line train service level (trains per hour)

Station	London Bridge or Blackfriars	Victoria
Brighton	3 peak/4 off peak	5 peak/3 off peak
Haywards Heath	6 peak/4 off peak	8 peak/3 off peak
Gatwick Airport	5 peak/4 off peak	6 peak/8 off peak
Redhill	4 peak/4 off peak	2 peak/2 off peak
Oxted	4 peak/1 off peak	3 peak/2 off peak
East Croydon	17 peak/11 off peak	12 peak/9 off peak

Figure 2 Current suburban train service level (trains per hour)

Station	London Bridge or Blackfriars	Victoria
Sydenham	7 peak/6 off peak	0 peak/2 off peak
Norbury	1 peak/2 off peak	6 peak/6 off peak
Crystal Palace (via Gipsy Hill)	1 peak/2 off peak	4 peak/4 off peak
Sutton (via Hackbridge)	3 peak/2 off peak	3 peak/4 off peak
Wimbledon (via Tooting)	4 peak/2 off peak	None
West Croydon	4 peak/4 off peak	5 peak/6 off peak

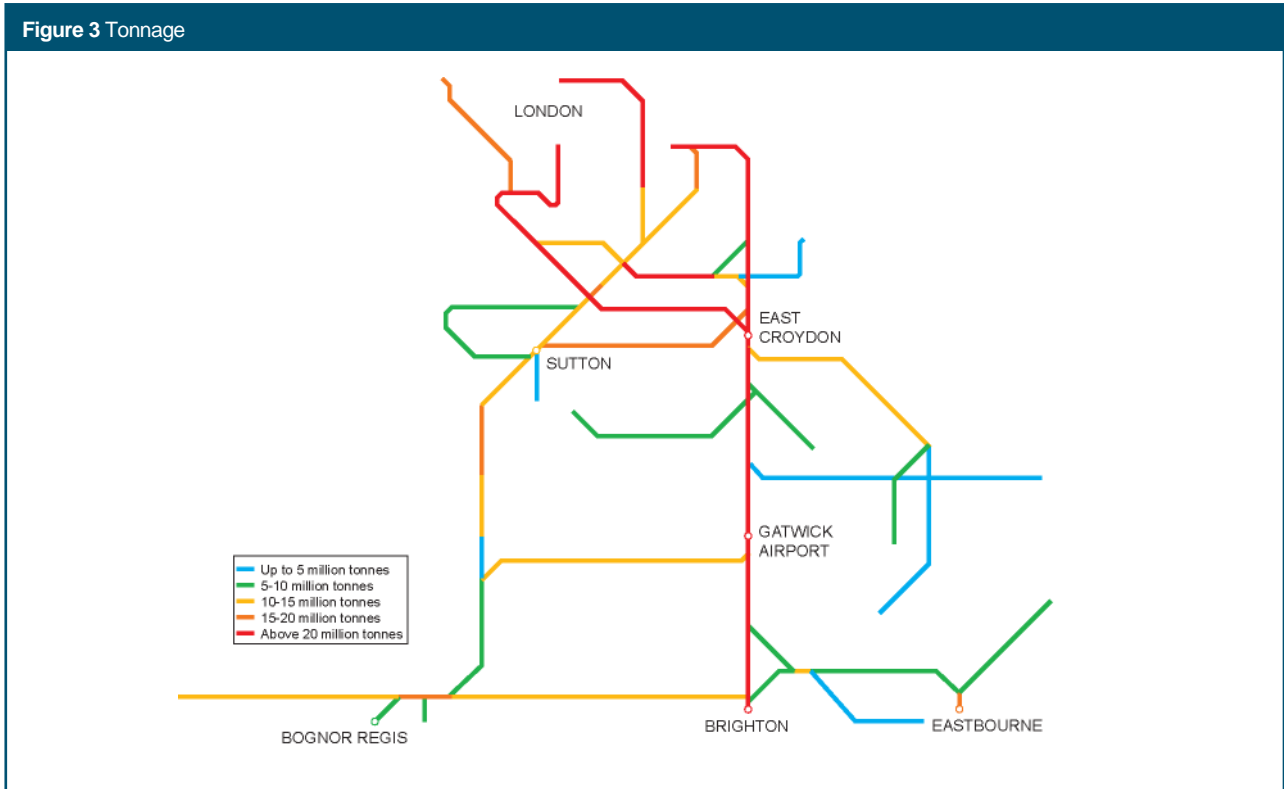


Figure 3 shows the total annual tonnage levels on the route.

Traffic volumes are summarised in Figure 4.

Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	37	1	38
Train tonne km per year (millions)	9,493	265	9,757

Current infrastructure capability

The following maps provide an indication of the predominant capability on each section of the route.

As part of the Infrastructure Capability Programme a number of Network Changes to Route Availability and Gauge, which may affect some of the detail of these maps, have been issued for consultation. Details of the Network Changes being consulted can be found on the [Network Rail](#) website and details of Network Changes established can be found on the [Network Rail](#) website.

Current capability is shown in the Network Rail Sectional Appendix.

Figure 5 Linespeed



Figure 6 Electrification

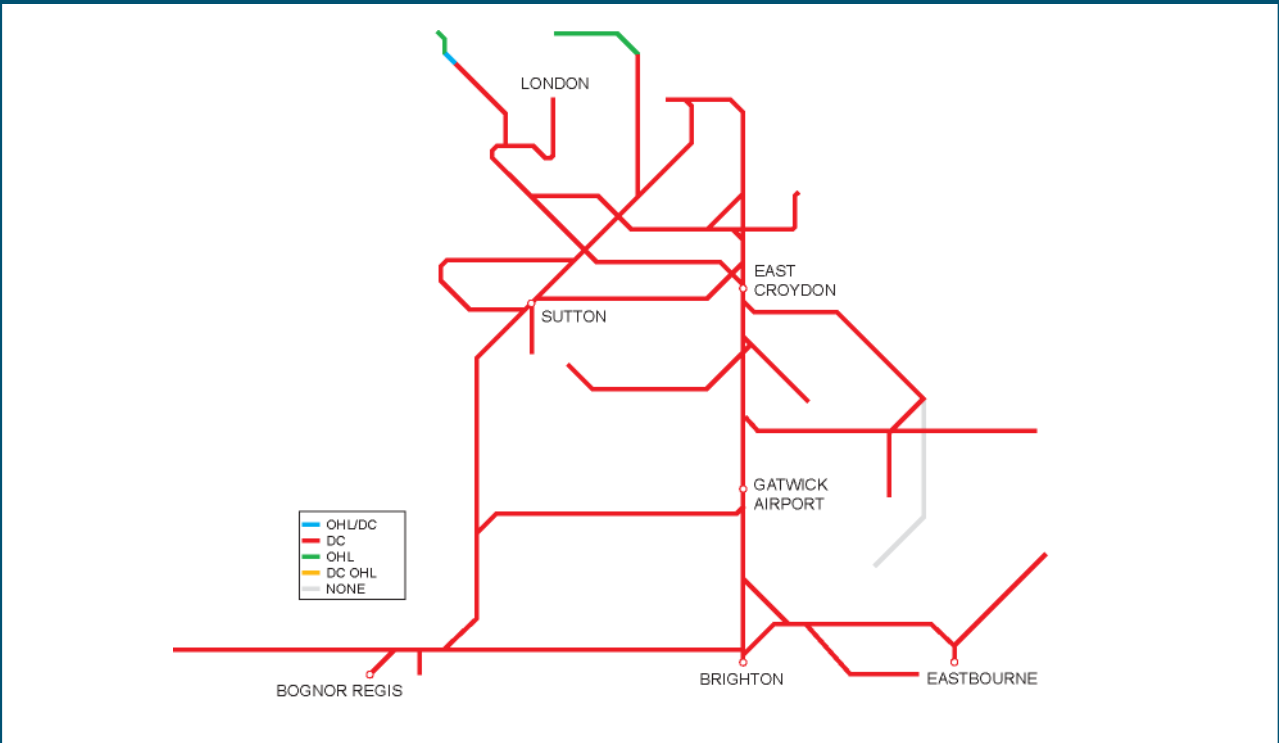


Figure 7 Route availability

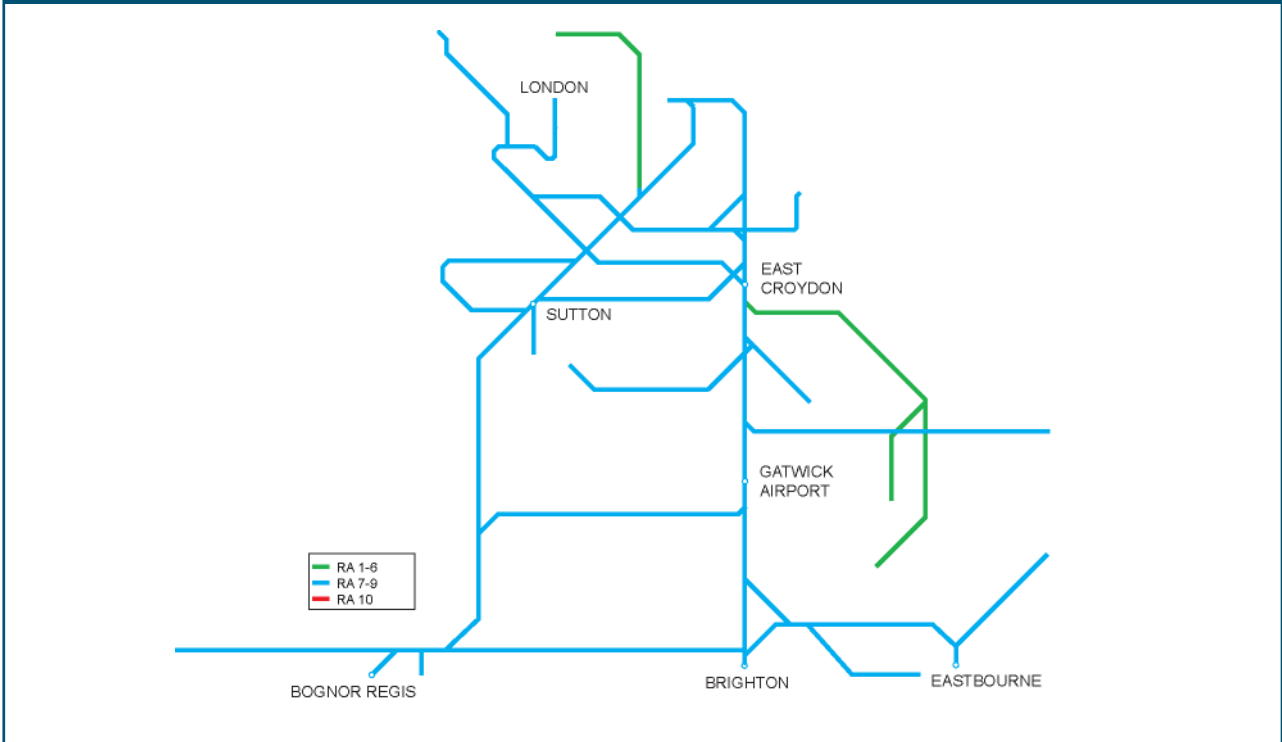
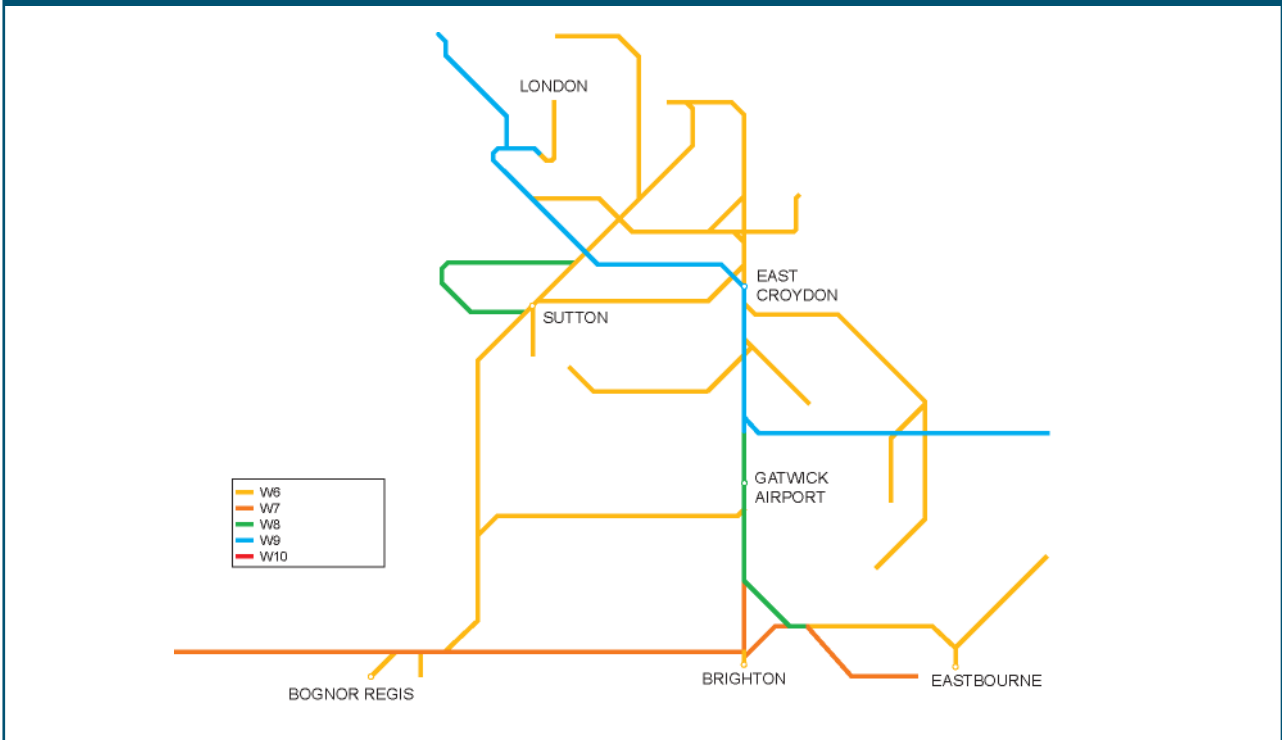


Figure 8 Gauge



Current capacity

The route is operating near capacity for several hours each day. This is governed by a mixture of constraints, in particular the layout of certain junctions, dwell times at stations, limited reversing facilities and some features of the existing timetable. The issues are interlinked and overall route capacity is affected by a combination of these factors.

Key constraints to main line services are highlighted below:

- Available platforms at Victoria, and the turnaround time of terminating services in the platforms
- the restrictive layout of the approaches to London Bridge and the limited number of platforms
- the two track railway between Balcombe Tunnel Jn and Brighton constrains capacity due to station dwell times on the stopping services
- 8-car platform lengths and limited through capability of the core Thameslink route
- 8-car platform lengths on the East Grinstead line
- conflicting moves between Down Victoria & Up London Bridge fast line services at Windmill Bridge Jn and fast to slow line crossing moves at Selhurst
- the current method of operation at Gatwick Airport, due to numerous crossing moves between the fast and slow lines
- the dedicated Gatwick Express Platforms 13/14 at Victoria limit other main line services to using Platforms 15-19
- Fixed 15 minutes headways between Gatwick Express services
- the restrictive track layout and number of trains needing to reverse direction or split and join at Redhill.

Key constraints to suburban services are highlighted below:

- the restrictive layout of the approaches to London Bridge, the limited number of platforms and the intensive use of the available peak capacity by main line services
- suburban platform lengths generally limit trains to eight-car
- Platforms 5 and 6 at Purley limiting attach and detach operations to no more than 8-car lengths
- suburban services are generally restricted to using only Platforms 9 to 12 at Victoria
- conflicting moves at the numerous flat junctions, particularly Battersea Park, Balham, Streatham North, Streatham Common, Selhurst and Gloucester Road
- the convergence of multiple suburban routes in the Croydon area, with very limited capacity for

turning trains round at both East and West Croydon. These challenges will increase substantially when ELL services commence in June 2010

- conflicting moves between Down Victoria and Up London Bridge slow lines at Windmill Bridge
- only a single platform available for turning trains in the Sutton area
- the requirement to run most peak period Brighton – Bedford services via Herne Hill utilises capacity that would otherwise be available for suburban services
- the short formation Victoria – Peckham Rye – London Bridge service utilises the same platform capacity at each end of its route as longer trains from further out.

Other notable constraints are:

- the power supply capacity, particularly south of Gatwick
- the flat junctions at either end of the West London Line with very limited locations suitable for holding freight trains anywhere else on Routes A or B
- the inability to operate Class 92 hauled freight services via Redhill, resulting in the lack of availability of a second unrestricted Channel Tunnel route
- the single line sections of the Uckfield Line
- passenger congestion at key stations such as Clapham Jn, Gatwick Airport, Balham, Victoria, London Bridge, Blackfriars, Farringdon and East Croydon
- route availability restrictions and train length restrictions to specific freight terminals

Figure 9 represents the number of trains in the morning peak hour.

Current performance

Figure 10 shows the latest PPM for the main TOCs operating over the route.

The Sussex Route is particularly sensitive to external events over which the rail industry has no direct control. Specific examples include:

- weather, particularly extremes of cold, rain and snow
- fatalities
- trees falling onto the railway from outside the boundary.

The complex layout and density of traffic on the Sussex Route means that performance can be severely affected by large incidents, partly due to the complexities of train crew and rolling stock diagrams. In depth joint contingency plans for the

Route, drawing on experience gained in previous incidents, have been agreed, these plans assist service recovery and are subject to continual review by the joint Control Centre team. Performance based table top exercises are being implemented to aid Control Centre staff in dealing with incidents, based upon the more usual events rather than the catastrophic e.g. complex cable failures, complex wrong-side failures and fatalities etc.

Figure 9 Current train service level (peak trains per hour)

Route Section	Fast lines	Slow lines
Battersea Park – Victoria	16	15
Sydenham – London Bridge	15	8
East Croydon – Windmill Bridge Jn	20	20
Keymer Jn – Balcombe Tunnel Jn	12	N/A

Figure 10 2009/10 PPM

TOC	MAA	As at period
Southern	90.6%	11
First Capital Connect	89.4%	11

Section 2: Tomorrow's railway: requirements

HLOS requirements

Figure 11 below shows the HLOS output requirement for the total demand to be accommodated on the former strategic route which makes up Route B: Sussex.

Figure 11 Total demand to be accommodated by Strategic Route

Routes	Annual passenger km in 2008/09 (millions)	Additional passenger km to be accommodated by 2013/14 (millions)
Sussex	4,681	536

Figure 12 Peak hour arrivals to be accommodated by Strategic Route

London Terminals	Peak three hours			High peak hour		
	Assessed demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)	Assessed demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)
Blackfriars (via Elephant & Castle only)	21,900	3,500		11,200	1,200	
London Bridge (includes Charing Cross/Cannon Street/Blackfriars and terminating services)	127,600	12,600	67	65,200	7,800	76
Victoria (includes Kent services)	58,700	5,300		29,300	2,800	

Note: the load factor requirement in the HLOS applies as an average across 12 London stations.

Future demand in CP4

Passenger numbers are anticipated to continue to grow strongly throughout the route, with peak commuter travel into London expected to grow to quickly fill up any additional capacity that can be provided in the short term.

A detailed assessment of future demand patterns for the London suburban area was carried out as part of the SL RUS. This work highlighted that passenger numbers on these services will grow at around 15 percent within the RUS period (to 2019). However existing demand is suppressed by typically 10 percent due to current overcrowding levels, leading to a potential overall growth rate of 25 percent.

The SL RUS acknowledges that annual growth rates higher than those projected over the 10 year period have been experienced in recent years. AM peak demand growth on Southern Metro services was around 15 percent over the three years to the end of 2007, however the rate of growth tailed off considerably during 2008 as trains became increasingly congested.

Currently available data suggests only a limited impact thus far from the recession, with passenger numbers on suburban services holding up around 2007/08 levels. Nevertheless it is reasonable to expect SL RUS growth projections to 2019 to be realised 2-3 years later than originally anticipated.

For main line services, the Sussex RUS published in January updated demand forecasts for main line services to 2020. The RUS covers all routes and services in the Route B area with the exception of those suburban routes covered in the SL RUS. Growth of 22 percent in passenger numbers is expected by 2020. This projection factors in the current recession.

The planned operation of ELL services from stations on the Sydenham line will open up new journey opportunities and demand from this line to northern parts of the City, plus interchanges to the Jubilee, District, Hammersmith & City and DLR.

Charing Cross, located in the heart of the West End, is likely to remain the preferred final destination for a significant proportion of the suburban flows into London Bridge.

There is significant peak period interchange from suburban services onto the Northern Line at Balham, contributing to congestion both at the station and on the Northern Line itself. Many of those interchanging are believed to work in the City

of London so it may be possible to reduce this feature over time by providing an increased level of peak service from the Norbury and Gipsy Hill routes direct to London Bridge.

The opening of Shepherd's Bush station on the WLL in late 2008 has led to even higher levels of peak crowding on the route. The station is adjacent to the new Westfield shopping centre development. Also on the WLL, Imperial Wharf station opened in autumn 2009 and crowding on some peak services has meant boarding some high peak trains at this station can be difficult. Growth associated with these new stations and existing stations at West Brompton and Kensington Olympia is likely to continue at a similar rate to the rest of the Sussex suburban network.

Passenger growth at Gatwick Airport is likely to continue in the medium to long term and increased rail share of passenger journeys to and from the airport continues to be a focus of the airport owners.

The increase in budget airlines operating from Gatwick is already reflected in higher rail passenger numbers over the last four to five years although the recent economic downturn has hit overall passenger numbers at Gatwick over the last two years. The airport has three distinct peak times which affect rail passenger loadings in the am peak, early afternoon and pm peak.

Demand on the Coastway routes is likely to continue to grow in line with employment and leisure growth in Brighton, Portsmouth and elsewhere. A further factor is the increasing traffic congestion on the A27 highway corridor and in town centres.

The high peak into Brighton from the West Coastway has experienced the greatest increase in passenger demand in recent years. Southern added significant additional capacity to the timetable in 2007 and the new franchise will provide further additional capacity between both the West and East Coastways and Brighton from December 2010.

Across most of Route B, demand for travel at weekends has grown substantially over the last five years and these trends are expected to continue throughout CP4.

With regards to freight, the Freight RUS was published by Network Rail in March 2007 and established by the Office of Rail Regulation in May 2007. A key input to the strategy was a set of ten year demand forecasts that were developed and agreed by the industry through the RUS Stakeholder Management Group. The forecasts

indicate demand in the Route B area is likely to continue to be predominantly aggregates traffic moving into the south east from quarries located in the Midlands and West and dredged aggregate sources in the Thames/ Thames estuary area. As a result future demand will be closely linked to the future of the construction market in the South East and also any major individual projects such as motorway widening and airport expansion.

Future demand beyond CP4

The Government's 2007 Rail White Paper predicts a doubling of freight demand over the next 30 years, and long term forecasts to 2030 have been agreed with the industry. These show the continued growth in freight beyond CP4.

For Passenger traffic, work done to support the Sussex RUS suggest demand forecasts for main line services to 2019 of 22 percent passenger growth and 30 percent passenger growth by 2026.

The SL RUS has outlined likely growth of 25 percent in the suburban area to 2019 as noted above.

Section 3: Tomorrow's railway: strategy

Figure 13 summarises the key milestones in delivering the proposed strategy for the route.

Further explanation of the key service changes and infrastructure enhancements are set out in the following sections.

Figure 13 Summary of proposed strategy milestones			
Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
May 2010	East London Line Extension Phase 1	New Cross Gate flyover Turnback siding at West Croydon Additional platforms and track layout changes at Crystal Palace Additional crossover at South Croydon & reversible signalling in Platform 4	ELL services to West Croydon and Crystal Palace
December 2010	Timetable changes on BML and Coastway routes	None	Additional capacity on Coastway routes into Brighton. Later evening services in the suburban area, possible additional off peak Brighton <-> Victoria services
December 2011	Thameslink Programme Key Output 1	<u>12-car platform lengths at Farringdon</u> <u>12-car platform lengths at Blackfriars, with new bay platforms</u> Power supply upgrade	<u>Allows 12-car services to operate across central London and onto BML from the Thameslink route</u> <u>Provides congestion relief at Farringdon, integrated with future Crossrail requirements</u> <u>Provides congestion relief and a new South Bank entrance at Blackfriars</u>
December 2011	12-car operations on East Grinstead Line	Several platform extensions and associated works. Power supply upgrade.	12-car East Grinstead to Victoria/ London Bridge services
March 2012	10-car suburban operations West / East Croydon <-> London Bridge	Platform extensions and associated S&C and signalling works at a number of stations.	10-car operation of high peak Sydenham slow line services
December 2012	Alterations to platforming of Gatwick Express services	Additional platform and track layout modifications at Gatwick Airport	Improved performance
To be confirmed	Commencement of London Bridge area construction works	<u>Construction of new platforms at London Bridge</u> <u>Track layout modifications on station approaches</u>	Temporary reduction of London Bridge Low level peak services from approximately 30tph to 24tph at peak times.

Figure 13 Summary of proposed strategy milestones

Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
December 2013	10-car suburban operations on Streatham Hill, Norbury and Hackbridge routes	Platform extensions and associated S&C and signalling works at a large number of stations. Power Supply upgrade	High peak operation of 10-car services on Streatham Hill, Norbury and Hackbridge routes
2014/15	DC regenerative braking	Modify circuit breakers and raise traction supply on all inner London routes to 750V DC (Regen currently available for some stock types)	Potential reduction in electric current for traction costs to train operators and a marginal increase in available traction supply capacity
CP5	Lengthening of remaining high peak Redhill corridor services 8- to 12-car	Possibly further stabling required at Horsham Down side	Three Redhill – Victoria services 8-/9-to 12-car (some Redhill – London Bridge services lengthened to 10- & 12-car in CP4).
CP5	Lengthening of Caterham and Tattenham joiners at Purley	Platform extensions at Purley	10- and 12-car operations of Tattenham and Caterham services in the high peak
CP5	Completion of Thameslink Programme	Completion of London Bridge station works, with nine through and six terminal platforms Completion of remodelling of approach tracks, including Bermondsey dive-under	To be confirmed
CP5	Lengthening of Uckfield services	Platform extension to allow 10-car 23 metre vehicles at Uckfield station	High peak hour Uckfield services extended to 10-car operation

Figures 14 and 15, below, show how the HLOS load factor targets for locations on the route are met by the proposed strategy.

The measures will also allow the total additional passenger km. The assumption on which services will be lengthened is based on Southern's commitments as part of the new franchise which commenced in September 2009.

Note that the temporary impact of construction works at London Bridge for the Thameslink

Programme been excluded from this table. The actual capacity provided at the end CP4 into London Bridge could therefore be different to that shown.

Capacity metric changes as a result of Thameslink Key Output 1 and other potential timetable change are excluded from Figures 14 and 15, but are unlikely to amount to more than 10 vehicles during CP4.

Figure 14 Capacity enhancements to meet HLOS peak capacity in CP4

Description	Approximate Additional vehicles involved	Station served	0700 – 0959 Capacity Impact	0800 – 0859 Capacity Impact
London Bridge/East Croydon/Norwood Jn to Victoria via Streatham Hill	14	Victoria	1,700	900
Sutton/Epsom Downs to Victoria via Norbury	22	Victoria	2,600	1,300
Horsham/ Epsom to Victoria via Hackbridge	14	Victoria	1,700	900
East Grinstead to Victoria/LB via Clapham Jn Fast Lines and Sydenham fasts respectively	32	Victoria/ London Bridge	3,000	1,400
East Croydon/ West Croydon/Epsom to London Bridge via Sydenham Slow Lines	24	London Bridge	2,600	1,300

Figure 15 Impact on HLOS peak capacity metric

London Terminals and regional Hubs	Peak three hours				High peak hours			
	Demand end CP4	Capacity start CP4	Capacity end CP4	Load factor end CP4	Demand end CP4	Capacity start CP4	Capacity end CP4	Load factor end CP4
Blackfriars (via Elephant & Castle only)	25,400	25,900	33,400		12,400	10,900	13,300	
London Bridge (includes Charing Cross/Cannon Street/Blackfriars and terminating services)	140,200	179,300	192,200	66%	73,000	81,100	88,900	75%
Victoria (includes Kent services)	64,000	95,700	103,800		32,100	41,400	45,300	
Other London Termini	332,300	442,100	533,800		164,800	190,600	231,500	

Strategic direction

The Sussex route will undergo a significant period of change over the next ten years. The most visible of these will be the completion of the extended East London Line Phase 1, the commencement and completion of construction works for the Thameslink Programme and the rolling programme of platform lengthening works in the suburban area.

In parallel with these major projects, significant timetable changes will be required in May 2010 to facilitate ELL services and in December 2010 to bring in further changes agreed as part of the new Southern franchise as outlined in Figure 13.

The SL and Sussex RUSs have identified that train and platform lengthening will be the major means of delivering growth in the London suburban area.

The key infrastructure enhancement requirements for CP4 are therefore:

- track layout, signalling and platform work at various sites to facilitate 10-/12-car operations as identified in Figure 13
- Power supply upgrades to support longer trains and new rolling stock
- implementation of the Thameslink Programme.

Future train service proposals

Figure 16 indicates the forecast percentage change in tonnage on the route to 2020.

The completion of the ELL extension and the construction works and subsequent completion of the Thameslink Programme will lead to opportunities for new train routeings.

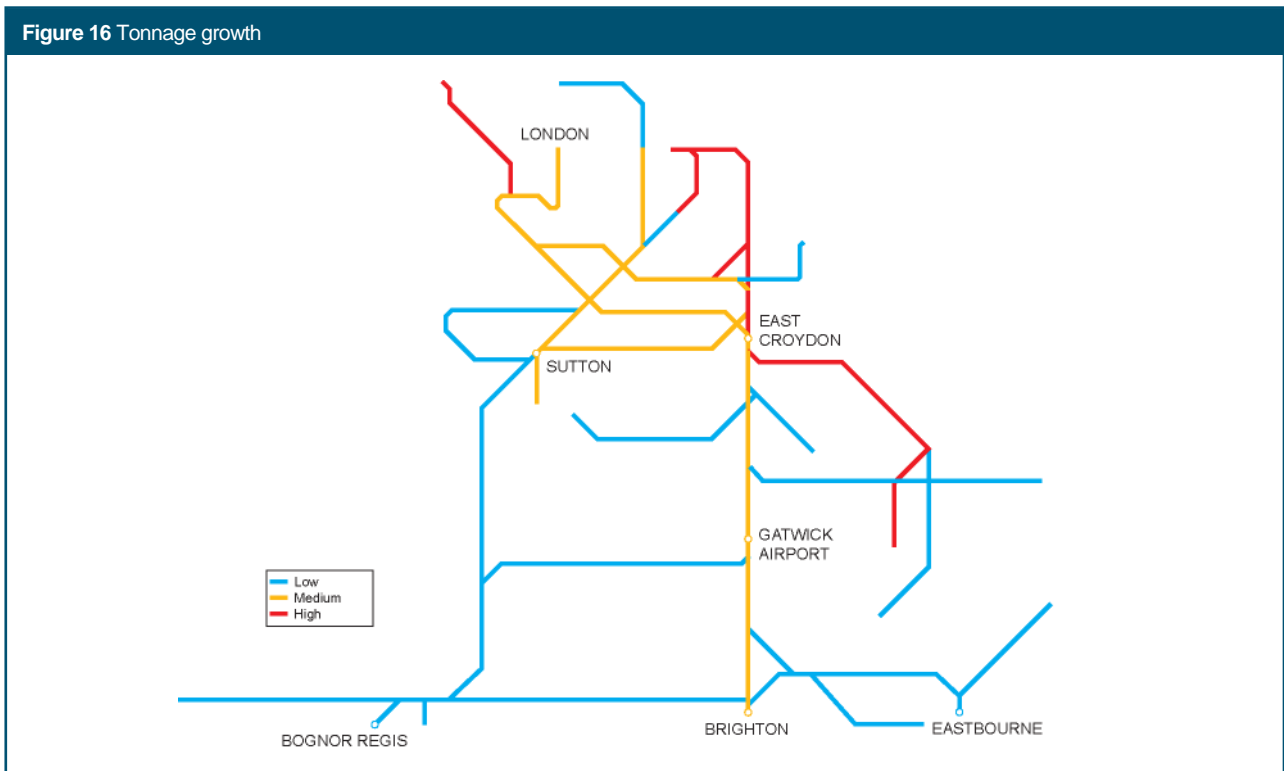
ELL services will operate onto the Network Rail network north of New Cross Gate. These will offer new journey opportunities but services will be restricted to 4-car so will be operated by high density rolling stock designed for large numbers of standing passengers. The service pattern on weekdays will be 4tph ELL core <-> West Croydon and 4tph ELL core <-> Crystal Palace.

Network Rail worked closely with the Department for Transport prior to the issue of the South Central Franchise Invitation to tender (ITT) to identify the opportunities for operating later trains in the Route B area on Friday and Saturday nights. The winning bidder, Southern, has committed to a number of significant service changes from December 2010; these include:

- Later trains on Friday and Saturday evenings in the suburban area
- Improvements to the timetable and available capacity between the West and East Coastway and Brighton.

In addition to these changes the Sussex RUS has recommended the insertion of stops at Clapham Junction into between two and four Gatwick Express services in the morning and evening high

Figure 16 Tonnage growth



peaks. This measure will decongest existing services from the coast that offer Clapham Junction interchange and also make best use of available capacity on Gatwick Express services in the peak.

Services from the Thameslink core will operate to various suburban and longer distance destinations on the Sussex route. Within CP4 these will be limited on the Sussex Route to Wimbledon loop destinations and Brighton/Three Bridges. Within CP5 origin/destinations are likely to expand to include service substitution to the Redhill corridor/Horsham via Crawley to London Bridge services and some services in the peak on the East Grinstead Route. These trains will operate both south and north of the Thames and will therefore be both AC and DC equipped.

Future capability

The key infrastructure capability issues are related to train lengthening requirements. Some of the platform lengthening works will require only minor associated works such as relocation of Driver Only Operation equipment and extension of existing platforms. Certain sites require more significant work such as track layout changes, bridge reconstruction and considerable alterations to the positioning of signals.

The most significant implications of the suburban 10-/12-car strategy for depots and stabling are likely to be at Selhurst depot, where many roads are not suitable for 10- or 12-car formations. Yard Road Headshunts 1 and 2 are to be extended to 10-car length. The Field Sidings site at Selhurst may also be required to support 12-car TLP services in CP5.

A number of other significant depots and stabling facilities such as Streatham Hill and Horsham do not have adequate capacity for 10- or 12-car formations at present though options exist for additional capacity particularly at Horsham, where the Up Dorking side and the Down Crawley side of the lines will be required in CP4 and CP5 for additional stabling (the former for TLP services). A number of regularly used stabling points such as Pugs Hole (Victoria) and Battersea Pier are unable to take 10-car formations and clearly could not be extended. In the short to medium term additional capacity at Stewarts Lane is available though the depot's location is sub optimal for the morning suburban peak.

Further stabling and depot facilities will also be needed for the Thameslink 12-car trains. The main depot provision for these formations is likely to be at Three Bridges with a number of other stabling sites also under consideration including Brighton (plus

Horsham and Field Sidings as previously mentioned).

Selective Door Opening capability will be required at a number of stations in the Route B area, in order to support 10- and 12-car operation in the suburban area. The stations where SDO will need to operate are listed in Network Rail's Delivery Plan.

Despite the recent completion of significant power supply upgrade work, further work will be required at a number of locations across the route to facilitate delivery of the proposed timetable changes and train lengthening set out in Figure 13. New substations will be built on the East Grinstead route. Upgrades to existing substations in the Croydon area will be completed and a TP hut to substation upgrade will be required at West Croydon and other sites in the Sutton area. Further works will be required on the BML south of Keymer Junction.

As part of the Strategic Freight Network, there is provision in CP4 for potential development of the Tonbridge – Redhill – Balham route as an alternative Channel Tunnel route compatible with Class 92 locomotive haulage. This will involve conversion of existing track circuits on part of the route and possible power supply upgrade. Subject to further cost development, if implemented this project will provide the ability to operate Class 92 hauled freights from the continent to WCML destinations even when the current Class 92 cleared route via Maidstone is blocked providing a key Channel Tunnel freight diversionary route.

Future capacity

The SL RUS and Sussex RUS highlight that the route is operating close to the maximum number of trains that can be run in peak periods at present.

As a result, both RUS's recommend a programme of train lengthening. The recommendations of the SL RUS are now committed and will be delivered as described in Figure 13 during CP4. A 20 percent uplift in high peak capacity will be achieved as a result on the Hackbridge, Norbury, Streatham Hill, Sydenham Slow line corridors, with a 50 percent uplift being achieved in the high peak on the East Grinstead route.

Rolling stock to deliver this programme is divided into two tranches. Firstly Southern will bring currently off lease Class 313 units into their fleet by 2010/11 allowing the cascade of Class 377 units into the suburban area to facilitate December 2011 lengthening of East Grinstead and Sydenham Slow line services.

The second phase of train lengthening in December 2013 on the Hackbridge, Norbury and Streatham Hill corridors, is dependent on the return of the 'Lot 10' Class 377's from Thameslink as new Thameslink stock arrives.

Also during CP4 infrastructure works on the Thameslink core will allow current 8-car services to operate between the BML and Thameslink destinations north of London at 12-car by December 2011. Precisely how many services will operate at this extended length will depend on available rolling stock but the infrastructure will be available to facilitate such operation.

On the West Coastway the new franchise will deliver extra vehicles to/from Brighton during the peak from December 2010 onwards.

The Sussex RUS identifies a further round of train lengthening for early CP5. In particular 10- and 12-car operation of Caterham and Tattenham joining services, 10-car operation of Uckfield services and 12-car operation of remaining 8-car Redhill corridor to Victoria services.

Also by CP5 it is clear that some form of train lengthening will need to be delivered on the West London Line to tackle current and anticipated future levels of overcrowding. Whilst LOROL services are likely to be limited to no more than 4-car operation, due to their origin and destination points on the North London Line, Southern services operating from Clapham Junction and Croydon to the WLL in the peak could be lengthened if Platform 17 at Clapham Junction could be extended, or if a crossover and reversible working was installed in Platform 16.

Network Rail has undertaken some initial feasibility assessment of these options and it is likely that a scheme will be proposed for CP5 funding.

In addition to train lengthening initiatives, a number of major infrastructure enhancements at key capacity bottlenecks are planned within CP4.

The planned remodelling of the Gatwick Airport track and platform layout would provide some additional capacity in this area and ease one of the major constraints on the route as well as providing performance benefits. However additional trains to London during the peak would be dependent on additional capacity being available elsewhere on the route, particularly through the East Croydon – Windmill Bridge Jn corridor and at London Victoria.

Land adjacent to the station at East Croydon station is being safeguarded in order to allow for the future

development of additional platform capacity in CP5 or CP6.

The SL RUS and Sussex RUSs plus other workstreams have identified that certain stations will require works to enable them to cope with the predicted growth in passenger numbers:

- London Bridge station is very congested. This is to be addressed by the London Bridge Masterplan which forms part of the Thameslink Programme
- parts of Victoria station, notably the interface between main line and underground stations, are very congested. Options for increasing passenger capacity are under development by Network Rail's Victoria Masterplan project and are being closely coordinated with London Underground's plans for de-congestion of access
- Blackfriars and Farringdon are also congested stations and capacity will be increased significantly by the Thameslink project
- Clapham Jn is severely congested in places. In addition to current Access for All work options for a short term improvement by providing a new station entrance to the footbridge have been developed and are planned for delivery in CP4. Network Rail will continue to seek adequate funding sources for work to improve stepping distances on the Sussex Route platforms. In CP5 further money may need to be spent on decongestion of some areas of the platforms and in particular access from platforms to the underpass.
- Balham station is currently congested with significant interchange movements to the Northern Line. An NSIP scheme is under development to provide a second entrance
- East Croydon will require works in the short term to relieve congestion. A project is under development for implementation in CP4 that would expand the area of the concourse between the ticket barrier line and the platform access and also provide a second entrance/ exit on the west side of the station.

Future performance

Figure 17 sets out the planned PPM for each train operator.

Figure 17 Forecast PPM MAA - CP4 plan

	2010/11	2011/12	2012/13	2013/14
First Capital Connect	92.1%	92.4%	92.7%	92.9%
Southern	90.9%	91.1%	91.6%	91.9%

Southern Railway

The performance of the Southern Railway franchise at period 11 2009/10 is currently 90.6 percent PPM.

The key performance issues and opportunities for this route have been identified as:

- the impact of the East London Extension, in particular the substantial increase in train movements in the West Croydon <-> Norwood Jn area from May 2010
- Thameslink Programme work
- the impacts of the December 2010 timetable change on the BML
- full remote condition monitoring for all assets;
- removal of certain permanent speed restrictions across the route
- reduce the impact of trespass, vandalism and fatalities
- weather management
- Rules of the Plan review.

First Capital Connect

First Capital Connect operates the suburban train routes into London King's Cross and the cross-London Thameslink route. The performance of the TOC is currently 89.4 percent PPM as at period 11 2009/10.

There is a significant level of change in service patterns driven by the Thameslink works throughout CP4. This, together with relatively major changes to fleet resources, will result in some challenges to maintain performance.

The key performance issues and opportunities identified for this TOC include:

- minimising the operational impact of the Thameslink programme, there is a degree of uncertainty around the full impact of the work programme
- the impact of the ELL extension and associated rewrite of the South London and Brighton Mainline timetables
- the impact of passenger growth
- the impact of enhancements on the East Coast – especially around King's Cross, Finsbury Park and Hitchin
- specific concerns over seasonal variation and the likely benefits of Remote Condition Monitoring;
- maintenance of journey times
- the impact of fleet changes – and stabling arrangements

The other passenger operators on this route are FGW, SWT and London Overground. The future performance section for FGW can be found in the plans for Routes J & K, SWT in the plan for Routes C and London Overground in the plan for Route E.

Network Availability

Engineering access on the route is largely managed by a cyclical possessions regime, generally providing our engineers with access to every location on the route at least every 13 weeks.

Overnight maintenance opportunities are particularly short, primarily due the very high passenger demand for trains leaving London late in the evening, this results in midweek possessions generally lasting no more than four hours, severely limiting the types of activity that can be carried out on weekdays and significantly increasing overall maintenance costs.

On the two-track section of the Brighton Main Line south of Balcombe Tunnel Junction, there is no weeknight cyclical maintenance access as London to Brighton services run throughout the night, and access is only secured on an exception basis.

In the suburban area (inner and outer) new, later services on Friday and Saturday nights are due to commence in December 2010 as a result of the 2009 South Central refranchising process, and at the time of writing these all look likely to be accommodated.

For most of the year demand for weekend services is significantly lower than that for weekday services, though it is rising consistently across the Sussex Route at present and is likely to soon be on a par with that off-peak on weekdays.

Major items of engineering work are presently scheduled to be carried out on Sundays, and in some cases Saturdays too, affecting fewer passengers than weekday possessions but still creating disruption for the growing weekend market. Weekend passenger demand is particularly high for coastal services (especially to Brighton) between mid May and mid September, during which time we seek to avoid disruptive engineering work.

16 consecutive weekends are kept blockade free on the Brighton Main Line during the summer, and for the December 2011 timetable this will increase to 26, with the intention that this applies all year round for the December 2012 timetable. Key events such as the Brighton Marathon and Lewes Bonfire are also factored into access planning.

There are opportunities to divert passenger services if main routes are closed, but these often result in significant extensions to journey times. However, multiple routes to London from Croydon, Sutton, Epsom and Horsham are used frequently and

successfully. It is normally possible for two tracks to be kept open to traffic during most types of maintenance work on the four track sections of the Brighton Main Line. This enables an hourly overnight service to run between London Victoria and Three Bridges every night of the week. If access to three lines is required, this can be taken on a Saturday night with trains worked over the remaining open line. If access to four lines or access of a longer duration is required, this is generally planned around Christmas Day and Boxing Day.

The route will be affected by some significant and challenging engineering projects over the next few years. Careful planning is underway for these schemes to minimise any adverse impact, and operators are closely involved in this process. Examples include the Thameslink Programme (especially works around London Bridge), together with the potential enhancement schemes at Gatwick Airport and East Croydon.

Some freight flows are also affected by engineering access, and customer needs are actively considered when it is being planned. This includes significant co-ordination between Sussex Route and Kent Route to ensure that Channel Tunnel freight can always operate via Tonbridge, Redhill and Clapham Junction when the usual route in Kent is blocked.

A number of recent developments stemming from the network-wide Seven Day Railway project are affecting the Sussex Route:

- Network Rail and the Association of Train Operating Companies (ATOC), with support from Passenger Focus, are undertaking an initiative that will help further reduce the need for replacement buses at weekends and on bank holidays on twenty key city to city routes, one of which is the Brighton Main Line. Network Rail will aim to facilitate a rail journey at all times other than exceptional circumstances when the demands of rail improvement work make this impractical. The commitment will be progressively introduced in 2010 and 2011, meaning that work planners will be required to look for alternative routes to divert via (not adding more than 30 percent additional time) and look at the use of single line working to get around any major works that are planned.
- Production of Joint Network Access Plan (JNAP) with Southern, outlining joint initiatives to reduce disruption to passenger services. This is supported by a monthly working group, which looks at ways of improving the management of the disruption caused by engineering access,

such as use of more single line working on selected routes and termination of services at more convenient locations for rail users.

- Reductions in summer and year-round weekend possessions on the East and West Coastway, in line with Brighton Main Line reductions detailed above.
- Greater collaboration with renewals teams to help minimise disruption to passenger services.
- Delivery of a number of small-scale enhancement schemes to improve the efficiency of Maintenance access are under consideration for possible Seven Day Railway funding:
 - new/improved track access points
 - new/improved storage areas at selected access points
 - major junction fixed lighting
 - motorised electrical hook switches

Long term opportunities and challenges

The Department for Transport published its formal consultation document 'Delivering a Sustainable Transport System' (DaSTS) in November 2008. It sets out long term transport priorities for the period to 2019 and beyond and reflects conclusions from the Eddington Study and the Stern review.

The document sets out five clear transport goals for the network these are:

To support national economic competitiveness and growth by delivering reliable and efficient transport networks.

To reduce transport emissions of carbon dioxide (CO₂) and other greenhouse gasses, with the desired outcome of tackling climate change.

To contribute to better safety and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health.

To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society, and

To improve quality of life for transport users and non transport users, and to promote a healthy natural environment.

Rail has potential to help meet these objectives and Network Rail will continue to engage with the Regions and Local Authorities at all levels of the process. There are four stages in the process. In stage one each Region was invited to propose a number of strategically relevant studies to take

forward which they believe will meet the DaSTS objectives. The DfT then selected the studies that would progress to stage two to generate options for appropriate interventions. All studies are currently in stage two and need to produce a long list of options by the end of March 2010 for further review. Stage three will involve the sifting and packaging of options, while stage four will see the completion of an overall programme, with all studies complete by 2012.

As part of the DaSTS programme there are both National and Regional studies, the national studies are led by DfT and the local studies are led by the Regions. There are a number of joint studies with the involvement of both the DfT and the Regions.

There is a national Freight Modal Choice study looking to confirm the economic, social and environmental benefits of current freight movements by non-road modes on national network corridors and to identify where changes in future modal choice, from road to rail or water, could address issues on the network and deliver against the five DaSTS goals. This includes consideration of the capacity and capability of the national infrastructure to accommodate these changes in modal choice.

On this route the studies that may affect long term opportunities and challenges are:

- West Sussex Coast DaSTS
- Gatwick Diamond DaSTS

We anticipate that accommodating growth in commuting and other travel to central London whilst maintaining performance will continue to be the main challenge on the route, with further growth in central London employment expected in the medium to long term. The context is that much of the route is already operating at, or very close to, capacity.

We believe that the solution to passenger growth and future capacity requirements could be met by a combination of several initiatives:

- an ongoing programme of train lengthening, commencing with suburban services into Victoria and London Bridge and concluding with lengthening of remaining outer suburban and Redhill corridor services
- construction of the Thameslink programme
- ticket pricing initiatives to spread the peak and smooth the high peak requirements
- remodelling of key infrastructure constraints such as Gatwick Airport, Redhill (providing an initial Platform face first and eventually remodelling to

allow increased parallel moves), East Croydon/ West Croydon (see below)

- re-appraisal of platform use at Victoria and the spacing and stopping patterns of some main line services
- maximising the throughput of the critical East Croydon corridor. In the medium term this may require an additional platform at East Croydon, in the long term further grade separation at Windmill Bridge Jn. Medium term delivery of a through Platform 1 and altered signalling layout at West Croydon to allow turnback of some current East Croydon terminating services there would also provide significant benefits

It is notable that certain infrastructure constraints on this route do not lend themselves to a solution in the foreseeable future. These factors limit the route's ability to cope with future growth:

- there are several lines where expansion from two to four tracks would be desirable, but there is insufficient land available at critical locations
- there are several flat junctions on the route, but there is insufficient space available for grade separation at many of the locations that would benefit from it
- the key terminus stations at London Bridge and Victoria are close to capacity in the peak and few options are available to provide additional terminating platform capacity. The Sussex RUS has confirmed that only a maximum of two to three further paths can reasonably be found into Victoria Central during the three hour peak
- extending suburban services operating via Tulse Hill and Herne Hill to beyond eight car would be very expensive.

Infrastructure investment in CP4

Figure 18 Infrastructure investment in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2010	(A) ELL Phase 1 extension	Extension of ELL services to West Croydon and Crystal Palace	New journey opportunities Provides additional capacity without requiring extra services into London Bridge <hr/> 4tph on weekdays ELL core <-> West Croydon <hr/> 4tph on weekdays ELL core <-> Crystal Palace	TfL	8
2011-14	(B) Strategic Route 2: Power Supply enhancements	Upgrade of TP huts, Upgrade to substations, upgrade to HV cables	Facilitates SL RUS strategy of suburban 10-car network and 12-car to East Grinstead	Periodic Review 2008	2-3
2011-14	(C) 10/12-car suburban operation into Victoria and London Bridge	Platform extensions to facilitate train lengthening from 8-car to 10-car on Norbury, Hackbridge, Gipsy Hill and Sydenham routes into Victoria and London Bridge. 12-car on East Grinstead routes	25% increase in peak capacity on selected suburban routes into Victoria and London Bridge. Up to 50% on East Grinstead route	Periodic Review 2008	4
December 2011	(D) Thameslink Programme Key Output 1	<hr/> 12-car platform lengths at Farringdon 12-car platform lengths at Blackfriars, with new bay platforms	<hr/> Allows 12-car services to operate across central London <hr/> Provides congestion relief at Farringdon, integrated with future Crossrail requirements <hr/> Provides congestion relief and a new South Bank entrance at Blackfriars	Periodic Review 2008	6
Mid 2012	(D) Other Thameslink Programme work pre-Olympics	<hr/> Civil engineering works for Borough Market viaduct <hr/> Resignalling of Thameslink core route	<hr/> Provides early infrastructure for Thameslink Key Output 2	Periodic Review 2008	4
2012/13	(E) Gatwick Airport remodelling	Improved track layout with additional Platform 7	Additional track layout flexibility – reduction in conflicting moves.	Periodic Review 2008/ 3 rd party	4

Figure 18 Infrastructure investment in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2011-2014	(F) East Croydon redevelopment	Station concourse and access improvements	Increased passenger capacity in the congested concourse/ ticket line area, 2 nd entrance to the west	Periodic Review 2008/Developer	3
2015-2019	(G) Implementation of Sussex RUS train lengthening recommendations	Works at Purley to allow 10 and 12 car trains to operate to/from London termini, Works at Uckfield to allow 10 car services to terminate at the station	10 and 12 car operation on Caterham and Tattenham services north of Purley. 10 car operation on Uckfield services. 12 car operation of Redhill to Victoria services	Periodic Review 2013 CP5 development fund funding only in CP4	2
To be confirmed	(H) Completion of Thameslink Programme	Completion of London Bridge station works, with <u>nine through and six terminal platforms</u> Completion of remodelling of approach tracks, including Bermondsey diveunder	Additional through paths to and from the Thameslink core.	Periodic Review 2008	3
2013-2018	(I) Victoria station redevelopment	Station redevelopment scheme	Improved station facilities	Network Rail	–

NRDF candidate schemes in CP4

Figure 19 Candidate NRDF schemes in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2010	(J) North Pole turnback	Turnback facility in the Down access road from North Pole	Allows operation of the May 2010 peak timetable on the West London Line.	Network Rail Discretionary Fund	5
2010	(K) Purley removal of double block	Removal of approach control on a signal on the Up fast at Purley	Increased capacity and improved performance on this stretch of the BML	Network Rail Discretionary Fund	5
2010	(L) Crystal Palace removal of approach control	Removal of approach control on a signal in the Up direction in Crystal Palace tunnel	Increased capacity and improved performance on this stretch of the Gypsy Hill line	Network Rail Discretionary Fund	5
2009-2011	(M) Falcon Jn & Bromley Jn	Removal of approach control	Reduction in time taken for the conflicting move	Network Rail Discretionary Fund	<u>3 (Bromley Jn)</u> 3 (Falcon Jn)
2009-2014	(N) PSR removal	PSR removal at a number of locations including Beddington + other locations on the East Coastway, Redhill, Gypsy Hill Line.	Potential reduction in journey times/ improvement in performance	Network Rail Discretionary Fund	0-8 (dependent on scheme)
2010	(O) Billingshurst Up platform extension	Platform extension to allow 8-car services to call without SDO	Removes trains fouling the level crossing whilst calling at the station, reduces station dwell time.	Network Rail Discretionary Fund	4
2011	(P) Banner repeater: between Arundel Junction and Angmering	Placing of a banner repeater between signals LG40 and LG42 on the West Coastway	Improved performance due to increased distance of running at linespeed	Network Rail Discretionary Fund	0

Figure 19 Candidate NRDF schemes in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2012	Ⓚ Linespeed improvements on the Brighton reversible line (Battersea Park – Victoria)	Raising of linespeed and crossover speed to 40mph on the Brighton reversible at Victoria.	Significant performance improvements, journey time savings and capacity benefits.	Network Rail Discretionary Fund	0
2012	Ⓜ Additional signals between Billingshurst and Christ's Hospital on the Arun valley	2 additional signals in each direction between Billingshurst and Christ's Hospital, delivered as part of signalling renewal	Improved performance and capacity on the Arun Valley line	Network Rail Discretionary Fund	3

GRIP stages: 1 Output definition, 2 Pre-feasibility, 3 Option selection, 4 Single option selection, 5 Detailed design, 6 Construction, test and commission, 7 Scheme hand back, 8 Project close out

Renewals activity

Figure 20 shows the estimated renewals costs and activity volumes.

The precise timing and scope of renewals will remain subject to review to enable us to meet our overall obligations as efficiently as possible consistent with the reasonable requirements of operators and other stakeholders.

It should be noted that in order to manage the deliverability of our Civils, Signalling & Electrification plans we have included an element of over planning in our work banks. As a consequence the sum of our route plans exceeds our plan for the network as a whole. It is likely that a small proportion of the activities in these areas will slip to subsequent years.

Figure 20 Summary of estimated renewals costs and activity volumes

£m (2010/11 prices)	2010/11	2011/12	2012/13	2013/14
Renewals				
Track	26	25	20	23
Signalling	9	19	19	27
Civils	12	8	14	21
Operational property	17	14	18	13
Electrification	10	12	14	15
Telecoms	3	4	4	5
Total renewals	78	82	91	102
Renewals volumes				
Track				
Rail (km)	35	31	36	36
Sleepers (km)	15	18	18	18
Ballast (km)	16	18	18	18
S&C (equivalent units)	10	12	9	10
Signalling				
Conventional (SEU)	0	31	98	0
ERTMS (SEU)	0	0	0	0
Level crossings (no)	4	4	6	3

Appendix

Figure 21 Strategic route section

Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference and RA is Route Availability												
SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway (mins)	No of Tracks
B.01	Victoria – Windmill Bridge Jn	VTB1	Primary	DfT	No	W6/W9	RA8	45-60	Third rail	TCB	2-3	4
B.02	Windmill Bridge Jn – Brighton	VTB2,3	Primary	DfT	No	W7/8/9	RA8	70-90	Third rail	TCB	2-4	2 and 4
B.03	London Bridge – Windmill Bridge Jn	LBW	London & SE	DfT	No	W6	RA8	60-70	Third rail	TCB	2-3	4
B.04	Three Bridges – Littlehampton Jn (Arun Valley Line)	TBH1	London & SE	DfT	No	W6	RA8	65-85	Third rail	Various	3-12	2
B.05	South Coastal Line (West Coastway)	BLI, PPH, BBR, TBH2	London & SE	DfT	No	W7	RA8	60-80	Third rail	TCB	3-4	2
B.06	Eastbourne Line (East Coastway)	KJE,BTL, STS, WJB	London & SE	DfT	No	W6	RA8	55-90	Third rail	Various	3-7.5	Mostly 2
B.07	Southern Inner Suburban	BTH1,HHT, LTH,BBJ, WTH,SCP, SSC,WCS, NFE,BJN, SNS	London & SE	DfT	No	W6	RA8	30-50	Third rail	TCB	2-3.5	Mostly 2
B.08	Southern Suburban Sutton Lines	SMS,NFE, BTH2,3	London & SE	DfT	No	W6	RA8	40-60	Third rail	TCB	3-7.5	Mostly 2
B.09	Dorking – Horsham	BTH3	Rural	DfT	No	W6	RA8	75	Third rail	mixed	3-9	2

Figure 21 Strategic route section

Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference and RA is Route Availability												
SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway (mins)	No of Tracks
B.10	Hurst Green Jn – Uckfield	SCU	London & SE	DfT	No	W6	RA6	70	None	TCB	12	1 and 2
B.11	Tattenham Corner and Caterham Lines	PAT,TAT	London & SE	DfT	No	W6	RA8	20-60	Third rail	TCB	4-8	2
B.12	East Grinstead Line	SCU,HGG	London & SE	DfT	No	W6	RA6	60-70	Third rail	TCB	3.5-8	2
B.13	West London Line	WLL,CJL, SCC,FLL, CKL,BSF	London & SE	DfT	No	W9	RA8	40-60	Third rail/overhead line	TCB	3-4	2
B.14	Thameslink Routes	HHH,FTL, MCL	London & SE	DfT	No	<W6	RA4	25-60	Third rail/overhead line	TCB	2-3	Mostly 2
B.15	Redhill – Tonbridge (North Downs Line)	RTT	London & SE	DfT	No	W9	RA8	60-85	Third rail	TCB	7-9	2

Capacity and other operational constraints

- A Gatwick Airport: track layout not optimised for terminating services, pedestrian capacity issues in station
- B East Croydon area: track and platform capacity at limit, pedestrian capacity issues in station
- C Windmill Bridge Jn: conflicts Down Victoria Slow with Up London Bridge Slow and Down Victoria Fast with Up London Bridge Fast
- D Victoria: present utilisation of platforms and service/stopping patterns of Fast Line services
- E Clapham Jn: pedestrian access issues in station
- F Suburban area: 8-car platforms
- G Spa Road/Blue Anchor Jn: flat crossing for FCC services between Sussex and Kent routes restricts capacity
- H Redhill: limited number of platforms and the need for services to reverse restricts capacity
- I Herne Hill: flat crossing between Sussex and Kent routes restricts capacity

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