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Route 2 Brighton Main Line and Sussex



Section 1: Today's railway

Route context

The Brighton Main Line provides a high capacity fast link between London (both the West End and City), Croydon, Gatwick Airport and the south coast, with a network of branches to other destinations in Kent, Surrey, East Sussex, West Sussex and Hampshire.

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 Railway 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 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 RUS (BML 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. An outline peak timetable incorporating ELL services for May 2010 was developed for the final South London RUS (SL RUS) document. This work has informed the DfT's Invitation to Tender (ITT) for the South Central franchise issued in November 2008.

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, commencing after the 2012 Paralympic Games.

The SL RUS identified a strong business case for a programme of train and platform lengthening for stopping services via Norbury, Gipsy Hill and Hackbridge into Victoria from 8-car to 10-car in Control Period 4 (CP4). Similarly there is a strong case for lengthening of suburban services to 10- or 12-car on the slow lines into London Bridge via Sydenham and to 12-car on the East Grinstead route for services to Victoria and London Bridge.

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.

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

The Sussex RUS was launched during 2008, and the Draft for Consultation will be published in Spring 2009, with a final document planned to be established in the Autumn of 2009. The RUS is covering all routes and services in the Route 2 area with the exception of those suburban routes already covered in the SL RUS.

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 (02.01) and London Bridge (02.03), joining together in the Croydon area to Brighton (02.02), reducing to two tracks at Balcombe Tunnel Jn
- branches off the main line forming routes to East Grinstead/Uckfield (02.12, 02.10), Caterham/Tattenham Corner (02.11), Tonbridge (01.11), Reigate (03.08), the Arun Valley (02.04), Eastbourne (02.06), Worthing (02.05) and beyond. Services joining from these routes make the main line increasingly busy closer to London
- lines leading west and east from Brighton providing links along the coast (02.05, 02.06)
- a complex network of suburban lines throughout south London (02.07, 02.08, 02.14). 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 (02.09)
- the WLL, providing an orbital north-south link around London (02.13)
- the Thameslink route, running in tunnels beneath the City of London, which connects radial routes north and south of the Thames (02.15).

The boundaries of the Sussex route with adjacent routes are particularly complex. There are a number of boundaries with Route 1 and Route 3 in particular, and also north of the Thames on the WLL and Thameslink routes.

In 2008, two new stations were opened on the Sussex route:

Mitcham Eastfields (02.07) is located between the Brighton Main Line junctions at Streatham and Mitcham Jn, it is located nearer to Mitcham town centre than the existing stations and straddles Eastfields level crossing, it is served by Southern Railway and First Capital Connect.

Shepherds Bush station (02.13) is located on the West London Line between Kensington Olympia and Willesden Jn High Level to serve the new Westfield Shopping Centre and provide interchange facilities with Shepherds Bush London Underground station; it is served by Southern Railway and London Overground.

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 but it is notable that the most intensive flight arrivals period at Gatwick Airport is also during the morning peak.

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 and District/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 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 Cufford and Maidstone East (on Route 1). 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 Railway 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 (formerly English Welsh and Scottish Railway (EWS)), Freightliner Ltd, Freightliner Heavy Haul, Fastline Freight, First GBRf and Direct Rail Services (DRS).

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 Surrey and the south coast at regular frequencies. There are some peak period additional services to certain destinations.

Southern Railway'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). There is wide variation in intervals between services.

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 arrive 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	5 peak/9 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)	2 peak/2 off peak	3 peak/4 off peak
Wimbledon (via Tooting)	3 peak/2 off peak	None
West Croydon	4 peak/2 off peak	3 peak/6 off peak

Figure 3 Tonnage

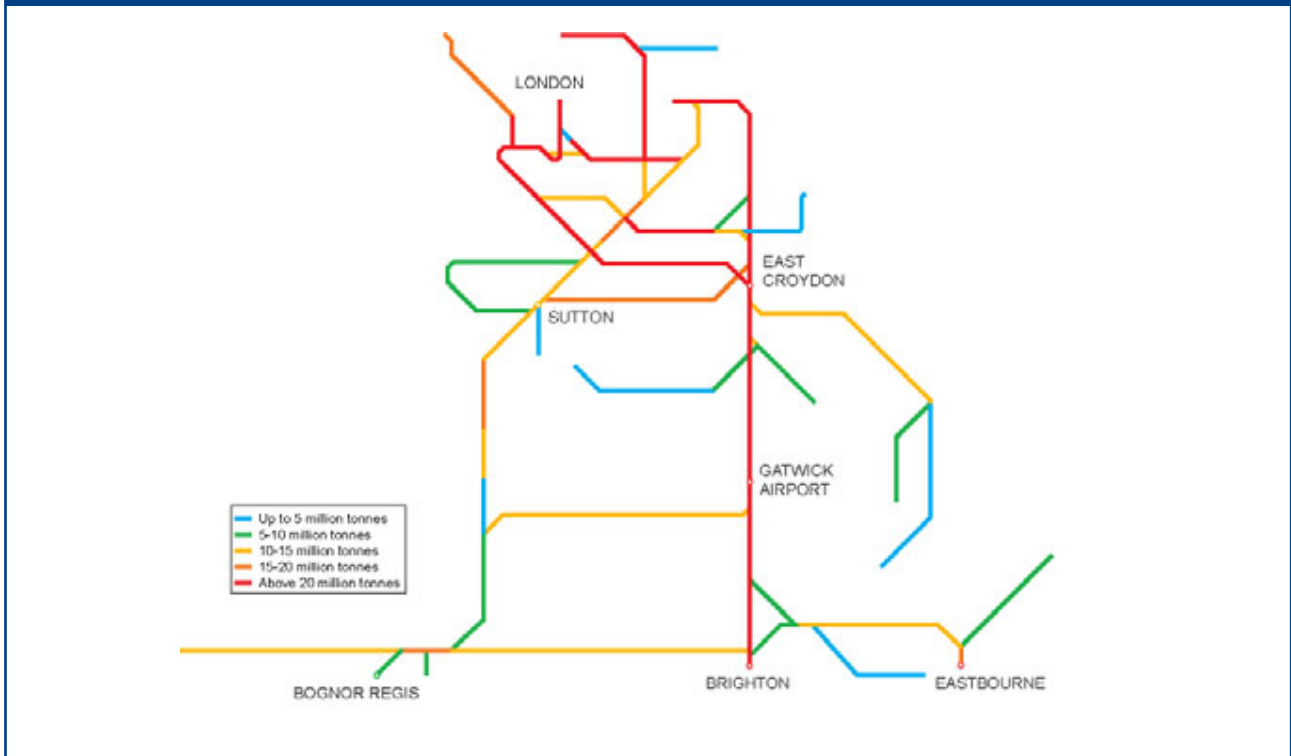


Figure 3 shows the total annual tonnage levels on the route.

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)	9,365	335	9,700

Current infrastructure capability

The following maps set out the capability of the current network.

Figure 5 Linespeed

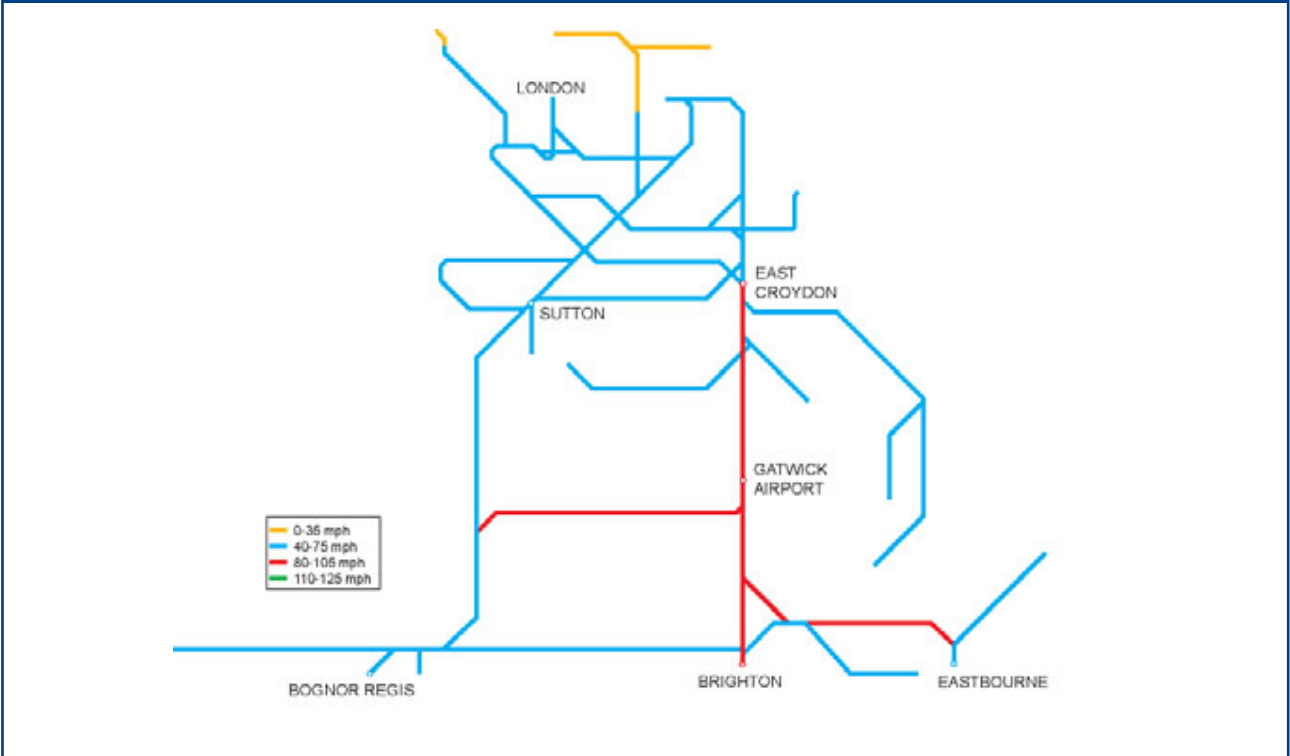


Figure 6 Electrification

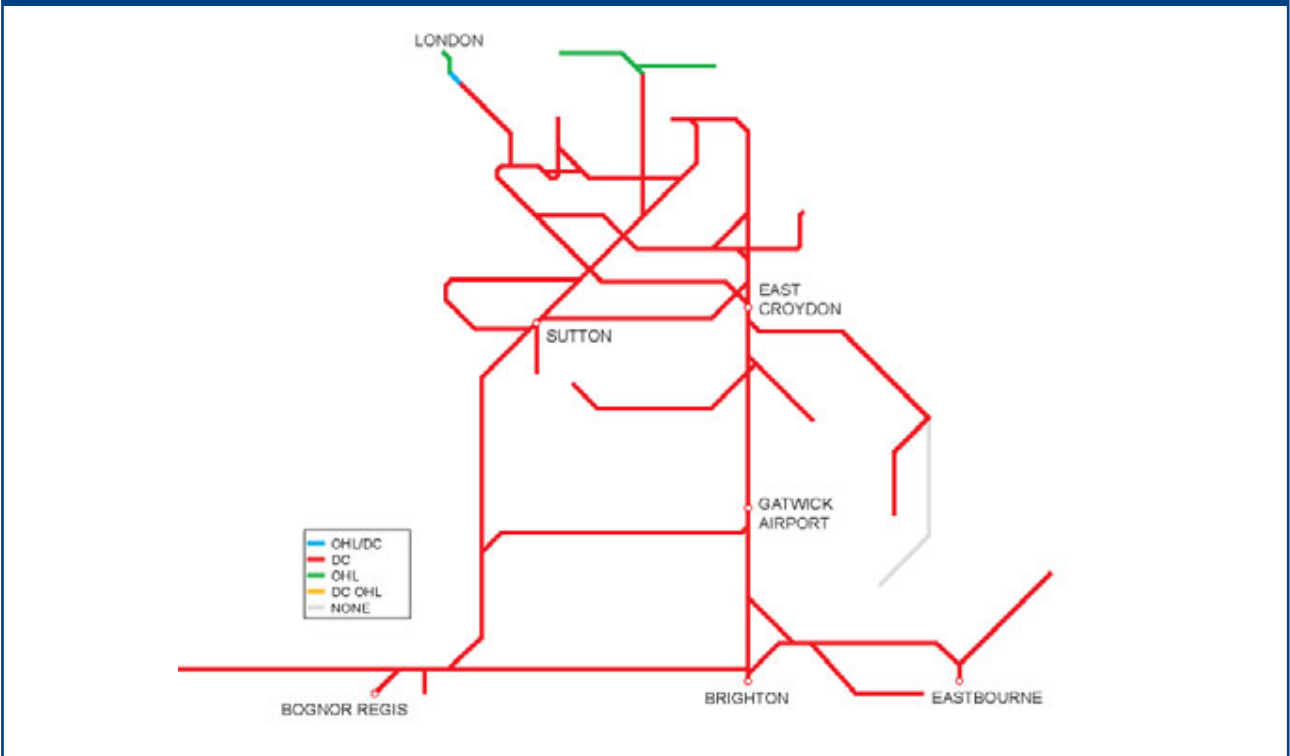


Figure 7 Route availability

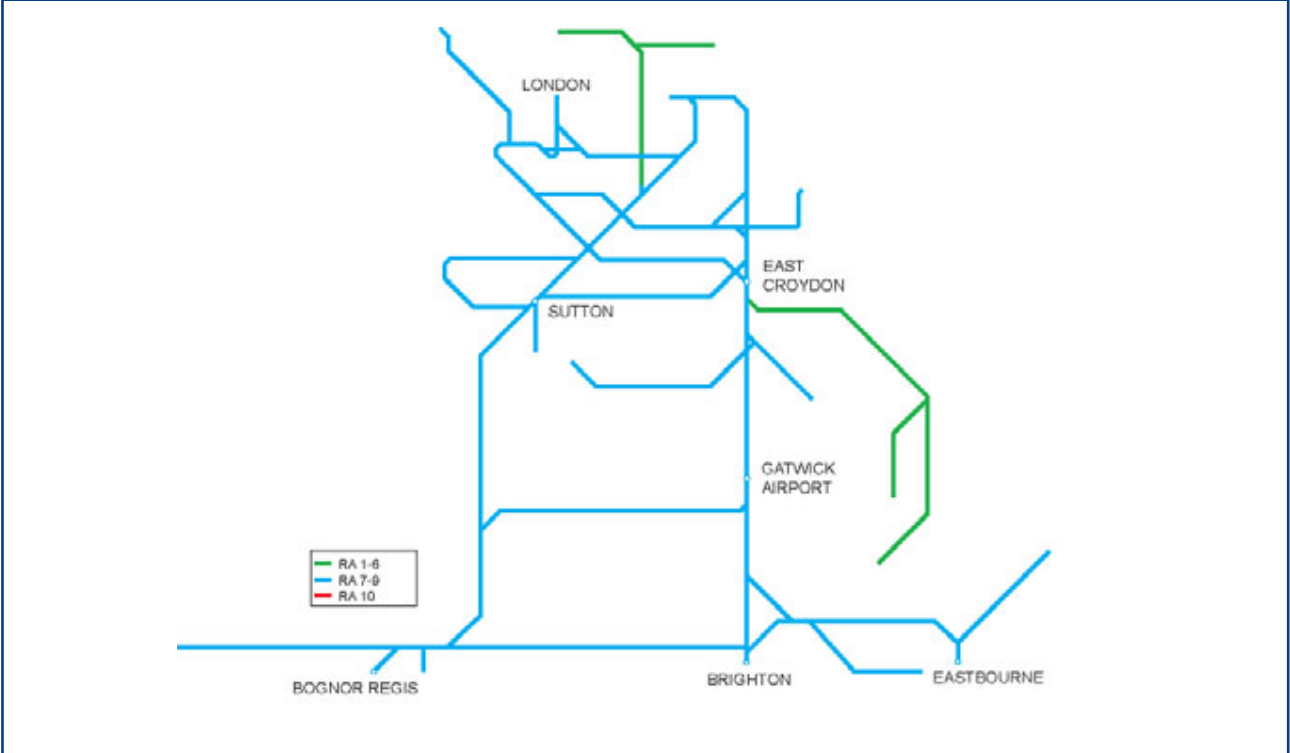
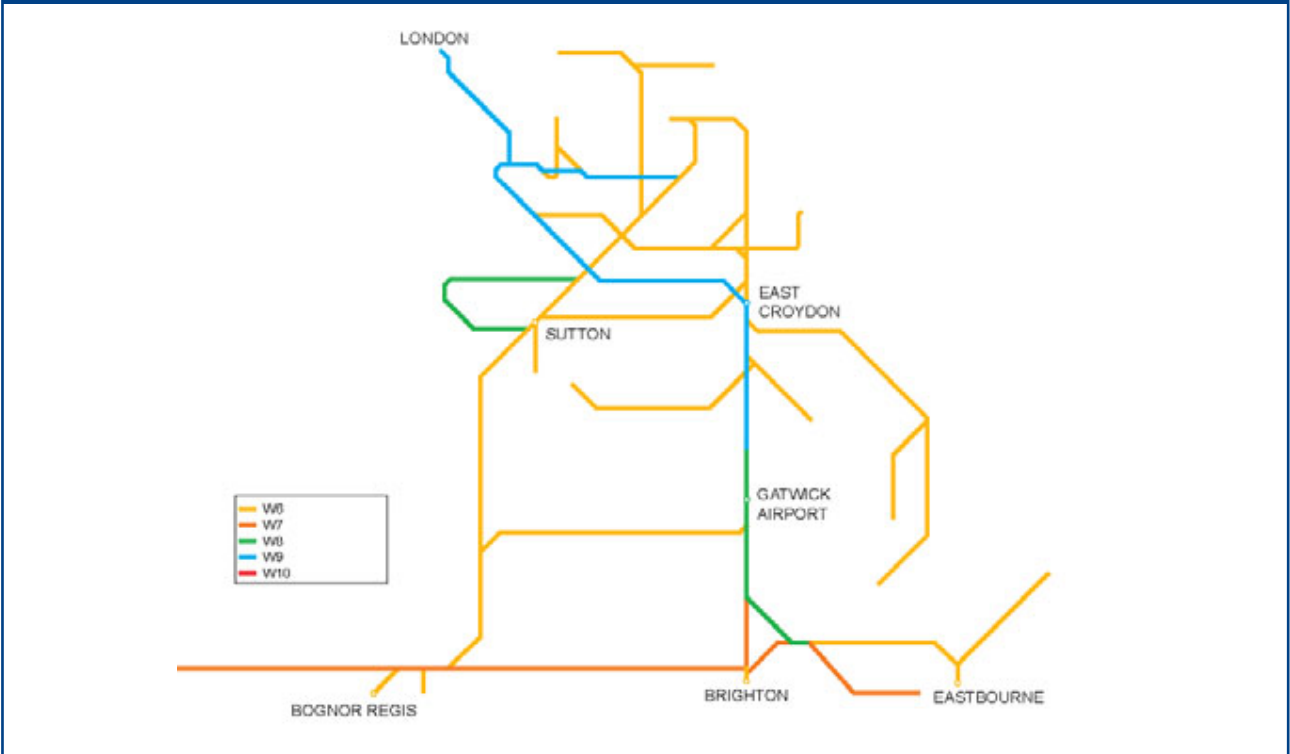


Figure 8 Gauge



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:

- 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 layout of the approaches to London Bridge and the limited number of platforms
- the current method of operation at Gatwick Airport, due to numerous crossing moves between the fast and slow lines and a train always occupying one of the through platforms
- the two track railway between Balcombe Tunnel Jn and Brighton constrains capacity due to station dwell times on the stopping services
- eight-car platform lengths and limited through capability of the core Thameslink route
- eight-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 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 1 or 2
- 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 to 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 and flash flooding where the existing drainage systems become overwhelmed
- fatalities
- trees falling onto the railway from outside the boundary
- incidents at level crossings, particularly on the outer area.

The complex layout and density of traffic on the Sussex Route means that performance can be severely affected by incidents, partly due to the complexities of train crew and rolling stock diagrams and the number of operators involved. In depth joint contingency plans for the Route, drawing on experience gained in previous incidents, have been developed to assist in service recovery and these plans are subject to continual review by the Integrated 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 2008/09 PPM

TOC	MAA	As at period
Southern	90.0%	10
First Capital Connect	92.1%	10

Section 2: Tomorrow's railway: requirements

HLOS requirements

Figure 11 Total demand to be accommodated by Strategic Route

Routes	Annual passenger km forecast 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		
	Forecast demand in 2008/09	Extra demand to be met by 2013/14	Maximum average load factor at end CP4 (%)	Forecast 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 has been around 15 percent over the three years to the end of 2007, however the rate of growth tailed off considerably during 2007 and 2008 as trains became increasingly congested.

It is too early to record any clear impacts of the economic downturn on suburban commuter traffic. Currently available data suggests only a limited impact thus far.

For main line services our understanding of demand is based on assessments that were undertaken by the SRA, and subsequently DfT, in developing the BML RUS. This predicted a background growth rate (due to new employment and housing etc) of between one percent and three percent per year on main line services up to 2012.

The draft Sussex RUS will publish updated demand forecasts for main line services to 2019 and 2026 in May 2009. The RUS will cover all routes and services in the Route 2 area with the exception of those suburban routes covered in the SL RUS.

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 by providing an increased level of peak service from the Norbury and Gipsy Hill routes direct to London Bridge.

It is likely that the development of improved through services from the West London Line to local stations south of Clapham Jn proposed in the SL RUS will lead to further demand growth on this route. The large shopping centre at Shepherds Bush is a significant off-peak destination and the new station also provides an interchange with the Central Line leading to significant new journey opportunities.

The planned redevelopment of Battersea Power station is likely to generate significant off-peak demand.

Passenger growth at Gatwick Airport is likely to continue in the medium to long term and increased rail usage continues to be a focus of the airport authority.

The increase in budget airlines operating from Gatwick is already reflected in higher rail passenger numbers over the last few years. The airport also has three distinct peak times which affect rail passenger loadings in the am peak, early afternoon and pm peak. The recent economic downturn has hit passenger numbers at Gatwick over the year – it is not possible at this stage though to draw conclusions from this recent trend for the medium and long term.

Demand on the Uckfield Line is expected to continue to grow. Options exist in the ITT for the South Central franchise and are also under consideration in the Sussex RUS that could relieve crowding on these services and these are referred to later in this document.

Demand on the Coastway routes is likely to continue to grow in line with employment and leisure growth at 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 again both the ITT for the new franchise and the Sussex RUS set out options for providing further additional capacity on this route.

Across most of Route 2, demand for travel at weekends has grown substantially during Control Period 3 and these trends are expected to continue throughout the next Control Period.

With regards to freight, demand on the WLL is the most likely area of growth as the Kent & Sussex Routes rely on this line to link them with the rest of the UK. Other freight traffic will grow modestly as aggregates and other flows develop. Again it is too early to predict the medium and long term impacts of the economic downturn on the freight business.

The planned major increases in capacity at Victoria underground station and on the Victoria Line are likely to encourage additional peak period demand on services into the main line station. At present, some journeys are made via alternative routes to avoid the Underground.

The planned construction of several new high rise developments in the City of London, with the tallest at London Bridge station itself, is likely to lead to a significant increase in demand for services to London Bridge and the Thameslink core stations.

The continued development of the Docklands area and London Olympics site is likely to lead to an increase in passengers interchanging to the Jubilee Line at London Bridge, especially from stations that will not be served by the extended ELL.

Future demand beyond CP4

The Government's 2007 Rail White Paper predicts a doubling of freight demand over the next 30 years.

For Passenger traffic the Sussex RUS will provide demand forecasts for main line services to 2019 and 2026. The SL RUS has outlined likely growth of 15 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 section.

Figure 13 Summary of proposed strategy milestones			
Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
May 2010	First major timetable change for new South Central franchise. Main line and suburban timetable rewrite (including West London Line route)	None	New timetable to allow ELL services to operate. It is intended that this will also implement SL RUS options and be compatible with Thameslink Programme Key Output 1
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	ELL services to West Croydon and Crystal Palace
Quarter 4 2011/12	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
Quarter 4 2012/13 (Sydenham route) Quarter 4 2013/14 (other routes)	10-car suburban operations into Victoria/ London Bridge*	Platform extensions and associated S&C and signalling works at a wide range of further locations Depot modifications Enhancements to stabling facilities Potential further power supply enhancement works	10-car services on suburban routes via Norbury, Gipsy Hill and Hackbridge into Victoria. 10-car suburban services on the Sydenham slow lines into London Bridge, with possible active provision for 12-car at some locations
Quarter 1 2012/13 (other routes)	Thameslink Programme Key Output 1	Blackfriars remodelling Farringdon remodelling	12-car services through the Thameslink core to/from BML
May 2012	East London Line Extension Phase 2	New junction at Queens Road Peckham. Reinstatement of Platform 1 at Clapham Jn	ELL services to Clapham Jn via the South London Line
October 2012	Start of London Bridge remodelling	Reduction in terminating capacity at London Bridge to allow construction works to proceed	Potential temporary service reductions to facilitate long term works to re-configure the station. Possible drop in low level peak capacity in the order of 30tph down to 20>24tph.

Figure 13 Summary of proposed strategy milestones

Implementation date	Service enhancement	Infrastructure enhancement	Expected output change
December 2012	Alterations to platforming of Gatwick Express services	Additional platform and track layout modifications	Improved performance
Quarter 1 2014/15	DC regenerative braking	Modify circuit breakers and raise traction supply on all inner London routes to 750V DC	Reduction in electric current for traction costs to train operators and a marginal increase in available traction supply capacity
2014 > 2015	Lengthening of peak Redhill corridor services to 12 car	Sussex RUS reviewing	3 Redhill > Victoria services 8/9 > 12 car. Redhill > London Bridge services lengthened 8 > 12 car ahead of Thameslink KO2
Quarter 4 2015/16	Thameslink Programme Key Output 2	Completion of the Thameslink Programme	Increase in through capacity via London Bridge. 4tph Redhill corridor to LB become 12-car services, Possible 12-car operation on some Sydenham slow lines to Thameslink core services

* The precise mix of which routes will have services lengthened to meet the HLOS metric is still subject to change due to ongoing work on cost, scope, possession planning, power supply and rolling stock strategy.

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 additional vehicles estimate is dependent on extent of lengthening outside the high peak hour. A basic assumption of lengthening for 2 of the 3 peak hours has been made.

Note that the temporary impact (2012 - 2015) 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 will therefore be different to that shown.

Capacity metric changes as a result of Thameslink Key Output 1 and other potential timetable change are also excluded from the table.

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	64%	73,000	81,100	88,900	74%
Victoria (includes Kent services)	64,000	95,700	103,800		32,100	41,400	45,300	
Other London Termini	332,300	443,100	552,500		164,800	190,600	234,100	

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 autumn/winter 2012 to facilitate Thameslink Programme construction works.

The SL RUS identified that train and platform lengthening will be the major means of delivering growth in the London suburban area and it is possible a further timetable change will be required in late CP4 to ensure optimisation of the benefits of the platform lengthening strategy and reduce any performance impacts – particularly at Windmill Bridge Jn and between Gloucester Road Jn and Selhurst.

Work on the Sussex RUS is underway and it is likely to have fewer such train lengthening options available, since many main line services are 12-car already. The RUS is therefore focusing on remaining opportunities for lengthening outer services and identifying whether additional train paths could be facilitated by infrastructure works at key constraints such as Gatwick Airport and East

Croydon and/ or via altering platform usage and other operating constraints in the Victoria area.

The key infrastructure enhancement requirements for CP4 are therefore:

- implementation of the Thameslink Programme;
- track layout, signalling and platform work at various sites to facilitate 10/12-car operations as identified in Figure 13
- modifications to depot and stabling facilities to support a 10/12-car peak railway.

Future train service proposals

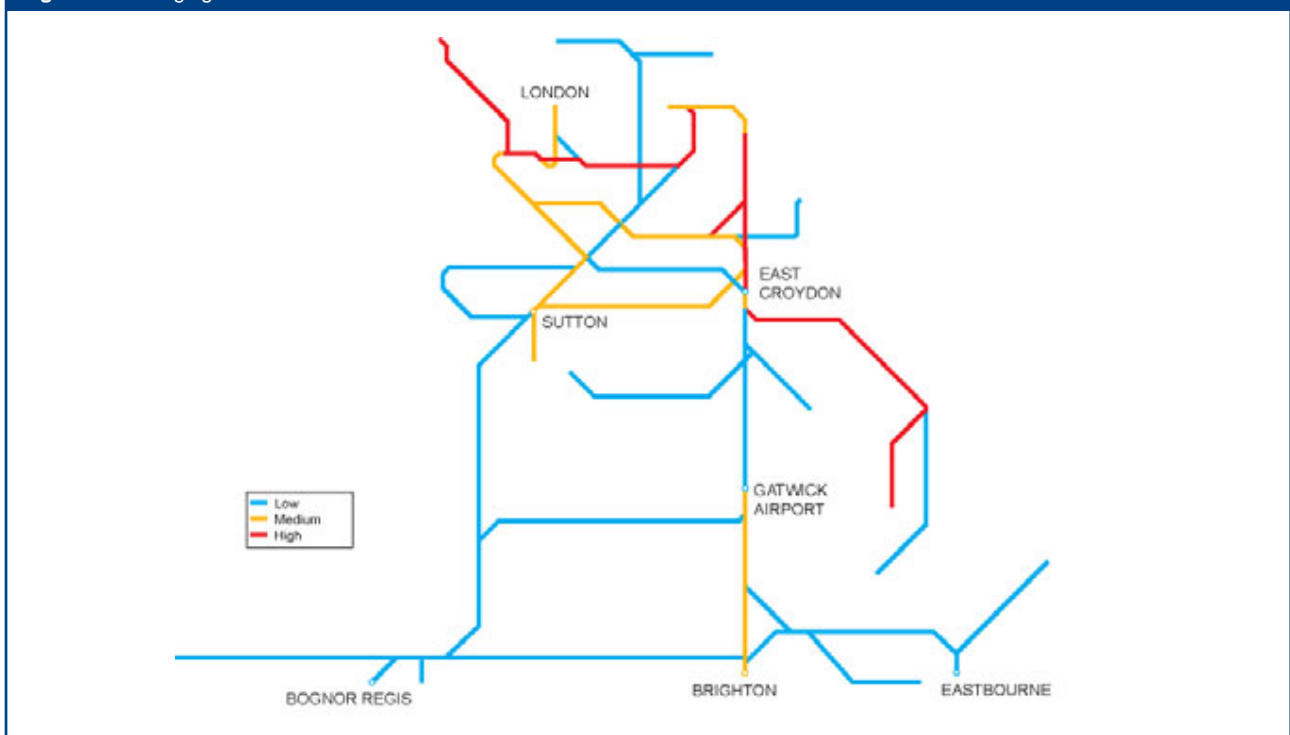
Figure 16 indicates the forecast percentage change in tonnage on the route to 2017.

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 four-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.

TfL has recently announced the intention to

Figure 16 Tonnage growth



proceed with ELL Phase 2. This scheme will see 4tph operating from Clapham Jn (a new Platform 1) via the Ludgate Lines to the South London Line and a new connection with the ELL north of Queens Road Peckham. A number of timetabling/performance issues remain to be resolved at this stage including conflicts with recessed freights on the Ludgate lines into Clapham. The ability to hold freights awaiting a path Down Ludgate to Down Windsor lines will be lost in some instances.

Up to 2tph WLL services will operate across Clapham Jn onto the slow lines to the Croydon area. Services will initially be restricted to four-car though until funding can be identified to lengthen Platform 17 at Clapham Jn and also provide necessary provision for lengthened trains at West Brompton. Some northbound services can potentially be terminated at Shepherds Bush/North Pole to minimise the need for dual voltage rolling stock and allow a higher frequency of service on the stretch of the WLL with the highest passenger demand. The services to/from the Norbury corridor will complement TfL/ London Overground plans for increased frequency up to 4tph throughout the day on Clapham <> NLL services, however, the requirement for freight pathways must also be maintained.

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 and the Sydenham slow lines. These trains will operate both south and north of the Thames and will therefore be both AC and DC equipped.

The Invitation to Tender for the South Central Franchise gives bidders the freedom to explore a number of changes to main line services from December 2010 onwards. The Sussex RUS is examining the practicality of timetable changes on the main line to allow for additional capacity to/from the Redhill corridor and the Brighton Main Line in the latter half of CP4 and in CP5.

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. The Field sidings site at Selhurst is likely to be required to be developed to support 10/12 car South Central suburban diagrams.

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. 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 a possibility 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 8- and 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.

Increased Selective Door Opening capability is likely to be required if, as expected, it proves impractical to extend all platforms on the routes proposed for train lengthening. However some of the sites which are the hardest to extend are the busiest stations where SDO may not be workable. Network Rail is working with Southern to identify potential SDO locations within the Sussex suburban area.

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.

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

By the end of CP4 the SL RUS recommends 10-car operation on the Norbury, Gypsy Hill, Hackbridge, Sydenham routes and 12-car capability on East Grinstead lines into Victoria and London Bridge.

Approximately 100 additional vehicles would be required to implement this suburban train lengthening strategy for the high peak (08:00 – 08:59 arrivals into London termini) and on some shoulder peak services.

Network Rail is presently reviewing the cost of delivering all five of these routes for longer trains by the end of CP4. Value management work is presently focusing on the Norbury corridor and the results of this work in summer 2009 could result in a re-prioritisation of the five train lengthening routes on Sussex identified in Figure 14.

In addition to those vehicles required to lengthen current eight car services, a small number of vehicles is required to strengthen existing peak services that are not presently operating at their potential maximum length. These are primarily on the Uckfield route where four to eight additional DMU vehicles would be required to strengthen peak and some shoulder peak services.

Train lengthening for the Thameslink programme will allow 12-car services to operate between the BML and Thameslink destinations north of London by December 2011.

This move from eight to 12-car would require up to 48 additional vehicles to cover the peak hours on the Sussex route and would be in addition to up to 48 additional vehicles likely to be required initially to cover timetable changes in December 2008 and December 2009. In due course, new Thameslink rolling stock of 8- and 12-car formation will replace the existing 4-car units.

The Sussex RUS is considering further the case for train lengthening and/or capacity enhancements on the East and West Coastway services and on other remaining 'outer' peak commuter services that are not already 10/12 car in particular Redhill corridor to Victoria services.

On the West Coastway a strong case is likely to exist to extend some current 3-car peak services to 4-car to/from Brighton. The Department for Transport has reflected this in its ITT for the South

Central Franchise. The Sussex RUS is likely to support this position but will review any power supply implications and also make recommendations with respect to the 2-car FGW services that operate in and out of Brighton in the peak.

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 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.

The Sussex RUS will report on the optimal approach for achieving additional through capacity to/from London, in the meantime land adjacent to the station at East Croydon is being safeguarded in order to allow for the future development of additional platform capacity.

The SL RUS and 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
- Blackfriars and Farringdon are also congested stations and capacity would be increased significantly by the Thameslink project
- Clapham Jn is severely congested in places. Options for a short term improvement by providing a new station entrance to the footbridge have been developed but have not been granted funding in CP4. Network Rail will continue to seek adequate funding sources for work to improve stepping distances on the Sussex Route platforms
- Balham station is currently congested with significant interchange movements to the Northern Line. A possible 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.

Future performance

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

Southern Railway

The performance of the Southern Railway franchise is currently 90.7 percent PPM which is worse than the trajectory required to deliver the Joint Performance Improvement Plan (JPIP) target of 90.8 percent by April 2009.

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
- Thameslink Programme work
- the impacts of the December 2008 timetable change
- full remote condition monitoring for all assets;
- removal of certain permanent speed restrictions across the route
- reduce the impact of trespass, vandalism and fatalities
- junction remodelling at Gatwick Airport
- weather management
- level crossing renewal
- timetable recast to ensure full compliance with an updated Rules of the Plan

Analysis currently suggests that performance on Southern Railway/South Central Franchise by April 2014 will be around 91.9 percent. This includes an allowance for passenger/traffic growth and for the effects of Thameslink Key Output 0.

The existing franchise will end on 19 September 2009. The DfT has invited bidders to tender for the new South Central franchise and the successful bidder will commence operations on 20 September 2009.

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 92.1 percent PPM and this is currently better than the planned April 2009 target of 91.03 percent.

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 12 & 13, SWT in the plans for Routes 3 and 4, and London Overground in the plan for Route 6.

Figure 17 Forecast PPM MAA – CP4 plan

	2009/10	2010/11	2011/12	2012/13	2013/14
First Capital Connect	91.7%	92.1%	92.4%	92.7%	92.9%
Southern	90.7%	90.9%	91.1%	91.6%	91.9%

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, rendering the unpopular option of bus substitution impractical in most cases, 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.

Demand for weekend services is presently significantly lower than that on weekdays for most of the year, though weekend passenger demand is rising consistently across the Sussex route at present and is likely to soon equal that of off-peak weekdays.

Major items of engineering work are presently scheduled to be carried out on Sundays, or in some cases on Saturdays, affecting fewer passengers than weekday possessions but still in some cases 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. There is also high weekend demand into principal towns in the month prior to Christmas and at times of other key events.

There are diversionary routeing opportunities that enable passengers to reach many of the main towns even if the main route is closed with, for example, multiple routes to London from Croydon, Sutton, Epsom and Horsham. There are also diversionary routes available to Brighton via either Horsham or Lewes, though both routes have significantly longer journey times than the main line and have limited capacity.

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 adjacent lines are required these can be taken on a Saturday night for four hours whilst trains are single line worked over the remaining open line. If any longer periods are required this is generally planned around Christmas Day and Boxing Day when a limited service would normally operate.

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.

Examples include implementation of the ELL project, the Thameslink Programme (especially works around London Bridge), together with the potential enhancement schemes at Gatwick Airport and the large number of platform lengthening works.

There are also potentially a number of further switch and crossing renewal schemes on the route. These are currently under investigation, though by their nature some of these will be extremely disruptive and will therefore be planned at times when there are fewer passengers travelling.

Freight is also subject to diversions with options complicated by route availability, gauging and traction issues.

Co-ordination between Sussex and Kent remains vital to ensure that Channel Tunnel freight can operate reasonably unhindered – with the Tonbridge – Redhill – Clapham Jn route a key overnight and weekend diversionary route from Kent.

Long term opportunities and challenges

We anticipate that accommodating growth in commuting and other travel to central London whilst maintaining performance will continue to be a significant 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:

- implementation of an improved main line and suburban timetable to facilitate the opening of the East London Line Extension
- an ongoing programme of train lengthening, commencing with suburban services into Victoria and London Bridge
- 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, though the Sussex RUS is examining operational solutions at Victoria
- 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
2015/16	(A) Strategic Route 2: Power Supply enhancements	Upgrade of TP huts, Upgrade to substations, possible new substations,	Facilitates SL RUS strategy of suburban 10-car network and 12-car to East Grinstead	Periodic Review 2008	1
2014/15	Regenerative braking	To facilitate the return of braking energy into power supply system	Reduction in operational costs	Periodic Review 2008	–
2009	(B) Imperial Wharf new station	New station	New journey opportunities	Developer	6
2010	(C) 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 <u>4tph on weekdays ELL core <> West Croydon</u> 4tph on weekdays ELL core <> Crystal Palace	TfL	6-8
2011-14	(D) 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	2
2012/13	(E) Thameslink Programme Key Output 1	Reconstruction of Blackfriars and Farringdon stations	Allows 12-car services to operate across central London, with timetable enhancements Station congestion relief and improved facilities	Periodic Review 2008	4
2012/13	(F) Gatwick Airport remodelling	Improved track layout with additional Platform 7	Additional track layout flexibility – reduction in conflicting moves. One of the enablers of the second Reading <> Gatwick service per hour.	Periodic Review 2008/Developer	3

Figure 18 Infrastructure investment in CP4

Implementation date	Project	Project description	Output change	Funding	GRIP stage
2011-2014	ⓐ East Croydon redevelopment	Station concourse and access improvements	Increased passenger capacity and improved station facilities	Periodic Review 2008/Developer	2-3
2012	ⓑ ELL Phase 2 extension	Extension of 4tph ELL services to Clapham Jn. Requires Clapham Jn Platform 1, possibly signalling and trackwork on the Ludgate lines, new junction north of Queens Road Peckham	New journey opportunities Provides additional capacity without requiring extra services into London Bridge or Victoria	TfL	1
2015/16	ⓒ Thameslink Programme Key Output 2	Reconstruction of London Bridge station and eastern approaches	Allows 24tph to operate across central London Station congestion relief and improved facilities	Periodic Review 2008	4
2013-2018	ⓓ 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
2009	(K) 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
2009-2011	(L) Falcon Jn & Bromley Jn	Removal of approach control	Reduction in time taken for the conflicting move	Network Rail Discretionary Fund	3 (Bromley Jn) 3 (Falcon Jn)
2009-2014	(M) PSR removal	PSR removal at a number of locations potentially to include various locations on the Wimbledon Loop, Stone Cross, Lewes, Ford and Redhill.	Potential reduction in journey times/ improvement in performance	Network Rail Discretionary Fund	0-1
2013-15	(N) Redhill Platform 0	Construction of a new Platform 0 at Redhill	Improve performance at Redhill, as splitting and joining operations increase. A contributor along with Gatwick remodelling to allowing second Reading – Gatwick through service to operate	Network Rail Discretionary Fund + 3 rd Party	2
2013-2015	(O) Reigate Platform 2 extension	Extension of Platform 2 at Reigate to 8 from 4-car – movement of crossover and shortening of adjacent siding	Allows Reigate splitting and joining services to operate at 12-car north of Redhill. Improves rolling stock utilisation by avoiding sending long trains to Horsham or Tonbridge	Network Rail Discretionary Fund	0

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 (2009/10 prices)	2009/10	2010/11	2011/12	2012/13	2013/14	CP4 total
Renewals						
Track	33	34	43	48	46	202
Signalling	5	10	13	23	22	74
Civils	26	28	19	17	16	105
Operational property	14	16	14	18	12	73
Electrification	7	9	9	9	9	44
Telecoms	2	1	2	3	2	10
Plant and machinery	2	1	1	2	3	9
Total	89	99	101	120	109	517
Renewals volumes						
Track						
Rail (km)	20					
Sleeper (km)	25					
Ballast (km)	34					
S&C (equivalent units)	14					
Signalling						
SEUs (conventional)	0	26	27	42	115	210
SEUs (ERTMS)	0	0	0	0	0	0
Level crossings (no.)	0	2	3	2	3	10

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
02.01	Victoria – Windmill Bridge Jn	VTB1	Primary	DfT	No	W6/W9	RA8	45-60	Third rail	TCB	2-3	4
02.02	Windmill Bridge Jn – Brighton	VTB2,3	Primary	DfT	No	W7/8/9	RA8	70-90	Third rail	TCB	2-4	2 and 4
02.03	London Bridge – Windmill Bridge Jn	LBW	London & SE	DfT	No	W6	RA8	60-70	Third rail	TCB	2-3	4
02.04	Three Bridges – Littlehampton Jn (Arun Valley Line)	TBH1	London & SE	DfT	No	W6	RA8	65-85	Third rail	Various	3-12	2
02.05	South Coastal Line (West Coastway)	BLI, PPH, BBR, TBH2	London & SE	DfT	No	W7	RA8	60-80	Third rail	TCB	3-4	2
02.06	Eastbourne Line (East Coastway)	KJE,BTL, STS, WJB	London & SE	DfT	No	W6	RA8	55-90	Third rail	Various	3-7.5	Mostly 2
02.07	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
02.08	Southern Suburban Sutton Lines	SMS,NFE, BTH2,3	London & SE	DfT	No	W6	RA8	40-60	Third rail	TCB	3-7.5	Mostly 2
02.09	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
02.10	Hurst Green Jn – Uckfield	SCU	London & SE	DfT	No	W6	RA6	70	None	TCB	12	1 and 2
02.11	Tattenham Corner and Caterham Lines	PAT,TAT	London & SE	DfT	No	W6	RA8	20-60	Third rail	TCB	4-8	2
02.12	East Grinstead Line	SCU,HGG	London & SE	DfT	No	W6	RA6	60-70	Third rail	TCB	3.5-8	2
02.13	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
02.14	South London Line	ATL	London & SE	DfT	No	W9	RA8	45	Third rail	TCB	2.5-3	2
02.15	Thameslink Routes	HHH,FTL, MCL	London & SE	DfT	No	<W6	RA4	25-60	Third rail/overhead line	TCB	2-3	Mostly 2

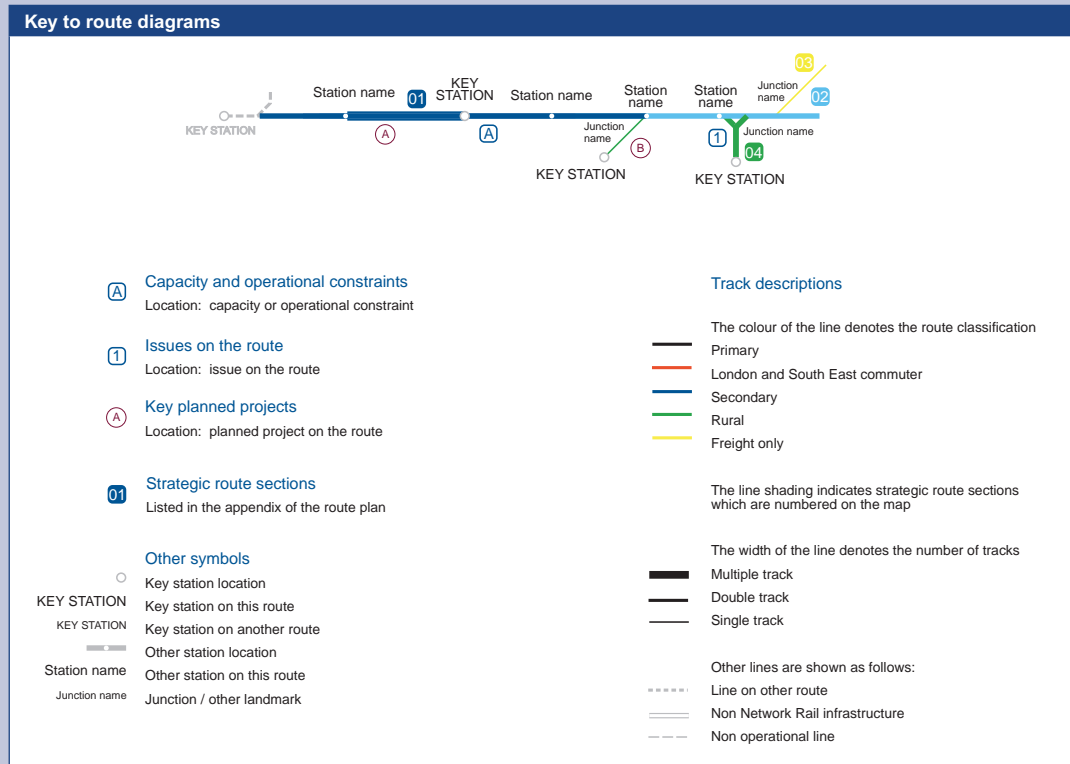
Capacity and other operational constraints

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

Note

This Route Plan forms part of the Control Period 4 (CP4) Delivery Plan and supersedes the version published in April 2008.

Other documents in the Delivery Plan can be found on the Network Rail website www.networkrail.co.uk



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

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