



Route 1 Kent

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Today's route

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

- the main line from Victoria/Blackfriars to Swanley (01.01) (two tracks via Herne Hill and two via Catford), where this splits into separate lines to Ramsgate (via Medway (01.10)) and Ashford (via Maidstone East (01.06)), with a connection via Bat and Ball to Sevenoaks (01.02);
- the main line from Cannon Street/Charing Cross to Tonbridge (01.03, 01.04, 01.05), where this splits into separate lines to Hastings (01.07) and Ashford (01.17);
- suburban lines into Victoria/Blackfriars (01.01) via Herne Hill, Catford and Lewisham (via Nunhead). These share tracks with main line services;
- suburban lines into Cannon Street/Charing Cross. Suburban services are mainly routed through Lewisham (01.08), which has lines to Hayes, Dartford (via Woolwich), Dartford (via Bexleyheath) and Dartford (via Sidcup). At Dartford these lines merge and continue on to join the main Medway line near Rochester (01.10);
- lines east of Ashford to Ramsgate (via Dover) and Ramsgate (via Canterbury West), and the Faversham to Dover line (01.14);
- connections to Waterloo International and section 1 of the Channel Tunnel Rail Link (CTRL);
- freight only lines to the Isle of Grain and Dungeness (01.16);
- the Redhill to Tonbridge line (01.11);
- the Community Rail lines to Sheerness-on-Sea (01.12), the Medway Valley line (01.13) and Hastings to Ashford line (01.15); and
- the branch line to Bromley North (01.09).

Route context

The Kent route is made up of a network of lines linking London (both the West End and City) with several different areas along the Kent and East Sussex coast. It includes the new high speed line to the Channel Tunnel, the final section of which is scheduled for opening in 2007.

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

There are significant overcrowding issues on both main line and suburban services. The extra capacity available upon completion of the new high speed line will provide opportunities both

to help address this and to reduce certain journey times.

In 2005 the Department for Transport awarded the Integrated Kent Franchise (IKF) to Govia. This franchise includes a major timetable recast, coinciding with new domestic services on the high speed line from 2009.

The Department for Transport's South East Regional Planning Assessment (RPA), which will define the long term planning structure for the area, is due for publication in 2006.

We will commence work on the Kent RUS in Summer 2007. This will provide a detailed strategy for future development of the Kent route.

Passenger and freight demand

Passenger demand predominates throughout the major areas of the Kent network. The principal feature is commuter flows to central London from the major population centres, leading to widespread peak period overcrowding. Services generally compete with the road network, especially the main A2/M2, A20/M20 and A21 routes, all of which suffer from high levels of congestion.

A significant portion of demand is for the sizeable short distance commuting flows on main line services to London from stations such as Orpington, Sevenoaks and Bromley South.

Demand for non-London services is focussed on the major towns, including Dartford, the Medway Towns, Maidstone, Ashford, Canterbury, Tunbridge Wells and Hastings. There is also moderate demand to the large Bluewater shopping centre via Greenhithe.

Many of the current travel patterns require passengers to interchange onto other rail, underground, Docklands Light Railway (DLR) or bus routes to complete their journey. Many of these also have limited capacity, currently suppressing journeys on certain routes. Key interchanges are Victoria (Victoria and District/Circle lines), London Bridge (Jubilee, Northern lines, Southern and Thameslink), Charing Cross (Bakerloo and Northern lines), Waterloo East (South West Trains and Jubilee line), Lewisham (DLR) and Greenwich (DLR).

Volumes of Channel Tunnel freight remain at a level significantly below the allocation of paths that are reserved for this purpose. Freight services from other locations are generally showing some modest growth, particularly in aggregates. Aggregate termini at Battersea/Stewarts Lane and Angerstein serve the market for central London construction materials, in addition to there being a number of terminals in Kent. Ports and heavy industry in the Thames/Medway corridors are the other main generators of freight demand.

Demand for Eurostar services has seen strong growth following the opening of section 1 of the CTRL.

Current services

The main operator on the Kent route is South Eastern Trains/London & South Eastern Railway. Passenger services are also operated on the route by Thameslink/First Capital Connect, Eurostar and Southern Railway. Freight services are operated by EWS, Freightliner, GB Railfreight and Direct Rail Services.

The passenger service structure is complicated by the complexity of the network, the different stopping patterns and the existence of several London termini. The main lines via Swanley and Orpington can, to some extent, be considered separately though there are linkages between them:

- main line services via Swanley generally run to Victoria (via Herne Hill), though there are some limited services into Blackfriars, Cannon Street and Charing Cross;
- suburban services via Herne Hill generally run from Orpington to Victoria;
- suburban services via Catford generally run from Sevenoaks (via Swanley) to Blackfriars;
- main line services via Orpington all run to a mixture of Charing Cross and Cannon Street;
- suburban services via Lewisham mostly run to a mixture of Charing Cross and Cannon Street, though there is also a limited service to Victoria via Nunhead; and
- suburban services via Greenwich generally run to a mixture of Charing Cross and Cannon Street.

Figure 1 Chatham Lines – current train service level (trains per hour)

Station	Victoria	Blackfriars	Cannon St or Charing Cross
Chatham	4 peak/2 off peak	N/A	3 peak/0 off peak
Maidstone East	2 peak/2 off peak	1 peak/0 off peak	0 peak/1 off peak
Sevenoaks (via Swanley)	N/A	3 peak/2 off peak	N/A
Bromley South	9 peak/6 off peak	7 peak/2 off peak	N/A
Herne Hill (excluding Thameslink)	5 peak/3 off peak	2 peak/0 off peak	N/A
Catford	N/A	4 peak/2 off peak	N/A

Figure 2 Tonbridge/Dartford Lines – current train service level (trains per hour)

Station	Charing Cross	Cannon Street	Victoria
Ashford (via Tonbridge)	2 peak/2 off peak	3 peak/0 off peak	N/A
Tunbridge Wells	4 peak/2 off peak	1 peak/0 off peak	N/A
Sevenoaks (via Orpington)	5 peak/4 off peak	3 peak/0 off peak	N/A
Hither Green	5 peak/4 off peak	3 peak/2 off peak	N/A
Greenwich	3 peak/2 off peak	2 peak/4 off peak	N/A
Lewisham	5 peak/4 off peak	8 peak/4 off peak	2 peak/2 off peak

Figure 1 and Figure 2 show the current level of service to London from principal stations.

Freight services in Kent mainly run to the Channel Tunnel (around 10 trains per day), Isle of Grain (7-8 tpd), Hoo Junction (4-5 tpd), Angerstein (3 tpd), Battersea/Stewarts Lane (2-3 tpd), Medway/Isle of Sheppey (2 tpd) and Mountfield (1-2 tpd).

The line via Maidstone East, Catford and the West London Line (on Route 2) is the major route for Channel Tunnel freight across London, connecting into the major lines beyond. Approximately 30-40% of this traffic is W9 gauge.

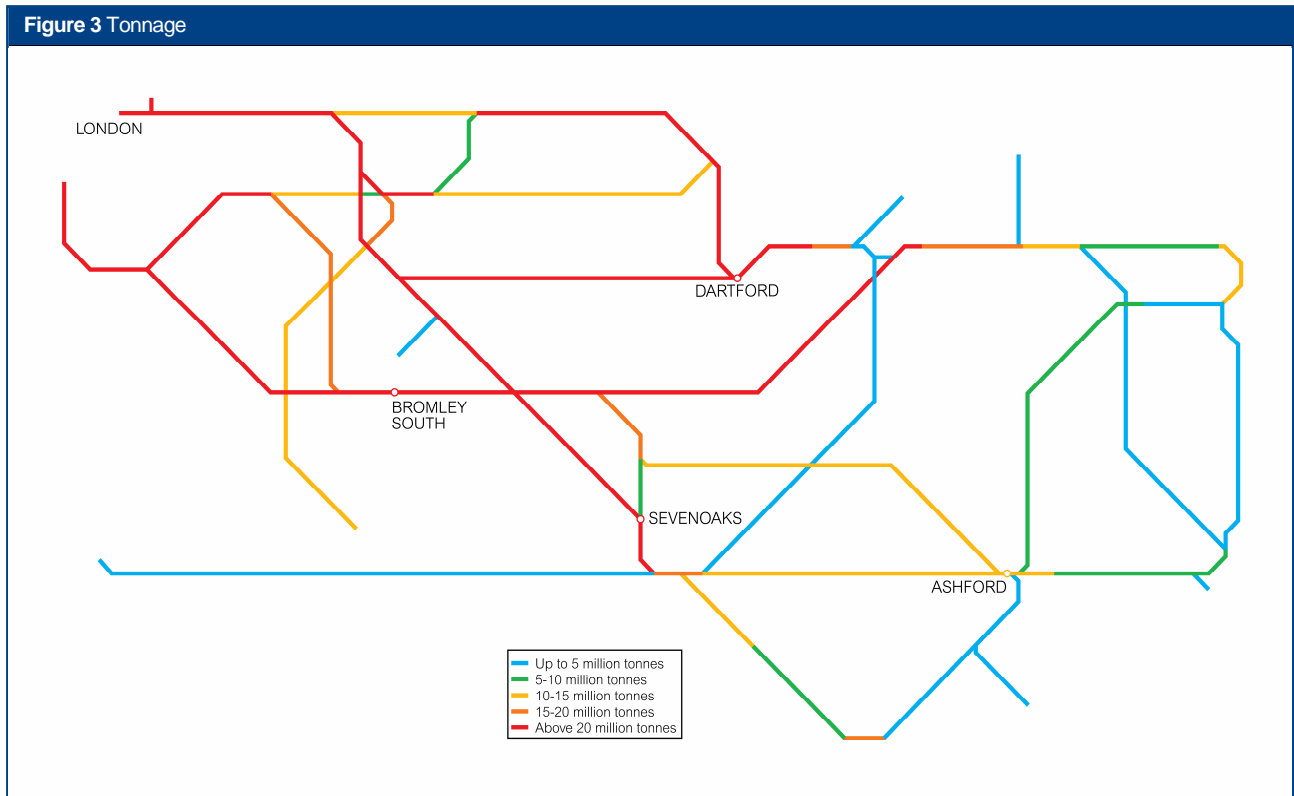
Current traffic

The Kent domestic passenger routes are mainly served by a mixture of new and midlife electric multiple units, with varying characteristics. The Hastings to Ashford line is served by new diesel multiple units.

The main freight flows in Kent are operated by a mixture of class 66 diesel and class 92 electric locomotives.

Eurostar trains will continue to run on the main line network between Waterloo International and Fawkham Junction (via both Herne Hill and Catford) until 2007, when CTRL Section 2 to St Pancras is scheduled to open.

Figure 3 shows the tonnage levels on the route.



Traffic volumes are summarised in Figure 4.

Figure 4 Current use

	Passenger	Freight	Total
Train km per year (millions)	30	2	32
Train tonne km per year (millions)	8,375	1,309	9,684

Current infrastructure capability

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

Figure 5 Linespeed

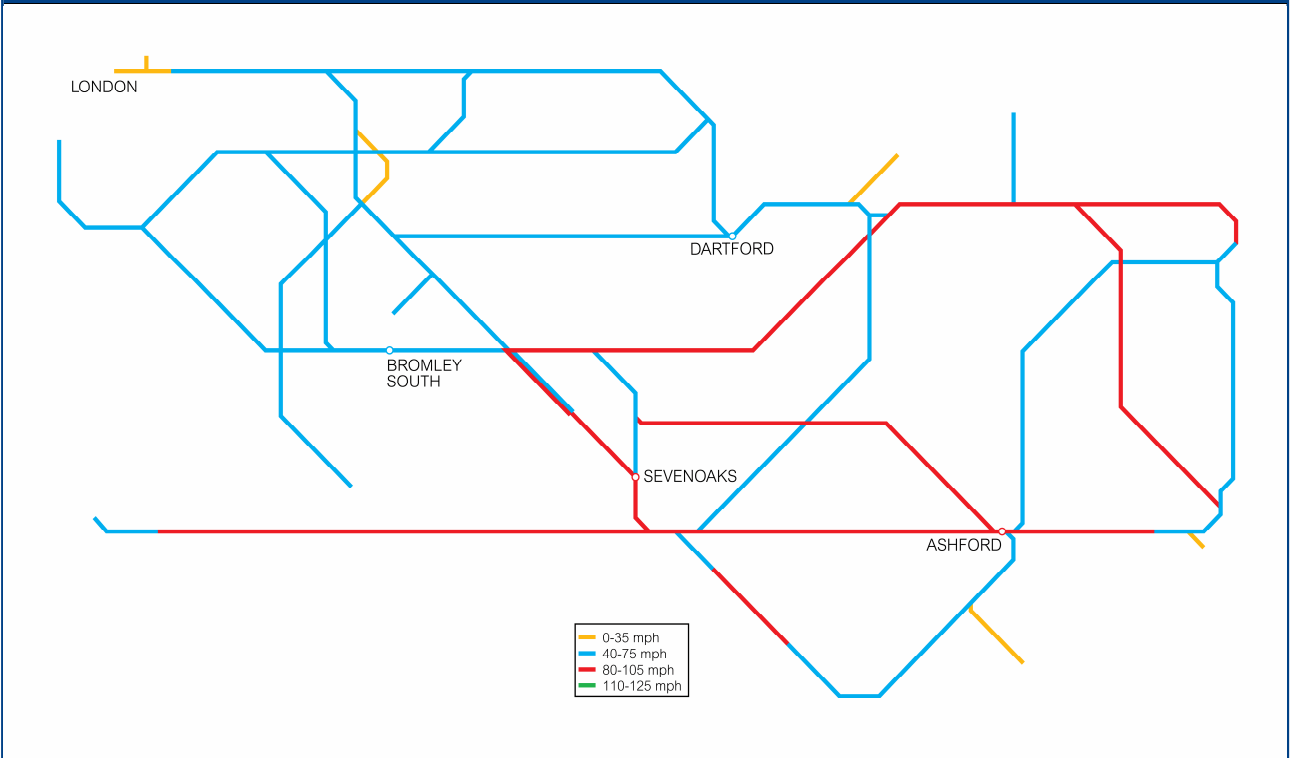


Figure 6 Electrification

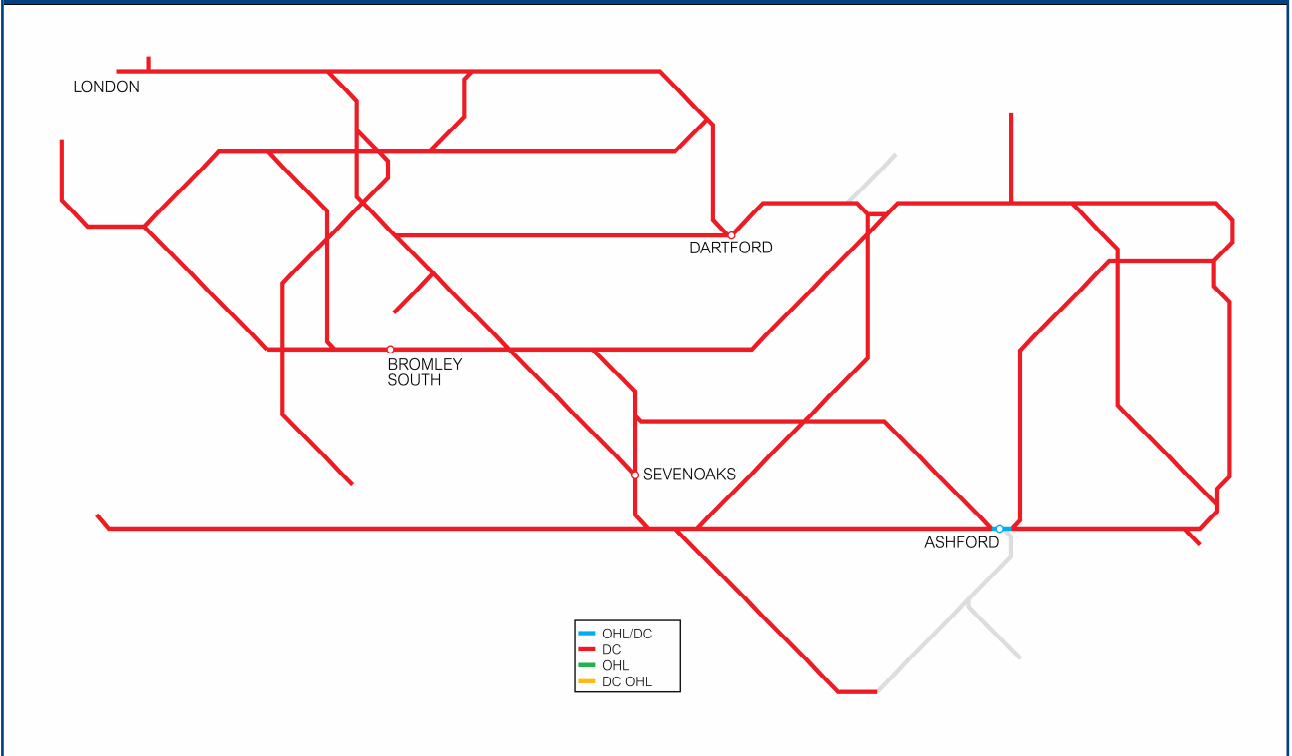


Figure 7 Route availability

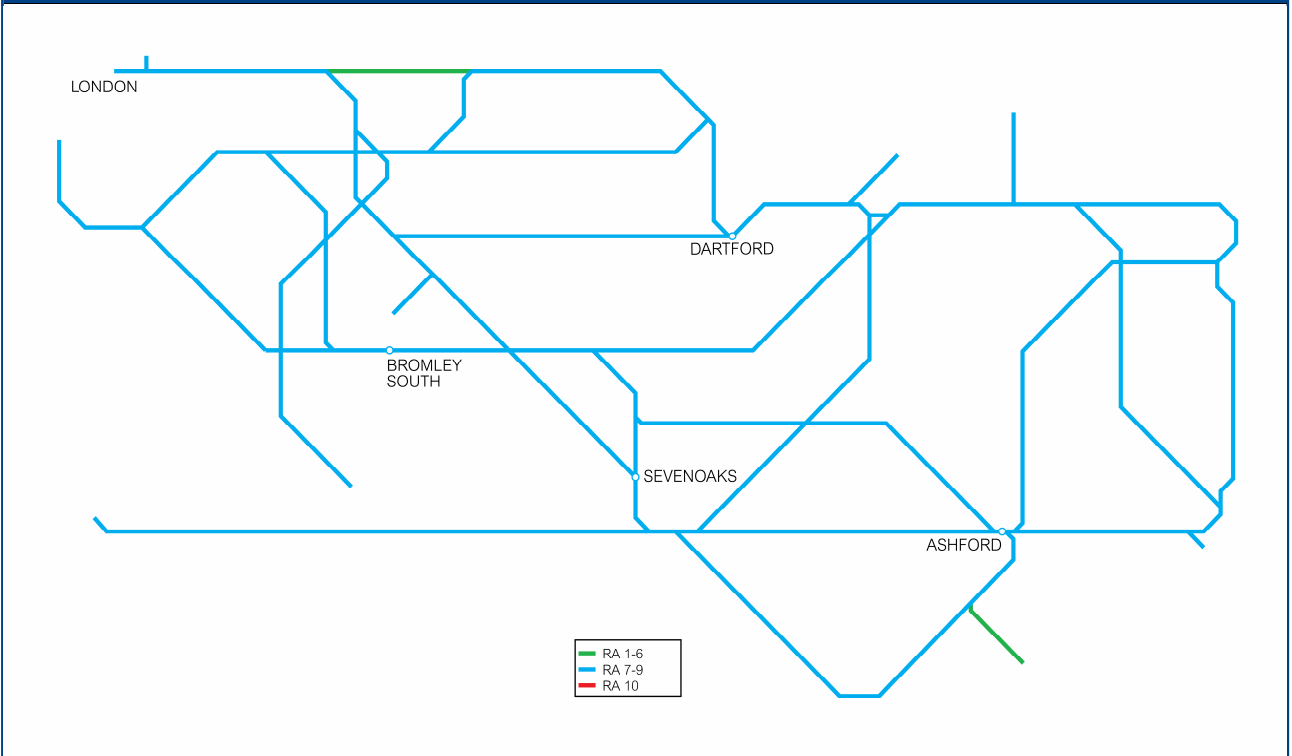
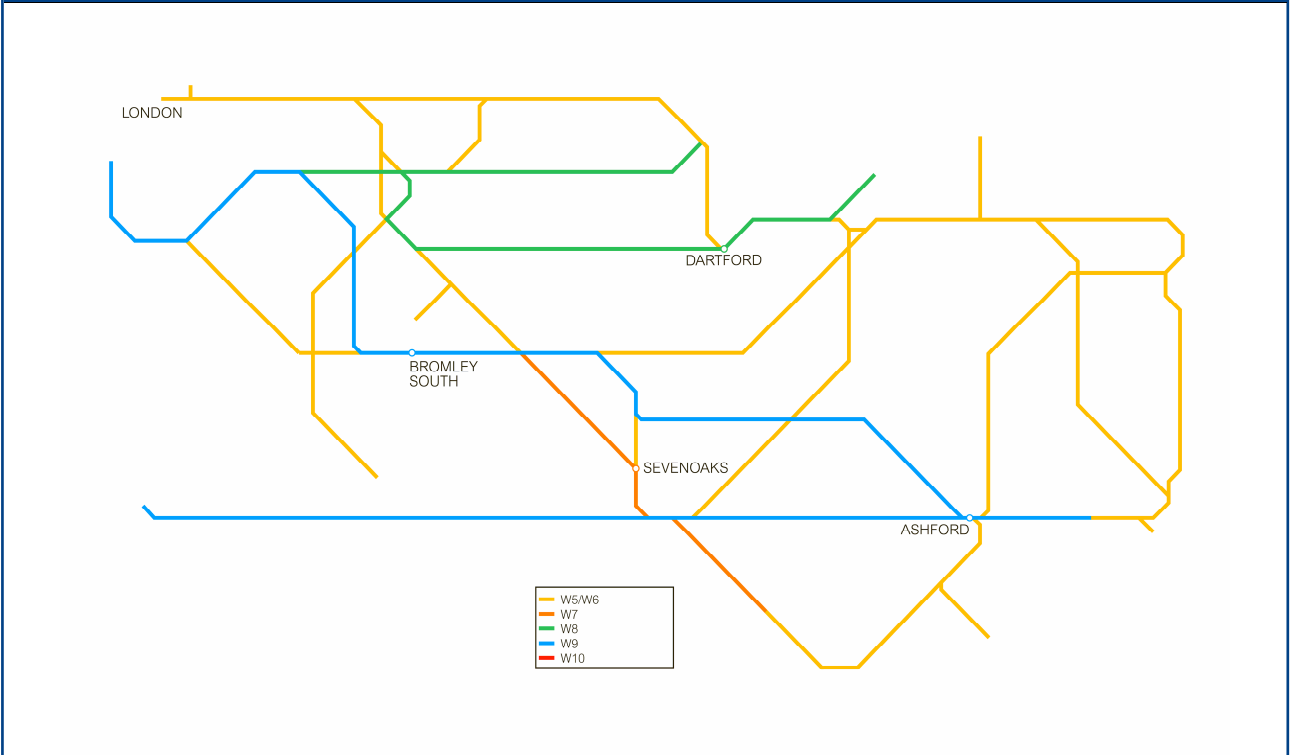


Figure 8 Gauge



Current capacity

The critical sections of the Kent route are operating near capacity for several hours each day. This is governed by a mixture of constraints, primarily limited capacity in the central London area.

Key constraints for passenger services are highlighted below. The first three apply to both Kent route and Thameslink services (on Route 2) as these share tracks through the critical London Bridge area:

- the restrictive layout of the approaches to London Bridge, with numerous conflicting moves between the different service groups across a series of flat junctions;
- the limited number of through platforms at London Bridge, especially on the Charing Cross line where all stopping London bound trains have to be timetabled through platform 6;
- the two track low speed section from London Bridge to Metropolitan Junction;
- the flat junctions in the Lewisham and Hither Green areas;
- the limited number of platforms at Charing Cross, together with some restrictions caused by the short length and reduced width at the end of platforms 5 and 6;
- a mix of fast and stopping services on the mainly two track section between Orpington and Tonbridge;

- power supply restrictions south of Tunbridge Wells, requiring trains to attach and detach in the station. This is exacerbated by the track layout in the area with several single track sections through gauge restricted tunnels;
- 10-car platforms on each of the lines to Dartford, and beyond;
- a mix of fast (including Eurostar) and stopping services on the two track section in the Herne Hill area, exacerbated by the flat crossing with the Thameslink route;
- the number of shunt moves required, and the capacity this takes up, to access the depot at Ramsgate; and
- passenger congestion at key stations such as Charing Cross, Waterloo East, Victoria and London Bridge.

Key constraints for freight services are:

- there are very few locations between the Channel Tunnel and the Wembley area where it is possible for freight services to be looped or regulated;
- freight services generally have to cross from the Atlantic lines to the Catford Loop lines at Crofton Road junction. This is a low speed move which introduces additional performance risk; and
- freight services are restricted by the loading gauge and trailing load limits on certain routes.

Figure 9 shows the current train service level in key sections of the route.

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

Route Section	Number of trains
London Bridge – Metropolitan Junction	29
London Bridge – Cannon Street	25
Sevenoaks – Orpington	15
all trains via Lewisham	16
all trains via Herne Hill (including Thameslink and Eurostar)	17

Figure 10 Current PPM MAA (2005/06)

TOC	MAA	As at period
South Eastern Trains	85.3%	10
Thameslink	86.0%	10
Southern	86.6%	10

Current performance

Figure 10 shows the current PPM for the main TOCs running along the route.

Train performance on the Kent route is currently running at around equal to the national average, with the main passenger TOC (South Eastern Trains) achieving a fourth successive year of performance improvement.

The reliability of assets under Network Rail's direct control has continued to improve. The improved condition of signalling infrastructure has produced particular benefits, with a significant and ongoing reduction in points failures, track circuit failures and other signalling faults.

The route is, however, highly sensitive to external events over which the rail industry has no direct control. Examples of such incidents include suicides, trespass/vandalism and fires on land outside the boundary.

The route has implemented measures to ensure improved service recovery and has developed contingency plans to mitigate the effect of incidents when they occur.

We have recently implemented an amended regulating policy at London Bridge, the results of this trial scheme are currently under review.

Future requirements

Strategic direction

A series of initiatives, with many significant impacts on the Kent route, is envisaged over the next few years. These are highlighted below:

- opening of Section 2 of the CTRL in 2007. This will remove Eurostar trains from the line via Herne Hill and Swanley, releasing sufficient performance buffer to enable additional Victoria to Beckenham Junction services to run;
- a major timetable recast, also in 2007. This is aimed at making better use of existing capacity and improving performance in the critical London Bridge corridor, by optimising the times at which peak trains run through this area;
- implementation of the new IKF timetable in 2009. This will provide high speed services from St Pancras via the CTRL to Medway and East Kent, leading to significant journey time reductions. It will also free up track space closer to London which will enable performance improvement and limited additional services on other lines;
- implementation of the Thameslink Programme. This will largely eliminate the bottleneck caused by the existing track and station layout in the London Bridge area. This will have major benefits for services into Charing Cross, including enabling all trains to call at London Bridge. There will also be some new direct journey opportunities created due to through running from certain Kent routes to the Thameslink network; and
- interfaces with Crossrail Line 1 at Abbey Wood, and potentially beyond.

Future demand

Demand from the Thames Gateway, Ashford and certain parts of east Kent is expected to grow very quickly, in line with considerable housing growth recommended by the South East Plan for these areas. It is expected that the new fast services to St Pancras will accelerate this effect significantly.

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 into London Bridge and Cannon Street. A further contributing factor will be the continued growth of the Docklands area and development of the Olympic site, both of which can be reached from London Bridge via the Jubilee Line.

The continued development of the Docklands area and London Olympics site is also likely to lead to an increased interchange to the DLR at both Lewisham and Greenwich.

The planned extension of the DLR to Woolwich is likely to lead to a sizeable interchange for this new cross-river link, accelerated by the development of the Royal Docks and the growth of London City Airport.

If the planned Crossrail scheme should go ahead, Abbey Wood would become a sizeable interchange and there would be a reduction in demand from beyond this point for services running via London Bridge.

Freight demand in Kent is likely to be dependent on the strength of the economy, transport policy, the pricing structure for Channel Tunnel freight and the success of railways in France and beyond in getting long distance freight onto railways. A detailed investigation is planned in Network Rail's Freight RUS, with a consultation draft planned for publication in 2006.

There is believed to be demand for the development of a road/rail interchange terminal located within a short motorway drive of the Channel Tunnel and Port of Dover. This would enable lorries from Europe to have their loads transferred to rail for their onward journey in the UK. We are aware of proposals for Howbury Park (near Dartford) and Hollingbourne (on the Maidstone East line). Such a site would need to be located on a route with sufficient train path availability to justify the investment required.

There may be some limited demand for fast freight services to Europe via the CTRL at some stage.

Figure 11 Tonnage growth

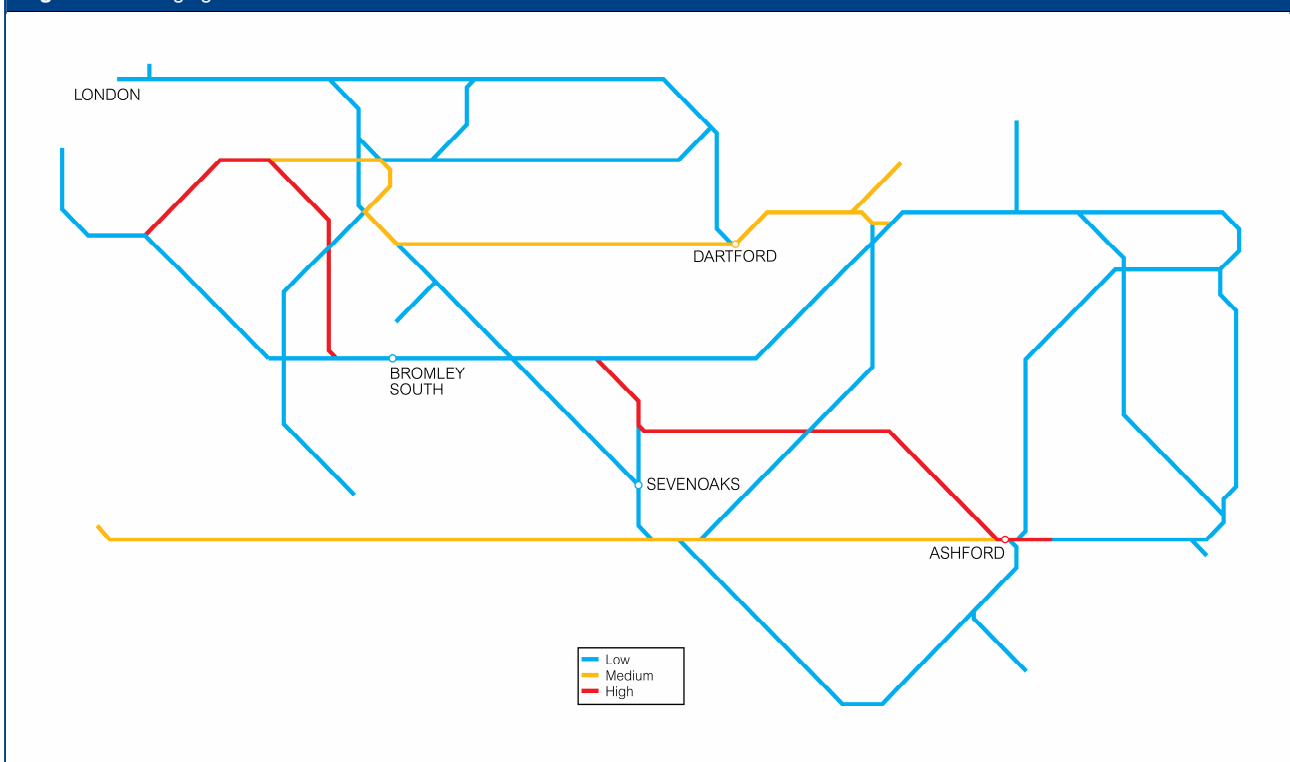


Figure 11 indicates the forecast percentage change in tonnage to 2015.

Future capability

A major upgrade to the power supply throughout the route has recently been completed. This has allowed complete replacement of all old slam door trains with a modern new fleet. Following completion of this work, there remain a number of outstanding power supply issues in the Kent area where further investigation is required:

- work is currently underway to ensure that the power supply for the 2009 timetable is adequate, particularly with respect to routes where the new trains providing the CTRL domestic services are planned to operate;
- power supply issues prevent operation of 12-car trains to Hastings. This leads to the need for trains to split and join at Tunbridge Wells, an activity that adds to journey times and regularly leads to delays. We are currently investigating whether it would be economically feasible to upgrade the power supply in the area to remove the need for this activity;
- power supply issues, together with several short platforms, prevent operation of 12-car trains on each of the lines to Dartford and beyond. We are currently investigating upgrading the power supply to remove this restriction on the Sidcup and Bexleyheath lines. This work, which would be required anyway by the Thameslink Programme, will also require platform extensions at New Cross, Hither Green, Eltham, Mottingham and Dartford; and

- work will be required to renew and upgrade the Network Rail power supply feed from the national grid at New Cross.

Linespeeds are generally considered adequate, as journey times are primarily dependent on stopping patterns rather than maximum speeds.

There are strong aspirations for CTRL domestic services to run to Dover, rather than terminate at Folkestone. This would require track realignment works, to maximise the clearance available, in the narrow bore Shakespeare Tunnels. We are currently working with HMRI to agree an appropriate solution. There appear to be clear benefits in serving Dover with these services.

We have aspirations to close the Folkestone Harbour branch as a means of making financial savings. The branch is in very poor condition and does not receive a regular train service.

The following capability issues have been identified regarding Channel Tunnel freight routes:

- the route via Sevenoaks is not cleared for the operation of W9 gauge freight traffic. Increasing the gauge on this route is believed to require extensive works, including track lowering in Sevenoaks tunnel. The current level of Channel Tunnel freight is, however, such that this work is not yet economically viable; and
- the route via Redhill is not cleared for the operation of class 92 electric freight locomotives. Allowing such traffic on this route is believed to require extensive works to protect the signalling

system and for power supply reinforcement between Redhill and Clapham Junction (on Route 2).

Future capacity

The route is operating close to the maximum number of trains that can be run at present. The following measures provide the most efficient utilisation of available capacity and are planned in 2009 upon introduction of the IKF timetable:

- maximisation of CTRL usage by introducing high speed domestic services to Medway and East Kent via Ashford. The diversion of most fast services from these areas onto the CTRL will free up capacity closer to London for use by other services;
- removal of conflicting moves across the flat junctions on the London Bridge approaches wherever possible. In particular this will require all Greenwich line services to run to Cannon Street rather than Charing Cross; and
- reduction in conflicting moves wherever possible at Lewisham.

Several further measures are envisaged as being necessary to accommodate the predicted growth:

- upgrades to the power supply on the Hastings, Sidcup and Bexleyheath lines as described in the capability section above. This will provide a significant increase in the number of lines where 12-car trains can operate;
- provision of a headshunt siding in Ramsgate depot and a direct connection to the main line at the Minster end of the depot. This is necessary to remove the current bottleneck caused by shunting requirements in this area;
- implementation of the Thameslink programme. This would provide a major increase in capacity and remove the major constraints for all services groups via Lewisham and Orpington. It would include providing four tracks at Borough Market, additional platforms at London Bridge (allowing all Charing Cross services to call) and grade separated junctions at key locations;
- significant changes may be required at Ashford station. The proposed 2009 timetable introduces regular CTRL domestic services but these will be unable to use international platforms 3/4 for which the track layout connecting to the CTRL was optimised. This may require platform 3 and/or 4 to be converted for domestic use; and
- it may be necessary to increase the speed of Crofton Road junction by remodelling the track layout and/or making changes to the signalling system.

The signalling headways in Kent are generally considered adequate. Headways are rarely the limiting factor on the numbers of trains that can be run on this route, which is primarily governed by the occupancy of junctions and platforms, especially in the London area. Headways in East

Kent will be reviewed as part of the resignalling scheme for the area.

Certain stations will require works to enable them to cope with the predicted growth in passenger numbers:

- Charing Cross station is very congested with no space available for expansion. It may be necessary to relocate some retail outlets on the concourse to provide an increase in the circulation space. It may also be necessary to open the Embankment end entrance for a greater proportion of the day as passenger volumes grow;
- Waterloo East station is very congested and demand is likely to grow due to large new office developments in the local area. Also, it is not practical to fit ticket barriers unless passenger numbers using the main station link bridge can be reduced or the available space increased in some way. We are investigating provision of a new entrance, adjacent to Southwark underground station. This would provide improved access to the local area and remove some passengers from the link bridge, potentially allowing ticket barriers to be installed;
- Victoria station is very congested. Options for increasing passenger capacity are under development by the Victoria Masterplan project. This project has a significant interface with plans by London Underground to expand the underground station; and
- London Bridge station is very congested. This is to be addressed by the London Bridge Masterplan which forms part of the Thameslink programme.

Future performance

The arrival of Govia as the South Eastern franchise holder presents the route with a fresh management outlook, providing the opportunity to build new relationships to aid improved performance. Govia has committed to raise PPM to 91.6% by 2010 and this will require improvements to both our operational management and infrastructure performance.

A key feature of our future performance plans emphasises the prevention of incidents, rather than how we react to them as they occur. We are taking steps to ensure that all signalling infrastructure failures, in particular, are reviewed and acted upon to prevent repeat occurrences. We also plan to renew life expired equipment where necessary.

Some examples of specific initiatives for performance improvement are as follows:

- renewal of track circuits between Tonbridge and Hastings;
- replacement of point machines;
- increased rigour applied to the management of possessions;

- renewal of points heating at certain locations;
- installation of lightning protection at critical locations; and
- installation of uninterruptible power supply at London Bridge and Victoria.

Performance should improve as longer distance trains are transferred onto the CTRL, commencing with Eurostar in 2007 followed by longer distance domestic services from 2009.

The proposed 2009 timetable is expected to improve performance due to a reduction in conflicting train movements at critical locations and an improved method of working through the critical London Bridge area.

Figure 12 shows the forecast reduction in Network Rail delay minutes compared with 2005/06.

Figure 13 shows the forecast PPM for the main TOCs running along the route.

Figure 12 Forecast reduction in delay minutes

	2006/07	2007/08	2008/09
% reduction in delay minutes	7%	13%	18%

Figure 13 Forecast PPM MAA

TOC	2006/07	2007/08	2008/09
South Eastern Trains	87.1%	88.0%	88.6%
Thameslink	85.9%	86.3%	86.6%
Southern	87.4%	88.3%	89.2%

Engineering access

Engineering access on the route is largely managed by a cyclical possessions regime, with two tracks being able to be kept open to traffic for most types of maintenance work on four track sections.

However, 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.

Notable works in the short term include the renewal of Hither Green interlocking over the 2006 Christmas period. Detailed planning of the alternative travel arrangements available during this work has now commenced.

In the longer term the reconstruction of London Bridge station as part of the Thameslink programme may require some diversions to other London terminals and/or temporary reductions in service levels.

Opportunities and challenges

We anticipate that accommodating longer term growth in commuting to central London will be a significant challenge on the route, with continued growth in central London employment expected. The context is that most of the route is already operating at, or very close to capacity.

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

- implementation of a finalised 2009 timetable;
- construction of the Thameslink programme;
- encouraging a review of ticket pricing measures to spread the peak and smooth the high peak requirements;
- incremental capacity enhancement (which can be delivered as improvements to planned renewals); and
- limited stand alone capacity enhancements at critical locations.

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 2 to 4 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; and
- there are numerous obstructions that physically limit platforms on the North Kent Line to 10-car length, routes into Victoria/Blackfriars to 8-car length and 12-car routes elsewhere.

Delivering future requirements**Summary**

The main categories of infrastructure investment planned for the Kent route in the next few years are as follows:

- completion of Section 2 of the CTRL;
- a comprehensive resignalling programme in the East Kent area in particular, with major track layout changes planned at Ramsgate, Margate, Faversham and Canterbury West. This work is being programmed so as to be substantially complete in advance of the introduction of domestic services via the CTRL from these locations;
- works in support of the 2009 timetable, comprising new depots at Ashford and Ramsgate, signalling changes to allow 12-car trains to run to Tunbridge Wells and works to Shakespeare Tunnel to allow CTRL services to run to Dover;
- major projects, principally Thameslink;
- a comprehensive resignalling programme for two of the major signalling centres on the route (Victoria and London Bridge);
- targeted incremental enhancements, with works tying into planned S&C renewals, resignalling schemes or property schemes wherever possible; and
- an ongoing renewals programme.

Expenditure

Figure 14 shows the planned level of expenditure on renewals on this route over the next three years. However, the precise timing and scope of

renewals remains 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.

Figure 14 Forecast expenditure

£m (05/06 prices)	2006/07	2007/08	2008/09
Renewals			
Track			
Plain Line	18	15	14
S&C	3	4	3
Track Total	21	19	18
Civils			
Underbridges	3	4	9
Overbridges	–	–	0
Bridgeguard 3	1	1	0
Earthworks	0	2	3
Tunnels	0	1	–
Coastal & estuary defence	3	2	0
Other	1	1	0
Civils Total	7	10	13
Signalling			
Resignalling	3	9	28
Minor works/other	4	4	7
Signalling Total	7	13	35
Electrification			
AC Systems			
HV switchgear	0	0	1
Other	0	–	–
DC Systems			
HV switchgear	6	2	2
HV cables	4	3	2
LV switchgear	2	5	6
Transformers/rectifiers	2	3	5
Grid supply points	0	0	0
Conductor rail	0	0	1
Other	1	2	2
SCADA	1	–	–
Electrification Total	17	17	18

Telecoms			
Concentrators: large	–	0	1
DOO CCTV	1	4	3
Other	–	0	1
Telecoms Total	1	4	4
Plant and machinery			
Fixed plant	0	0	1
Signal supply point	–	–	0
Point heating	2	2	2
Plant and machinery Total	2	2	2
Operational property			
Stations	15	24	7
Operational property Total	15	24	7
Total Renewals	70	88	96
Enhancements (funded by)			
Network Rail (RAB)			
12 car trains on Sidcup & Bexleyheath Lines	0	10	10
Isle of Grain freight route	0	4	–
Other	1	–	–
Network Rail (RAB) Total	1	14	10
Other Third Party			
Allto Ashford & Ramsgate depots for CTRL domestic services	1	1	0
Crossrail	2	2	10
Howbury Park intermodal freight terminal	0	2	0
Magnitude freight terminal	1	1	0
Other	4	1	1
Other Third Party Total	7	7	11
Total Enhancements	8	20	21

Figure 15 Forecast volumes

	2006/07	2007/08	2008/09
Track			
Rail renewal (km)	30	28	28
Sleepers renewal (km)	28	27	27
Ballast renewal (km)	29	28	28
Drainage (km)	2	2	2
Civils			
Underbridges (square metres)	649	1,826	2,946
Overbridges (square metres)	97	469	136
Embankments (square metres)	58	19,990	24,270
Tunnels (square metres)	357	3,009	–
Coastal & estuary defence (linear metres)	250	250	100
Signalling			
Resignalling (SEUs)	–	–	110
Electrification			
AC Systems			
HV switchgear (CBs)	–	1	1
DC Systems			
HV switchgear (CBs)	36	16	12
HV cables (km)	13	24	13
LV switchgear (CBs)	–	139	104
Transformers/rectifiers (no)	7	12	18
Grid supply points (CBs)	1	3	–
Conductor rail (km)	10	6	8
Telecoms			
Concentrator: large (no)	–	–	2
Concentrator: small (no)	–	–	6
DOO CCTV (systems)	–	207	100
Plant and machinery			
Signal supply point (no)	–	–	1
Point heating (point end)	113	152	194

The planned volume of renewals is detailed in Figure 15.

It should be noted that in order to manage the deliverability of our Civils, Signalling & Electrification plans we have included an element of overplanning 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.

Maintenance

Figure 16 below shows the planned level of expenditure on maintenance on this route over the next three years.

Figure 16 Forecast expenditure

£m (05/06 prices)	2006/07	2007/08	2008/09
Maintenance	58	54	49

Infrastructure investment

Figure 17 highlights committed schemes that are planned for completion in the financial year shown.

Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
A CTRL Section 2	Completion of CTRL to St Pancras	Significant journey time reductions on Eurostar (from 2007) and domestic services (from 2009). Removal of Eurostar from lines to Waterloo frees paths for other services	New line	London and Continental Railway	6	2007/08
B Ashford depot (01.14)	Reconfigure depot	Maintenance facilities for CTRL domestic services	Depots	DfT	6	2007/08
C Ramsgate depot (01.14)	Reconfigure depot	Stabling facilities for CTRL domestic services	Depots	DfT	6	2008/09
C Ramsgate headshunt (01.14)	New siding at depot entrance	Reduced need for shunting moves via the main line. Improved performance	Track, signals	TOC	3	2007/08
D Hither Green signals (01.04)	Like for like renewal of signal interlocking	Improved asset condition and performance	Signals	None	4	2006/07
E Folkestone Warren (01.14)	Cliff face stabilisation	Route has a history of problems due to rock falls arising from erosion of the coastline. Scheme will reduce this risk. Improved asset condition and performance	Structures	None	3	2006/07
Af Shakespeare tunnel class 395 clearance (01.14)	Track realignment and various minor works	Allow CTRL domestic services to serve Dover	Track, structures	None	3	2008/09
E Folkestone East signal renewals (01.14)	Like for like signalling renewal, with closure of the Folkestone Harbour branch under consideration	Improved asset condition and performance. Network simplification. Alternative options for operating the Orient Express are being assessed	Signals, track, property	None	4	2006/07

Figure 17 Planned infrastructure investment

Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year	
F	Sevenoaks tunnel water management (01.05)	Water ingress management scheme	Tunnel has a history of problems due to water ingress. Improved asset condition and performance	Structures	None	3	2006/07
F	Driver only operation CCTV renewals (01.05)	Like for like CCTV renewals at various sites	Improved asset condition	Telecoms	None	4	2008/09
G	East Kent resignalling (Ramsgate) (01.14)	Combined track and signal renewals. Revised track layout to comply with modern signalling standards. New direct Minster end connection into depot	Improved asset condition and performance. Minster end connection should eliminate need for most shunting moves of on main line and increase capacity	Signals, track	NRDF	3	2009/10
G	East Kent resignalling (Faversham) (01.10)	Signal renewals with changes to allow services to reverse in platform 3. Likely to require revised track layout to comply with modern signalling standards	Improved asset condition and performance. Track layout options currently under investigation	Signals, Track	NRDF	2	2009/10
K	East Kent resignalling (Margate) (01.10)	Signal renewals with rationalisation of existing layout. Closure of platform 4	Network simplification with improved layout. Improved asset condition and performance	Signals, track	None	3	2009/10
L	East Kent resignalling (Canterbury East) (01.14)	Signal renewals with changes to allow services to reverse	Improved asset condition. Improved opportunity for service recovery	Signals	NRDF	3	2009/10
L	East Kent resignalling (Canterbury West) (01.14)	Combined track and signal renewals. New track layout to be provided. New platform under consideration	Improved track layout for terminating trains. Reduced road closure times at level crossings. Improved asset condition and performance	Signals, track, station	NRDF	3	2009/10

Figure 17 Planned infrastructure investment

Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
M East Kent resignalling (other works) (01.10)	Like for like signal renewals. Removal or reinstatement of existing disused crossovers	Improved asset condition. Improved opportunity for service recovery by reinstating turnbacks at Whitstable and Heerne Bay (Birchington removed)	Signals, track	None	3	2009/10
G Rochester River bridge (01.10)	Bridge strengthening or reconstruction	Improved asset condition	Structures	None	1	2006/07
H Maidstone to Ashford earthworks (01.06)	Embankment strengthening at Hollingbourne, Bearsted and Charing	Improved asset condition	Structures	None	2	2008/09
I Darenth viaduct (Swanley – Fawkham Junction) (01.10)	Brickwork repairs	Improved asset condition	Structures	None	5	2006/07
N Bopeep Junction S&C (01.07)	Like for like S&C renewal	Improved asset condition and performance	Track	None	2	2008/09
O Factory Junction S&C (01.01)	Like for like S&C renewal	Improved asset condition and performance	Track	None	4	2006/07
P DLR extension (01.08)	Station changes at Woolwich Arsenal	New journey opportunities	Station	TfL	5	2009/10
Q Deptford station (01.08)	Station redevelopment	Improved station facilities	Station	None	4	2007/08
R Greenhithe station (01.10)	Station redevelopment	Improved station facilities	Station	None	4	2007/08
S Grove Hill tunnel slab track renewal (01.07)	Like for like renewal of slab track in tunnel	Improved asset condition	Track	None	4	2007/08

Figure 17 Planned infrastructure investment

Project	Scope	Enhancement or output change	Main asset type(s)	Third Party funding	GRIP stage	Completion year
⊗ Victoria ASC UPS (01.01)	Renewal of battery backup system to signalling centre	Improved asset condition and performance	Signals	None	1	2006/07
⊙ London Bridge ASC UPS (01.04)	Renewal of battery backup system to signalling centre	Improved asset condition and performance	Signals	None	1	2008/09
⊙ London Bridge CIS (01.04)	Upgrade to customer information system	Improved passenger information	Telecoms	None	2	2007/08

Figure 18 highlights uncommitted schemes under development.

Project	Scope	Enhancement or output change	Main asset type(s)	Status
U Thameslink Programme (01.04)	Major works including remodelling of London Bridge and approaches. Provision of four tracks between Borough Market and Metropolitan Junction. Significant major renewals included	Elimination of major bottleneck at London Bridge. Improved capacity and performance across a wide area. Enables running of 12 car trains on an expanded Thameslink network. Improves access to Charing Cross for other services	All asset types	TBC
V London Bridge Masterplan (01.04)	Reconstruction of London Bridge station. Includes interface with 'Shard of Glass'	As above	All asset types	TBC
C East Kent resignalling phases 2 and 3 (01.10)	Resignalling scheme with possible opportunities for track layout changes	Improved asset condition and performance	Signals	Under consideration
S Tunbridge Wells 12-car turnback (01.07)	Relocate signals into tunnel to allow 12-car services to reverse	Allows increase from 10-car to 12-car for Charing Cross – Tunbridge Wells services	Signals	Under development
T Hastings line 12-car trains (01.07)	Power supply upgrade	Removes need to attach/detach at Tunbridge Wells. Improved capacity and performance	Electrification	Under development
W 12-car Networker scheme (Sidcup and Bexleyheath lines) (01.08)	Platform extensions: New Cross, Hither Green, Eltham, Motingham and Dartford. Power supply upgrade and minor works	12-car operation on Sidcup and Bexleyheath lines to Dartford	Platforms, electrification	Part of Thameslink programme works. Under consideration for earlier implementation.
X Victoria resignalling (01.01)	Resignalling scheme with possible opportunities for track layout changes	Improved asset condition and performance	Signals	Under consideration
V Isle of Grain freight enhancements (01.16)	Construction of a passing loop on freight only branch	Minimal opportunity at present for standing freight trains between Kent and WCML/GWML. Would increase cross-London timetable opportunities	Track, signals	Under consideration

Figure 18 Infrastructure investment under consideration

Project	Scope	Enhancement or output change	Main asset type(s)	Status
		and improve performance		
Z	Crofton Road Junction speed review (01.01)	Removal of approach control on the signal protecting the junction	Signals	Under consideration by Cross London RUS
F	Second 'unrestricted' freight route to the Channel Tunnel.(01.05,01.11)	Upgrade one of the existing channel tunnel routes (either via Redhill or Sevenoaks) so that it is suitable for both W9 gauge traffic and class 92 electric locomotives	Signals, electrification, structures	Under consideration
W	Regenerative braking (01.08)	Allow energy to be returned to power supply system from train braking	Electrification	Under consideration
X	Victoria Masterplan (01.01)	Redevelopment of Victoria station	Station	Under development
YA	New Cross Grid power supply renewal (01.08)	Renewal and upgrade of power supply feed from national grid to Network Rail	Electrification	Under consideration
B	Ashford domestic use of platforms 3 and/or 4 (01.17)	Options under consideration. Station layout changes likely to be required; minor track and signalling changes may also be needed	Station, track, signals	Under discussion with DfT and Eurostar
TE	Cannon Street development (01.03)	New office building above station concourse	Property	Under development
TC	Waterloo East additional entrance (01.04)	Additional entrance near Southwark LUL	Station	Under development
		Congestion relief. Improved access to local area to cater for major developments. May facilitate ticket barrier installation at main entrance		

Figure 18 Infrastructure investment under consideration

Project	Scope	Enhancement or output change	Main asset type(s)	Status
1D Howbury Park (01.08)	New freight terminal	Freight capacity	Depot	Capacity in area under review
1E New Hythe (01.13)	Freight terminal to replace existing facility at Paddock Wood	Freight capacity	Depot	Awaiting outside party funding
1H Hollingbourne (01.15)	New freight terminal	Freight capacity	Depot	Awaiting outside party funding
1F Port of Dover rail connection (01.14)	New freight connection to serve Dover docks	Freight capacity	Depot	Awaiting outside party funding
1G Gravesend station (01.10)	Station redevelopment	Improved station facilities	Station	Under development
1A Maidstone East station (01.06)	Station redevelopment	Improved station facilities and expanded station car park	Station	Under development
1J Denton new station (01.10)	New station	New journey opportunities	Station	Under consideration
1K Battersea Pier to Linford Street Junction intersection bridges (01.01)	Like for like bridge renewals. Upgrades to ballasted decks are being considered	Improved asset condition. Reduced maintenance requirements	Structures, track	Under consideration

Non-infrastructure developments

Figure 19 highlights significant timetable schemes for the route are under development.

Figure 19 Timetable development				
Description	Key issues	Actions or options being developed	Benefits	Target timetable implementation
2007 timetable recast	Performance through London Bridge	Under development	Improved performance through the critical London Bridge corridor	2007 implementation
2009 IKF timetable	CTRL capacity. Journey times	Under development	Additional capacity. Shorter journey times to Kent coast.	2009 implementation
Thameslink construction period	Temporary capacity reductions in the London Bridge area	Options being developed	Aim to maintain capacity into London during the works	TBC
Resilient timetable review	Performance	Review Rules of the Plan to ensure accurate fit with route constraints	Improves knowledge of route capability	Ongoing

Figure 20 Other projects				
Description	Key issues	Actions or options being developed	Benefits	Start date
Smartcard introduction	Revenue protection and flexible ticketing	Discussion with DfT, TfL and ATOC.	Revenue increase and potentially demand management improvements.	To be determined

Appendix

Figure 21 Strategic route sections

Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference, RA is Route Availability

SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway	No of Tracks
01.01	Victoria Lines	VIR, CAT, NTL	London & SE	DfT	No	W6/W9	RA8	45-60	Third rail	TCB	2.5 – 3 mins	2-4
01.02	Oxford – Sevenoaks	OJS	London & SE	DfT	No	W6	RA8	40	Third rail	TCB	3 – 4	2
01.03	Cannon Street	CBM	London & SE	DfT	No	W6	RA8	20	Third rail	TCB	2 – 2.5	3
01.04	Charing Cross – Chislehurst Junction	XTD	Primary	DfT	No	W6	RA8	60	Third rail	TCB	2 – 3	2-4
01.05	Chislehurst Junction – Tonbridge	XTD	Primary	DfT	No	W6	RA8	70-90	Third rail	TCB	2 – 3.5	2
01.06	Chislehurst Junction – Ashford via Maidstone E.	VIR, SBJ	Primary	DfT	No	W9	RA8	70-80	Third rail	TCB	3 – 4	2-4
01.07	Tonbridge – Hastings	TTH	London & SE	DfT	No	W6	RA8	60-80	Third rail	TCB	3 – 5.5	1-2
01.08	Dartford Lines plus Hayes	NKL, BEX, BTC, NCS,	London &	DfT	No	W6/W8	RA6/8	60	Third rail	TCB	2 – 6	2

Figure 21 Strategic route sections

Predominant aspect recorded (secondary aspects recorded in brackets). ELR is Engineers Line Reference, RA is Route Availability												
SRS	SRS Name	ELR	Classification	Funding	Community Rail	Freight Gauge	RA	Speed	Electrification	Signalling Type	Signalling Headway	No of Tracks
	Branch	HDR, LLL, SE LCH										
01.09	Bromley North	BNG	London & SE	DfT	No	W6	RA8	40	Third rail	TCB	3	2
01.10	Dartford and Swanley – Margate	VIR,HDR	London & SE	DfT	No	W6	RA8	70-90	Third rail	TCB	2 – 4	2
01.11	Redhill – Tonbridge	RTT	Secondary	DfT	No	W9	RA8	60-85	Third rail	TCB	7 – 9	2
01.12	Sheerness Branch	SEJ	London & SE	DfT	Yes	W6	RA8	30	Third rail	TCB	4	1
01.13	Strood – Paddock Wood	PWS	London & SE	DfT	Yes	W6	RA8	55	Third rail	TCB	7	2
01.14	East Kent Routes	VIR,FDM,A CR,BME,X TD	London & SE	DfT	No	W6	RA8	40-70	Third rail	abs block	3 – 14.5	2
01.15	Hastings – Ashford	ATH	Rural	DfT	No	W6	RA8	40-60	none	mixed	13 – 14	1-2
01.16	Freight lines	Various	Freight only	DfT	No	W8	RA6/7	30	none	key token	N/A	1-2
01.17	Tonbridge – Continental Junction	XTD	Primary	DfT	No	W9	RA8	90-100	Third rail	TCB	2.5 – 3.5	2

Capacity and operational constraints

- A London Bridge: insufficient platform capacity for service growth or for all existing Charing Cross services to call
- B Borough Market – Metropolitan Junction: two track section restricts capacity
- C Spa Road: flat junctions between Tonbridge, Greenwich and Brighton lines restrict capacity
- D Lewisham, Hither Green: flat junctions restrict capacity
- E Orpington – Tonbridge: mainly two track railway with differing stopping patterns restricts capacity
- F Herne Hill: Flat crossing between Sussex and Kent routes restricts capacity
- G Tonbridge – Hastings: four single track tunnel sections restrict capacity track arrangement not good for terminating services at Tunbridge Wells
- H Ashford International platforms not available for domestic services unable to access CTRL from platforms 1 & 2
- I Ramsgate: track layout at depot restricts capacity
- J Charing Cross: platform capacity constraints with no space for future growth

Other issues on the route

- 1 All routes: proposed new timetable, including high-speed services on the Channel Tunnel Rail Link, to improve capacity and performance
- 2 Borough Market – Metropolitan Junction: four tracking proposed for the Thameslink programme will increase capacity
- 3 London Bridge: remodelling and additional platforms proposed for the Thameslink programme will increase capacity
- 4 Bermondsey: grade separated junction proposed for the Thameslink programme will eliminate crossing moves and increase capacity
- 5 Lewisham: improvements to junction proposed for the Thameslink programme will increase capacity
- 6 Woolwich Arsenal: interchange with the proposed DLR extension
- 7 Abbey Wood: interchange with the proposed Crossrail line
- 8 Shakespeare Tunnels: evacuation procedure for proposed CTRL domestic services being assessed