I am delighted to present Network Rail’s Route Utilisation Strategy (RUS) for Kent which sets out the strategic vision for the future of this vital part of the rail network serving Kent, parts of East Sussex and London.

This publication comes at an historic time for passengers on this route following the launch of the country’s first domestic high speed service into London St Pancras. This service, which is already helping to reduce congestion on the existing network, demonstrates the benefits that high speed rail can bring.

Passenger numbers continue to grow, despite the current economic conditions, and every indication points to substantial growth in the longer term, evidenced by a renewed focus on reducing CO2 emissions and the continuing development of the Ashford and Thames Gateway growth areas. These factors are all likely to lead to a further increase in popularity of the railway and the RUS recommends an appropriate strategy for growth on this basis.

The RUS starts by describing the capacity and capability of the existing railway network. It moves on to describe those schemes we have already committed to deliver, including an indication of the impact on rail services during the remodelling of London Bridge station as part of the Thameslink Programme, and the services envisaged as running once the project is complete. The RUS then moves on to analyse future demand, identify “Gaps” and recommend “Options” to address them.

The dominant issue, similar to that in other RUSs, and even after the completion of the Thameslink Programme, will be the need to provide sufficient capacity on peak services to and from London. The recommended short to medium term approach is to enable longer trains to serve the route. This initially focuses on the small number of shorter trains on main line services via London Bridge, then considers services to Victoria and finally turns to the new high speed trains to London St Pancras, many of which are 6-car at present. Beyond this, two further opportunities are identified; the safeguarded Crossrail extension to Gravesend and, in the longer term, the potential conversion of the Hayes branch to an alternative transport mode such as a London Underground extension.

This RUS was initially published as a Draft for Consultation in April 2009. A great many issues were raised during the consultation period and these have now influenced several aspects of the strategy. I would like to thank everyone who responded to the consultation for their contribution.

The production of this RUS has been led by Network Rail, but it has been developed by the whole industry. A large number of organisations, including Southeastern as the predominant passenger train operator, Passenger Focus, and others including the other passenger and freight operators have been fully involved in getting us to this stage and I would like to thank them all for their efforts.

Iain Coucher
Chief Executive
Executive summary

Introduction
This Kent Route Utilisation Strategy (RUS) provides a further step towards achieving full network coverage from this national programme, set up in response to changes introduced to strategic planning under the 2005 Railways Act. Like many of the other RUSs to date, it considers how best to meet capacity challenges on the railway, in this case to 2020 for the main line train service currently operated by Southeastern. It also covers other passenger journeys in Kent and parts of East Sussex, together with issues affecting freight flows such as those from the Channel Tunnel.

Scope and background
This RUS is published shortly after the introduction of the country’s first truly high speed commuter operation, the Class 395 services now running between Kent and St Pancras International via High Speed One (HS1). These trains, which are capable of running at up to 140mph, represent a major improvement for many passengers, both providing additional capacity and reducing journey times.

However, in terms of the issues it seeks to resolve, the RUS primarily concentrates on the “classic” network – ie. main line or “outer” trains which run throughout the day to and from London Victoria or Charing Cross, supplemented at peak times by services to and from Cannon Street and the Thameslink network. The predominant issue to consider is therefore commuter demand to central London, since all peak trains are heavily loaded. Whilst this strategy focuses on main line services, operational issues result in a significant element of overlap with the strategy in the South London RUS for suburban trains, as established in 2008. Infrastructure constraints in the central London area are a key consideration for both service groups.

As well as peak commuting, off-peak travel to London is a major consideration and it is also a key factor that the RUS geography includes major towns such as Maidstone, Canterbury, Medway, Hastings, Ashford, Folkestone, Dover, Sevenoaks, Tonbridge, Tunbridge Wells and Ramsgate, so local travel into and between these centres is included in the strategy.

Nearly all of the passenger trains covered are operated by Southeastern, part of the Govia group of companies, who hold the franchise for this part of the network until 2014. However, it is also important to note that Southern Railway, Eurostar and charter train operators also operate over certain route sections. In addition, First Capital Connect is an important interfacing operator, sharing critical sections of infrastructure in the London Bridge area and elsewhere.

All of the major rail freight companies operate over this part of the network, with the predominant flows being from the Channel Tunnel and the Thames Gateway.

Committed schemes
The RUS area will be significantly impacted by committed schemes – especially the Control Period 4 (CP4) capacity programme and Thameslink – which are assumed to go ahead as planned and have therefore been factored into the baseline prior to further analysis. This forms the “Do-minimum” scenario against which detailed appraisal of further interventions has then been undertaken.

An important consideration is that, in certain cases, the detailed impacts of committed schemes have not yet been fully defined by industry funders, so informed assumptions on issues such as service patterns have needed to be made by the RUS. The consultation process
Freight capability
Improved freight capability is expected to be provided in CP4, though at present some aspects remain subject to affordability constraints. The most likely schemes are a new passing loop on the single track Isle of Grain branch, enabling more trains to run, and capability for electric haulage via Redhill, which would provide an equivalent diversionary route for use when the usual lines via Catford and Maidstone East are unavailable.

Thameslink Programme
In the latter half of CP4 a period of significant and extended changes to services across a wide area will commence, linked to the Thameslink Programme remodelling works at London Bridge. This will involve the reconfiguration of the station and the approach tracks on each side, with a prolonged but temporary reduction in train throughput and platform availability during the works.

Current expectations are that the remodelling will be delivered in two phases. The first of these is envisaged to involve Charing Cross trains being unable to call at London Bridge, whilst the second is expected to see Cannon Street services unable to call. Detailed consideration of the major transport planning implications of this element of the strategy remains ongoing, including consequential impacts on other transport modes.

The completion of the Thameslink Programme works at London Bridge will trigger an extensive recast of train services across much of Kent, Sussex and South London, as well as on the Midland Main Line and East Coast routes. As far as the Kent network is concerned the current expectation is that all fast peak period trains to Cannon Street from the

has identified some concerns as a result of this approach, as described later.

The key committed schemes are considered below:

CP4 capacity plan
In CP4 Southeastern is expected to provide a significant volume of additional capacity by means of a train lengthening programme, subject to agreement with DfT. However, due to the opportunities available this will be predominantly focused on 12-car operations in the suburban area, rather than the trains covered by this RUS.

Notwithstanding the above, some limited main line lengthening can be expected as part of the “Do-minimum” scenario, with all high peak services on the Tonbridge Main Line likely to be 12-car formations within the next few years. On routes to Victoria some further 8-car operations on the Maidstone East line and 12-car operations via Rochester are anticipated. Due to platform length constraints at critical sites, such as Charing Cross and Tunbridge Wells, all main line lengthening requires the use of Class 375 or similar rolling stock with Selective Door Opening (SDO).

East Kent Resignalling
The major East Kent Resignalling scheme will commence in late 2011, initially involving the remodelling of the track layout in the Faversham, Margate and Ramsgate areas. The next stage will cover the constrained section of railway through the Medway towns, where it is anticipated that opportunities will be available to increase the throughput of trains in the critical Rochester to Gillingham corridor, together with the associated turnback capability.
Tonbridge Main Line will be incorporated into the Thameslink network, calling at London Bridge but running onwards to Blackfriars and beyond to provide new journey opportunities. The need for this change is linked to the reduction in peak capacity at Cannon Street from 25tph today to a recommended 22tph in the future – an increase from 20tph assumed in the Draft for Consultation. This capacity reduction at Cannon Street is a consequence of the planned track layout in the Borough Market area, which removes the current method of working by which some empty trains depart from Cannon Street station via the sidings at Blackfriars.

An all-day Thameslink service to/from the Maidstone East line via Bromley South is also anticipated, as described in the Draft for Consultation.

A new recommendation in this final RUS is that, following Thameslink Programme completion, all Kent main line and suburban trains will need retiming to run at 15 or 30 minute intervals at peak times, requiring a major recast. This is because detailed timetable development (undertaken since the Draft) has shown that overlaying Thameslink services on the existing 20-minute frequency service would not be operationally viable.

A particular feature described in the RUS which has led to a high level of concern from stakeholders is that the revised City service will need to commence from no further south than Tunbridge Wells, primarily because the power supply south of this location is unable to support 12-car operations and the Thameslink rolling stock will be fixed formation 12-car sets. However, unlike today all Charing Cross trains will call at London Bridge and further options to respond to the concerns raised are now considered in detail in the strategy.

Completion of the London Bridge works should also facilitate a major performance improvement, by easing the existing major bottleneck in this area and reducing interactions between service groups.

In terms of capacity the fixed formation stock for the Thameslink routes will carry more people than the equivalent trains today, partly due to the seating configuration but also because fixed-formation sets reduce the space taken up by toilets and driving cabs.

**Crossrail**

Following some temporary modifications to suburban services in the Abbey Wood area, whilst Crossrail tunnelling operations and other works are carried out, Crossrail will provide a new route from this location to central London by 2017. This will primarily be of benefit to suburban passengers, but some journey opportunities from Medway will be possible by changing trains.

Looking to the future, the potential extension to Gravesend which would be of relevance further into the Thames Gateway, is safeguarded and is therefore considered in the planning process for other schemes on this route. As a result, Network Rail’s CP4 remodelling scheme for Gravesend station is designed with both 12-car operations and Crossrail in mind.

**Passenger and freight demand**

Despite tough economic conditions at present, the outlook for the railway over the medium term is one of ongoing growth. Taking 2008 as the base year, total passenger demand in the RUS area is forecast to grow faster than elsewhere on the network, with 30 percent more passengers by 2022. This is due to two factors:

Firstly, the recently introduced high speed services to St Pancras International are already stimulating new demand for use of the railway, with a step change in the quality of service on offer. East Kent is now within a reasonable commuting time of London, encouraging people to take jobs in the capital that they would not previously have considered. Others may choose to relocate to this part of the country, with commuting from Ashford becoming comparable to locations such as Milton Keynes or Peterborough.
Secondly, the impact of the planned major housing developments in the Thames Gateway and Ashford will lead to above-average population growth in these areas, with a proportion commuting by rail to jobs elsewhere. These two areas are designated for major growth by the South East Plan.

This above-average level of growth needs to be considered in the context of a busy railway network, carrying Passengers In eXcess of Capacity (PIXC) on certain trains already. Whilst the recession has undoubtedly led to the time at which extra capacity is needed being pushed back slightly, the RUS strategy still seeks to accommodate growth.

**Gaps**

RUSs consider “Gaps” where the current or future railway system does not or will not meet the requirements that will be placed upon it, unless intervening action is taken. The analysis has led to the identification of the strategic gaps below, between committed supply and forecast demand.

**Options**

16 option groups were identified as having potential to bridge the gaps shown and have been assessed in detail by the RUS, generally for implementation in Control Period 5 (CP5). The table at the end of this Executive Summary includes a full listing of the options and the recommendations arising from the analysis.

**Peak capacity – “classic” network**

In response to Gap A, options to increase capacity on the “classic” network have been considered. Even after the CP4 schemes have been implemented there are likely to be a small number of peak trains which will not be at full length, primarily on routes to Victoria but also in the shoulder peaks on the Tonbridge Main Line. The RUS has identified that there would be a strong case for lengthening many of these remaining services, with a robust case identified for up to around a further 100 extra vehicles for the Kent franchisee at this stage. However, most of these could be expected to be utilised in the suburban area rather than the main line services directly covered by this RUS. Additional berthing would need to be constructed to accommodate the extra vehicles.

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**Strategic Gaps**

**Gap A** is between committed capacity and the forecasts of future demand on peak services to/from London, leading to a prediction that such trains will become unacceptably overcrowded.

**Gap B** is between the planned train service within Kent (including linkages to adjacent areas) and the need to provide a train service consistent with future levels of demand across all transport modes.

**Gap C** concerns accessibility to the rail network.

**Gap D** is between the train service on offer at evenings, weekends and on bank holidays and the predicted demand for travel at such times.

**Gap E** is between the current capability of the railway network to accommodate freight and the likely needs of the freight industry in the future.

**Gap F** is between anticipated train performance on an increasingly busy network and the need for strategic level interventions to reduce major delays.

**Gap G** is between the envisaged future peak train service from south of Tunbridge Wells to London and aspirations for existing trains from Hastings to Cannon Street to be retained.
Beyond this, providing additional capacity on the “classic” routes is problematic. On the Tonbridge Main Line, whilst the Thameslink Programme alleviates track capacity constraints at London Bridge, there will still not be spare capacity in the central London area for additional trains to run. Furthermore, the two-track section in the Orpington – Tonbridge area is a major barrier to growth, as are the large numbers of crossing moves needed between the fast and slow lines inwards from Hither Green under any realistic timetable structure. Schemes such as advanced signalling systems and other infrastructure enhancements have been considered, but no evidence has been found that additional trains could run on this route as a result.

Routes into Victoria appear to have more spare capacity over certain route sections, but it may be difficult to link these sections together to create additional usable train paths. Further development work on the post-Thameslink Programme timetable has not yet produced a definite answer on this issue, so the current assumption is that there are no viable extra train slots. However, there are more train lengthening opportunities on these routes, since many services via Sole Street could be lengthened to 12-car, as could services on the Maidstone East line in the longer term. Due to platform length constraints some SDO is likely to be appropriate for the former and would be an essential requirement for the latter, due to the difficulties involved in achieving platform extensions at Maidstone East.

It can be seen from the above that opportunities to increase capacity on the “classic” network are very limited, this being a significant challenge for the RUS.

Opportunities to St Pancras International
Given the conclusion above, the RUS has therefore turned to the St Pancras International services as the only practical means of responding to the peak capacity gap in a meaningful way in the medium term. Fortunately, Southeastern’s existing high speed service to St Pancras International offers several opportunities for further development without impacting on international traffic.

Firstly, four of the eight trains in the high peak hour to St Pancras International are currently formed of 6-car trains. If these trains were extended to 12-car this would provide extra capacity from the key growth areas as demand for these services grows. However, additional rolling stock suitable for use on HS1 would be required to implement this.

Secondly, there are opportunities in which the current service pattern could be adjusted to start some St Pancras International services back from further within Kent, enabling them to serve additional locations and hence be of use to more passengers. This would also require additional vehicles, since running services for longer distances means that “bounce-back” opportunities would be lost and each train could only make a single journey in the peak. Specifically, the RUS analysis recommended the following:

- starting the peak-only Rochester – St Pancras International service back from Faversham. This may require additional capacity to be provided through the Medway towns as part of the East Kent Resignalling scheme. Alternatively, it may be necessary to free up the capacity by curtailing some peak London suburban services (via Dartford) at Rochester rather than Gillingham

- starting the peak-only Ebbsfleet – St Pancras International shuttle back from Ashford. This would be highly beneficial but would require additional domestic platform capacity at Ashford, potentially involving conversion of one of the international platforms. It also requires the relevant HS1 paths to be extended back beyond Ebbsfleet, increasing the interaction with international traffic

- as an alternative to the above, starting the peak-only Ebbsfleet – St Pancras International shuttle back from Maidstone West, providing extra capacity at
Gravesend and Strood whilst avoiding additional traffic on HS1 and through capacity constraints at Rochester Bridge junction. However, benefits are lower than for a service extension to Ashford. Variants such as starting at Strood could also be considered.

There appears to be a strong economic case for this approach of enhancing the St Pancras International services, though clearly there are choices to be made between alternative options. The recommended strategy would require between 8 and 13 additional 6-car trains for use on HS1 within CP5, and it is highlighted that this is the only realistic way that has been identified to respond to the peak growth which has been forecast.

**Hastings line**
In response to newly identified Gap G, detailed consideration of the post-Thameslink service pattern on the Hastings line has been unable to identify a viable way of retaining a Hastings to Cannon Street service, without creating wider problems. As a result, the RUS has sought to consider those users who might be inconvenienced as a result of this change and provide appropriate mitigation.

The RUS therefore recommends that the Hastings line to Charing Cross service be enhanced by having all peak trains formed of fast and slow portions from Hastings, and also that linespeed increases on this route now be sought. These factors would enable journey time reductions from Hastings to London, though timetable development is currently at an early stage. Additionally, unlike today, the peak Charing Cross services would call at London Bridge, providing convenient access to the City of London.

The combination of these recommendations is considered by the industry to provide a realistic level of service on this route given the constraints identified.

**Other interventions**
The RUS has considered several possible options for increasing off-peak frequencies on routes not via London, many of which are in response to stakeholder requests. The specific routes considered were Ashford – Hastings, Maidstone – Tonbridge and Redhill – Tonbridge. However, the analysis has shown that the RUS is unable to recommend increasing service levels on any of these routes, since there is insufficient demand forecast for the socio-economic benefits to justify the additional operating costs. However, if local or national government policies were to successfully achieve a modal shift away from travel by private car, these findings could be revisited.

Similarly, the RUS has considered amending service specifications to provide new linkages between key traffic objectives by direct train, principally by extending the Medway Valley line service through the Medway towns (to link Maidstone and Medway), by reinstating a Tonbridge to Gatwick Airport service and by extending some Maidstone East line trains to Canterbury. Again, no service changes have been identified which can be recommended with anticipated demand levels.

Whilst the recent timetable change has drastically cut journey times to much of Kent, the RUS has identified significant benefits if linespeeds could be increased to achieve further incremental savings. Further refinement of these proposals will be undertaken during the remainder of CP4.

Access to stations has been considered, which has identified the need for increased parking, improved walking routes and further integration with buses throughout the network. This is an area where detailed consideration at local level is now recommended. Significant benefits have been identified if Rochester station were to be relocated closer to the town centre.

The RUS includes mention of potential new stations, including Parkway sites which could be considered as part of the local planning
process to serve the Maidstone and Thanet areas, in addition to the existing Parkway station at Ebbsfleet. A small number of these may be worthy of further consideration.

The Seven Day Railway approach to improving train services at weekends, bank holidays and late in the evening is currently under development. The RUS notes the clear benefits of such an approach to both passengers and freight operators.

Cross-London freight currently requires further consideration in the post-Thameslink timetable structure, with four paths recommended between Kent and the West London Line in each off-peak hour. Two of these would generally serve Channel Tunnel routes, whilst the others would serve the Thames Gateway. It is also possible that freight services will be in operation on HS1 for specific flows.

Summary

The most significant of the RUS recommendations to 2020 are summarised below.

Modelling at a generalised level indicates that crowding on the Tonbridge Main Line in the busiest morning peak hour will only marginally reduce from an estimated 136 percent seat utilisation today to 130 percent in 2020, even with implementation of the committed schemes. However, if the RUS strategy were to be implemented by extending the St Pancras to Ebbsfleet peak shuttle service to Ashford this would reduce to 124 percent seat utilisation in the busiest morning peak hour. Crowding on the Chatham Main Line is slightly lower and since there are more short trains on this route the future lengthening recommended in this strategy could reduce crowding to 111 percent seat utilisation in the busiest peak hour.

Principal Interventions to 2020

Implement CP4 committed schemes as planned, including Thameslink and train lengthening.

Commence detailed development of the post-Thameslink timetable, with peak services generally modified to run at 15 or 30-minute intervals, rather than today’s 20-minute pattern.

Further train lengthening in CP5 with approximately 100 extra vehicles to ensure all high peak trains and the busiest shoulder peak trains run with maximum capacity.

Procure additional rolling stock for use on High Speed line to enable:

- lengthening of 6-car Class 395 peak trains to 12-car
- Rochester – St Pancras International peak only service to start from Faversham
- Ebbsfleet – St Pancras International peak only service to start from Ashford (or Strood/Maidstone West if necessary due to infrastructure constraints).

Improve access to stations and integration with other transport modes.

Prioritise incremental journey time improvements.
Longer term

Government strategy as outlined in the 2007 White Paper “Delivering a Sustainable Railway” anticipates a doubling of passenger and freight traffic over the next 30 years. However, this is a national average and there will clearly be major variations in growth rates across the country.

Much of the additional traffic envisaged would be achieved by a modal shift from road, so London commuting – for which rail already has a large modal share – cannot be expected to grow to such an extent. However, there is still potential for significant numbers of additional passengers, especially from the Ashford and Thames Gateway growth areas.

There are very limited opportunities for increasing peak capacity into London once the RUS strategy to 2020 is complete. However, two potential schemes have been identified.

Firstly, the extension of Crossrail services beyond Abbey Wood to Gravesend is worthy of serious consideration. This would provide a new route into central London from the expanding Thames Gateway, alleviating crowding throughout the area. Four journey opportunities per hour from Medway to The City of London/West End/Heathrow would be possible, changing trains at Gravesend. However, this extension would require Crossrail services to be operated by dual voltage rolling stock, since overhead electrification of the North Kent line would only be possible at prohibitive cost.

Further into the future, it is possible in a high growth scenario that a solution will need to be found for Tonbridge Main Line capacity. Even with Thameslink completed, no simple way of responding to this in the short term has been identified, as the numbers of trains which can run is limited by capacity in the central London area as well as constraints such as the Orpington – Tonbridge two-track section. However, it may be possible to free up central London capacity by reconfiguring the network, possibly by the Hayes branch being served by an extended London Underground Bakerloo Line.

It should also be noted that several of the non-London train frequency options the RUS has been unable to recommend over the next 10 years could potentially become relevant in the longer term if high rates of growth materialise.

Consultation process

The Kent RUS Draft for Consultation was published in April 2009, with a press release and media briefing announcing its publication. Hard copies were distributed to various stakeholders, including local authorities and passenger groups, and the document was placed on Network Rail’s website. A briefing event was held for the principal stakeholders shortly after publication, to ensure the key features of the proposed strategy were understood. As a result of this process the Draft generated significant local interest and 86 formal written responses were received during the 12-week consultation period and these have now been published on the Network Rail website.

A high proportion of the issues emerging from the consultation process related to the RUS’s treatment of committed schemes, principally Thameslink, rather than the further interventions it then considered for later years. However, this approach was unavoidable since considering a “Do-nothing” scenario of today’s train service as the future year baseline is not a realistic scenario.

A key concern was the assumption made in the Draft that main line services to Thameslink via Tonbridge would replace all of today’s main line services to Cannon Street on this route. Whilst it appears to have been accepted that this approach is aimed at providing additional capacity and new journey opportunities in the busy Orpington to Tunbridge Wells corridor, it was highlighted by many stakeholders that stations south of Tunbridge Wells would lose out, since 12-car trains are unable to operate on the Hastings line due to power supply constraints. This has led to a local campaign in the Hastings area seeking to retain today’s
services to Cannon Street. As described in detail, the RUS considers this to be impractical after completion of the Thameslink Programme, but does recommend that all Hastings to Charing Cross trains should call at London Bridge, and that more of these trains should have separate fast and slow portions operating from Hastings to Tunbridge Wells.

Similar issues were raised from the Medway area as the Draft RUS considered that the anticipated 20tph capacity at Cannon Street post-Thameslink would require a reduction in services from this area. However, robust capacity for 22tph at Cannon Street has now been demonstrated which will allow the existing level of service to be retained.

Many stakeholders sought additional information on the likely phasing of the remodelling works at London Bridge and expressed concern regarding any reduction in capacity in this critical area.

Due to limited opportunities on the congested “classic” network the main thrust of the strategy in the Draft RUS was built around providing additional capacity on HS1 to St Pancras International. Stakeholders in general appear to have recognised that such an approach is likely to be the only one practical, but have some concerns regarding future fare levels on this route which will need to be considered in future re-franchising and Government policy decisions.

Many stakeholders have expressed their disappointment that the RUS has been unable to recommend increasing off-peak frequencies, especially on the Ashford to Hastings route, or to provide new services to locations not currently well served from this area, especially to Gatwick Airport. There were also those who felt that new stations such as the proposed Thanet Parkway should have been considered in more detail.

Beyond CP5, the approach of extending Crossrail beyond Abbey Wood to Gravesend was widely supported, and for the longer term the concept of extending London Underground’s Bakerloo Line to take over the Hayes line was agreed as a potential way of freeing up paths into Charing Cross or Cannon Street.

We are grateful to all those who responded to the Draft for Consultation, and we hope that where possible, within our terms of reference, we have been able to take account of genuine concerns.

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<tr>
<th>Option</th>
<th>Description</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td><strong>Option 1 – Alleviating constraints to allow additional high peak trains on the Tonbridge Main Line</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Advanced signalling systems deployment</td>
<td>No capacity benefit identified</td>
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<tr>
<td>1.2</td>
<td>Review pattern of services calling Dunton Green, Knockholt</td>
<td>A 30-minute peak frequency at these stations is likely to be required in post-Thameslink base. However, no opportunity for extra trains on the network as a whole has been identified as a result of these changes</td>
</tr>
<tr>
<td>1.3</td>
<td>Reduce crossing moves Hither Green area</td>
<td>No capacity benefit identified</td>
</tr>
<tr>
<td>1.4</td>
<td>Other infrastructure modifications</td>
<td>No capacity benefit identified</td>
</tr>
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**Gap A** is between committed capacity and the forecasts of future demand on peak services to/from London, leading to a prediction that such trains will become unacceptably overcrowded.
### Option 2 – Tonbridge Main Line high peak train lengthening (post-CP4 HLOS)

| 2 | Further CP5 lengthening in high peak to 12-car | Assumed as entirely 12-car operations in CP5 base so no further option to consider |

### Option 3 – Running additional high peak trains via Bromley South

| 3.1 | Run 2tph extra in the peaks from the Medway area to Victoria, Blackfriars or Waterloo International | Not recommended due to track capacity constraints |
| 3.2 | Run 2tph extra in the peaks from the Maidstone East line to Victoria, Blackfriars or Waterloo International | Not recommended as crowding is closer to London |
| 3.3 | Run 2tph extra in the peaks from the Swanley area to Victoria, Blackfriars or Waterloo International | Cannot be assumed to be operationally practical. Further development work recommended |

### Option 4 – Lengthening of high peak trains via Bromley South (post-CP4 HLOS)

| 4.1 | Lengthening of all high peak services to 12-car on the Chatham Main Line and 8-car on the Maidstone East line | Recommended |
| 4.2 | Platform extensions to permit 9-car to 12-car operation on the Maidstone East line | Not recommended due to high cost |
| 4.3 | Selective Door Opening to permit 9-car to 12-car operation on the Maidstone East line | Recommended for consideration in the longer term if demand requires |

### Option 5 – Capacity in the shoulder peaks

| 5.1 | Running the high peak main line service for a longer period | Not recommended due to track capacity constraints |
| 5.2 | Lengthening of shoulder peak main line services to the maximum length allowed by the post-HLOS infrastructure capability | Recommended for implementation progressively in line with demand |

### Option 6 – Providing further capacity on services running via HS1 to St Pancras International

| 6.1 | Lengthening of Rochester to St Pancras International peak services from 6-car to 12-car | Not recommended in isolation due to insufficient demand |
| 6.2 | Extension of Rochester to St Pancras International peak service to start back from Faversham (as 12-car) | Recommended |
| 6.3 | Lengthening of the Ebbsfleet to St Pancras International peak shuttles from 6-car to 12-car | Not recommended in isolation due to insufficient demand |
| 6.4 | Extension of Ebbsfleet shuttle to start back from Maidstone West via the Medway Valley line | Recommended for further consideration on a tactical basis, pending 6.5 in the longer term |
| 6.5 | Extension of Ebbsfleet shuttle to start back from Ashford International or beyond | Recommended |
| 6.6 | Run 10tph at peak times to St Pancras International (domestic) on HS1 | Not recommended due to track and platform capacity constraints |
Gap B is between the planned train service within Kent (including linkages to adjacent areas) and the need to provide a train service consistent with future levels of demand across all transport modes.

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<tbody>
<tr>
<td><strong>Option 7 – Increasing off-peak frequencies</strong></td>
<td></td>
<td></td>
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<tr>
<td>7.1</td>
<td>4tph service on the Maidstone East line (all-day City of London service)</td>
<td>Assumed as delivered in CP5 base</td>
</tr>
<tr>
<td>7.2</td>
<td>2tph service on the Redhill to Tonbridge route</td>
<td>Not recommended at present due to insufficient demand and operational difficulties</td>
</tr>
<tr>
<td>7.3</td>
<td>2tph service between Maidstone West and Tonbridge</td>
<td>Not recommended at present due to insufficient demand and operational difficulties</td>
</tr>
<tr>
<td>7.4</td>
<td>2tph service between Ashford and Hastings</td>
<td>Not recommended at present due to insufficient demand</td>
</tr>
<tr>
<td>7.5</td>
<td>4tph all-day service on the Ashford route to St Pancras International</td>
<td>Unlikely to be required prior to 2020</td>
</tr>
<tr>
<td>7.6</td>
<td>4tph all-day service on the Medway route to St Pancras International</td>
<td>Unlikely to be required prior to 2020</td>
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| **Option 8 – Providing new journey opportunities** | | |
| 8.1 | Extend Ashford International via Maidstone East line services to Canterbury West | Not recommended at present due to insufficient demand to cover the infrastructure costs |
| 8.2 | Combine Medway Valley line and Sittingbourne to Sheerness-on-Sea service into a single operation | Not recommended due to track capacity constraints |
| 8.3 | Combine Victoria to Gillingham and Sittingbourne to Sheerness-on-Sea service into a single operation | Not recommended at present due to high operating costs relative to benefits |
| 8.4 | Combine Medway Valley line and Redhill to Tonbridge line into a single operation | Not recommended, since more passengers are likely to disbenefit than gain from any changes |
| 8.5 | Provide new service between Tonbridge and Gatwick Airport | Not recommended at present due to insufficient demand and capacity constraints on the Brighton Main Line |
| 8.6 | Providing the Hastings area with a direct service onto HS1 | Not possible at present due to the track configuration at Ashford International. Infrastructure likely to be prohibitively expensive and would represent poor use of capacity on HS1 |
| 8.7 | New journey opportunities by linking Northfleet and Ebbsfleet stations | Unlikely to be a demand case in isolation but recommended for consideration as part of wider development strategy for the area |
| 8.8 | Provide bus links from key stations to Ebbsfleet | Recommended for consideration at a local level |
8.9 New journey opportunities created by development of the area between Stratford Regional and Stratford International stations | Assumed as delivered in CP4

8.10 New journey opportunities between East Kent and Northern France | Recommended for consideration at a regional level

**Option 9 – Reducing journey times**

9.1 Linespeed improvements | Recommended for further development subject to business case
9.2 Review station stops | Recommended for further consideration through the timetable development process

**Gap C concerns accessibility to the rail network.**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option 10 – Improving station accessibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.1</td>
<td>Car parking</td>
<td>Recommended for consideration at a local level</td>
</tr>
<tr>
<td>10.2</td>
<td>Local bus</td>
<td>Recommended for consideration at a local level</td>
</tr>
<tr>
<td>10.3</td>
<td>Foot and bicycle</td>
<td>Recommended for consideration at a local level</td>
</tr>
<tr>
<td>10.4</td>
<td>Relocation of Rochester station</td>
<td>Recommended for further consideration but would need to be integrated into the East Kent Resignalling scheme</td>
</tr>
</tbody>
</table>

**Option 11 – New stations**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1</td>
<td>Thanet Parkway</td>
<td>Recommended for further consideration subject to business case</td>
</tr>
<tr>
<td>11.2</td>
<td>Appledore Parkway</td>
<td>Recommended for further consideration subject to business case</td>
</tr>
<tr>
<td>11.3</td>
<td>Ashford South</td>
<td>Further development not recommended</td>
</tr>
<tr>
<td>11.4</td>
<td>Westenhanger Parkway</td>
<td>Further development not recommended</td>
</tr>
<tr>
<td>11.5</td>
<td>Wilting Farm</td>
<td>Recommended for further consideration subject to business case</td>
</tr>
<tr>
<td>11.6</td>
<td>Maidstone Parkway (on HS1)</td>
<td>Recommended for further consideration subject to business case</td>
</tr>
</tbody>
</table>

**Gap D is between the train service on offer at evenings, weekends and on bank holidays and the predicted demand for travel at such times.**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option 12 – Seven Day Railway</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Implementation of Seven Day Railway programme</td>
<td>Anticipated during CP4 and beyond on Tonbridge and Chatham Main Lines</td>
</tr>
</tbody>
</table>
Gap E is between the current capability of the railway network to accommodate freight and the likely needs of the freight industry in the future.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option 13 – International freight capability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.1</td>
<td>Use of HS1 for freight</td>
<td>Anticipated to occur in the “Do-minimum” situation</td>
</tr>
<tr>
<td>13.2</td>
<td>Use of electric haulage on the diversionary route via Redhill</td>
<td>Anticipated to occur in the “Do-minimum” situation following Strategic Freight Network scheme, subject to affordability</td>
</tr>
<tr>
<td>13.3</td>
<td>Running longer freight trains on Channel Tunnel routes</td>
<td>No case identified for infrastructure enhancement prior to 2020</td>
</tr>
<tr>
<td>13.4</td>
<td>Gauge enhancements via Catford/Maidstone East</td>
<td>No case identified for infrastructure enhancement prior to 2020</td>
</tr>
<tr>
<td><strong>Option 14 – Thames Gateway freight capability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.1</td>
<td>Provision of run-round capability at Plumstead</td>
<td>Anticipated to be needed as part of the access strategy for Crossrail engineering works at Abbey Wood</td>
</tr>
<tr>
<td>14.2</td>
<td>Increasing capacity to the Grain branch</td>
<td>Passing loop anticipated in the “Do-minimum” situation, subject to affordability, together with improvements to operational practices. Consideration of further schemes in the area recommended</td>
</tr>
<tr>
<td>14.3</td>
<td>Construction of new terminal capacity</td>
<td>Anticipated to be considered by the freight industry in response to market developments</td>
</tr>
<tr>
<td>14.4</td>
<td>Timetabling solutions</td>
<td>Recommended for further development</td>
</tr>
<tr>
<td>14.5</td>
<td>Gauge enhancements to the Grain branch</td>
<td>Unlikely to be viable prior to 2020 but further consideration possible in CP5 as part of the Strategic Freight Network</td>
</tr>
<tr>
<td>14.6</td>
<td>Construct new Higham to Grain chord</td>
<td>No case identified for infrastructure enhancement prior to 2020</td>
</tr>
</tbody>
</table>
Gap F is between anticipated train performance on an increasingly busy network and the need for strategic level interventions to reduce major delays.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1</td>
<td>East Kent Resignalling enhancements</td>
<td>Further development now underway</td>
</tr>
<tr>
<td>15.2</td>
<td>Additional (domestic) platform capacity at Ashford International</td>
<td>Unable to be recommended on performance grounds alone. Linked to additional trains as described in Option 6.5</td>
</tr>
<tr>
<td>15.3</td>
<td>Additional platform capacity at Canterbury West</td>
<td>Unable to be recommended at present on performance grounds alone. Linked to additional trains described in Option 8.1. Safeguarding of land recommended</td>
</tr>
<tr>
<td>15.4</td>
<td>Additional infrastructure in the Tonbridge area</td>
<td>Unable to be recommended at present on performance grounds alone</td>
</tr>
<tr>
<td>15.5</td>
<td>Infrastructure modifications in the New Cross – Orpington four-track section</td>
<td>Double-tracking of Tanners Hill flydown anticipated as part of “Do-minimum” scenario. No further scheme identified</td>
</tr>
</tbody>
</table>

Gap G is between the envisaged future peak train service from south of Tunbridge Wells to London and aspirations for existing trains from Hastings to Cannon Street to be retained.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.1</td>
<td>Upgrade power supply south of Tunbridge Wells to enable Thameslink services to be extended to Hastings</td>
<td>Not recommended due to infrastructure costs exceeding benefits identified</td>
</tr>
<tr>
<td>16.2</td>
<td>Replace some peak Tonbridge Main Line to Charing Cross trains (post-Thameslink) with trains from Hastings to Cannon Street</td>
<td>Not recommended because this would lead to a reduction in Charing Cross services from the Tonbridge Main Line</td>
</tr>
<tr>
<td>16.3</td>
<td>Replace some planned peak Tunbridge Wells to Thameslink trains with trains from Hastings to Cannon Street</td>
<td>Not recommended because this would lead to major disbenefits in the suburban area and remove many of the benefits associated with providing Thameslink services from the Tonbridge Main Line</td>
</tr>
<tr>
<td>16.4</td>
<td>Procure Thameslink trains in non-fixed formations to enable a Thameslink service to Hastings</td>
<td>Has not been assessed, because this is a wider issue than can be covered by the limited geographic scope of the Kent RUS</td>
</tr>
<tr>
<td>16.5</td>
<td>Form all Charing Cross trains (post-Thameslink) by attachments of fast and slow portions from Hastings throughout the peak</td>
<td>Recommended</td>
</tr>
</tbody>
</table>
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8.4 Gap C – accessibility to the railway network

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1. Background

1.1 Introduction

1.1.1 Following the Rail Review in 2004 and the Railways Act 2005, the Office of Rail Regulation (ORR) modified Network Rail’s network licence in June 2005 (as further amended in April 2009) to require the establishment of Route Utilisation Strategies (RUSs) across the network. Simultaneously, the ORR published guidelines on RUSs. A RUS is defined in Condition 1 of the network licence as, in respect of the network or a part of the network, a strategy which will promote the route utilisation objective.

The route utilisation objective is defined as: “the effective and efficient use and development of the capacity available on the network, consistent with the funding that is, or is likely to become available”.

The ORR Guidelines explain how Network Rail should consider the position of the railway funding authorities, their statements, key outputs and any options they would wish to see tested. Such strategies should address:

- Network capacity and railway service performance;
- Train and station capacity including crowding issues;
- The trade-offs between different uses of the network (eg. between different types of passenger and freight services);
- Rolling stock issues including deployment, train capacity and capability, depot and stabling facilities;
- How maintenance and renewals work can be carried out while minimising disruption to the network;
- Opportunities from using new technology; and
- Opportunities to improve safety.

The guidelines also set out principles for RUS scope, time period, and process to be followed and assumptions to be made. Network Rail has developed a RUS Manual which consists of a consultation guide and a technical guide. These explain the processes we will use to comply with the Licence Condition and the guidelines. These, and other documents relating to individual RUSs and the overall RUS programme, are available on the Network Rail website at www.networkrail.co.uk

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- Rolling stock issues including deployment, train capacity and capability, depot and stabling facilities;
- How maintenance and renewals work can be carried out while minimising disruption to the network;
- Opportunities from using new technology; and
- Opportunities to improve safety.

The process is designed to be inclusive. Joint work is encouraged between industry parties, who share ownership of each RUS through its industry Stakeholder Management Group (SMG). In order to ensure passengers’ interests are represented, the SMG also includes Passenger Focus and London Travelwatch (where relevant).

1.1.3 There has also been extensive informal consultation outside the rail industry by means of regular briefings of local authorities by Network Rail and by a series of Wider Stakeholder Group (WSG) events.

1 The definition of network in Condition 7 of Network Rail’s network licence includes, where the licence holder has any estate or interest in, or right over a station or light maintenance depot, such station or light maintenance depot.
1.1.5
The ORR guidelines require options to be appraised. This is initially undertaken using the Department for Transport’s (DfT’s) appraisal criteria, though bespoke analysis will be used where shown to be necessary. To support this appraisal work RUSs seek to capture implications for all industry parties and wider societal implications in order to understand which options maximise net industry and societal benefit, rather than that of any individual organisation or affected group.

1.1.6
RUSs occupy a particular place in the planning activity for the rail industry. They utilise available input from processes such as the DfT’s Regional Planning Assessments. The recommendations of a RUS and the evidence of relationships and dependencies revealed in the work to reach them in turn form an input to decisions made by industry funders and suppliers on issues such as franchise specifications and investment plans.

1.1.7
Network Rail will take account of the recommendations from RUSs when carrying out its activities. In particular they will be used to help inform the allocation of capacity on the network through application of the normal Network Code processes.

1.1.8
The ORR will take account of established RUSs, and those in preparation, when exercising its functions.

1.2 Document structure

1.2.1
This document starts by outlining, in Chapter 2, the geographic scope and timescales of the RUS, and the planning context within which it has been developed. It also describes the linkage to associated work streams and studies, which relate to the RUS.

1.2.2
Chapter 3 describes the railway today, covering passenger and freight demand and the capability of the infrastructure to meet that demand. Issues such as the current levels of overcrowding are identified.

1.2.3
In Chapter 4, the planned train service and committed infrastructure enhancement schemes are explained.

1.2.4
The main planning documents of relevance to this RUS are summarised in Chapter 5, together with their vision for the role of the railway over the next 30 years.

1.2.5
Chapter 6 analyses the rail passenger demand forecasts for a range of scenarios up to 2020, and examines how patterns of freight traffic are likely to change over the same period.

1.2.6
Chapter 7 covers the consultation process, including a summary of the responses received and how these are taken into account in the final document.

1.2.7
Chapter 8 covers the strategic “Gaps” identified by the RUS. These are where the supply and demand elements of the railway system are not balanced.
1.2.8
Chapter 9 covers the “Options” which have been considered to bridge these gaps, together with the results of the quantified appraisals undertaken.

1.2.9
Chapter 10 pulls together the committed schemes and options recommended by this RUS into a strategy to 2020. This enables the likely supply and forecast demand features of the railway network at that time to be considered.

1.2.10
Chapter 11 covers gaps which are likely to remain beyond 2020, together with the opportunities to respond to such longer term problems.

1.2.11
Chapter 12 describes the next steps in the process, including the consideration of this RUS by the ORR.

1.2.12
Supporting data is contained in the appendices to this document, some of which, owing to their size, are only available electronically from Network Rail’s website
www.networkrail.co.uk
2. Dimensions

2.1 Introduction

2.1.1 This chapter describes the geographic scope of the Kent Route Utilisation Strategy (RUS), its time horizon, the planning context in which it is set, and the assumptions it makes about other schemes.

2.2 Geographic scope

2.2.1 This RUS concentrates primarily on main line services from Victoria (Eastern), Charing Cross and Cannon Street, together with all freight services running through its scope area or to/from destinations within it. The limited main line operation to the Thameslink network via Bromley South is also covered. Additionally, the RUS includes some local passenger lines not linked to London: the Ashford to Hastings “Marshlink” route, the Sheerness branch and the “Medway Valley line” between Strood and Paddock Wood/Tonbridge.

2.2.2 On the multi-track London approaches there is significant interaction between fast and slow services. In these areas the RUS seeks to resolve issues relevant to “outer” or main line services, i.e. those which run fast into London. Some passenger journeys in the London area, such as Bromley South to Victoria or Sevenoaks to London Bridge, are therefore included within the scope of the Kent RUS. However, in general the strategy for suburban services is not covered as this has previously been determined through the now established South London RUS.

2.2.3 Beyond London the services considered are predominantly contained within the boundaries of the county of Kent. In addition, the RUS also covers the Medway Unitary Authority area and parts of East Sussex.

2.2.4 The following lines, as shown in Figure 2.1, are covered by this RUS:

- the Chatham main line from Victoria via Bromley South. At Swanley this splits into two separate routes: the line through the Medway towns and the line to Ashford via Maidstone East. At Faversham the Medway route splits again, with lines to both Ramsgate and to Dover Priory via Canterbury East. There are also some services, mostly during weekday peak periods, in operation to both Cannon Street and the Thameslink route
- the Tonbridge main line from Charing Cross via Sevenoaks. At Tonbridge this splits into two separate routes: the Hastings line and the route to Ashford International via Paddock Wood. Some peak only services also operate to Cannon Street
- lines east of Ashford International to Ramsgate, via both Dover Priory and Canterbury West
- connections to the High Speed line (HS1) near Longfield, Gravesend and Ashford International
- the Sheerness-on-Sea branch line and the Medway Valley line
- the Ashford to Hastings line (“Marshlink”), together with the freight only branch to Dungeness
- the Redhill to Tonbridge line (as an interface with the adjacent Sussex RUS).
2.2.5
In addition to the geographic scope above a route of particular relevance to the Kent network is the High Speed One (HS1) line from the Channel Tunnel to St Pancras. Whilst HS1 infrastructure has not, in general, been considered in any detail by the analysis, the RUS has worked on the premise that HS1 domestic services form a key factor relevant to passenger and potentially freight demand, so these services are considered by the RUS where appropriate.

2.2.6
The RUS also includes appropriate analysis of traffic generators lying outside the area covered, particularly where they may have a significant effect on the pattern of demand within the scope area. Examples include Gatwick Airport and the Sussex Coast.

2.3 Time horizon
2.3.1
The RUS examines a time period of 30 years to 2040. The strategy will include detailed recommendations covering the period up to 2020 and an indicative strategy beyond that point.

2.4 Planning context
2.4.1
The RUS fits into a framework of wider planning decisions. This framework covers rail schemes but also extends to other transport modes, land use planning and economics. This planning context is described in Chapter 5.

2.5 Links to other RUSs
2.5.1
This RUS interfaces with other parts of the railway network through the following geographic RUSs:
- the South London RUS (2008), which concentrated primarily on suburban services mostly within the London boundary, but made a number of assumptions on wider issues. Further development work has taken place since this RUS was published and as a result some additional detail is provided here. This principally applies to the construction strategy for the London Bridge area and the envisaged service structure following the completion of work on the Thameslink Programme
- the Sussex RUS (Draft for Consultation published in May 2009), which interfaces with the Kent RUS at London terminals and over the Thameslink network. It also interfaces on both the Tonbridge – Redhill and the Hastings – Eastbourne lines, and demand to locations such as Brighton and Gatwick Airport is relevant to both RUSs
- the London and South East RUS, which is currently under development and is anticipated as addressing some of the cross-boundary issues not covered by the geographic strategies published thus far.

2.5.2
In addition, this RUS interfaces with various national elements of the RUS programme:
- the Freight RUS (Network Rail 2007), which looked at the key strategic issues for freight across the network as a whole, including that covered by this RUS
- the Network RUS, which has produced a network-wide Electrification Strategy and long distance forecasts.
2.6 Links to other railway networks

2.6.1 Unusually, the Kent RUS connects to major sections of railway which are not directly covered by the national RUS programme. These are the HS1 line from St Pancras and the Channel Tunnel infrastructure, controlled by Eurotunnel.

2.6.2 As described in 2.2.5 domestic passenger services from Kent to St Pancras International using the HS1 route have been covered by the analysis, and these form a key part of the strategy.

2.6.3 With respect to international railfreight, cross-Channel services have been considered where the issues are relevant to the overall strategy. However, international passenger services have not been covered, as these would operate solely over the HS1 route and are beyond the scope of this RUS.

2.7 Assumptions about other schemes

2.7.1 In preparing the base case (or “do-minimum”) demand forecasts for the future years, it has been assumed that only committed (funded) schemes will go ahead. Following Southeastern’s new enhanced timetable, which was introduced in December 2009, the major schemes in this category are now as follows:

- the Thameslink Programme, together with the temporary timetable changes necessary to enable the engineering works at London Bridge to commence, followed by permanent timetable changes which are envisaged upon completion of the scheme
- train lengthening, generally in connection with the platform lengthening works described in Network Rail’s Delivery Plan for Control Period 4 (CP4). This is primarily of relevance to suburban services but has a degree of interaction with the main line trains covered by this RUS
- additional vehicles, to be delivered under the Department for Transport’s (DfT’s) rolling stock strategy, to facilitate the lengthened trains
- planned major renewals, for example the East Kent Resignalling scheme
- various station improvements, for example those provided for under the Access for All programme and the National Stations Improvement Programme
- freight schemes, including those under development as part of the national Strategic Freight Network programme.

2.7.2 Further details about the committed schemes are provided in Chapter 4.

2.7.3 Beyond the committed schemes, any further changes to current infrastructure or operations would need to be considered by the RUS as an intervention.
Figure 2.1 – Geographic scope
3. Current demand, capability and delivery

3.1 Introduction
3.1.1
In this chapter, the present day function and capability of the rail network in the Route Utilisation Strategy (RUS) area are described. Profiles are provided of passenger operations and freight movements, as well as information about current demand patterns, infrastructure, how the railway performs, and how it is maintained.

3.2 Historical context
3.2.1
The building of the rail network within Kent was characterised by rivalry in the nineteenth century between the South Eastern Railway and London Chatham and Dover Railway companies. This effectively led to the development of two separate railway systems, which competed for many of the same traffic flows for many years.

3.2.2
The current geography of the railway network was determined at the outset by planning decisions taken by these two companies. Many towns, for example Maidstone, Ashford, Sevenoaks, Canterbury, Ramsgate and Dover, benefitted from links to London provided by both companies. The West End of London terminals at Victoria and Charing Cross, and City terminals at Blackfriars and Cannon Street were developed independently by each of the companies.

3.2.3
The rail network within Kent has been heavily influenced by the region being the gateway to Europe. This has dramatically increased in significance upon completion of the Channel Tunnel, subsequently complemented by completion of High Speed One (HS1) to St Pancras.

3.3 Passenger train operators
3.3.1
At present, three passenger train operators run scheduled services over the lines covered by this RUS. These are:

- Southeastern, who operate the majority of trains concerned, with a comprehensive network of main line, high speed and rural services throughout the RUS area. Southeastern is therefore by far the largest passenger train operator covered by this strategy

- Southern Railway, who run trains over the Redhill – Tonbridge line and the East Coastway service on the route between Brighton and Ashford. These services are jointly considered by this and the Sussex RUS

- Eurostar\(^1\), who operate services from St Pancras International to a variety of destinations on the continent via HS1. However, demand for international passenger travel has not been covered by this RUS and these trains have therefore only been considered in the case of operational interaction with domestic services on HS1 or beyond.

3.3.2
Not technically within the geographic scope of this RUS – but important from an overall capacity viewpoint – there is also significant usage of two critical locations on the network by First Capital Connect. The first of these is the route through London Bridge platforms 5 & 6, including the eastern approaches from Bermondsey, then onwards over Borough Market viaduct and Metropolitan Junction. The second is the flat crossing between the north-south and east-west routes at Herne Hill.

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\(^1\) Eurostar only operate over infrastructure within the scope of this RUS in the immediate Ashford International station area, and only then when calling at the station.
3.3.3
Open access/passenger charter operators run occasional services through the RUS area. The main examples are excursion trains to Canterbury and the UK side of the Venice Simplon Orient Express (VSOE) service which operates between London and Folkstone.

3.3.4
There are large numbers of passengers travelling to/from the Kent RUS area who – in addition to using services covered by this RUS – use other rail or public transport services for part of their journey. Such services are not in themselves within the geographic scope but they are relevant to demand trends of those which are. The main examples are:

- London Underground, which is readily accessible from the Kent main lines by means of an interchange at various stations in central London²
- South West Trains services, which are mostly accessed from the Kent RUS area by passengers walking between Waterloo East and Waterloo
- Southern Railway, with the majority of passengers travelling between the two networks doing so via either Victoria or London Bridge
- First Capital Connect, with the principal interchange being at London Bridge
- Southeastern’s Metro services, which can be reached by changing from main line trains at locations such as Bromley South, Sevenoaks, Orpington or Chatham, as well as at the London terminals
- Eurostar services via HS1, with stations at Ebbsfleet and Ashford particularly relevant to passengers in Kent, avoiding the need to travel across London to reach St Pancras
- some journey opportunities from Kent which are possible using the London Tramlink system, by means of the Beckenham Junction to Croydon line. However, this generally requires passengers from the RUS area to change twice, since main line trains do not call at Beckenham Junction
- Docklands Light Railway services, which similarly may be accessed at Lewisham, Greenwich and Woolwich Arsenal, but this would also incur an additional change as no main line trains call at these stations
- ferry operators to the continent, which can be reached from Dover Priory station – though this requires use of a local connecting bus service. There is also a more limited ferry service from Ramsgate. There are currently no scheduled local public transport services using the Channel Tunnel
- local bus operators, which provide onward travel opportunities to numerous destinations, many of which cannot be reached by rail from a large number of stations.

3.4 Profile of the passenger market
3.4.1
The RUS considers passenger demand over an extensive network of routes originating in Kent and parts of East Sussex. Whilst numerous journey opportunities throughout and beyond the RUS area are available, passenger volumes are dominated by London travel,

² Note that Blackfriars underground station is currently closed so does not offer any interchange opportunities. However, alternative underground connections on this route are available at Farringdon, St Pancras and, on certain trains, at Elephant & Castle.
especially peak time commuting flows. Every weekday morning peak period over 30,000 passengers arrive in London on services covered by this RUS. Approximately two-thirds of all journeys from or to the RUS area involve one of the London terminal stations.

3.4.2 Rail travel enjoys a very high modal share of the London commuting market, mainly due to the journey time penalty imposed by significant road congestion on radial routes into London and the limited and expensive parking capacity in central London. The Kent network offers the passenger a choice of destinations at Victoria, London Bridge, Charing Cross, Cannon Street, the Thameslink network and St Pancras International.

3.4.3 Since the publication of the Kent RUS draft, Southeastern introduced a preview service on HS1 ahead of implementation of the full timetable in December. Commencing in June 2009, the introductory timetable offered peak services between Ashford International and St Pancras International, as well as off-peak services to and from Ebbsfleet International. The introductory timetable was extended to include services from Ramsgate via Canterbury West and Dover Priory via Folkestone in early September, and in October a weekend service from Ashford and Ebbsfleet commenced. These services proved a significant success and an early indication of the potential of the new journey opportunities offered. Feedback from the preview services informs the current and future passenger demand sections in this document.

3.4.4 Outside the London commuter market, rail travel captures far less modal share. The layout of the network does not promote efficient travel by train between some local towns and cities. Major commercial and residential districts such as Medway and Ashford have poor rail links between them. Whilst this means that rail has a very limited share of the non-London market at present, there are significant growth opportunities connected with even a small level of modal shift.

3.4.5 The geographic area covered by the Kent RUS encompasses a broad spectrum of society. Within Kent and East Sussex there are significant residential and industrial centres as well as rural areas with a dispersed population. Combined with the complex demographic factors, there is a wide variation in affluence and socio-economic status.

3.4.6 The rail network in the RUS area has evolved primarily as a London-focused commuter system. Towns closest to London, such as Sevenoaks and Orpington, have benefitted from their proximity, being a short rail journey to the capital but far enough away from the London conurbation. Much of this growth was spurred by the extensive electrification schemes of the 1930s and the 1960s which inspired much house building.

3.4.7 Further away from the capital, the population centres are more dispersed, with consequent hindrance to connectivity and journey times. Allied to this, the decline of certain industries such as ship repairs in the Medway towns, coal-mining in east Kent and tourism in the coastal towns have contributed to the economic challenges faced in these areas. The imbalance between communities has many different historical reasons not associated with transport linkages. However, the provision of efficient transport links to economic centres, notably London, is seen by many as key to the regeneration and development of these areas.
3.5 Passenger train services – December 2009 timetable

3.5.1
December 2009 saw the most important change on the Kent rail network for many years when the High Speed domestic timetable was introduced. The timetable provides services from Margate via Canterbury West and Dover Priory via Folkestone joining HS1 at Ashford. The north Kent route is served by services from Margate, Broadstairs, Faversham and Rochester joining the HS1 near Gravesend. At peak times a further service is provided between St Pancras and Ebbsfleet International wholly on HS1.

3.5.2
The High Speed services provide a significant and very welcome addition to other domestic services. The non-High Speed services provide links between the London terminals and the major towns in the RUS area, based around the main lines via Chatham, Tonbridge and Maidstone East. Additionally, local services run on the Sheerness branch and the Medway Valley line as well as Marshlink services between Ashford and Brighton.

3.5.3
The Kent network benefitted from a large number of additional vehicles in 2009, with 222 vehicles being provided in total. The first of these were 48 Class 377/5 vehicles, used to facilitate the joint FCC/Southeastern operation through the Thameslink core. This has enabled the cascade of the third rail Networker vehicles previously used on these services to lengthen other trains. The second element was Southeastern’s new 29 x 6-car fleet of Class 395 High Speed trains.

3.5.4
The current morning peak frequencies and fastest journey times (arrivals at a London terminal between 08:00 – 08:59) are highlighted in Figure 3.1.

3.5.5
Figures 3.2 and 3.3 show a diagrammatic representation of the current Kent RUS area train service structure, for both the morning peak and a typical off-peak standard hour. Each line represents a train arriving at the London terminals from each route.

3.6 Passenger demand trends

3.6.1
There has been steady passenger demand growth from within the RUS area in recent years. In the 10 years from 1999 to 2008 rail patronage increased by approximately 28 percent. There are many reasons for this, including a growing population in the south east of England, the increase in job provision in central/west London and Docklands, and the attractiveness of London-based employment opportunities. The service improvements offered by the rail industry through new trains and improved reliability have also been a factor in stimulating growth.

3.6.2
Passenger demand trends for mainline peak services over the last 10 years are shown in Figure 3.4 and 3.5. The peak services into and out of London have seen a 14 percent increase since 1999. This increase, although very significant, is slower than the off-peak and non-London growth in the Kent RUS area.

3.6.3
During this period there has been major investment in new rolling stock. However, overall capacity has changed only marginally on the domestic network as there has been little change to the overall quantum of trains entering or departing the London terminals during each peak, which has constrained growth. As a consequence, passengers may choose to travel at less congested times, or seek alternative transport arrangements.

3.6.4
Additionally, peak passenger growth is governed by the vicissitudes of the central London employment market. The recent economic downturn may have had some impact on the number of passengers commuting into London, but it is likely that patronage will return to, and subsequently exceed, previous demand as economic conditions improve.
Figure 3.1 – Fastest morning peak journey times and frequencies to London terminals (December 2009 timetable)
Figure 3.2 – High peak timetable structure London arrivals 08:00 – 08:59
(December 2009 timetable)
Figure 3.3 – Off-peak standard hour (December 2009 timetable)
Figure 3.4 – Southeastern morning peak demand trends

Figure 3.5 – Southeastern evening peak demand trends
3.6.5
Figure 3.6 gives an indication of passenger growth by journey type since 1999. The largest proportion of journeys taken is trips to and from central London, which comprise around two-thirds of all journeys to and from the RUS area. The all-day demand to and from London has increased by 28 percent since 1999 indicating a strong growth in off-peak demand.

3.6.6
Figure 3.7 gives a breakdown of the average daily London passenger flows to and from the key towns and districts in the RUS area for

![Figure 3.6 – Passenger numbers by journey type](image)

![Figure 3.7 – Passenger demand at key towns](image)
1999 and 2008. All these areas have seen significant growth in London demand. It should be noted however, that the level of growth may not be an accurate indication of all demand trends in an area. Growth may be suppressed by excessive crowding on existing services; by the removal of specific journey opportunities; or by amendment of the timetable structure at a particular station. In order to understand overall demand, travel patterns by road therefore also need to be considered.

3.6.7
The introduction of the High Speed preview services from Ashford in June, and the subsequent extension of the preview timetable to Ramsgate and Dover in September, has provided an indication of the high level of demand available for these services. Within a short space of time some peak services required lengthening from 6 to 12-car formation in order to cope with passenger numbers.

3.6.8
The growth in passenger demand is not confined to the London market. Journeys wholly within the RUS area, and those to other destinations have increased at an equivalent rate. Figure 3.8 provides a breakdown of the largest non-London flows within the RUS area during 2008 with an indication of growth since 1999.

3.6.8
Figure 3.9 ranks the local train trips by the greatest growth shown between 1999 and 2008.

| Figure 3.8 – Average trips per day within Kent RUS area – highest daily flows in 2008 |
|-------------------------------------------------|-------|----------------|-----------------|
| Local journeys within Medway Towns              | 2783  | 2878           | 95              | 3%               |
| Between Swale District and Canterbury           | 2313  | 2820           | 507             | 22%              |
| Between Thanet District and Canterbury          | 1401  | 2753           | 1352            | 97%              |
| Between Tunbridge Wells and Tonbridge           | 1794  | 2643           | 849             | 47%              |
| Local journeys between Folkestone and Dover & Deal| 1922  | 2109           | 188             | 10%              |
| Local journeys in and around Hastings           | 1022  | 1782           | 760             | 74%              |
| Between Swale District and Medway Towns         | 1238  | 1542           | 304             | 25%              |
| Between Canterbury and Folkestone, Dover & Deal | 1165  | 1294           | 129             | 11%              |
| Between Swanley and Bromley                     | 1389  | 1278           | -110            | -8%              |
| Between Canterbury and Ashford                   | 773   | 1269           | 496             | 64%              |
3.7 Crowding in peak periods

3.7.1
Crowding represents a major issue on weekday peak trains to and from London. The South London RUS recommended an extensive programme of platform lengthening to respond to the issue of excessive crowding in the London suburban inner area. However, the solution is not appropriate for main line service groups, since many of these already operate using 12-car trains at present.

3.7.2
Figure 3.10 indicates how crowding builds up on each line towards London during the weekday peak periods at present – based on initial indicators regarding the December 2009 timetable. The problem is exacerbated at stations served by both fast and slow services such as Sevenoaks or Bromley South. Passengers are potentially faced with the choice of standing on a fast service or sitting on an all stations stopping service, the majority of them choosing the former option.

3.7.3
The Department for Transport (DfT) defines the standard by which any crowded trains are considered to be carrying Passengers In eXcess of Capacity (PiXC). For short journeys of less than 20 minutes a proportion of standing passengers is considered acceptable. For other journeys PiXC standards require that all passengers should be able to find a seat.

3.7.4
There are only a very limited number of peak period sub 20-minute journeys to London available from the RUS area. These are principally some journeys between Bromley South and Victoria, some journeys between Chelsfield/Oprington and London Bridge and journeys on the High Speed service from Ebbsfleet International. If PiXC standards were met, all other passengers would be able to find a seat at the location they join the train in the morning peak. This is not the case at present.
Figure 3.10 – Seat utilisation (modelled) in December 2009 timetable
3.8 Passenger demand issues off-peak, evenings and weekends

3.8.1
Rail passenger trends at times other than the traditional weekday commuter peaks are affected by different factors. Many of these passengers are likely to have more choice as to whether to make their journey, and the choice of using rail if they do travel.

3.8.2
Historically, the railway has carried out the maintenance and renewal of infrastructure during overnight possessions and at weekends and bank holidays, since disruptive works at these times will affect the minimum number of people.

3.8.3
The last decade has seen a change to travel patterns with an increase in demand for weekend and off-peak travel and the need to supply regular train services over all seven days of the week. The strategy of closing sections of line at weekends to undertake all types of engineering work is no longer desirable.

3.8.4
Figure 3.11 gives a summary of off-peak demand over the past five years. It can be seen that there has been a significant increase in demand over this period. However, it should also be noted that the installation of improved ticketing and gating facilities in recent years will have captured patronage that may not previously have been registered.

3.9 Stations and station usage

3.9.1
There is a large variance in patronage between stations within the RUS area reflecting not only the size of the community the station serves but the provision of car parking and other facilities. Station usage statistics are provided in the appendices.

Figure 3.11 – Off-peak journeys over the past five years
Figure 3.12 – Car park utilisation

Key
- **No Car park**
- Usage: <70%, <60%
- <75, Between 75 & 200
- >200, Between 75 & 200
- >85%

<table>
<thead>
<tr>
<th>No of spaces</th>
<th>No Car park</th>
<th>&lt;70% &amp; &lt;60%</th>
<th>Between 75 &amp; 200</th>
<th>&gt;200</th>
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3.9.2
Station facilities are also shown in the appendices and it can be seen that many of the smaller stations in the Kent RUS area have relatively limited facilities. Features such as step-free access between a station entrance and the platforms are not universal, even at the busier stations.

3.9.3
Figure 3.12 also highlights car parking at stations and current usage. It can be seen that car parking at a significant number of stations is at or near capacity, particularly at the major nodes. This may currently be causing some passengers to amend their travel plans and use other modes of transport.

3.9.4
There is some “rail heading” throughout the RUS area, where passengers travel to stations closer to their destination for more frequent services, better facilities or alternative destinations. This practice potentially represents a lost opportunity for the rail industry and may also have detrimental effects on road congestion.

3.9.5
Postcode analysis of season ticket holders highlights these trends. For example, Headcorn and Staplehurst stations experience significant rail heading, with both stations seeing potential abstraction from the Maidstone East line.

3.10 Freight train operators
3.10.1
The Kent RUS area sees freight services operated by nearly all of the UK Freight Operating Companies, namely: DB Schenker Rail (formerly English, Welsh and Scottish Railway Company), Freightliner Intermodal, Freightliner Heavy Haul, First GBRf, Fastline Freight and Direct Rail Services (DRS).

3.10.2
A significant volume and variety of freight is carried on routes covered by the RUS. This includes imported and exported goods via the Channel Tunnel and port facilities on the Sheerness branch. Additionally, bulk aggregates for the rail and construction industries are also carried to and from various handling points in the RUS area.

3.11 Profile of the freight market
3.11.1
A condensed summary of today’s rail freight generation and handling points is shown below, with an indication as to the traffic types and typical frequencies associated with each.

- Dollands Moor (Channel Tunnel freight yard) is the key nodal point for Channel Tunnel through freight services and handles approximately 8 to 10 return trips per day, including: intermodal services from Italy and Spain; conventional wagon services from Germany and France; finished cars to Italy and Belgium; China Clay slurry from Antwerp to Irvine; and bulk steel from north east England and south Wales

- Sheerness branch, variously serving:
  - steelworks at Queenborough, sporadic wagonload dispatches of finished steel to Scotland
  - steelworks at Sheerness, regular inbound scrap from East Anglia and London and outbound finished product, typically two to three return trips per day
  - Sheerness port, imported finished car traffic (suspended at time of writing), typically one return trip per day to the East Midlands
  - Ridham Dock, rail connected wharf, currently dormant
Since Channel Tunnel traffic commenced in the mid-1990s, volumes have fluctuated. From a peak of over three million tonnes per annum (mtpa), tonnages have dropped to less than one mtpa in 2003 due to various reasons. Traffic has subsequently recovered and is starting to grow following the recent introduction of new services and amendments to Eurotunnel’s charging regime.

A series of usage agreements between the various parties have guaranteed the provision of 35 paths per day, in each direction, between the Channel Tunnel and Wembley. These paths are safeguarded until 2052, and would be sufficient to handle at least eight mtpa.

There are very limited locations where it is possible to recess freight services without delaying passenger traffic behind. This issue is potentially a significant constraint for freight operators, since paths on one part of the network need to match up with those a significant distance away. An important regulating location is outside the Kent RUS area on the freight-only route between the West London Line (Latchmere No.2 Junction) and the South London Line (Factory Junction). Whilst not geographically in the RUS area this facility is used by freight services of relevance to the RUS.

The map in Figure 3.13 shows the principal freight routes in the RUS area. Further information about freight utilisation can be found in Network Rail’s Freight Route Utilisation Strategy, published in March 2007 and available on the Network Rail website www.networkrail.co.uk.
3.12 Freight specific infrastructure
3.12.1 The loading gauges within the RUS area are shown in Figure 3.14. Loading gauge defines the maximum height and width of vehicles that can be safely accommodated without fouling structures such as bridges and platforms. Most of the area can only allow the passage of vehicles built to the historic W6 gauge. However, the two routes to the Channel Tunnel (the main route via Swanley, and the diversionary route via East Croydon) are capable of accepting W9 gauge vehicles.

3.12.2 Route Availability (RA) is primarily of interest with respect to freight operations. RA is a system for determining which types of locomotive and rolling stock can travel over any given section of route, and is normally a function of the strength of underline bridges in relation to axle load and speed. A locomotive rated as RA8, for example, would not normally be permitted on a route rated as RA6. Most of the RUS area is classified as RA8, which permits axle loads of up to 24.1 tonnes per axle. Only in certain specially controlled circumstances may trains with heavier axle loads be allowed to operate.

3.13 Infrastructure
3.13.1 This section describes more general aspects of the infrastructure in the RUS area, including:
- number of tracks
- linespeeds
- signalling
- electrification
- platform lengths
- driver-only operation (DOO)
- stabling.

3.13.2 The majority of the RUS area is a twin track railway, with one “up” and one “down” line. However, there are significant sections of four track railway closer to London, notably inwards of Orpington towards London Bridge, approaching Victoria and between Shortlands and Swanley. There are also some single track sections, for example many of the tunnels on the Hastings line, most of the Marshlink line between Ashford and Hastings, and sections of branch line routes.

3.13.3 Figure 3.15 shows the existing linespeeds within the RUS area. Most of the network has maximum plain linespeeds of between 70mph and 90mph. However, there are many sections of track where high speeds cannot be attained due to factors such as gradient, track curvature and level crossings, thus limiting capacity and adversely affecting journey times.

3.13.4 The signalling system mostly comprises modern track circuit block equipment with colour light signals. Non track-circuited “Absolute Block” signalling is still used at several locations, for example between Wateringbury and Cuxton, between Faversham and Shepherds Well, between Appledore and Hastings and between Deal and Minster. Semaphore signals also remain in place at several locations.

3.13.5 The signalling control centres and their geographic boundaries are shown in Figure 3.16. Also shown on this map are the level crossings within the area.

3.13.6 Signalling headways are shown in Figure 3.17. The headways are not felt to be a constraint to current capacity, which is influenced more heavily by the largely two-track railway and capacity at London terminals.

3.13.7 Most of the area has third rail 750 volt DC electrification. However, the Ashford – Hastings route (including the Dungeness branch) is non-electrified. Connections to HS1 and to Eurotunnel infrastructure are electrified using 25 kv AC overhead line equipment.
Route availability - all Kent RUS area is RA6 (up to 22.5 tonnes per axle) except the Dungeness branch which is RA6 (up to 20.3 tonnes per axle)
Figure 3.15 – Linespeeds

Map is not to scale. Therefore actual location of linespeed changes are for indication only.
Figure 3.16 – Signalling control and level crossings
3.13.8 Existing platform lengths are shown in Figure 3.18.

3.13.9 Most of the network requires both drivers and guards to operate trains, with only a limited extent of driver only operation (DOO), which is also shown in Figure 3.18.

3.13.10 A further important consideration is the stabling capacity for passenger rolling stock. Current facilities and usage are shown in Figure 3.19.

3.14 Track capacity

3.14.1 The industry’s standard measure, the Capacity Utilisation Index (CUI), is an indicative, but somewhat limited, measure of how much of the planning capacity of a section of railway is being utilised by the current timetable. However, the CUI is really designed to describe a simple plain line railway and it does not deal well with how issues such as junctions and station dwell time affect capacity utilisation.

3.14.2 Because the RUS area is characterised by a large number of flat junctions and stations, the raw CUI data has been supplemented with stakeholders’ professional judgment in an effort to provide a realistic assessment of capacity utilisation during the peak periods. The results of this exercise are shown in Figure 3.20.

3.14.3 The major capacity constraints are of the following types:
- turnback capability, since reversing a train is a significantly more complex operation than running a through train
- stations where platform occupation times create a constraint
- constraints caused by the structure of the timetable
- absolute block signalling in some places.

3.14.4 The locations where the network is most highly utilised during the busiest times of day are:
- on the London approaches between Bromley South and Victoria
- on the London approaches between Tonbridge and London Bridge
- Platforms 5 and 6 at Ashford International station
- through the Medway Towns, between Rochester Bridge Junction and Gillingham
- in the Ramsgate station and depot area.

3.14.5 Unsurprisingly, the least densely used parts of the network tend to be further away from London or those not serving it including Dover – Faversham, the Ashford – Hastings line, the Medway Valley line and Sittingbourne – Sheerness. However, some of these are also close to the existing line capacity, due to infrastructure constraints such as long signalling sections (on the Dover – Faversham line) and long single track sections (on the Ashford – Hastings and Sheerness lines).

3.15 Train performance

3.15.1 Services from the Kent RUS area into London are routed into one of the most congested parts of the UK network. As such, even relatively minor disruption can quickly escalate due to the density of main line and suburban traffic in the London area.
Figure 3.18 – Train and platform lengths
Figure 3.19 – Depots and stabling
Figure 3.20 – Capacity Utilisation (December 2009 timetable)
3.15.2
The key constraints to performance are in the London Bridge area, where a significant amount of fast and stopping traffic is routed through a limited number of tracks. The Thameslink Programme will resolve many of these issues by reducing the conflicting moves in the area with dedicated tracks for specific service groups on the London Bridge approaches.

3.15.3
However, although the Thameslink Programme should deliver a step change in punctuality, it would be unrealistic to anticipate the end of congestion issues. The Kent network is marked by limited terminal capacity, a number of flat junctions at key locations, and few locations where trains may be regulated.

3.15.4
The principal causes of delays on the Kent RUS area are infrastructure and rolling stock failure. However, it should be noted that delays attributed to these causes have reduced in recent times due to improved and predictive maintenance techniques for rolling stock, track and signalling.

3.15.5
There are three principal measures used to monitor performance in the current control period: Public Performance Measure (PPM), delay minutes and Cancellations and Significant Lateness (CaSL).

3.15.6
The Public Performance Measure provides an all-industry metric for overall passenger train punctuality and reliability and is expressed as a percentage of all trains arriving on time (within five minutes for London and South East operators) at destination, compared to the total number of trains planned.

3.15.7
Figures 3.21 to 3.24 give the PPM trends over recent years for Southeastern main line service groups for peak and all-day punctuality.

All service groups display an improving trend over recent years, which is an indication of improved train planning, maintenance regimes and the development of joint performance initiatives between Network Rail and Southeastern. There is, however, a marked variance in performance between service groups and in some cases inconsistency within a service group between morning and evening peaks and off-peak services.

3.15.8
Morning peak trains to Charing Cross and Cannon Street experience the least consistent performance, being several percentage points lower than evening peak and off-peak punctuality for the same routes. These services traverse the very heavily congested approach to London Bridge via Parks Bridge Junction and North Kent East Junction. Over 50 percent of delays affecting these services occur within this small proportion of congested track. The vast majority of delays in this section are not directly caused by incidents occurring on this section, but are reactionary delays from incidents happening elsewhere on the network.

3.15.9
Completion of the Thameslink Programme will mitigate these problems by providing an enhanced track layout using grade-separated junctions and increasing the number of cross-London services (thus obviating the time consuming task of turning back trains at terminals).

3.15.10
Figures 3.25 and 3.26 give the PPM trends for non-mainline services on the Kent RUS area. Both the Sheerness-on-Sea branch and Medway Valley line services enjoy consistent performance that is some way above the local and national average for punctuality. Marshlink trains between Ashford and Brighton, however, perform less well.
3.15.11
The structure of the Marshlink line affects its performance (as well as its capacity) as the single line and low frequency service does not facilitate intervention to recover the service in the event of incidents. A large proportion of delay is due to trains awaiting passing opportunities at Rye.

3.15.12
It is too early to provide an analysis of performance for domestic services on the High Speed line. However, the preview services and the recent introduction of the full timetable in December have provided a very reliable and robust service with PPM at or approaching 100% on many days.

3.15.13
Delays accrued during a train journey are expressed in delay minutes, which are broken down by responsibility and cause. Delay minutes attributed to Network Rail typically relate to infrastructure failure, operation of the network, timetabling or external events. Passenger or Freight Operator attributed delays relate to fleet reliability, station delays and operational incidents.

3.15.14
A breakdown of the historic trends in delay minutes for both passenger and freight services are provided in figures 3.27 and 3.28.

3.15.15
A new metric, ‘Cancellations and Significant Lateness’ has been included in Network Rail’s regulatory targets for Control Period 4. The measure represents the number of trains that are either cancelled, fail to complete their scheduled journey, fail to call at all scheduled stops or arrive 30 or more minutes late at destination. It is expressed as a proportion of trains planned. An historic trend for all Southeastern services, including main line, suburban and the preview high speed service, is shown in figure 3.29. The ‘spike’ shown during period 12 of 2008/09 reflects the disruption caused by the cold weather and associated heavy snowfall. Whilst recent data is not yet available at time of publication, winter 2009/10 has again seen heavy snowfall and proved particularly problematic, with large numbers of cancellations on certain days.

Figure 3.27 – Southeastern delay trend by responsibility (main line and regional)
Figure 3.28 – Freight delay trend by responsibility

Figure 3.29 – Cancellations and Significant Lateness – all Southeastern
3.16 Engineering access

3.16.1
Network Rail needs to gain access to sections of route in order to meet its obligations safely to maintain, renew and enhance the infrastructure. Delivering this programme of works with minimal disruption to passengers and freight presents one of the biggest challenges to the industry.

3.16.2
Within the Kent RUS area most major items of engineering work are at present normally scheduled to be carried out on Sundays (and in some cases on Saturdays as well) as historically this affected fewer trains and people. However, as described in section 3.8, the demand for weekend services has risen considerably during the last decade and the industry is now faced with the challenge of adapting working practices to meet this demand.
4. Committed schemes

4.1 Introduction

4.1.1
This chapter describes the committed and funded infrastructure enhancement schemes planned for implementation during the early years of the Route Utilisation Strategy (RUS) period or, in many cases, already underway. It also describes the consequential train service changes which are considered as necessary to facilitate these schemes.

4.1.2
The RUS assumes that committed schemes will happen as planned and therefore form part of the baseline. Any interventions proposed by the RUS (the “Options” described in Chapter 9) are therefore assessed against this “do-minimum” scenario, rather than the present “do-nothing” situation.

4.1.3
The treatment of committed schemes – and their likely effects – as part of the RUS baseline was a major issue for stakeholders during the consultation process, as is described further in Chapter 7. For example, a large number of the comments received were in relation to the then planned December 2009 timetable change, for which it should be noted that the new service structure had been previously determined through a re-franchising process rather than by the RUS. Perhaps more fundamentally, as described later, the RUS’s assessment of the impacts of the already committed Thameslink Programme generated a very high level of stakeholder interest.

4.1.4
It is an important subtlety to understand that the Draft RUS did not recommend particular consequential impacts arising from committed schemes. However, the RUS needs to form a robust view of their likely impacts – especially those in relation to the timetable to be introduced after completion of the Thameslink Programme – since such considerations are an essential part of the “do-minimum” scenario.

4.1.5
It should be noted that established RUSs remain live documents, and they will be reviewed and, if necessary, updated in the event of any significant change in circumstances. This could apply if alternative impacts of already committed schemes were identified or if new schemes became committed.

4.1.6
The following sections consider in detail the major schemes in this category; these are actively being planned and therefore are expected to take place over the next few years. An illustration of the principal committed schemes on the route is provided in Figure 4.1.

4.2 Control Period 4 train lengthening

4.2.1
Government’s High Level Output Specification (HLOS) for the 2009 – 2014 period (Network Rail’s Control Period 4) required that a defined amount of additional peak passenger capacity be provided each morning into central London in the high peak hour and across the whole of the three hour peak. This was specified on a London wide basis and for each major central London terminal in response to an ongoing long-term trend of rising passenger numbers.

4.2.2
Network Rail’s Control Period 4 (CP4) Delivery Plan was published in response to the HLOS and has been updated since the Draft RUS was published. The key item of relevance is that the primary means of delivering the
additional capacity on Network Rail’s Kent route is anticipated to be – subject to commercial negotiations between the Department for Transport (DfT) and Southeastern – by means of a train lengthening programme. The strategy is of necessity based on longer rather than additional trains, since no means has been identified of providing extra train paths in this congested area of the network.

4.2.3
The major part of the train lengthening plans for Network Rail’s Kent route is concerned with trains in the London suburban area. These are not covered by this RUS but are relevant to it due to issues such as the rolling stock strategy and terminal capacity constraints at Cannon Street and Charing Cross. As described in Network Rail’s CP4 Delivery Plan (June 2009 refresh) the suburban area will see platform lengthening to allow 12-car Class 465 Networkers to operate by October 2012 as far as Dartford (via all routes), to Hayes and to Sevenoaks (via Grove Park). 12-car capability will then be extended through to Gravesend, which requires more complex remodelling work in the station area, by May 2014.

4.2.4
As far as main line services are concerned it is only practical to lengthen a relatively small number of high peak trains, since the majority already run at the 12-car length which is the maximum that the London terminals concerned can realistically accommodate. However, lengthening of the small number of peak trains shorter than 12-car up to this limit is envisaged, facilitated by the works in the CP4 Delivery Plan as described below:

- the recently installed turnback siding at Tunbridge Wells will enable future capacity growth for mid distance services by allowing trains starting or terminating at this location to be operated in 12-car formations in the future, subject to the use of rolling stock equipped with Selective Door Opening (SDO). Previously such services were 11-car at most due to the platform length between the tunnels at each end of the station
- the use of SDO will also enable main line services calling at Pluckley to be operated by 12-car formations. The platform lengths at this station are 8-car and SDO is considered an appropriate solution, given the relatively low station usage
- whilst most peak fast services from the Chatham Main Line are already 12-car, several stopping services (many of which are operated by Class 465 Networkers) are not. Future use of SDO equipped rolling stock on this route in due course will enable lengthening of these to 12-car, subject to platform availability at Victoria. However, as described in section 4.10 below, it is envisaged that an opportunity is likely to arise to lengthen the platforms at Rochester to 12-car as part of the East Kent Resignalling project and this would help further
- many services on the Maidstone East line are currently limited to 6-car length due to short platforms at Kemsing, Barming, Hollingbourne, Harrietsham and Charing. These trains are simple to lengthen to 8-car with SDO equipped rolling stock and the CP4 Delivery Plan assumes that many such

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1 All platforms at Charing Cross can accommodate 12-car Class 375 main line rolling stock, though Selective Door Opening (SDO) is needed. Restrictions will apply in several platforms for 12-car Class 465 / 466 Networker units, but this is primarily of relevance to the suburban area and a Rear Vehicle Door Inhibit system is likely to be necessary for this site. At London Victoria (Eastern) platforms 1, 2, 5, 6 and 7 can accommodate 12-car train lengths, platforms 3, 4 and 8 are therefore envisaged for utilisation by suburban services. Cannon Street, Blackfriars and the Thameslink route will be able to accommodate 12-car train lengths.
For description of Thameslink works and service specification, see sections 4.4-4.6

Figure 4.1 – Committed schemes
services will be lengthened as such stock becomes available. Lengthening to 12-car is more problematic, especially if there is any requirement to use the bay platform at Maidstone East, but is considered under Options 4.2 and 4.3 in Chapter 9 given the planned platform lengthening at Gravesend, together with the potential platform lengthening at Strood and Rochester, it is notable that longer trains could in future operate on the Medway to St Pancras route, without any SDO requirement, though SDO is in fact fitted to the trains concerned.

4.2.5
In order to achieve the additional capacity in CP4 described above the acquisition of additional rolling stock is necessary. The DfT rolling stock plan is currently being reconsidered on a national basis following the recent commitment to electrify sections of the network, and it must be borne in mind that Kent commuters benefitted in 2009 from a significant investment in new vehicles, as described in 3.5.3. However, the RUS understands that the Kent network will see CP4 delivery of 6 additional 12-car fixed-formation trains, which will eventually be used for Thameslink route services, but could operate between Tunbridge Wells and Charing Cross in the interim. This would enable a cascade of the vehicles currently in use on such services to lengthen others.

4.2.6
Any further additional vehicles, beyond the above, would need to be considered by the RUS as an intervention. At the end of CP4 the above vehicles will enable most high peak main line services to Charing Cross and Cannon Street to run in 12-car formations. However, there are likely to be some shorter formations remaining to Victoria, including from the Maidstone East line which would be 8-car at most.

4.2.7
Given that the CP4 Delivery Plan is reliant on an element of SDO at key stations including Charing Cross and Tunbridge Wells where platforms cannot realistically be lengthened, it is an important recommendation of this RUS that all future additional main line stock must be SDO equipped.

4.2.8
Additional berthing is assumed in either the Paddock Wood or Tonbridge areas, as part of the Thameslink Programme. The current assumption is that this will enable stabling of the new Kent main line to Thameslink route units, freeing up berthing capacity elsewhere to assist with the train lengthening programme.

4.3 Power supply enhancement
4.3.1
A significant investment in power supply capability throughout the London area is planned in CP4 to facilitate the longer trains. Work is generally not required on routes where Eurostar trains previously ran or electrically hauled Channel Tunnel freight currently operates. However, significant upgrades are required elsewhere on the network, principally to support the longer trains in the suburban area.

4.3.2
In addition to the above some strengthening is required to support the recently introduced Class 395 service on the classic network, though short term mitigation measures are currently in place pending a permanent power supply solution for these vehicles.

4.4 Thameslink Programme
4.4.1
The Thameslink Programme is a major construction project which will significantly expand the number of trains running across central London, rather than having to terminate at London Bridge, Cannon Street or Kings Cross as at present. It will alleviate historic infrastructure bottlenecks and reduce the need for passengers to interchange from main line rail onto London Underground services. It has already delivered changes to services which previously terminated at Blackfriars or Moorgate.
4.4.2  
Thameslink Key Output One (KO1), by December 2011, will introduce 12-car capability at Farringdon and Blackfriars, though 12-car operation is not anticipated on services relevant to the Kent RUS area at that time. Other Thameslink Programme infrastructure works before the Olympics will include the completion of the new bay platforms at Blackfriars station and the major civil engineering works associated with the new viaduct in the Borough Market area. It is also anticipated that the planned double-tracking of the Tanners Hill Flydown will be undertaken within this timescale, improving access from Charing Cross to routes through Lewisham.

4.4.3  
Key Output Two (KO2), following completion of the London Bridge works, will utilise the enhanced capability in this area. This will permit new service patterns to operate, though due to infrastructure constraints elsewhere on the Kent route it is envisaged that any new Kent to north of London via Farringdon services would need to replace services that currently operate to either Cannon Street or Charing Cross.

4.4.4  
The Thameslink Programme is also expected to deliver significant reliability benefits relevant to Kent RUS services. This is primarily due to the enhanced infrastructure being provided in the London Bridge station area, with a significant reduction in the need for conflicting movements between lines. The provision of two Up platforms for Charing Cross services will be a major improvement which will allow all trains to call and reduce the delays which currently occur whilst waiting outside the station for platform 6 to become available.

4.4.5  
Locations away from London Bridge will also benefit indirectly from the remodelling of that station, for example due to the complete removal of Thameslink route trains from the flat junction at Herne Hill. This will free up capacity for some new services into the planned Blackfriars bay platforms and reduce the effect of this existing timetabling constraint on services to Victoria (Eastern).

4.5 London Bridge reconstruction – Temporary modifications to services

4.5.1  
A factor which is of national importance is that major construction works on the remodelling of London Bridge station and its eastern approaches will be required within the early years of the strategy. This extensive Thameslink Programme engineering work is expected to impact on services from the Kent RUS area for a prolonged period.

4.5.2  
The current expectation is that all Charing Cross services will not call at London Bridge whilst platforms 4-6 are remodelled. Associated with this major change approximately five high peak services are likely to need to be removed from the Charing Cross corridor, due to the reduced capacity which will be available at this time. It is currently envisaged that these will be suburban (South London RUS) trains rather than those of relevance to the Kent RUS – the rationale for this being that the suburban train lengthening project described earlier (primarily during this stage on the Cannon Street trains as these will be those which do call at London Bridge) will allow overall capacity in terms of numbers of carriages from each route to be maintained.

4.5.3  
Having Charing Cross trains not able to call at London Bridge is expected to lead to extensive temporary impacts elsewhere on the network. For example, additional passengers will alight at Waterloo East, for which Network Rail is proposing a new eastern end station entrance to reduce overcrowding. Increased passenger numbers are anticipated at alternative locations such as Cannon Street and Victoria. Care in the timetable development process will be needed so that high levels of interchange do not occur at other congested stations such as Lewisham.
Figure 4.2 – Indicative service changes during London Bridge reconstruction works
4.5.4
A schematic version of the expected high peak timetable during this initial phase of London Bridge reconstruction works is shown in Figure 4.2.

4.5.5
Approximately half way through the programme it is planned that construction will switch to platforms 1-3 at London Bridge. This will create further challenges, with train lengthening then needed to be focused primarily on the Charing Cross trains, since these will then be the ones taking London Bridge passengers.

4.6 Completion of Thameslink Programme (Control Period 5 timetable baseline)

4.6.1
The Draft RUS described the most recent assumptions being made by the industry regarding the timetable structure for the high peak and off-peak following the completion of the Thameslink Programme. This long-term service structure was the one used by the Draft RUS for appraising interventions requiring investment. As described in Chapter 7, the assumptions triggered a significant stakeholder response.

4.6.2
Further development of the post-Thameslink operating plan is now underway. This work is seeking to add extra capacity where possible, respond to stakeholder concerns identified in response to the Draft RUS, and to mitigate some significant operational problems which have been identified as a result of timetable development work to date.

4.6.3
A particular finding of the work to date has been that a mix of Thameslink route services at a 15 minute pattern and Kent suburban services at a 20 minute pattern (consistent with the current timetable) cannot be made to work on the London Bridge approaches. As a result the RUS now recommends re-specification of Southeastern’s peak service at entirely 15 or 30 minute intervals to resolve the issue.

However, such a move would create a number of consequential alterations in the London suburban area, due to both Charing Cross and Cannon Street trains needing – with a small number of exceptions – to be an even number of trains per hour on each route.

4.6.4
The industry’s current view of the post-Thameslink Programme service pattern is that a 4tph peak-only Tonbridge Main Line to north of London via Farringdon operation is required to meet passenger demand on this line, to form a part of the 24tph core service running north of Blackfriars. However, due to the lack of any spare capacity over the Orpington – Tonbridge section of route, and similar issues on the London Bridge approaches, this requires a corresponding reduction in either Charing Cross or Cannon Street services from this area. The current assumption is that north of London via Farringdon services will substitute for Cannon Street services, consistent with commitments made during the Thameslink Programme TWA process. The extra capacity provided on the Tonbridge Main Line will therefore be due to the higher capacity Thameslink rolling stock, rather than any additional trains. This is the RUS’s assessment of the “do-minimum” situation and was therefore described in the Draft for Consultation, given that the Thameslink Programme is a committed scheme.

4.6.5
Building on the above the Draft RUS also advised that the north of London via Farringdon services will be unable to operate south of Tunbridge Wells, since they will be operated by 12-car fixed formation rolling stock which is incompatible with the power supply on this route. In combination with these needing to be substitutions of Cannon Street services this creates some important concerns on the Hastings line which are described further in Chapters 7 and 8. The RUS’s recommendations in response to this issue are then provided Chapter 9.
Figure 4.3 – Control Period 5 (post-Thameslink indicative timetable structure)
4.6.6
A further consideration is that work has now identified that a future capacity at Cannon Street of 22 trains in the high peak hour is now considered robust, rather than the 20 tph anticipated previously. This is still a reduction from today’s 25tph, but this finding now allows additional trains to be considered beyond those assumed in the South London RUS. Importantly, it allows today’s total quantum of 54tph to be maintained from the Kent route via London Bridge, including the current 3tph Medway fast to Cannon Street service (though due to the reasons described in 4.6.3 these are unlikely to be at regular 20 minute intervals).

4.6.7
The post-Thameslink timetable development process is a comprehensive piece of work involving a complex recast of much of the south-east’s timetables. It will involve multiple iterations over the coming years but the main findings described above are considered robust.

4.6.8
A schematic representation of the assumptions made by this RUS regarding the high peak hour timetable structure for Control Period 5, covering both main line and suburban services, is shown in Figure 4.3.

4.7 Crossrail

4.7.1
Construction of the Crossrail scheme is expected to be complete by 2017. This major project will involve new tunnels beneath, and stations within, central London, and will include a new line linking to the existing railway at Abbey Wood.

4.7.2
Whilst services on the Kent branch of Crossrail would be contained well within the London suburbs (i.e. not within the infrastructure scope of the Kent RUS), there will still be impacts on demand patterns within the RUS area. For example, passengers from the Medway conurbation would be able to catch a semi-fast train to Abbey Wood, and then change onto Crossrail.

4.7.3
DfT has recently updated the safeguarding of the potential future Crossrail extension beyond Abbey Wood to Gravesend. The land being safeguarded includes provision for additional tracks in the congested Dartford area and for turnback/stabling facilities at Hoo Junction. Network Rail is seeking to ensure that other work undertaken between Abbey Wood and Hoo – for example 12-car capability at Gravesend station – does not hinder provision for future Crossrail services over this section and this is discussed further in Chapter 11.

4.8 Improving freight capability

4.8.1
At present there is only a single W9 gauge route (via Catford and Maidstone East) to the Channel Tunnel which can be used by Class 92 electric freight locomotives. This means that diesel locomotives must be sourced from elsewhere on the network whenever this route is closed for maintenance. However, the current expectation is that Class 92 operations will be permitted on the route via Redhill in CP4, which will resolve this issue.

4.8.2
The South London RUS recommended construction of a passing loop on the single track Isle of Grain branch. The design and business case for this scheme remain under development at present but it is expected that it will be implemented in late CP4 or early Control Period 5 (CP5). Our most recent analysis has shown that a loop would increase the numbers of trains able to run on the branch beyond the current infrastructure capability limit of approximately 20 trains per day each way to around 25, whilst also improving freight timetable flexibility and reducing any adverse performance impacts of increasing freight on trains such as the new St Pancras International to Medway services.

4.8.3
In addition to the above, smaller scale capability improvements are anticipated at nearby Hoo. These include improvements to operational procedures, for example shunting management, and in the longer term the
potential installation of a new crossover to allow down trains direct access to the Up yard. As with the Grain works these will increase the timetable flexibility for freight in this area.

4.8.4
Restoration of freight sidings at Northfleet is anticipated, just outside the RUS area. This will encourage new freight flows to this part of the Thames Gateway development.

4.8.5
Construction of Howbury Park rail freight terminal, adjacent to Slade Green depot, is anticipated over the next few years. As with those described above, this scheme is geographically located just outside the Kent RUS area, but will involve a large site with potential to encourage new traffic flows, so is of relevance to demand for freight in Kent.

4.8.6
Away from the Thames Gateway, restoration of a rail freight connection to the Port of Dover is planned. This will enable rail freight to capture some modal share from short sea shipping routes currently using this port.

4.9 Improvements to stations
4.9.1
The following congestion relief work is planned at key central London stations, all of which are of relevance to Kent RUS services.

- rebuilding of Blackfriars is ongoing, as part of the Thameslink Programme. This will provide a new South Bank entrance to increase the catchment area of the station and alleviate passenger congestion
- rebuilding of Farringdon is ongoing, as part of the Thameslink Programme. Together with longer term works as part of the Crossrail project this station will be expanded into a major interchange
- rebuilding of parts of the London Bridge station complex is ongoing as part of the Shard of Glass development and further work will commence in CP4 as part of the Thameslink Programme
- rebuilding of Cannon Street is ongoing, as part of a major office development
- renewals work to the roof at Victoria station has recently commenced as a first stage in the station redevelopment. Works by London Underground to provide a significant increase in capacity to the congested Underground station are also well underway
- provision of an additional entrance at Waterloo East is intended, which would reduce congestion by better spreading out the flow of passengers at each end of the platforms. This will help accommodate the passengers displaced from London Bridge whilst Charing Cross trains are unable to call. The scheme has a robust business case but does not yet have planning approval
- studies are anticipated to commence shortly regarding a long term strategy for Charing Cross

4.9.2
The ‘Access for All’ programme will provide an accessible route for mobility-impaired passengers via the provision of lifts and step-free access. In addition to schemes recently completed, the DfT has provided funding for the following further stations of relevance to the Kent RUS area: Canterbury West, Sittingbourne, Gravesend, Strood and Swanley.

4.9.3
Work will be carried out under the National Stations Improvement Programme (NSIP). NSIP is a jointly developed and owned programme between Network Rail and train operators, backed by the DfT, with the objective of delivering schemes to improve the experience of the travelling public by facilitating investment in station environments. The initiative also intends to optimise opportunities for leveraging in third party funding over and above existing allocation. The relevant stations with works still to complete are Bromley South, Canterbury West, Chatham, Folkestone Central, Gillingham, Margate, Paddock Wood,
Rochester, Sevenoaks, Sittingbourne, Strood, Swanley, Tonbridge, Tunbridge Wells and Waterloo East.

4.9.4
A number of schemes are proposed to improve car parking capacity at key stations. These include Canterbury West, Chatham, Sevenoaks and Sittingbourne.

4.9.5
Detailed planning for a direct pedestrian link between Northfleet and Ebbsfleet is in progress, having been identified as an option in the Draft RUS. The scheme is not fully funded at this stage, but is considered reasonably likely to proceed in CP4.

4.10 East Kent Resignalling
4.10.1
The timing of infrastructure renewal projects is important as they represent the best opportunity to make any desired enhancements. The largest renewals project within the RUS area is East Kent Resignalling (EKR), which is anticipated for completion by 2014.

4.10.2
This scheme involves replacing all of the lineside signalling equipment and signalling control over nearly 50 miles of route between Strood and Ramsgate (inclusive). It is also anticipated to include much of the Canterbury East line and possibly sections of the Medway Valley Line.

4.10.3
As a result of the need to comply with modern design standards, a “like-for-like” renewal is impractical and track layout modifications will be required merely to provide the existing functionality at certain locations. This requirement to alter the current track layout therefore presents a unique opportunity to provide enhanced capacity.

4.10.4
Phase one of the project is planned for implementation late 2011. It covers the area from Faversham eastwards. The following elements are incorporated:

- major track layout changes in the Ramsgate station area, which will provide increased capacity, flexibility and improved access to the major depot at this site
- smaller scale track layout changes at Margate, which will also increase the flexibility of the network
- track layout changes at Faversham – already commenced – which are designed to add extra functionality and improve train performance
- reduced signalling headways throughout the area.

4.10.5
Phase two of the project will cover the section of route from Strood to west of Faversham. Since phase two does not yet have a finalised scope of works, there is an opportunity for the analysis undertaken to date by the RUS to influence it. The following elements are currently considered most likely to be appropriate to take forward, given the passenger demand and service pattern assumptions described in this RUS:

- reduced signalling headways through the Medway towns, to cope with the increased traffic feeding into the area from the combination of the routes via Gravesend (to both St Pancras, Charing Cross and Cannon Street) and via Sole Street (to Victoria, Blackfriars and Cannon Street)
- additional turnback capability to maximise the number of trains which can serve the bulk of the densely populated Medway conurbation, without having to miss out key stations or travel long distances beyond it. On this basis, and given the current depot location, Gillingham is considered the most desirable location for additional turnback capability. However, there may also be a case elsewhere if this is impractical or insufficient
- track and signal changes to facilitate 12-car capability at Rochester and Strood for all
trains and at Gillingham for 12-car Class 465s. The potential relocation of Rochester station could be taken forward as a potential option to facilitate this, though this is likely to require additional funding from outside the railway industry

- bi-directional signalling between Strood and Rochester to improve flexibility in the Rochester Bridge area. However, there does not appear to be a viable business case for extending the bi-directional signalling east of Rochester as it appears unlikely such a facility would be fully utilised

- bi-directional signalling of the down line in the Sittingbourne area, to minimise any interaction between the Sheerness service and the main line.

4.11 Other renewals

4.11.1
A further major renewal project of relevance to the Kent RUS is Victoria signal interlocking renewal. At present, this scheme is at an earlier stage of development than EKR above, so the scope is not fully defined. Whilst it is believed unlikely that significant enhancement opportunities will be provided by this scheme, there may be some specific interventions which it may facilitate.

4.12 Other changes

4.12.1
Subject to the agreement of stakeholders it is anticipated that the Folkestone Harbour branch will close in the near future as this line has not received a scheduled service for many years.
5. Planning context

5.1 Introduction

5.1.1
Travel patterns are influenced by demographic trends, employment opportunities, land use changes and many other factors affecting society as a whole. Transportation issues are therefore intrinsically linked to the wider planning process.

5.1.2
The Route Utilisation Strategy (RUS) must be consistent with Government policies as specified by the Department for Transport (DfT). The following are DfT’s most significant publications of relevance for the railway network covered by the Kent RUS:

- “The South Eastern Regional Planning Assessment (RPA) for the Railways”, published in 2007

5.1.3
A more detailed specific regional context for the planning process is set by the relevant regional governmental bodies, by means of plans known as Regional Spatial Strategies. The key documents which are being referred to in developing the Kent RUS are:

- the South East Plan, published by the Government Office for the South East (GOSE)
- the London Plan, published by the office of the Mayor of London.

5.1.4
Working in accordance with the relevant regional spatial strategy, local authorities (such as County Councils, District and Borough Councils, Unitary Authorities and London Boroughs) also prepare their own Local Transport Plans or Local Implementation Plans. In many cases this leads to the identification of priorities and aspirations for the rail network. As an example, Kent County Council (KCC) is in the process of developing an Integrated Transport Strategy which is of relevance to this RUS and is covered in section 5.11.

5.1.5
As well as being informed by current regional and local planning policies, the RUS will also inform future policy making within its geographic scope. It can, for example, influence planning decisions regarding the location of major proposed developments, since most local policies require that these should be located in areas with adequate transport links.

5.1.6
Many features from each of the above are relevant to the analysis undertaken by the RUS. These key issues are described below.

5.2 The South East Plan

5.2.1
The South East Plan sets out the long-term spatial planning framework for the South East Region to 2026. The Plan is a key tool to help achieve sustainable development, protect the environment and combat climate change. It provides a spatial context within which Local Development Frameworks and Local Transport Plans need to be prepared, as well as influencing regional economic, housing and environmental decisions.

5.2.2
The final South East Plan was published in May 2009, following an extensive development
linking each area through enhanced accessibility, primarily by public transport. The hubs within the RUS area are the major town centres of Medway, Maidstone, Canterbury, Ashford, Hastings and Tonbridge/Tunbridge Wells.

5.2.6
The RTS considers that the rail network should be developed to carry an increasing share of freight movements, with priority given to several routes, including the Dover/Channel Tunnel to London corridor. Additionally, the development of new inter-modal interchange facilities to support anticipated markets is supported.

5.3 Designated growth areas
5.3.1
The Government's Sustainable Communities Plan (2003) set out a plan of action to accelerate new development in designated growth areas including Ashford and the Thames Gateway.

5.3.2
The Thames Gateway development area covers a large region located on both the north and south sides of the Thames. On the Kent side it stretches from Greenwich to beyond the Medway Estuary, taking in much of south east London, Dartford, the area around Ebbsfleet station, Gravesend, the Medway conurbation and the Swale area.

5.3.3
The framework notes that the key intention in developing the Thames Gateway is to focus on the regeneration of the large areas of brownfield land which are present throughout much of it. Development would be particularly concentrated near transport hubs, such as the new station at Ebbsfleet and around Chatham.
The Ashford area, which now benefits from improved connectivity to London due to the new HS1 services, will also see significant new housing being built. Unlike in the Thames Gateway, much of this is likely to be on land not previously developed, since there are only limited opportunities with respect to brownfield sites.

5.3.5
The plans for both designated growth areas encourage sustainable development with a balance between provision of additional housing and provision for any additional employment. However, any sizeable development of this nature can be expected to lead to substantial outward commuting, especially when considered in the context of the fast train links now on offer from each of them to St Pancras International.

5.3.6
In addition to these areas, Dover and Maidstone have been granted Growth Point status. This designation aims to support high rates of housing delivery over the first ten years of the South East Plan.

5.3.7
Future demand implications arising from the designated growth areas will be considered further in the next chapter.

5.4 The London Plan

5.4.1
The London Plan covers the entire Greater London Authority (GLA) area. Since the publication of the draft Kent RUS, the current Mayor of London published a draft replacement of the existing London Plan in October 2009.

5.4.2
The draft plan is comprised of three documents: The London Plan is the overall strategic development plan for the capital, and sets out an integrated economic, social, environmental and transport policy framework for London over the years to 2031; The Economic Development Strategy sets out ambitions for the economic future of London; and the Mayor’s draft Transport Strategy (MTS) sets out a vision for transport in London over the next 20 years. The draft Plan was open for public consultation until 12 January 2010, and is currently being developed through the examination in public (EiP) process.

5.4.3
The MTS sets the following strategic goals:

- economic development and employment growth (managing public transport crowding and highway congestion, preparing for further population and employment growth, strengthening the role of outer London in London’s economy)
- quality of life (addressing poor air quality and climate change and ensuring that journeys are as comfortable as possible)
- safety and security (maintaining and improving safety and security of streets and the transport network)
- transport opportunities for all (improving the accessibility of the transport system)
- climate change (cutting CO2 emissions and preparing for change).

5.4.4
In response to these challenges the MTS sets out a comprehensive range of proposals to improve London’s rail network, to be delivered by a range of stakeholders including passenger and freight train operating companies and Network Rail. Those with particular relevance to the Kent RUS are summarised below:

- the development of rail freight terminals in or near London for international freight, in line with the London Plan policy to identify new sites for strategic rail freight interchanges. Additionally, the MTS supports the development of rail freight
routes that enable goods not arising from or destined for London to bypass the capital entirely

- the completion, by 2017, of Crossrail, which the MTS notes needs to be fully integrated with the rest of London’s public transport system. In the longer term it is suggested that future extensions of Crossrail that reduce congestion and improve connectivity will be considered

- delivery of the committed improvements to the rail network as set out by the DfT’s High Level Output Specification (HLOS) for the period 2009-2014, which were described in Chapter 4 of this RUS. Further rail capacity improvements will be sought by the Mayor beyond those schemes already committed

- achieving the HLOS Public Performance Measure targets and an overall reduction in significant lateness and cancellations for London and South East services

- delivering capacity and interchange improvements at London terminals and relieving other congested stations, such as Bromley South within this RUS area

- encouraging achievement of a seven day railway by better planning and management of necessary engineering and maintenance work on the railway

- encouraging the provision of rail services in London that meet common service standards including improved ambience, amenities and wayfinding at all stations, and staff availability

- seeking longer term enhancements and extensions to the Underground network, including a southern extension to the Bakerloo line, subject to the results of further study.

5.5 Department for Transport

5.5.1
The “Delivering a Sustainable Railway” White Paper was published in July 2007. This included a High Level Output Specification (HLOS) for Network Rail’s Control Period 4 (CP4), specifying the capacity, safety and performance outputs that Government requires to be made available by 2014. This RUS is consistent with Network Rail’s CP4 Delivery Plan (published in response to the HLOS) and is envisaged to inform HLOSs for further control periods.

5.5.2
The DfT is also the specifying authority for the current Southeastern franchise which expires in 2014. The outcome of this RUS will help to inform future specifications for this and other affected franchisees.

5.6 “Delivering a Sustainable Railway” White Paper

5.6.1
The “Delivering a Sustainable Railway” White Paper confirmed that the Government’s policy for the railways is to facilitate significant growth, with a commitment to a continuing investment programme.

5.6.2
The White Paper describes a long-term ambition for a railway that:

- can handle double today’s level of freight and passenger traffic nationally

- is even safer, more reliable and more efficient than now

- can cater for a more diverse, affluent and demanding population; and

- has reduced its own carbon footprint and improved its broader environmental performance.

5.6.3
The White Paper describes how demand nationally has grown by 40 percent within the last 10 years and is predicted to grow by at least 30 percent over the next 10 years.
5.6.4
Figure 5.1 shows total demand which the HLOS requires to be accommodated on Network Rail’s Kent route in CP4. Note, however, that much of this demand relates to Southeastern’s suburban services which are not covered by the Kent RUS.

Figure 5.1 – HLOS capacity metric for Kent route

<table>
<thead>
<tr>
<th>Route</th>
<th>Annual passenger km forecast in 2008/09 (millions)</th>
<th>Additional passenger km to be accommodated by 2013/14 (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kent</td>
<td>3350</td>
<td>333</td>
</tr>
</tbody>
</table>

5.6.5
Figure 5.2 shows total demand which the HLOS requires to be accommodated at the relevant London stations. However, as above, these figures do not directly translate to the Kent RUS geographic scope, since large numbers of other services are also included, for example Southern services into London Victoria and London Bridge and services from the north into St Pancras International.

Figure 5.2 – HLOS capacity metric for London terminals relevant to the RUS

<table>
<thead>
<tr>
<th>London Terminus</th>
<th>Peak three hours</th>
<th>High-peak hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Forecast demand in 2008/09</td>
<td>Extra demand to be met by 2013/14</td>
</tr>
<tr>
<td>Blackfriars (via Elephant &amp; Castle)</td>
<td>21900</td>
<td>3500</td>
</tr>
<tr>
<td>London Bridge, Charing Cross, Cannon Street</td>
<td>127600</td>
<td>12600</td>
</tr>
<tr>
<td>Victoria</td>
<td>58700</td>
<td>5300</td>
</tr>
<tr>
<td>St Pancras (includes domestic services on HS1)</td>
<td>25900</td>
<td>10900</td>
</tr>
</tbody>
</table>

1 The relatively small number of peak Blackfriars services which are not routed via Elephant & Castle are covered by the London Bridge/Charing Cross/Cannon Street capacity metric.
5.6.6
The railway is described as safe and getting safer. Accidents, such as the derailment at Grayrigg in Cumbria in 2006, are infrequent but they have not yet been completely eliminated. However, Government has not specified that any major new safety-related investment or new regulation is necessary before 2014, so the emphasis is on using well established improvement procedures to drive up safety performance and reduce risk.

5.6.7
Reliability has improved steadily. The White Paper sought a continuing improvement in minor delays to trains and a particular focus on major delays (trains which are cancelled or over 30 minutes late), since these inconvenience passengers the most. There are significant railway industry processes dealing with the delivery of improved performance, including new measures on Cancellations and Significant Lateness (CaSL) as described in Chapter 3.

5.6.8
The White Paper notes that Railtrack had lost control of costs and its collapse had led to a large burden falling to taxpayers. It identifies that, at the time of publication, Network Rail had commenced the process of delivering efficiencies and improving network performance, but it is noted that a robust funding package is dependent on further improvements being delivered. This is consistent with the challenging targets set to Network Rail by the Office of Rail Regulation’s Periodic Review for CP4.

5.6.9
The upgrade programme will be funded by a mixture of passenger fares and through direct Government investment. Nationally, fare policy is described as continuing annual increases in regulated fares of RPI + 1%\(^1\) which, combined with increasing numbers of passengers travelling, will lead to a significant proportion of the investment programme being funded directly by passengers.

5.6.10
Passenger journeys will be improved by measures such as smartcard technology to reduce the need to queue at a ticket office. Many stations will be modernised and made more secure. The White Paper recognised that access to stations can be an issue, with “travel plan” improvements recommended.

5.6.11
It is noted that with a continuing move towards a 24/7 society the railway will increasingly be expected to deliver consistent services throughout the day, on every day of the week and at times of year such as Christmas and Bank Holidays.

5.6.12
Particular mention is made regarding the success of international passenger rail services, especially for flows where the rail journey time is less than three hours. Given that international rail services operate through Kent over HS1 this is of unique relevance to this particular RUS.

5.6.13
It is noted that great potential exists for a substantial increase in rail freight modal share, provided that service performance is improved and the economic case compared to road haulage is bettered.

5.6.14
The White Paper notes rail’s potential contribution to tackling climate change by increasing its capacity to accommodate additional demand which would otherwise be carried by other modes. However, it is also noted that rail must reduce its own carbon footprint, for example by reducing fuel usage.

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\(^1\) With respect to the Kent RUS area, Southeastern’s franchise agreement permits them to increase regulated fares by up to RPI + 3% until January 2011 and then reverts to RPI + 1%. It also allows for “premium fares” to be charged for the new High Speed St Pancras services.
5.7 Delivering a Sustainable Transport System studies

5.7.1 In order to support the delivery of goals described in the White Paper, the DfT is sponsoring the development of a series of ‘Delivering a Sustainable Transport System’ (DaSTS) studies. The DaSTS studies will be developed at a regional level and will generate and consider a wide range of transport strategy and investment options and take full account of transport’s wider impact on climate change, health, quality of life and the natural environment.

5.7.2 Of particular relevance to the Kent RUS is the DaSTS study for ‘Access to Cross Channel Ports’. The emphasis of the study is on the future performance of the strategic road and rail networks linking the Kent Ports and the Channel Tunnel with London, the M25 and the national rail networks beyond Kent, and opportunities for promotion of a higher proportion of sustainable movement for both freight and passengers.

5.7.3 Although these studies are currently being developed, they will hold particular relevance to decisions made between local authorities and transport providers in the future.

5.8 The South Eastern Regional Planning Assessment for the Railways

5.8.1 Regional Planning Assessments (RPAs) are published by the DfT and are intended to form a link between regional spatial planning (such as the London Plan and the South East Plan) and rail industry planning (such as this RUS). The South Eastern RPA was published in January 2007, covering a 20-year period.

5.8.2 The South Eastern RPA identified that passenger demand would continue to grow significantly, particularly in connection with the housing growth in the Thames Gateway and Ashford areas, and the then planned domestic services using HS1.

5.8.3 Regarding the freight sector, the RPA suggests that there will largely be sufficient capacity on the railway network to accommodate predicted levels of growth, but suggests that additional capacity at terminals may be required. The main growth areas anticipated are:

- steady to strong growth in aggregates to/from the area
- potential for strong growth in international traffic to/from the Channel Tunnel in the longer term, but its realisation subject to a number of variable and external factors
- some greater penetration into the general merchandise sector via new interchange developments.

5.8.4 The RPA recommended the priorities as shown in Figure 5.3 for further development work. Many of these issues are considered by this RUS in our analysis of Gaps (Chapter 8) and Options considered (Chapter 9).
Figure 5.3 – Priorities for further development work identified in the South Eastern RPA, Jan 2007

Short/medium-term

- Working with local authorities on the development of their programmes responding to the designation of Canterbury, Ashford, Medway Towns and Ebbsfleet as “regional hubs”. The “hub packages” would be likely to include: improving stations as interchanges, ensuring that they are well-integrated with the local walking, cycling and bus networks, as well as having adequate and appropriate car parking; ensuring that new trip-generating developments are well-located and strongly linked to existing stations. Similar work could be done for the other key town centres, including, but not limited to: Dover, Folkestone, Sittingbourne and Gravesend.

- Investigating increases in car parking capacity at appropriate stations. This should be done in partnership with the local authorities, taking opportunities for pro-active master planning around stations, as well as having regard to the local planning context and highways issues. The RPA noted that stations in town centre locations and urban settings should be considered for additional parking, as well as those in out-of-town locations. This would probably include, but not be limited to: Rainham, Gillingham, Chatham, Rochester and Strood, Dover Priory, Folkestone Central, Broadstairs, Herne Bay, Whitstable and Faversham.

- Encouraging more use of rail services for travel to the main town centres in the area, including on contra-peak direction services in the peak periods, and on all services outside of peak times.

- Exploring opportunities for relatively low cost improvements to journey times on the classic network which could be implemented at the same time as infrastructure renewals, such as increases in line speed if possible.

- The principles of community rail development could be applied to the then anticipated Sheerness-on-Sea to Dover Priory service, with the aim of increasing usage, and increasing wider community participation in and community benefit from, the service offered at the smaller stations along the line. However, following the publication of the RPA proposals for this service were dropped.

- The RPA suggested that as demand grows to fill high speed domestic trains, there will be a number of options to increase capacity, not least running the peak service of eight trains per hour (tph) for a longer period than the peak hour only. However, the RPA recognised that such options would need to be investigated alongside the requirements of international services.

- It was noted that 12-car trains could be operated to Rochester, with either platform lengthening or selective door opening (SDO) at Gravesend, Higham, Strood and Rochester. The RUS now treats 12-car at Gravesend as a committed scheme, as described in Chapter 4, with the other sites’ potential enhancement opportunities under the coming East Kent Resignalling programme.

- It was also noted that South East England Regional Assembly (SEERA) and Kent County Council had proposed an enhancement of Rochester Bridge Junction to increase capacity between the main line through the Medway Towns and the North Kent Line. The RPA suggested that this could be examined further by Network Rail, but is not thought to be necessary for the service frequency required.

- The RPA suggested that if the Thameslink upgrade programme were to go ahead, more capacity will be created west of London Bridge, and platform capacity will be released at Charing Cross and Cannon Street. Therefore the RPA considered that the potential would exist to run additional services, if a business case exists to do so. However, it is noted that this finding of the RPA is inconsistent with Network Rail’s assessment of capacity following the Thameslink Programme, as described in Chapter 4 of this RUS.
Long-term options

- When specifying the next franchise, the RPA suggesting returning again to the issue of the most beneficial balance between the level of service provided at lightly-used intermediate stations and the journey time offered between well-used stations along routes.

- If demand continues to grow beyond that forecast in the RPA, the suggestion was that the most cost-effective means of providing extra capacity should be kept under review. It was thought that this was likely to be longer trains rather than more trains; however, if new signalling technology coming on stream in the next 20 years allows more efficient operation of key junctions, then it is possible that more trains might become the more cost-effective option.

- In the longer term, probably beyond the time horizon of the RPA, measures that could be examined to increase capacity on HS1 services could include the use of double decker stock, since HS1 is built to continental gauge.

- In the longer term the RPA noted that if maintaining the route through Folkestone Warren became prohibitively costly due to deterioration in the underlying geology, one option to investigate would be closing Folkestone – Dover and linking Dover to Ashford via a new chord at Canterbury.

Third party schemes

The RPA noted that the following schemes had been proposed and appeared in the Draft South East Plan Implementation Plan. They were considered potentially compliant with strategic objectives for the railway, but would need to be promoted and funded by third parties, such as local authorities, developers, port companies/authorities and/or the freight industry.

- Sheerness rail freight improvements
- Thamesport/Isle of Grain rail freight improvements
- Dover Western Docks rail freight link
- Rail access to Kent International Airport, Manston
- Improved rail station at Aylesham, related to Aylesham expanded community.
5.9 The Eddington Transport Study

5.9.1 Sir Rod Eddington was jointly commissioned by the Chancellor of the Exchequer and the Secretary of State for Transport to examine the long-term links between transport and the UK’s economic productivity, growth and stability, within the context of the Government’s broader commitment to sustainable development. The Study was announced in Budget 2005 and reported on 1 December 2006 to accompany the 2006 Pre-Budget Report.

5.9.2 Eddington’s key recommendations are summarised in Figure 5.4.

5.9.3 Many of Eddington’s recommendations have implications for the Kent RUS. Examples include:

- the focus on maximising the usage of existing networks suggests that reopening disused alignments is not currently a priority for Government. Whilst this does not rule out investigation of such schemes on their individual merits, such schemes could generally only be progressed by the RUS if they met a RUS gap and are appraised according to DfT criteria

- the emphasis given to international gateways is highly relevant, for example regarding routes to the Channel Tunnel, to Dover, links to airports and for access to Ebbsfleet

- with respect to passenger and freight demand, the suggested “level playing field” pricing policy between all transport modes has potential to lead to a significant modal shift to rail.

Figure 5.4 – Recommendations of the Eddington Transport Study

1. To meet the changing needs of the UK economy, Government should focus policy and sustained investment on improving the performance of existing transport networks in those places that are important for the UK’s economic success.

2. Over the next 20 years, the three strategic economic priorities for transport policy should be: congested and growing city catchments, and the key interurban corridors and the key international gateways that are showing signs of increasing congestion and unreliability. These are the most heavily used and economically significant parts of the network.

3. Government should adopt a sophisticated policy mix to meet both economic and environmental goals. Policy should get the prices right (especially congestion pricing on the roads and environmental pricing across all modes) and make best use of existing networks. Reflecting the high returns available from some transport investment, based on full appraisal of environmental and social costs and benefits, the Government, together with the private sector, should deliver sustained and targeted infrastructure investment in those schemes which demonstrate high returns, including smaller schemes tackling pinch points.

4. The policy process needs to be rigorous and systematic: start with the three strategic economic priorities, define the problems, consider the full range of modal options using appraisal techniques that include full environmental and social costs and benefits, and ensure that spending is focused on the best policies.

5. Government needs to ensure the delivery system is ready to meet future challenges, including thorough reform of sub-national governance arrangements and reforming the planning process for major transport projects by introducing a new Independent Planning Commission to take decisions on projects of strategic importance.
5.10 Local Authorities

5.10.1
Within the context provided by the national and regional planning authorities, other local authorities produce spatial development and implementation plans which also cover transport issues. These authorities include counties, unitary authorities, districts and boroughs.

5.10.2
The following local authorities are particularly relevant to the geographic scope of this RUS:

- Kent County Council (KCC), together with each of its constituent districts and boroughs
- Medway Unitary Authority
- East Sussex County Council, together with relevant constituent districts and boroughs.

5.10.3
The planning decisions of local authorities feed into the analysis undertaken for the RUS appraisals. This is an indirect process, with land use planning informing the DfT’s TEMPRO database, which in turn feeds the DfT’s PLANET South AM model, which in itself is the primary dataset by which RUS options are appraised.

5.11 Kent County Council Integrated Transport Strategy

5.11.1
In November 2009, KCC published their draft Integrated Transport Strategy (ITS), which is open for consultation until February 2010. The ITS seeks to respond to current and anticipated challenges by developing an integrated transport network that promotes and encourages use of a wide range of different transport modes over the next 20 years.

5.11.2
The strategy outlines a range of measures and initiatives which will deliver the integrated transport network, of which there are five key elements that will need to be in place to ensure success:

- **New infrastructure** – investment to solve key bottlenecks on the transport network
- **Maximising the Benefits of HS1** – ensuring that more of Kent’s communities and businesses have better access to the high speed rail services
- **Integrated Bus Network** – developing and integrating ‘Fastrack’ type services, inter-urban coaches, local bus services and rural bus services to create a bus network that meets Kent’s needs, complementing all other forms of transport
- **Making Public Transport Travel Easier** – making public transport easier, simpler and cheaper to use through new technology, integrated ticketing and promoting better understanding of how to use it
- **Flexible working** – supporting Kent’s residents in working in ways that suit them and business and that also reduce the needs to travel, especially at peak periods.

5.11.3
Relevant proposals described in the strategy include:

- enhancing the benefits of High Speed Rail through improved connections to existing and planned communities; development of parkway stations integrated with other transport modes; electrification of the Ashford to Hastings line; and the development of Transmanche Metro, connecting intermediate stations on both sides of the channel
- providing value for money rail fares through “Carnet” ticketing and extension of the Kent Freedom Pass to rail
- specific enhancements to the local rail network including station accessibility improvements; Smartcard technology to allow ticket-less integrated travel; cycle hire and storage; and improved real-time journey information
support of other rail industry schemes including expansion of the Thameslink network, train lengthening programme, and extension of Crossrail services to Gravesend

provision of an integrated bus network with efficient interchange at key sites, including train stations

working with the freight industry to identify and overcome barriers for transferring freight from road to rail

Support of strategic road/rail freight terminals if they are located in the correct place with relevant operational considerations met.

5.11.4
Following the end of the consultation process, KCC will consider the views received and publish a final version in March 2010.

5.12 Medway Transport Strategy
5.12.1
Medway Council has started work on the new Local Transport Plan (LTP3), which is due to come into effect from April 2011. LTP3 will run for 15 years and will comprise of the Medway Transport Strategy – a long-term strategy document which will run until 2026 – and shorter implementation plans that will cover successive three-year periods throughout the strategy’s life.

5.12.2
Following initial discussions with stakeholders, a draft Medway Transport Strategy will be produced by late spring 2010, followed by public consultation. After consideration of the views raised, The strategy, as a component of LTP3, will be launched in April 2011.

5.13 East Sussex County Council Transport Strategy
5.13.1
East Sussex County Council is currently developing its third Local Transport Plan (LTP3) which will provide a strategic framework for transport services in the county from 2011 to 2026. LTP3 will also include a rolling implementation plan for delivery of the strategy which will be refreshed annually. The draft LTP3 Strategy is expected to go out to full public consultation in Summer 2010.
6. Future demand

6.1 Introduction

6.1.1
This chapter considers the predicted changes in demand in both the passenger and the freight markets within the Kent Route Utilisation Strategy (RUS) area. It covers passenger traffic in detail to 2026, and takes freight traffic forecasts from the Strategic Freight Network workstream to 2030, interpolating for intervening years where necessary.

6.1.2
The RUS analysis has been undertaken during a severe recession, but this is mitigated by many factors which are likely to increase demand beyond this period. Current economic conditions have obviously affected recent passenger numbers and freight volumes, although to what extent this will affect the situation going forward is unclear. In particular, there remains considerable uncertainty regarding the timescale for recovery, following the UK's anticipated exit from recession in 2010. The passenger demand forecasts now used in this RUS were formulated in Autumn 2009 and factor in the industry's prevailing view of the recession at that time.

6.1.3
These forecasts therefore assume that economic recovery does happen, although the level of passenger growth to 2019 in the Draft for Consultation is not now expected to be achieved until 2022. On that basis the Draft RUS forecast remains a realistic view of passenger numbers in the medium to long term and the impact of the recession has not therefore materially affected the conclusions from our analysis. However, it must be recognised that there are also now additional affordability constraints which may have the potential to impact on the timings of any interventions recommended in this strategy.

6.1.4
It is worth noting that much of the forecast passenger growth identified by the analysis is due to improvements in rail services, including increased travel from Kent to St Pancras International as demand patterns mature in response to the recently introduced new services. We would expect such improvements to generate growth for rail, even if the economy as a whole recovers slowly.

6.1.5
Beyond the early years of the strategy, forecasts become less certain. In considering future demand, the RUS notes the Government's target in the "Delivering a Sustainable Railway" White Paper is to double rail usage nationally over the next 30 years. However, this target sets an overall context for the future development of the railway and is not intended to be a forecast for any specific route or area. Therefore, specific evidence would be needed for the RUS to recommend any interventions requiring such high levels of growth.

6.2 Passenger demand: drivers of change

6.2.1
Drivers of change have been taken into account when developing the forecasts used in the analysis. These include factors external to the rail industry, such as socio-economic and demographic changes, and internal factors, such as changes to rail services.

6.2.2
Perhaps the single most significant external factor affecting growth in the Kent RUS area is the planned housing growth in Ashford and the Thames Gateway development described in the previous chapter. This housing growth is reflected in the forecast population growth in
the Department for Transport’s (DfT’s) TEMPRO model, shown in Figure 6.1. The population in Ashford is predicted to grow by 27 percent by 2022, compared to the average forecast for the South East of about 10 percent. The high growth related to the Thames Gateway development is reflected in the forecast for Dartford and Gravesham.

6.2.3 Other external factors that influence passenger demand include employment and economic growth. A number of data sources regarding these external drivers were used in compiling the forecasts:

- Gross Domestic Product (GDP) and central London employment forecasts were obtained from Oxford Economic Forecasting.
- forecasts of local population and employment (except central London employment) were obtained from version 5.4 of the DfT’s TEMPRO model.
- elasticity assumptions were drawn from Passenger Demand Forecasting Handbook (PDFH) version 4.1, except for the elasticity to fare increases, for which PDFH 4.0 guidance was used.
- changes in fares have been assumed to be consistent with Southeastern’s franchise agreement with DfT, i.e. increases of RPI + 3% until 2011, and RPI + 1% thereafter.
- assumptions on the real cost of fuel and levels of car ownership were derived from TEMPRO version 5.4.

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1 The fare elasticities in PDFH v4.0 are considered more credible by Network Rail and stakeholders than those in v4.1.
6.2.4  
As well as external factors, passenger demand is influenced by substantial committed improvements to rail services in the Kent RUS area. These are described in Chapter 4. Those with the most significant effect on demand are:

- The recently introduced domestic services on High Speed One (HS1), the full impact of which on demand is expected to take a while to materialise
- Planned lengthening of peak train services in Control Period 4 (CP4)²
- New journey opportunities which are expected to be created upon completion of the Thameslink Programme – assuming the timetable structure described in Section 4.6 – together with improved train performance once additional capacity is available in the London Bridge area
- Interchange opportunities at Abbey Wood, principally from the Medway area as far as this RUS is concerned, onto Crossrail.

6.2.5  
Smaller scale demand factors include the recent introduction of Oyster Pay As You Go (PAYG) ticketing, though this is restricted to the London Travelcard area so only of relevance to this RUS for journeys between Bromley South or Orpington and London, therefore the impact is likely to be relatively minor. We have not assumed any further extension beyond the London travelcard boundary.

6.2.6  
Based on these drivers of change, the RUS has formulated two sets of demand forecasts. The first is a high level forecast that considers total demand in the whole of the RUS area to 2022; the second focuses in more detail on morning peak demand into London, and extends to 2026.

² At the time the forecast was formulated, a larger number of vehicles for lengthening services were assumed as committed in the base, compared to the current expectation described in Chapter 4. This can be expected to increase crowding and constrain demand growth, but the effect is minor.

Figure 6.2 – Forecast change in total demand 2008 – 2022

Draft forecast Autumn 2008  
RUS forecast Autumn 2009
6.3 Total demand

6.3.1 Total passenger demand in the RUS area is forecast to grow by 30 percent between 2008 and 2022. This is shown in Figure 6.2.

6.3.2 In developing this forecast for demand growth, the RUS has adapted the short-term forecast produced by Southeastern in 2008. This forecast extends to 2013/14 and includes growth arising from changes to the rail service offered (for example, the impact of domestic services on HS1) as well as external factors such as changes in population, employment and car ownership. The element of growth due to external factors has been updated to reflect more recent projections of employment and population change.

6.3.3 Beyond this, the forecast has considered growth due to external factors only. This forecast does not therefore include the effect of service changes after 2013/14, for example Thameslink and Crossrail, for which the impact is expected to be modest in relation to overall demand across the RUS area as a whole.

6.3.4 Growth beyond 2013/14 has been modelled based on the approach set out in version 4.1 of the PDFH, except for fare elasticities which were based on PDFH version 4.0. The PDFH is the industry standard tool for developing underlying demand forecasts. A high-level exercise was undertaken to provide reassurance that PDFH methodology would, on average, have adequately predicted historic growth in the RUS area, and is therefore an appropriate tool for producing forecasts of future growth due to external factors.

6.3.5 The forecast shows higher levels of demand growth around Ashford and the Medway conurbation, as would be expected given the higher population growth forecast in these areas. This is shown in Figure 6.3.

6.3.6 These forecasts have been used in analysis of all-day service proposals, and all proposals not involving London.

Figure 6.3 – Forecast change in total demand 2008 – 2022: Ashford and the Medway conurbation compared to average

<table>
<thead>
<tr>
<th>Year</th>
<th>Ashford growth</th>
<th>Medway conurbation growth</th>
<th>Kent RUS average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td></td>
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<td>2022</td>
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6.4 Morning peak demand forecast

6.4.1 Morning peak demand into London represents a crucial market in the Kent RUS area. A detailed forecast was therefore developed, taking into account both external drivers of growth and changes to rail services, as well as the effects of crowding. This forecast extends to 2026 and has been formulated using the PLANET South (PSAM) model. Demand on domestic HS1 services has been modelled in PLANET to align with forecasts produced by Southeastern.

The morning peak demand forecast was developed in Autumn 2008. The level of growth forecast in the Draft RUS is still expected to be achieved by, or shortly after, 2026 as much of the forecast growth is led by changes in service quality.

6.4.2 The assumptions used in the PLANET model are similar to those stated in section 6.2.3. They differ only in the source of Greater London employment data, where data provided by the Greater London Authority (GLA) were used, and data regarding economic growth, where forecasts from Cambridge Econometrics were used.

6.4.3 Committed service changes between 2008 and 2026 were described in Chapter 4 and are included in the forecast assumptions.

6.4.4 The increase in passenger volume between 2008 and 2026, shown in Figure 6.4, is mostly as a result of the growth areas and the improved services. About 10,000 extra journeys per day are expected as a result of the domestic HS1 services alone. Further increases are expected due to the Thameslink Programme and Crossrail. Demand associated with these services will build up over a number of years as people (and in some cases businesses) respond to the new or better journey opportunities provided, for example in their choice of where to live or locate.

6.4.5 The implications of this increase in demand are considered throughout much of the remainder of this document. The PSAM model described has been used in analysis of proposals involving peak trains into London.

Figure 6.4 – Forecast growth in journeys to London – morning peak

![Figure 6.4 – Forecast growth in journeys to London – morning peak](image)
6.5 Future freight demand

6.5.1 Since the publication of the draft RUS, the Strategic Freight Network workstream has developed freight traffic forecasts for 2030, which have been agreed within the industry. These forecasts (shown in Figure 6.5) have been supplemented by aspirations from the DfT and other stakeholders to increase the proportion of freight carried by rail throughout the UK. The DfT’s 2007 White Paper “Towards a Sustainable Transport System” provides support for transferring freight from road to rail in order to reduce road congestion and carbon emissions.

6.5.2 Potential for freight growth exists in all market sectors and the following scenarios describe the main opportunities in each sector.

6.5.3 The aggregates market is likely to be supported in the short term by the construction of several capital projects in London and the south east. Construction of Crossrail and the Olympic site in Stratford may directly result in a significant increase in the amount of building material transported by rail through the RUS area. Housing growth in the Thames Gateway and Ashford, as well as other local developments, will also make further demands on the aggregates market and may result in further growth.

6.5.4 Within the international sector, there is a significant amount of scope for further growth. Channel Tunnel rail freight has reduced in volume in recent years, and therefore presents an opportunity to return to, or exceed, the tonnage peak of 1997.

6.5.5 Eurotunnel has recently undergone a significant restructuring of its usage charges for rail freight which has removed one source of business risk and uncertainty, but further work will be needed from all stakeholders to develop a cohesive “end-to-end” strategy for customers.

6.5.6 The protected freight paths from the Channel Tunnel should provide sufficient capacity for short to medium-term growth projections. However, with the international market increasingly using unitised containers for transporting general merchandise, gauge issues may become a limiting factor.

6.5.7 Additionally, Class 92 locomotive hauled freight services are not currently permitted to use the secondary freight route via the Redhill line due to power supply and signalling immunisation issues. As stated in Chapter 4 we anticipate this being resolved in Control Period 4 (CP4).

6.5.8 It is possible that within the timescale of this RUS, freight flows may be established on HS1. Such flows would provide capacity to supplement the existing Channel Tunnel routes. However, until future markets and flows are established, it would not be robust to predict the additional volumes or the mix of traffic between established and new Channel Tunnel routes.

6.5.9 As well as infrastructure issues, cross-Channel freight operators will also need to ensure that rolling stock and depot facilities will meet the requirements of an increase in Channel Tunnel traffic.

6.5.10 Other freight volumes will continue to be led by the vicissitudes of the market. The recent economic downturn has seen a reduction in the quantity of steel, cars and other goods transported via facilities on the Sheerness and Grain branches, although there is no reason to suppose that an improvement in market conditions will not return these flows to previous levels.
Figure 6.5 – Strategic Freight Network forecasts for 2030

- Sheerness ~ 5 daily paths
- Dartford – Lewisham ~ 18 daily paths
- Bromley South ~ 5 weekly paths
- Channel Tunnel ~ 35 daily paths*
- Allington ~ 15 weekly paths
- Mountfield ~ 4 daily paths
- Dungeness ~ 2 weekly paths
- To Midlands and North via West London Line
- Dungeness ~ 2 weekly paths

Key:
- Up to and including 5 daily paths
- Between 5 and 20 daily paths
- Between 20 and 40 daily paths
- Over 40 daily paths
- Second Channel Tunnel route not assessed but likely to primarily be used for diversionary purposes
- High Speed line not assessed
6.5.11
Freight transported via facilities on the Grain branch, although not within the geographic scope of this RUS, does have a significant interface with local and high speed services via Gravesend. An increase in the volume of freight using the Grain branch will need to be considered when developing future timetable and infrastructure plans for this area.

6.5.12
In addition to the existing flows, the expectations for new freight terminal sites as described in Chapter 4 would increase demand. For example, the rail connection at Dover Western docks would be aimed at capturing a proportion of the cross-Channel freight flow, whilst the planned terminal at Howbury Park is envisaged as attracting Channel Tunnel and deep sea traffic for onward distribution in the South East.

6.5.13
Beyond the above, a rail freight terminal at Hollingbourne near Maidstone has been proposed and is being considered through local authority and wider planning processes. This would be located on the Channel Tunnel freight routes, so trains could be W9 gauge and up to 775m in length.

6.5.14
In general the RUS has used freight forecasts qualitatively, to identify whether a “step-change” intervention is necessary. This is because the rail-freight companies are in general well placed to make speedy decisions on specific new services on a commercial basis, so detailed appraisal of particular flows by the RUS would not be appropriate.
7. Consultation process and overview

7.1 The Draft for Consultation

7.1.1
The Kent RUS Draft for Consultation was published in April 2009, along with a press release announcing its publication. The document described the baseline situation and the likely impact of funded schemes, the first of which – Southeastern’s December 2009 timetable change – has since been implemented. The Draft then outlined a number of gaps between the committed capability of the network and the predicted demand up to 2019. It proposed a range of options for bridging the gaps and described an indicative strategy beyond 2019. Responses were invited on all items covered in the document.

7.1.2
The Draft for Consultation was distributed to a wide range of stakeholders and also made available on the Network Rail website. A period of 12 weeks was given to allow stakeholders to respond, which ended on 23 July 2009.

7.1.3
The Sussex RUS Draft for Consultation was published 4 weeks later than the Kent proposals. This provided an 8 week overlap within the consultation periods in order that a small number of issues relevant to both RUSs could be considered appropriately.

7.1.4
During the consultation period Network Rail held meetings with a number of stakeholders, either collectively or individually, at which specific issues and concerns were discussed.

7.2 Consultation responses

7.2.1
Stakeholders who responded to this consultation fell into six broad categories. Formal responses were received from:

- The RUS Stakeholder Management Group
  - Association of Train Operating Companies
  - DB Schenker Rail (UK)
  - Department for Transport
  - London and Southeastern Railway
  - Office of Rail Regulation
  - Transport for London
  - Passenger Focus

- Other rail companies and industry organisations
  - Eurostar UK Ltd
  - New Southern Railway
  - Rail Freight Group

- Statutory and voluntary rail user groups
  - Bexhill Rail Action Group
  - Edenbridge & District Rail Travellers Association
  - Kent Community Rail Partnership
  - London TravelWatch
  - Maidstone Area Rail Users Group
  - Malling and District Rail Travellers’ Association
  - Marshlink Action Group
  - Railfuture
  - Sevenoaks Rail Travellers Association
  - Sussex Community Rail Partnership
  - Tonbridge Line Commuters
  - West London Line Group
Companies, other public or private organisations, elected representatives

- Barton Willmore on behalf of Taylor Wimpey and Persimmon Homes
- Bexhill Chamber of Commerce and Tourism
- Cannon Consulting Engineers
- Gatwick Airport Consultative Committee
- Hastings Chamber of Commerce
- Hastings & Bexhill Taskforce
- Hastings & Rye Liberal Democrats
- Hastings Shopping Centre
- Highways Agency
- International Air Rail Organisation
- Jacobs Consultancy
- Kent International Airport
- Locate East Sussex
- London Gatwick Airport
- Lydd Airport
- Nu Venture Coaches
- Sir John Stanley MP
- Sussex Coast College
- Thames Gateway Kent Transport Group
- Transport Enterprises

Additionally, there were around 20 responses received from members of the public.

7.2.2
Some 86 formal written responses were received during the consultation period. Copies of the various organisations’ responses can be found in the Kent RUS section at www.networkrail.co.uk
7.3 Key themes in the consultation responses

7.3.1
The RUS covers a large and diverse population, which was reflected in the responses received. The Draft for Consultation generated considerable interest which is a significant indication of the importance attached to rail transport in the area. It is not practical in this chapter to provide a complete review of all responses, instead the key concerns and recurring themes are summarised below.

7.3.2
The Draft RUS identified gaps and grouped options responding to these into six broad categories which were subject to quantitative and/or qualitative appraisal as appropriate. In general, the reaction to the gaps identified in the Draft for Consultation was positive and no significant omissions have been noted. The resulting options appraised were also felt to be appropriate in terms of scope. Furthermore, there was widespread agreement to the belief that there will be ongoing growth in rail demand. However, the RUS analysis of these options and resulting recommendations was challenged by many, principally due to the view that the forecast demand was too low. In addition, several stakeholders have concerns that the appraisal methodology used did not adequately take into account additional generators such as housing growth, new colleges or employment centres and regeneration benefits.

7.3.3
There was widespread support for options to increase peak capacity between the RUS area and London. It was generally recognised that there is limited opportunity to run additional trains on a congested network and the small scale main line train lengthening options proposed beyond Control Period 4 were therefore supported as better than the “do-minimum” scenario of CP4 train lengthening only.

7.3.4
However, consultees expressed disappointment that once all peak main line services have been lengthened, very few opportunities exist to enhance peak capacity further on the ‘classic’ network due to terminal capacity and other infrastructure constraints. This view was widely held, but especially so in those areas not benefitting from increased capacity via High Speed One (HS1).

7.3.5
A further set of options in the Draft for Consultation explored opportunities to improve capacity on HS1 services. The success of the introductory high speed service from June 2009 underlined the support for these options. The Draft described a number of potential interventions, which elicited positive responses:

- the lengthening of peak Rochester to St Pancras International services from 6 to 12-car and extending the journey to start back from Faversham received approval. However, it was noted that the appropriate balance between high speed, main line and suburban services serving the Medway towns should be maintained

- similarly, lengthening the peak Ebbsfleet to St Pancras International services and extending these to start back from Ashford International or beyond was also supported by many. It was recognised by stakeholders that this option would present challenges to platform availability at Ashford, for which the Draft RUS recommended conversion of one of the international platforms to domestic use. This approach was generally supported subject to it not resulting in an undue constraint on existing or future international services

- an alternative to the Ashford via HS1 option was extending the Ebbsfleet service to start from Maidstone West via Strood and Gravesend. This option received significant support from stakeholders as it would provide new journey opportunities to St Pancras International from the Maidstone area.
7.3.6 Stakeholders representing rail users broadly welcomed the additional journey opportunities which could be available if the proposed strategy of accommodating growth on HS1 were implemented. However, it was widely felt that this should not be at the expense of forgoing options on the remainder of the network. In addition, concerns were expressed regarding future fare levels, since the HS1 element of such journeys is at present subject to a premium fare under Southeastern’s franchise agreement with DfT.

7.3.7 The Draft RUS included an indicative view of the Control Period 5 (CP5) baseline train service, which it considered would be an operationally practical service structure following the completion of construction work on the Thameslink Programme. This included a 4tph peak only service from Tonbridge Main Line to the Thameslink corridor, but the RUS emphasised that due to no capacity existing for additional services on this corridor this would need to be a replacement for the Tonbridge Main Line to Cannon Street services currently in operation. Additionally, due to power supply constraints and the use of fixed formation rolling stock, existing Cannon Street services from Hastings would be replaced by the new Thameslink Corridor services which would originate from Tunbridge Wells instead.

7.3.8 The above issue generated significant concern amongst stakeholders representing the Hastings area, with extensive representations from numerous bodies concerning the need to retain existing peak services from south of Tunbridge Wells to the City. This is now recognised by this RUS, with a new “gap” which is described further in Chapter 8, with options developed in response as described in Chapter 9.

7.3.9 The CP5 service described also assumed a reduction of fast Cannon Street services from Medway from today’s 3tph to 2tph. The assumption was primarily based on the expected reduction in capacity at Cannon Street following the Thameslink Programme, though there are also timetable constraints through the Medway towns. This also generated stakeholder concern, with many Medway respondents seeing retention of existing Cannon Street services as a higher priority than improvements to the St Pancras services.

7.3.10 The RUS has clearly raised stakeholder awareness of the expected reduction in capacity at Cannon Street once the London Bridge construction works are complete, with this issue having triggered a significant level of interest within the industry and elsewhere. It is important to understand that this effect will be caused by the unavoidable loss of the existing ability to route empty trains from Cannon Street towards the sidings at Blackfriars, since the space taken up by these tracks will be used for Thameslink corridor trains. Future capacity at Cannon Street will therefore be determined by the rate at which the platforms can be vacated for new arrivals, with trains only able to exit the station via London Bridge rather than having an alternative route away as at present.

7.3.11 However, as described in Chapter 4, further analysis has been undertaken since the Draft and the RUS baseline now assumes a reduction in Cannon Street capacity in the high peak hour from 25tph to 22tph (rather than to 20tph as described in the Draft). At 22tph the RUS is now able to work on the basis that the existing 3tph Medway to Cannon Street fast service (as described in 7.3.9) can be retained. However, the revised assumptions regarding Cannon Street capacity do not resolve the Hastings issue (as described in 7.3.7 - 7.3.8), since these are also subject to the constraint posed by the Orpington – Tonbridge two-track section.

7.3.12 Consultees also expressed concern about the potential disruption during the Thameslink
Programme construction works at London Bridge, which are due to commence within the next few years. The likely impact of the construction works at London Bridge, and elsewhere on the network, during this period was described in Chapter 4.

7.3.13 Options describing linkages within and beyond the RUS area produced a great deal of stakeholder interest. The wide-ranging opinions on the options published in the draft are impractical to express here in full, but the key themes are described below.

7.3.14 Unsurprisingly, there was no dissension to developing options to improve journey times within the RUS area. This was seen as a key issue by many stakeholders, particularly those on the Maidstone East line and those at the southern end of the Hastings line, where journey times to the capital are not seen to be as competitive compared to other areas in the South East.

7.3.15 There was strong representation to improve services via the Redhill line, specifically to Gatwick Airport. Many consultees challenged the demand figures on which the appraisals were based, citing the number of trips to the airport by other modes. Additionally, some responses felt that early morning services to the airport would provide significant benefit.

7.3.16 The Ashford to Hastings line generated particular stakeholder interest. The current 1tph service was not believed to offer sufficient frequency for the areas the line serves, particularly in light of connections with high speed services at Ashford. Stakeholders generally sought a 2tph service and many responses felt that electrification and dual-tracking of the line between Ashford and Ore should be implemented to provide improved operational flexibility. In addition, some stakeholders felt that direct services should be provided between the Marshlink route and HS1, though it is unclear whether it was appreciated that the track layout at Ashford International precludes this at present (as now described under option 8.6 in Chapter 9).

7.3.17 Several stakeholders noted that both of the above option groups have interfaces with the area covered by the draft Sussex RUS. Responses on the cross-boundary issues have been considered jointly by both RUSs, and the boundary is not a constraint to the overall strategy.

7.3.18 Implementation of regional connectivity options was not recommended generally due to appraisals showing revenue from forecast demand not being sufficiently high to cover the cost implications. Some consultation responses challenged the basis of the demand forecasts, feeling that additional factors such as new colleges, employment centres and regeneration benefits were not taken into account. Additionally, some consultees considered that the appraisal criteria did not fulfil local and national modal shift priorities. The RUS is required to conform to the Department for Transport’s appraisal guidelines.

7.3.19 Options to improve station accessibility also drew considerable attention. There was a wide, and sometimes conflicting, range of opinion on the various options to improve the passengers’ whole-journey experience.

7.3.20 Many responses cited the need for additional station car parking where facilities are felt to be inadequate to cope with existing or future demand. It was recognised in some responses that additional car parking does not provide a sustainable solution and many stakeholders felt that the provision of enhanced cycling facilities and bus links were key to improving local transport options.

7.3.21 Creation of an improved walking route between Northfleet station and nearby Ebbsfleet
International was seen as strategically important, in order to allow local rail connections into high speed and international services. Additionally, efficient interchange between Stratford International and Regional stations was emphasised in order to provide linkages with the Jubilee line, Docklands Light Railway and other routes and thus relieve some pressure from London terminals. It was also noted that both of these connectivity options could create additional journey opportunities in connection with Crossrail, since Stratford Regional will see Crossrail services from 2017 and Northfleet is located on the safeguarded future extension to Gravesend.

7.3.22
Several stakeholders felt that the RUS should have given more detailed consideration to new stations, even where the additional station call would increase rail journey times. Proposals for several schemes were highlighted through the consultation process. These proposals are therefore now described more fully and have been subject to initial evaluation in Chapter 9.

7.3.23
The principles of the 7 Day Railway programme to deliver efficient maintenance activity and improved services at weekends, evenings and bank holidays was welcomed. Reducing the use of buses during engineering works as far as possible was seen as key by many respondents.

7.3.24
Consultation responses referring to freight capability underlined the opportunity that exists to transfer road freight to rail in order to reduce highway congestion. The provision of a diversionary route for electric locomotives to/from the Channel Tunnel via Redhill, as described in Chapter 4, was strongly welcomed by the industry. The mention made of the possible use of HS1 for freight generated significant interest.

7.3.25
The final option group described opportunities to improve performance. Several forthcoming investment schemes were outlined in the RUS as providing potential performance benefits and responses underlined the need to reap any benefit from enhanced infrastructure.

7.3.26
The Draft RUS also provided a longer term view of accommodating additional growth within the RUS area. The Draft recommended further development of the concept of extending Crossrail from Abbey Wood to Gravesend. This recommendation received very strong support from stakeholders in the Thames Gateway and Network Rail continues to seek to avoid works on this corridor which would conflict with or hinder such a scheme. The importance of dual voltage rolling stock is emphasised, since any need for overhead electrification in this area would probably render such a scheme impractical.

7.3.27
The concept of a long-term solution involving conversion of the Hayes line to an alternative rail mode was welcomed as a bold step by several stakeholders. This would free up paths into Charing Cross and Cannon Street which could then be used for other purposes. Transport for London is currently understood to be reviewing long-term opportunities for a Bakerloo line extension and this route is one of many options which would need to be explored.

7.3.28
We are grateful to all those who responded to the draft RUS, and we hope that where possible, within our terms of reference, we have been able to take account of genuine concerns.
8. Gaps

8.1 Introduction

8.1.1
Route Utilisation Strategies (RUSs) consider “Gaps” as where the current or future railway system does not or will not meet the requirements that will be placed upon it, unless intervening action is taken.

8.1.2
The Draft RUS identified six strategic gaps (A to F), each of which was presented as being between an aspect of supply and demand of the railway system. Stakeholder responses to the consultation process have not highlighted any significant concerns with those gaps listed, which are broadly consistent with local views.

8.1.3
In addition, the consultation process has enabled a better understanding of some significant concerns on the Hastings line, as was described in Chapter 7. In response to this a new strategic Gap G has been created, focusing on future peak frequencies south of Tunbridge Wells, together with demand between the Hastings area and the City of London.

8.1.4
These gaps are now described in more detail in the sections which follow.

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**Figure 8.1 – Strategic Gaps**

- **Gap A** is between committed capacity and the forecasts of future demand on peak services to/from London, leading to a prediction that such trains will become unacceptably overcrowded.

- **Gap B** is between the planned train service within Kent (including linkages to adjacent areas) and the need to provide a train service consistent with future levels of demand across all transport modes.

- **Gap C** concerns accessibility to the rail network.

- **Gap D** is between the train service on offer at evenings, weekends and on bank holidays and the predicted demand for travel at such times.

- **Gap E** is between the current capability of the railway network to accommodate freight and the likely needs of the freight industry in the future.

- **Gap F** is between anticipated train performance on an increasingly busy network and the need for strategic level interventions to reduce major delays.

- **Gap G** is between the envisaged future peak train service from south of Tunbridge Wells to London and aspirations for existing trains from Hastings to Cannon Street to be retained.
8.2 Gap A – between committed capacity and the future forecasts of peak demand to/from London

8.2.1
Chapter 3 identified that there are overcrowding problems on peak trains to and from London at present. The worst of the problems generally occur inwards of the Bromley South and Sevenoaks areas, with many Passengers in eXcess of Capacity (PiXC) at the busiest times, but standing often extends further into Kent.

8.2.2
At this stage it is too early to tell the full extent of any crowding pattern changes following Southeastern’s recently introduced December 2009 timetable, as passenger behaviour – which can include moving job or home – takes some time to respond fully to service alterations. However, the new St Pancras services have clearly provided extra capacity from the Ashford and Thames Gateway areas and initial indications are passengers are responding to this by using the new services. The PLANET modelling undertaken as part of the RUS baseline has sought to provide an approximation of on-train crowding in 2010 once demand patterns have stabilised. Figure 3.10 in Chapter 3 indicated that despite the additional capacity, the model predicts that significant crowding levels will still exist.

8.2.3
An important factor which will provide some mitigation of crowding in Control Period 4 (CP4) is that the committed baseline as described in Chapter 4, which delivers the High Level Output Specification (HLOS) Capacity Plan, will include some lengthening of main line commuter services to London. This will provide a limited amount of extra capacity relative to today on some routes. This is built into our PLANET modelling for the “Do-Minimum” scenario, and demonstrates that Chatham Main Line crowding can be expected to be reduced, primarily by train lengthening.

8.2.4
However, despite the commitments described above, the baseline demand and anticipated long-term growth (identified in Chapter 6) suggests that overcrowded trains in the peaks will remain an issue and, more importantly, as far as the Tonbridge Main Line is concerned, are forecast by the modelling to worsen in the period to 2020.

8.2.5
Option Groups 1-6 in the next chapter therefore seek to identify ways of responding to this gap.

8.3 Gap B – between the planned train service within Kent (including linkages to adjacent areas) and the need to provide a train service consistent with future levels of demand across all transport modes

8.3.1
Whilst rail has a high modal share for services to London, a far smaller proportion of travellers making journeys solely within the RUS area use the railway. Given the fit with planning policies which seek to deliver a modal shift to rail the RUS has therefore identified this issue as a gap. This has enabled potential interventions to be identified through the optioneering process and appraised accordingly.

8.3.2
Evidence from elsewhere in the country suggests that improving the train service on offer would encourage more passengers to travel by train rather than car. This would
contribute to the following government objectives as described in Chapter 5:

- the target of doubling usage of the railway over the next 30 years
- an increased usage of the railway at off-peak times and away from the London area, as recommended for further development by the Southeast Regional Planning Assessment (RPA)
- a reduction in road congestion
- a reduction in road accident rates associated with travel by car
- a reduction in CO₂ emissions from the transport sector.

8.3.3 The evidence supporting Gap B is therefore based on these more complex multi-modal factors, rather than any need to alleviate existing and forecast overcrowding on trains as considered under Gap A, which is perhaps simpler for the rail industry to consider in isolation.

8.3.4 The main issues covered by this gap are limited off-peak frequencies on certain routes, some journey opportunities which are not provided for by rail and journey times which are uncompetitive with road or slower than similar routes elsewhere. The following sections consider each of these in turn.

Off-peak frequencies

8.3.5 The committed off-peak service frequency throughout the RUS area up to 2014 is as per existing franchise agreements between the Department for Transport (DfT) and the affected Train Operating Companies (TOCs).

8.3.6 With regard to this relatively short-term period there are known to be stakeholder concerns regarding off-peak service frequencies on the following routes:

- the Maidstone East line to London, which has a 2tph service off-peak. In addition to this, the off-peak services on this line all now run to Victoria, and no services are provided to the City of London (the off-peak 1tph fast Cannon Street service was withdrawn in the December 2009 timetable change)
- the Ashford to Hastings line, where a 1tph service is provided
- the Redhill to Tonbridge line, where services were reduced from 2tph to 1tph in December 2008
- the Maidstone West to Tonbridge line, which has a 1tph service.

8.3.7 In order to further investigate these concerns, quantified economic appraisals have been undertaken by the RUS where appropriate.

8.3.8 In undertaking the analysis, a key factor is that long intervals between trains have a negative impact on passengers’ overall journey times. For example, with an hourly service, a passenger arriving unplanned at a station will have to wait 30 minutes on average for the next train. This can be readily quantified in terms of socio-economic impact, as can the additional passengers which would be generated by any frequency increases.

8.3.9 On most routes there is capacity to provide additional services at off-peak times using existing infrastructure and without requiring any additional rolling stock. However, in some cases more significant investment in infrastructure may be needed.

8.3.10 With regard to the longer term, some stakeholders have noted that the new St Pancras services will not be particularly frequent, with key nodes such as Chatham and Ashford only being served every 30 minutes, and Ebbsfleet receiving no more than four trains per hour. Whether there is a case for this
to be increased would be dependant on the flows that materialise from December 2009, making any analysis at present subject to considerable uncertainty.

8.3.11
Option Group 7 in Chapter 9 seeks to identify ways of responding to this gap with additional services.

Journey opportunities
8.3.12
The railway network in Kent was generally designed to facilitate links between the major population centres and London. It also provides many links between other key locations, but this objective is less ably fulfilled. In particular, it is observed that there are several major towns within and beyond the RUS area which are poorly linked by rail.

8.3.13
The following describe some specific issues raised by stakeholders as potentially relevant to this gap:

- The Medway Valley line does not currently serve a sizeable settlement at either end of its route. At the northern end, journeys between the Medway conurbation and Maidstone require a change of train at Strood, whilst at the southern end passengers must in general change at Paddock Wood at peak times. The result is that, for example, a journey from Maidstone to Tunbridge Wells can require two changes of train and takes over an hour. Unsurprisingly, most such journeys are made by car at present.

- Rail links between Medway and Ashford are particularly awkward, requiring a significant detour. Given that these are the two major growth areas covered by the RUS, this has potential to lead to significant additional road usage.

- Since December 2009, there have been no direct trains between the county town of Maidstone and the city of Canterbury. Passengers making this journey now need to change at Ashford.

- A common observation is that there are limited rail links between Kent and Gatwick Airport. In most cases such journeys require a change of train, so the majority of passengers currently travel via London. There is only limited use made of the two alternative routes from Kent, via Godstone or Bexhill. Large numbers of journeys to the airport are, however, made by means of the M25/M23 motorway route, demonstrating that significant overall demand does exist.

- Journeys between the west Kent area (Sevenoaks/Tonbridge/Tunbridge Wells) and the relatively close Sussex Coast (Brighton/Lewes/Eastbourne) are poor, requiring a detour via Hastings. However, as with the above, many such journeys are made by road.

- Rail journeys between Kent and Essex have historically needed to be made via central London, whilst road users benefit from the Dartford crossing.

8.3.14
Whilst the above is not an exhaustive list, the feature that they all have in common is that the majority of journeys concerned are currently made by other transport modes.

8.3.15
Option Group 8 in the next chapter seeks to identify ways of responding to this gap with service amendments or new services.

Journey times
8.3.16
Since summer 2009, the new Hitachi Class 395 trains have run at up to 140mph on High Speed One (HS1) to St Pancras International. However, once on the “classic” network, services are restricted to the same speed as other trains.

8.3.17
Stakeholders representing the Kent and East Sussex coastal areas within the RUS believe that the perception of long journey times to their areas by rail is a drawback to economic development. Even in areas benefitting from
the introduction of the new high speed services to St Pancras, some stakeholders feel factors such as stopping patterns adversely affect journey times.

8.3.18
Long rail journey times, especially to London, lead to areas being isolated from wider economic activity. Poor transport links tend to put off prospective employers from relocating to an area, which limits opportunities for employment growth. Given that Chapter 3 identified that certain areas of the Kent and East Sussex coasts suffer from high levels of social deprivation and unemployment, it is possible that cutting journey times to such areas would be beneficial.

8.3.19
This issue is potentially relevant to several areas, but the main ones suggested by RUS stakeholders are as follows:

- St Pancras to north Kent (Thanet via Medway), where journey times are restricted by linespeeds, especially in the Gravesend and Medway areas, together with the number of stations served
- St Pancras to east Kent (via Ashford), which is constrained by speeds east of Ashford, together with the need for peak services to split and join into/from Canterbury West line and Dover Priory portions at Ashford
- London to Maidstone. Journeys to the county town, in general, take longer than the time taken to reach Ashford and east Kent on HS1. This is due to the relatively low overall speed of the Otford/Bromley South route, and no station being located on the HS1 in the Maidstone area
- London to Hastings via Tonbridge. The main issue on this route is south of Tunbridge Wells, where there are factors such as the general curvature of the alignment, the need to serve several small stations and, on many trains, attachment and detachment of carriages at Tunbridge Wells
- Coastway services (Ashford to Hastings/Eastbourne/Brighton). These services are slow due to relatively low linespeeds, the need to serve several small stations and, as far as flows such as Hastings to Lewes and Ashford to Brighton are concerned, the need for all services to run via and reverse at Eastbourne.

8.3.20
Option Group 9 in Chapter 9 seeks to identify ways of reducing journey times through either linespeed enhancements or modifications to calling patterns.

8.4 Gap C – accessibility to the railway network

8.4.1
The elements of a journey between the origin and destination points and the relevant stations at each end are important factors in the overall travelling experience by rail. Hence, accessibility of stations is a key issue.

8.4.2
Several stakeholders have highlighted their particular concerns regarding access to stations in the Kent RUS area. Some of these are general issues, whilst others are specific to particular locations.

8.4.3
With respect to the general issues, there are many ways in which station accessibility can be a problem. Some common themes are:

- stations with insufficient car parking to cope with the current demand or that predicted in the future
- stations where the amount of car parking available is disproportionate to the capacity of the local road network
poor integration or connections between rail services and local bus networks

- stations which are difficult to reach on foot or by bicycle and therefore serve their local catchment area poorly

- certain stations where the environment is considered insecure, likely to attract crime and deter travel.

8.4.4
It is noted that no single solution is available to resolve these concerns as there may be conflicting priorities. The issues are described in more detail below.

8.4.5
There is quite a high degree of reliance on travel by car to reach stations in the RUS area. Parking provision at stations is therefore a significant factor in facilitating travel by rail. If passengers do not have the confidence to park their car securely at a station they will be deterred from using it. For example, off-peak travellers will avoid using stations if car parks are completely full before 9am.

8.4.6
However there is a risk that encouraging station access by car will reduce demand at low footfall stations. This is because passengers living nearby may choose to drive to a larger station (known as “railheading”) where there are faster or more frequent train services. This has the potential to both reduce the overall rail element of a journey and increase road traffic, so runs counter to stakeholder policy objectives.

8.4.7
Furthermore, encouraging travel by local bus serves to reduce traffic congestion and the need for station car parking. Numerous local bus services provide access to stations in much of the area from locations which are not directly served by rail. If there are poorly designed interchange facilities or long waits between the two journey elements passengers will be deterred from travelling by rail.

8.4.8
At stations in town centres, many passengers reach the station on foot. In order to increase usage, well designed pedestrian facilities are important, for example good quality signage, direct rather than circuitous routes and safe highway crossings. There are also similar issues regarding access to stations by bicycle.

8.4.9
Where stations are perceived as unsafe or insecure this will put off potential users, especially those travelling during the hours of darkness.

8.4.10
There are particular concerns with regard to public transport access from much of the RUS area to the new station at Ebbsfleet, especially for connecting to international trains. The station fills its “parkway” role well, is ideally placed for the M25 motorway and has excellent local bus links, but there is a risk that limited public transport from areas such as southeast London and west Kent could encourage car usage and run counter to modal shift policy objectives.

8.4.11
A further specific issue has been identified with respect to the location of Rochester station. Many stakeholders consider this to be positioned sub-optimally with respect to transport interchange, the waterfront, the town centre and future development sites.

8.4.12
Finally, there are lines in the RUS area which pass through or close to a population centre or other potential traffic generator without the presence of a station. In some locations there are local aspirations from stakeholders for new stations to be constructed.

8.4.13
Sections 9.15 – 9.20 in Chapter 9 seek to identify and assess ways of responding to the gaps identified in this section.
8.5 Gap D – between the train service on offer at evenings, weekends and on bank holidays, and the predicted demand for travel at such times

8.5.1
Whilst the predominant usage of the Kent railway network is for weekday peak period commuting, the railway is also busy at other times and is becoming increasingly more so. However, services during the late evening and on Sundays in particular are much less frequent than at other times, and are also prone to being affected by engineering work.

8.5.2
There is an increasing trend towards a 24/7 lifestyle, which has led to increased demand for travel at off-peak times, including evenings, weekends and bank holidays. This trend is forecast to continue. Specific interventions are likely to be required to respond to this market.

8.5.3
Societal trends have led to a significant increase in commercial and leisure activity on Sundays. Sunday trading laws were relaxed some years ago, with the result that large numbers of journeys for shopping trips are now made into the major retail centres on Sundays as well as Saturdays. Additionally, there are numerous major events in central London on Sundays (the London Marathon, Remembrance Day, etc.), which attract large numbers of attendees into London from Kent.

8.5.4
As far as demand to the Kent RUS area, rather than out of it, is concerned, Chapter 3 noted that traditional seaside resorts on the Kent and East Sussex coast, for example Margate and Hastings, have experienced an element of economic decline over recent years. Encouraging day trippers to visit such towns at the weekends is an important element in planned regeneration initiatives.

8.5.5
A specific problem is that Network Rail mainly carries out maintenance, renewal and enhancement activities late at night and at weekends. This significantly impacts on services from time-to-time, with extended journey times and/or replacement buses becoming necessary. It is recognised that such features can suppress demand and act as disincentives for passengers to travel by rail at such times or at all.

8.5.6
As mitigation for the above, an unusual feature of the Kent railway network is that there is more than one routeing option available for the most popular journeys between many of the major towns and London. For example:

- Canterbury can be reached from London by means of services to either Canterbury East or Canterbury West, and engineering work can be planned such that at least one route is open.
- Ashford can be reached by services via Tonbridge, Maidstone East or Ebbsfleet, so would only be unreachable from London in the event of major engineering work in the immediate station area itself.
- Maidstone is served by services to either Maidstone East or West, so again should always be accessible by at least one route.
- Dover can be reached via either Ashford or Canterbury.
- Medway is accessible via either Gravesend or Bromley South, though this is of no benefit in the event of engineering work on Rochester Bridge or in the Medway area itself.
- Hastings can be accessed by means of services routed through Tunbridge Wells, Eastbourne or by changing at Ashford.
- Tunbridge Wells can be reached by trains routed via either Sevenoaks or Redhill.

However, the above is not relevant to all towns and only applies as far as demand to London is concerned. Furthermore, journey times are usually slower on the alternative route so passenger journeys are still affected. Some of
the alternative routes also serve a different London terminal to the one passengers would normally use.

8.5.7
Many stakeholders have suggested that issues associated with evening and weekend services lead to a strategic RUS gap. Section 9.21 in Chapter 9 therefore seeks to identify and assess ways of improving services at such times.

8.6 Gap E – between the current capability of the railway network to accommodate freight and the likely needs of the freight industry in the future
8.6.1
Whilst the majority of stakeholders’ most obvious aspirations for the future development of the railway appear to relate to passenger services, there also appears to be unanimous support for increasing rail’s modal share for freight movements. Such an approach is consistent with government policy, as identified in the “Delivering a Sustainable Railway” White Paper for a doubling of freight traffic over the next 30 years.

8.6.2
Despite high levels of growth occurring in many sectors before the recent recession, rail still has a low modal share of the overall freight operation. As a comparison, Chapter 3 described the current traffic levels of 8-10 freight trains per day running through the RUS area to the Channel Tunnel. This is small when considering that Heavy Goods Vehicles (HGVs), mostly heading for Europe, make up approximately 20 percent of all traffic on the parallel M20 motorway with the rail freight modal share being significantly less than five percent. However, the important consideration here is that this low modal share represents a major opportunity for the growth in rail freight with only a small shift in modal share.

8.6.3
The nationwide initiatives which rail freight is undertaking to increase its modal share are as follows:

- More efficient operating costs, seeking to reduce the distance at which rail freight is competitive with road haulage
- Increasing network capacity, with infrastructure schemes such as the Isle of Grain loop seeking to minimise constraints and facilitate additional traffic. However, an increase in traffic may exacerbate congestion on other sections of the network, particularly at peak times. Suitable opportunities would need to be explored to maintain operational robustness
- Providing additional rail freight terminals, since the movement of goods to and from freight trains is a critical issue in determining the overall viability by rail of a particular flow
- A long-term strategy to increase the loading gauge of parts of the network, with tunnels and other structures needing to be large enough to accommodate the containers being carried. However, no specific gap has been identified on the Kent RUS in this respect in the long term. The main reason is that European Gauge freight traffic can now run via HS1 to the Channel Tunnel – so high value “big box” traffic will be able to run to Europe on this route, subject to the development of suitable terminal capacity in the Barking area and routes beyond. Subject to capacity, this is felt to be a more realistic strategy than the major works that would be needed to facilitate bigger boxes via existing routes. The routes to the Thames Gateway will, however, remain restricted to smaller gauges, though this is consistent with the likely future traffic flows
- Increasing train length limits on parts of the network, though this is not a problem on the Channel Tunnel route (Catford/Maidstone East) which can accommodate 775m long freight trains, matching the maximum length anywhere in the UK
- Increasing flexibility, recognising that movements by road can be planned or modified at the last minute
Increasing network availability and improving diversionary routes, since freight trains cannot be put onto replacement buses when a line is closed for maintenance. However, the scheme described below to allow Class 92 electric haulage via Redhill means that this is not considered a specific gap.

Improving reliability and providing predictable journey times to meet the expectations of customers.

8.6.4 Specific to the Kent RUS, the freight gap primarily appears to relate to the Thames Gateway area (Howbury Park, Northfleet, Hoo Junction, the Grain branch and Sheerness branch). There is also a potential gap to consider for international services, though it is probable that the protected paths to the Channel Tunnel, committed Class 92 clearance via Redhill, and future opportunities for freight on HS1 may be sufficient to provide long-term scope for improved freight operations between the UK and mainland Europe.

8.6.5 Based on the above, the RUS considers that some aspects of rail freight capability are likely to become a strategic gap within the period considered. Section 9.25 in Chapter 9 therefore seeks to identify viable improvements.

8.7 Gap F – between anticipated train performance on an increasingly busy network and the need for strategic level interventions to reduce major delays

8.7.1 Certain parts of the Kent railway network have become significantly busier since the new services to St Pancras have been in operation. These are primarily the Medway area, the domestic platforms at Ashford, the area around Ramsgate depot and Tunbridge Wells station.

8.7.2 The CP4 funding package agreed with the ORR requires that the industry continue the recent encouraging trends in improving train performance, together with a particular emphasis on the need to reduce major delays.

8.7.3 Current performance projections indicate that whilst the present trajectory shows ongoing improvement, it has not been robustly demonstrated that the HLOS performance targets will be met with the additional traffic in operation. This therefore leads to a potential RUS gap.

8.7.4 Furthermore, responding to Gap A and, to a lesser extent, Gap B has the potential to lead to increasing numbers of trains on the network beyond CP4. This suggests that there will be additional pressure on train performance in CP5 and beyond.

8.7.5 Based on the above, the RUS considers that train performance within CP4 has the potential to remain a strategic gap unless further interventions are undertaken. Section 9.26 in Chapter 9 therefore seeks to identify solutions to this issue.

8.8 Gap G – between the envisaged future peak train service from south of Tunbridge Wells to London and aspirations for existing trains from Hastings to Cannon Street to be retained

8.8.1 The Draft RUS made a number of “assumptions” regarding the Control Period 5 base timetable structure, which it considered would be an operationally practical proposition upon completion of the remodelling works at London Bridge. The extensive concerns raised by stakeholders in response to the assumptions made, as described in Chapter 7, has led to the creation of a “gap” in response to this issue.

8.8.2 As described in Chapter 4 the RUS considers committed schemes, which are expected to go ahead as planned, to be part of the baseline. It
is important that the RUS analysis is based on the “do-minimum” scenario rather than a “do-nothing” case which would be unrealistic. However, it is often the case that committed schemes interact with other services on the network. The RUS process seeks to describe these interactions where appropriate.

8.8.3
The Draft RUS identified the following “do minimum” situation regarding the Tonbridge Main Line service structure following completion of the Thameslink Programme.

- 4tph to the Thameslink route is anticipated as operating from the Tonbridge Main Line via London Bridge to destinations north of Blackfriars at peak times, enabling this key corridor to benefit from new journey opportunities and high capacity rolling stock.

- However there is no spare capacity over the Orpington – Tonbridge route section or on the London Bridge approaches for any additional services regardless of origin or destination. The 4tph to Thameslink will therefore need to replace 4tph currently running to one of the two London terminals involved.

- A reduction in Charing Cross services from the Tonbridge Main Line, or any other route, is likely to lead to insufficient capacity to London’s West End, so is considered unacceptable. Such an approach would, in any case, breach commitments made during the TWA process.

- Replacement of services to Cannon Street with services to the Thameslink route is therefore assumed. Passengers currently using Cannon Street will, as a result, generally need to use London Bridge, Blackfriars or City Thameslink instead, all of which are also in the City of London. In addition, peak Charing Cross main line services would be able to call at London Bridge, which is easy to reach from much of the City.

8.8.4
For the reasons above the Draft RUS made the assumption that the only way to implement the Thameslink service as described would be to convert the 4tph Tonbridge Main Line to Cannon Street service to a 4tph Tonbridge Main Line to Thameslink service. Since a re-configuration to 15/30 minute timetable intervals is also required (to fit into Thameslink services from other routes) the RUS assumption is for a 30 minute interval peak Thameslink service to each of Tunbridge Wells and Paddock Wood.

8.8.5
Since publication of the Draft RUS, as an alternative to the Tonbridge Main Line to Cannon Street services becoming future Thameslink services, the RUS has also considered whether it would be appropriate for alternative existing Cannon Street trains to be incorporated into the Thameslink network instead. Taking each of the other service groups to this terminal in turn, the following issues apply:

- Greenwich line services would not be appropriate to run to the Thameslink network, since this would create severe operational problems with the crossing moves which would be necessary between tracks in the North Kent East Junction area.

- Suburban services from the Bexleyheath and Sidcup lines could potentially run to Thameslink, substituting Cannon Street services on these routes as per previous assumptions. However, the RUS considers that this has the following drawbacks:
  - firstly, such an approach would lead to the removal of most, if not all, Cannon Street services from these routes. This would therefore merely transfer the issues identified by the gap onto another part of the network.
  - secondly, since service levels through the Thameslink core only need to be 24tph at peak times, with a reduced frequency off-peak, it is unlikely that the 4tph Kent
route to Thameslink service (via London Bridge) would operate all day. This would create difficulties regarding off-peak service patterns on the Sidcup and Bexleyheath lines, given that they both have well established all day services to Cannon Street.

- linked to the above, the track layout at North Kent East necessitates significant crossing moves between tracks for whatever Kent route to Thameslink services are required. To ensure all-day robust performance it would be undesirable for services to need to use this connection other than at peak times

- having Thameslink services via Sidcup and/or Bexleyheath risks creating operational difficulties at Dartford, where two separate operators with different rolling stock types would need to terminate in an area with limited berthing capacity

- finally, having Thameslink services on these routes would lead to Lewisham station having trains to four separate areas of central London (Charing Cross, Cannon Street, Victoria and Thameslink). This would significantly increase interchange at a station which is already congested and has limited opportunities for expansion.

It can be seen that the RUS has not been able to identify an alternative viable group of Cannon Street services for substitution to Thameslink, so considers the Tonbridge Main Line to Cannon Street the most appropriate.

8.8.6
The implications of the above are that the RUS considers that all Tonbridge Main Line to Cannon Street services will need to be removed upon completion of the Thameslink Programme. Inwards of Tunbridge Wells/Paddock Wood the new Thameslink route trains – calling at London Bridge, Blackfriars, City Thameslink, Farringdon and St Pancras and beyond – will provide a replacement which is arguably at least equivalent for most passengers and will be an improvement for many. However, the Draft RUS drew stakeholders’ attention to the likelihood that the remainder of the Hastings line would only be served by Charing Cross trains. There is a similar issue to the east of Paddock Wood, though this could be mitigated if necessary by starting the Paddock Wood to Thameslink service back from Ashford, which would be a relatively simple change should demand require it at the time.

8.8.7
Unfortunately, extending the Tunbridge Wells to Thameslink service back to Hastings is not viable in the same way. This is primarily due to the new Thameslink rolling stock being planned as fixed-formation 12-car sets which are, as a result, incompatible with the infrastructure south of Tunbridge Wells. Specifically, this is due to major power supply limitations on this route restricting train lengths to 8-car at maximum at present. The Draft RUS therefore described the resulting conclusion from the above that the Hastings line south of Tunbridge Wells would see Charing Cross services only.
8.8.8

Based on the above, the RUS recognises the stakeholder concern this issue has created on the Hastings line. Whilst the “do nothing” option of leaving services as they are today is not considered operationally viable after completion of the Thameslink Programme – there would be insufficient capacity at Cannon Street – the RUS has identified and considered several options in detail in response to this particular “gap”. These are covered in Section 9.27 in Chapter 9.
9. Options considered

9.1 Introduction

9.1.1
This chapter describes the options which the Route Utilisation Strategy (RUS) has investigated to bridge the gaps identified in Chapter 8, together with the results of analysis which has been carried out on them.

9.1.2
Socio-economic assessment of the options has been undertaken for the RUS, based on Department for Transport (DfT) appraisal guidance (WebTAG). Benefit-Cost Ratios (BCRs) and Net Present Values (NPV) have been calculated where appropriate.

9.1.3
Based on the currently available information and appraisal results, some of the options considered appear to have a high value for money business case, so are now recommended in the strategy described in the next chapter. However, implementation will still be dependent on future affordability.

9.1.4
For other options, there appear to be either a weak economic case or practical difficulties in implementing the option as described. In these cases the RUS is therefore unable to recommend further consideration at present.

9.1.5
A summary table of the conclusions regarding the options considered is included on pages 13 to 17.

9.2 Responding to Gap A – options to increase peak capacity between Kent and London

9.2.1
The PLANET modelling\(^1\) undertaken for the RUS indicates that high peak overcrowding on the busiest main line services between Kent and London will remain an issue – especially on the Tonbridge Main Line – even once the implementation of committed schemes is considered. This section therefore considers options that seek to alleviate this issue.

9.2.2
The interventions considered first are those which utilise the “classic” railway network – the Tonbridge and Chatham Main Lines – since this is the infrastructure which the RUS scope directly covers. However, since domestic services to St Pancras International via High Speed One (HS1) also cater for demand from much of Kent, interventions using this route have also been considered.

9.2.3
These options are considered in detail in sections 9.3 to 9.10 which follow.

9.3 High peak capacity options

9.3.1
There are two main potential ways of providing additional capacity in the busiest high peak hour. These are running additional trains or running longer trains. As a generalisation, running additional trains would offer improved benefits against running longer trains, since passengers would benefit from improvements in service frequencies. However, train lengthening is potentially an appropriate way of providing extra capacity when track capacity constraints prevent additional trains from running.

9.3.2
The above issues are now considered separately for the Tonbridge and Chatham Lines, in the following Options 1 to 4.

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\(^1\) PLANET modelling forecasts for the 2020 high peak hour “Do-minimum” scenario are shown in Section 10.4.
9.4 Option 1 – alleviating constraints to allow additional high peak trains on the Tonbridge Main Line

9.4.1 Running of additional peak trains on the Tonbridge Main Line is highly problematic, requiring three significant and interacting constraints to be overcome. These are described below.

9.4.2 The first constraint is central London capacity. The anticipated overall level of service into/through London Bridge after the completion of the Thameslink Programme is now 88tph, as described in Chapter 4. This is considered to be the maximum that the planned infrastructure and terminal capacity in central London can support. This capacity can be broken down as shown in Figure 9.1.

9.4.3 The Kent main line services assumed in Figure 9.1 are as below:
- 4tph to Charing Cross via Paddock Wood
- 4tph to Charing Cross via Tunbridge Wells
- 3tph to Cannon Street from the Medway area (fast via Swanley)
- 2tph to Thameslink from Paddock Wood
- 2tph to Thameslink from Tunbridge Wells.

9.4.4 Central London capacity will remain a barrier to any further high peak trains beyond those shown in Figure 9.1. Fundamentally, any additional main line services would require a reduction in suburban service levels. This is unlikely to be appropriate given the existing crowding problems and anticipated demand growth in the suburban area.

9.4.5 The second constraint is the capacity of the mainly two-track section between Orpington and Tonbridge. Combining the services routed via Tunbridge Wells and Paddock Wood from 9.4.3 (12tph) with a 2tph suburban stopping service from Sevenoaks to London (serving Dunton Green, Knockholt and Chelsfield then stations via Chislehurst) leads to a 14tph service over this congested section, with stopping services needing to use the same tracks as fast main line trains. Given the need for an even number of trains per hour, which was described in Chapter 4, it is unlikely that additional trains would be practical.

9.4.6 The third constraint is the large number of fast to slow line crossing moves required in the Hither Green to London Bridge area, which limit the available capacity. This problem is exacerbated by each crossing move occurring

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**Figure 9.1 – Capacity at London Bridge following completion of construction works**

<table>
<thead>
<tr>
<th></th>
<th>Kent main line</th>
<th>Kent suburban</th>
<th>Sussex route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charing Cross</td>
<td>8tph</td>
<td>20tph</td>
<td></td>
</tr>
<tr>
<td>Cannon Street</td>
<td>3tph</td>
<td>19tph</td>
<td></td>
</tr>
<tr>
<td>Thameslink</td>
<td>4tph</td>
<td>14tph</td>
<td></td>
</tr>
<tr>
<td>Sussex (terminating)</td>
<td></td>
<td></td>
<td>20tph(^2)</td>
</tr>
</tbody>
</table>

\(^2\) Upon completion of the 24tph Thameslink core service.

\(^3\) Currently there are 15tph in the high peak over this section.
over a track on which trains travel in the opposite direction. Even if additional capacity could be provided in central London and over the Orpington – Sevenoaks section, a solution to this issue would still be required to facilitate additional trains.

9.4.7
Unfortunately, providing infrastructure to eliminate the three constraints described above is unlikely to be realistic or cost effective in either the short or medium term. For example, additional tracks between Orpington and Sevenoaks would require extensive land acquisition through protected green belt countryside.

9.4.8
As a result of the above, consideration has been given as to whether it is possible to identify options for extra high-peak trains on this route without eliminating the constraints described. The following were considered, to identify whether they could resolve the issues described:

- implementing an advanced signalling system, to allow trains to run closer together
- reviewing the service pattern at stations on the two-track section, particularly Dunton Green and Knockholt, to see if any benefits can be achieved by reducing the interaction between fast and slow trains in this area
- amending the timetable structure to reduce crossing moves between fast and slow lines inwards of Hither Green.

9.4.9
It is conceivable that investment in advanced signalling systems, such as Automatic Train Operation (ATO) or European Rail Traffic Management System (ERTMS), would enable additional trains to operate over the two-track Orpington to Tonbridge section. There would remain issues with the mix of fast and slow services over a single pair of tracks, but these would be lessened as trains would be able to run closer together. However, even if improved capacity over this section were provided, the other two constraints would still exist. In particular, for the terminal stations at Charing Cross and Cannon Street it is the numbers of platforms and the track layout of the approaches, rather than the signalling system per se, which is the limiting factor on the number of trains which can run.

9.4.10
In simplistic terms, therefore, the RUS considers it unlikely that advanced signalling systems would enable an increase in peak services operating on the Tonbridge Main Line, primarily because such systems would not increase the capacity of either Cannon Street or Charing Cross stations.

9.4.11
The RUS has therefore sought to consider whether a review of station calls offers an alternative solution. At first glance the stopping service over the Orpington – Sevenoaks section appears to be a potential poor use of capacity. However, the following factors limit the benefits of any changes:

- even if this service were to be removed between Orpington and Sevenoaks, it would still be required to operate between Orpington and central London to meet passenger demand. One drawback is that this would add to congestion in the Orpington station area, where limited turnback capacity is available. More importantly, making such a change would not free up any capacity in the congested central London area or over the approaches inwards of Hither Green. As a result, the stopping service could not be directly replaced by a main line service

- if such a change were made, some services from Dunton Green and Knockholt will still be required. If these were to be served by main line trains this would add to journey times. Alternatively, if service levels at these stations were to be reduced there would be disbenefits for the relevant users
if the service were to run fast from
Orpington there would need to be a
replacement stopping service in operation
on the Chislehurst line. However, there is
no spare capacity in central London to
enable such a service to operate.

As a result, no significant changes to the
operation of the Orpington – Sevenoaks
section beyond those described in Chapter 4
are recommended by the RUS.

9.4.12
Amending the timetable structure to reduce
crossing moves between fast and slow lines
inwards of Hither Green has been considered.
However, this is significantly complicated by the
need to avoid services which are inconsistent
with passenger demand in the suburban area
(given that existing travel patterns require
services to both Charing Cross and Cannon
Street), and no viable solution has been
identified.

9.4.13
Other infrastructure modifications in this area
have been considered but again no viable
proposal has been identified which would
enable additional services to run.

9.4.14
These issues are summarised in Figure 9.2.
The conclusion from the above is that no viable
scheme has been identified which would
increase the peak level of service on the
Tonbridge Main Line.

9.5 Option 2 – Tonbridge Main Line
high peak train lengthening (post-
CP4 HLOS)

9.5.1
Since section 9.4 shows that no additional high
peak trains are practical the priority is therefore
to ensure that all high peak Tonbridge Main
Line services operate using 12-car formations.
The intervention that needs to be tested by the
RUS is whether anything additional to the Control
Period 4 (CP4) plans can be recommended,
given that the RUS is taking the implementation
of the High Level Output Specification (HLOS)
capacity plans in CP4 as a committed scheme
and part of the “Do-minimum” scenario.

9.5.2
Away from central London there are some
constraints relevant to entire 12-car operations
on the Tonbridge Main Line. These are as
follows:

- significant limitations in the power supply
  system between Tunbridge Wells and
  Hastings, which restrict formations to 8-car
  over this section. As a result services need
  to have carriages attached at Tunbridge
  Wells to form 12-car trains to London
- 10-car usable platform lengths at Tunbridge
  Wells station itself, which can only be
  served by 12-car trains fitted with Selective
  Door Opening (SDO)
- 8-car platforms at Pluckley, which can only
  be served by 12-car trains fitted with SDO.
9.5.3
More fundamentally there are also significant constraints associated with running all trains into Charing Cross as 12-car. The principal issues are:

- with the exception of Platforms 1, 2 and 3 (which are utilised by suburban services), none of the platforms are envisaged as being able to accommodate 12-car trains without requiring doors on the rear vehicle to be prevented from opening
- platform 5 cannot be made to accommodate 12-car Class 465 vehicles, even if the doors on the rear vehicle do not open
- 12-car trains have longer turnaround times than shorter formations, since additional time is required to allow the driver to change ends and, in some cases, to allow passengers to clear the platforms before an arrival on an adjacent platform. Given that the operation of Charing Cross is dependent on quick turnarounds this is potentially a significant issue.

9.5.4
The combination of 9.5.2 and 9.5.3 suggests that achieving entirely 12-car main line train lengths into Charing Cross requires the following:

- SDO equipped rolling stock on main line services, though this is fortunately a feature of the Class 375 vehicles currently in use and all likely future new rolling stock
- ensuring that platform 5 is used entirely for main line trains at peak times, since Class 375 stock is slightly shorter than the Class 465 “Networker” stock which is used for suburban trains. This enables platform 5 to accommodate 11-car in length and in conjunction with the SDO system on Class 375 vehicles allows 12-car formations to use this platform
- a potential need for turnaround drivers to maintain the overall quantum of trains which can operate. The new driver would get in the rear vehicle as the train arrived in the platform so the train would be ready for departure sooner than if they needed to walk the length of a 12-car train.

9.5.5
Detailed development work on the CP4 operating plans and post-Thameslink timetable is needed to inform the industry on these issues and this work remains ongoing at present.

9.5.6
Notwithstanding the above the RUS is proceeding on the basis that the committed CP4 “Do minimum” schemes will provide 12-car operations on all high peak Tonbridge main line services (resolving the above operational issues as necessary), so no further intervention can practically be considered beyond this point. However, sensitivity tests have been carried out, which indicate that if there were still any short formations remaining there would be a strong case for lengthening these in Control Period 5 (CP5).

9.6 Option 3 – running additional high peak trains via Bromley South

9.6.1
The Kent main line services covered in this section are those which operate via Bromley South to Victoria, Blackfriars or the Thameslink route. The base position after completion of Thameslink, as described in Chapter 4, provides the following:

- 4tph to Victoria from the Medway area and beyond, of these 2tph would serve stations via Sole Street and are likely to need to be routed via Denmark Hill
- 4tph to Victoria from the Maidstone East line
- 2tph to Blackfriars from the Medway area
- 2tph to Thameslink from the Maidstone East line

9.6.2
At first glance, this corridor appears to have fewer constraints when considering additional services than the route towards London Bridge which has been considered under Option 1. In investigating the level of train service which
could operate the following factors are particularly relevant:

- the route no longer has to accommodate Eurostar services, but benefits from a legacy of schemes which were connected to such services, for example the grade separation at Shortlands Junction
- there is potentially some usable capacity available in platforms 1-8 at Victoria, which are significantly less busy than other comparable termini. However, Platforms 3, 4 and 8 cannot accommodate 12-car trains
- the completion of the Thameslink Programme will alleviate congestion at Herne Hill junction, since peak Brighton – Bedford services will run via London Bridge and no longer need to be routed via Herne Hill.

### 9.6.3
The following interventions have therefore been considered on this route in further detail:

- 2tph extra in the peaks from the Medway area to London
- 2tph extra in the peaks from the Maidstone East line to London
- 2tph extra in the peaks from the Swanley area to London.

### 9.6.4
The appraisal tables for each of the above options are provided in the section which follows.

<table>
<thead>
<tr>
<th><strong>Assessment of Option 3.1</strong></th>
<th><strong>Run 2tph extra in the peaks from the Medway area to Victoria, Blackfriars or Waterloo International</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept</strong></td>
<td>A 2tph additional service from a location such as Faversham would be provided, giving additional peak capacity into London.</td>
</tr>
<tr>
<td><strong>Operational analysis</strong></td>
<td>This option would increase the pressure on network capacity at constrained locations such as the Medway towns, Rochester Bridge junction, the London approaches via Herne Hill junction, plus the Victoria and/or Blackfriars station areas. The Medway area would be particularly problematic if options for additional St Pancras International trains had also been implemented (see Option 6.2, described later), since the additional trains to Victoria/Blackfriars would need to be accommodated as well as No operational solution has been identified.</td>
</tr>
<tr>
<td><strong>Infrastructure required</strong></td>
<td>Not known</td>
</tr>
<tr>
<td><strong>Passenger impact</strong></td>
<td>Additional 12-car services would alleviate crowding in the Bromley South to London area and increase service frequency.</td>
</tr>
<tr>
<td><strong>Freight impact</strong></td>
<td>Freight services do not in general run during the high peak. However, this option may have consequential effects on any freight traffic on routes such as the South London line at these times.</td>
</tr>
<tr>
<td><strong>Financial and economic analysis</strong></td>
<td>Since this option is not operationally viable, no economic appraisal has been carried out.</td>
</tr>
<tr>
<td><strong>Link to other options</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>This option is not recommended as it is not considered operationally viable.</td>
</tr>
</tbody>
</table>
### Assessment of Option 3.2

<table>
<thead>
<tr>
<th>Concept</th>
<th>Run 2tph extra in the peaks from the Maidstone East line to Victoria, Blackfriars or Waterloo International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational analysis</td>
<td>Whilst the Maidstone East line is much less congested than the Medway route, this option would still increase the pressure on network capacity constrained locations such as the London approaches via Herne Hill junction, plus the Victoria and/or Blackfriars station areas. Based on the 2009 timetable no opportunities have been identified.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>None identified.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>Additional 8-car services to alleviate crowding in the Bromley South to London area.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>Freight services do not in general run during the high peak. However, this option may have consequential effects on any freight traffic on the Maidstone East route and the South London line at these times.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>No economic appraisal has been carried out.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>None.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>This option has not been shown to be viable and hence is not recommended at present. It is also noted that this option is potentially an inefficient use of resources, since the crowding gap it seeks to resolve is closer to London. Option 3.3 therefore seeks to consider more localised options to alleviate Bromley South – London crowding.</td>
</tr>
</tbody>
</table>
### Assessment of Option 3.3

**Run 2tph extra in the peaks from the Swanley area to Victoria, Blackfriars or Waterloo International**

<table>
<thead>
<tr>
<th>Concept</th>
<th>A 2tph additional service from a location in the Swanley area would be provided, to cater for passengers travelling from stations such as Swanley, St Mary Cray and Bromley South to London.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational analysis</td>
<td>This option would increase the pressure on network capacity at constrained locations such as the London approaches via Herne Hill junction, plus the Victoria and/or Blackfriars station areas. Whilst certain sections of the network in this area have some spare capacity this does not mean that additional end-to-end train paths are available. Based on the 2009 timetable no opportunities for additional trains have been identified. Detailed development of the post-Thameslink timetable is the only way to provide a definitive answer and this process has now commenced.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>There are no facilities to turn trains clear of a running line in the Swanley area so a new turnback siding in this area would be required. As an alternative, it may be worth considering the alignment of the connection between HS1 and Fawkham Junction, previously used for Eurostar services to Waterloo, for this purpose, since this infrastructure is not expected to be much utilised. In this case the service could also call at Farningham Road.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>Additional 12-car services would alleviate crowding in the Bromley South to London area.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>Freight services do not in general run during the high peak. However, this option may have consequential effects on any freight traffic on the Maidstone East route and the South London line at these times.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>No quantified economic appraisal has been carried out. However, it is likely that there would be a strong economic case to run additional trains, should the capacity be available to do so.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>None.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>This option is recommended for further consideration during development of the post-Thameslink timetable. However, at the present time it cannot be assumed to be viable.</td>
</tr>
</tbody>
</table>

9.6.5

The conclusion from the above is that it is considered unlikely at present that additional trains (relative to the base assumptions described in Chapter 4) could operate via Bromley South in the high peak. However, further timetable development work will be undertaken over the next few years to produce a definitive answer.
9.7 Option 4 – lengthening of high peak trains via Bromley South (post-HLOS)

9.7.1
Section 9.6 concludes that it cannot be assumed that the provision of additional high peak trains via Bromley South is practicable. As with the Tonbridge Main Line, consideration of train lengthening, beyond that provided in CP4, is therefore required as an alternative.

9.7.2
There is likely to be more scope for lengthening these services than those considered under Option 2, since the majority of high peak trains operate with shorter formations than 12-car at present. In contrast to the Tonbridge Main Line the RUS has therefore not assumed that the CP4 HLOS capacity plan will lengthen all high peak trains to the maximum allowed by the route capability. Whilst the actual train formations that will operate without this invention is subject to uncertainty this is considered unlikely to materially affect the conclusions presented.

9.7.3
When considering the impact of the CP4 plans the following issues are relevant:

- services calling at Rochester are currently limited to 10-car maximum due to short platform lengths, except where SDO is fitted. However, as described in Chapter 4 there is a reasonable likelihood that a case will be able to be made for 12-car capability to be provided as an enhancement to the East Kent Resignalling scheme. Combined with some further work at Strood and Gillingham this would allow 12-car Networker operations on suburban services via Dartford and would also facilitate additional 12-car main line trains towards Victoria

- stopping services via Sole Street are currently limited to 8-car maximum due to short platform lengths. SDO is not fitted to the Class 465/466 Networker vehicles normally used for these services at present. Network Rail’s CP4 Delivery Plan anticipates that 12-car trains with SDO will be used on this route in due course

- services calling at several of the stations on the Maidstone East line are currently limited to a 6-car maximum due to short platform lengths. SDO is not fitted to the Class 465/466 Networker vehicles normally used for these services at present. The RUS analysis has been on the assumption that these will be replaced with 8-car trains with SDO as rolling stock becomes available

- given the expected removal of the South London Line service there may be a requirement for additional station calls in trains to Victoria at Denmark Hill/Peckham Rye. If this was to be in the Gillingham to Victoria semi-fast service, the platform lengths at Denmark Hill/Peckham Rye would preclude lengthening to 12-car.

9.7.4
As the above infrastructure constraints become eased, either through platform lengthening or by SDO equipped rolling stock, further lengthening opportunities beyond that likely to be implemented in CP4 will arise. This has been treated by the RUS as an intervention.

9.7.5
As with Charing Cross, there are constraints associated with running additional 12-car trains into Victoria, since Platforms 3, 4 and 8 cannot accommodate 12-car trains and cannot be readily lengthened. However, given that the 8-car suburban routes via Herne Hill and Denmark Hill are not planned for platform lengthening in CP4, this issue is not considered insurmountable. Turnaround times at Victoria do not in general pose the same problems as they do at Charing Cross.

9.7.6
The following options have therefore been considered:

- further lengthening in CP5 to 12-car for all high peak services from the Chatham Main Line and 8-car for all high-peak services from the Maidstone East line
- extending trains on the Maidstone East line to 9-car or 12-car, but carrying out major remodelling in the Maidstone East area to accommodate longer trains in the platforms.

- extending trains on the Maidstone East line to between 9-car and 12-car, utilising SDO to enable trains to serve Maidstone East.

9.7.7 The appraisal tables for each of the above options are provided in the following section.

<table>
<thead>
<tr>
<th>Assessment of Option 4.1</th>
<th>Lengthening of all high peak services to 12-car on the Chatham Main Line and 8-car on the Maidstone East line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept</td>
<td>This option seeks to lengthen any high peak services which remain as short formation following the implementation of the industry’s CP4 capacity plans.</td>
</tr>
<tr>
<td>Operational analysis</td>
<td>Increasing 12-car trains into Victoria in the high peak would put pressure on station operations, since Platforms 3, 4 and 8 are not 12-car capable. The use of these platforms would therefore need to be restricted to suburban services and the Maidstone East line, since these are 8-car maximum. This could result in some performance detriment at the busiest times of the day but is considered manageable.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>Additional carriages would require associated facilities, such as berthing and stabling to be provided at an appropriate location. In addition, power supply implications would need to be considered.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>Lengthening of further high peak trains would provide additional capacity, beyond that provided in CP4. This would provide significant alleviation of crowding at the busiest times.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>None identified.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>Since DfT and Southeastern are still in negotiation regarding details of future train lengthening, plans are not sufficiently developed at this stage to enable an accurate appraisal of the high peak in isolation.</td>
</tr>
<tr>
<td></td>
<td>Appraisal of this option has therefore been combined with Option 5.2 later, which seeks to make a case for additional carriages to enable lengthening across the whole of the three hour peak.</td>
</tr>
<tr>
<td></td>
<td>However, the analysis carried out clearly indicates that any high peak train lengthening would have a strong economic case, so implementation of Option 4.1 would be a priority.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>Appraisal of all other options has been undertaken on the basis that this option is implemented.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>This option is recommended for implementation in CP5.</td>
</tr>
</tbody>
</table>
## Assessment of Option 4.2

**Platform extensions to permit 9-car to 12-car operation on the Maidstone East line**

**Concept**

Trains would be lengthened on the Maidstone East line to provide additional capacity in the London area. Maidstone East station would be subject to major remodelling to accommodate longer trains.

**Operational analysis**

Train lengthening will enable additional capacity to be provided without requiring additional train paths over congested sections of infrastructure between Bromley South and Victoria/Blackfriars.

There will be some limited impact on junction clearance times which could impact marginally on network capacity.

There are limited 12-car platforms at Victoria Eastern, so platform workings in the station area will become more constrained. Whilst this is considered manageable there would potentially be an adverse impact on performance due to tighter platform workings.

If longer trains were formed by detachments/attachments at Ashford International this would exacerbate the capacity constraint in the station area.

**Infrastructure required**

Longer trains will require platform lengthening at Otford, Kemsing, Borough Green & Wrotham, West Malling, East Malling, Barming, Maidstone East, Bearsted, Hollingbourne, Harrietsham, Lenham and Charing.

At Maidstone East platform extensions would be extremely expensive due to the track layout in the station area. The likely solution would be for platforms to be extended over the River Medway. Since this would make Platform 3 inaccessible, a new turnback siding east of Maidstone would be required.

Additional carriages would require associated facilities, such as berthing and stabling to be provided at an appropriate location.

**Passenger impact**

Longer trains would alleviate overcrowding, especially between Bromley South and Victoria.

**Freight impact**

Remodelling of the Maidstone East area might create some knock-on effects for freight services, though these would be minor.

**Financial and economic analysis**

The infrastructure costs for going beyond 8-car on this route are considered to be at least £75 million, principally due to the need to remodel the Maidstone East station area and extend platforms across the River Medway bridge.

As a result of these high costs, the environmental impacts that such a scheme would cause and the limited number of trains which would be lengthened as a result, no further appraisal has been carried out.

**Link to other options**

None.

**Conclusion**

This option is not recommended due to high cost.
## Assessment of Option 4.3

**Selective Door Opening to permit 9-car to 12-car operation on the Maidstone East line**

### Concept

Trains would be lengthened on the Maidstone East line to provide additional capacity in the London area.

Expensive works on the route, principally at Maidstone East station, would be avoided by using Selective Door Opening beyond Swanley.

### Operational analysis

Train lengthening will enable additional capacity to be provided without requiring additional train paths over congested sections of infrastructure between Bromley South and Victoria/Blackfriars.

There will be some limited impact on junction clearance times which will impact marginally on network capacity.

There are limited 12-car platforms at Victoria Eastern, so platform workings in the station area will become more constrained. Whilst this is considered manageable there would potentially be an adverse impact on performance due to tighter platform workings.

Trains longer than 8-car would not be able to reverse in Platform 3 at Maidstone East, so 12-car services would need to run all the way to/from Ashford International. Alternatively, a new 12-car turnback facility could be provided elsewhere, for example at Bearsted.

There would be an element of performance risk in the Swanley area, since any passengers in the rear four vehicles (except those for Ashford International) would need to have disembarked by that point.

### Infrastructure required

Additional carriages would require associated facilities, such as berthing and stabling to be provided at an appropriate location.

### Passenger impact

Longer trains would alleviate overcrowding, especially between Bromley South and Victoria. However, with only the front eight vehicles available for journeys to the Maidstone East line itself, large numbers of passengers would be restricted in the part of the train they could use. This could result in trains being unevenly loaded. Selective Door Opening would therefore remove some of benefits of train lengthening.

### Freight impact

None.

### Financial and economic analysis

A detailed economic appraisal has not been carried out at the present stage.

However, this option represents an inefficient use of rolling stock resources since the crowding gap it seeks to resolve is closer to London. It is therefore unlikely to represent high value for money.

### Link to other options

None.

### Conclusion

Since no long-term solution for Bromley South – London capacity has been confirmed as viable in a high demand scenario, this option may need to be implemented if the gap cannot otherwise be resolved (in such a scenario).

However, it is noted that there is no pressing reason to make a decision on this option at the present time. It is therefore recommended that it be left as a tactical decision for future operators.
The conclusion from the above section is that there is a strong case for lengthening all high peak services to 12-car on the Chatham main line and 8-car on the Maidstone East line. At present there is no pressing evidence for going beyond 8-car on the Maidstone East line, though longer trains with SDO on this route may be a potential tactical solution for train operators to consider for the busiest services.

9.8 Option 5 – capacity in the shoulder peaks

9.8.1
As with the busiest high peak hour period, there are two main potential ways of providing additional capacity in the shoulder peaks, being the running of additional trains or running longer trains. These options would provide space for passengers who would otherwise be “crowded off” high peak trains, assuming that passengers were prepared to travel at different times.

9.8.2
Running additional trains is considered further under Option 5.1.

* For the morning peak this is considered to be trains which arrive in central London between 07:00 – 07:59 and 09:00 – 09:59
## Assessment of Option 5.1

### Concept
The high peak main line service only operates for approximately 60 minutes in each of the morning and evening periods. Outside of this time services are thinned out and a less frequent service operates.

This option is based around maintaining the high peak level of service for a longer period, which would provide increased capacity in the shoulder peaks.

### Operational analysis
Whilst high levels of capacity utilisation can be sustained over a short period of time, increasing the duration of the peak would be operationally problematic.

Specifically, it is noted that the high peak level of service leaves very limited capacity available for service recovery. It is therefore important to ensure that there are sufficient “fire-breaks”, or opportunities for service recovery, in the timetable to avoid delays propagating indefinitely.

Upon completion of the Thameslink Programme peak-only services are expected to operate for a 90-minute period in each of the morning and evening periods. On many routes this could lead to amendments in shoulder peak frequencies.

Operation of this intensive timetable for a longer period than currently planned is not considered consistent with the need for robust operations.

### Infrastructure required
Additional carriages would require associated facilities, such as berthing and stabling to be provided at an appropriate location. In addition, extra power supply is likely to be required.

### Passenger impact
This option has the potential to reduce crowding, assuming that some passengers travel in the shoulder peaks rather than the high peak.

### Freight impact
Few freight services run in the high peak at present. However, if the peak service were extended in duration it is likely that there would be a reduction in opportunities for freight services to run. This would be inconsistent with freight requirements.

### Financial and economic analysis
No economic appraisal has been carried out.

### Link to other options
None.

### Conclusion
This option is not recommended as a general policy, since it would severely impact on both train performance and capacity for freight services. However, detailed development of the post-Thameslink timetable is required to determine a specific duration for the high peak period.
9.8.3

As an alternative to Option 5.1, additional capacity could be provided by lengthening formations in the shoulder peak periods. This is considered further under Option 5.2.

<table>
<thead>
<tr>
<th>Assessment of Option 5.2</th>
<th>Lengthening of shoulder peak main line services to the maximum length allowed by the CP5 infrastructure capability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept</strong></td>
<td>The additional rolling stock anticipated to implement the CP4 capacity plan will result in most high peak trains running at the maximum length permitted by the infrastructure. However, there will be significant opportunities to lengthen shoulder peak trains. This option tests providing additional rolling stock, to enable all main line trains to run at maximum length for the three hour peak. It is noted that Thameslink Programme trains are unlikely to be short formation at any time, since they will be fixed formation rolling stock.</td>
</tr>
<tr>
<td><strong>Operational analysis</strong></td>
<td>With respect to Charing Cross services, increasing the number of 12-car trains over an extended period has the potential to reduce overall capacity due to longer turnaround times. When combined with issues such as increased clearance times at junctions, this may result in some performance detriment arising from additional train lengthening on this corridor. With respect to Victoria services, it is noted that increasing 12-car trains would put pressure on station operations, since Platforms 3, 4 and 8 are not 12-car capable. The use of these platforms would therefore need to be restricted to suburban services and the Maidstone East line (which are currently 8-car maximum). Again, this could result in some performance detriment.</td>
</tr>
<tr>
<td><strong>Infrastructure required</strong></td>
<td>Additional trains would require associated facilities such as berthing and stabling to be provided at an appropriate location. Some additional power supply is likely to be necessary.</td>
</tr>
<tr>
<td><strong>Passenger impact</strong></td>
<td>Following implementation of the CP4 capacity plan, approximately an extra 200 vehicles would be required to lengthen all main line services in the three hour peak. This would deliver additional crowding benefits for existing users and offer additional capacity for new users. However, the capacity provided would not in general be at times when it is most needed. The benefits would vary significantly on a train by train basis, since most shoulder peak trains would not suffer from crowding to the same degree as the high peak. However, this might change if a differential fare structure were created for shoulder peak travel, making it more attractive to passengers.</td>
</tr>
<tr>
<td><strong>Freight impact</strong></td>
<td>None identified.</td>
</tr>
</tbody>
</table>


Financial and economic analysis

This option was tested against the December 2009 timetable. Assumptions about train lengthening in CP4 and the Thameslink Programme train formations were built into the base before testing.

The following table outlines the appraisal results:

<table>
<thead>
<tr>
<th>30-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>Nil assumed</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>175</td>
</tr>
<tr>
<td>Revenue</td>
<td>-166</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>38</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>47</strong></td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>309</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>96</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td><strong>405</strong></td>
</tr>
<tr>
<td>NPV</td>
<td>358</td>
</tr>
<tr>
<td>Quantified BCR</td>
<td>8.5</td>
</tr>
</tbody>
</table>

The above appraisal assumes that all trains in the three hour peak would be lengthened to the maximum. This is unlikely to be a realistic scenario but provides a starting point for further analysis on a train-by-train basis. Given other uncertainties, including details of CP4 train lengthening and infrastructure costs, the figures above should be considered as indicative only.

Link to other options

Appraisal of all other options has been undertaken on the basis that this option is implemented. This approach ensures that the results for other options are conservative. In terms of the appraisal carried out, it is likely that a small number of the trains considered will in fact be in the high peak, principally services to Victoria as described under Option 4.1.

Conclusion

This option is recommended for partial implementation in CP5. Further investigation would be needed on a train-by-train basis to determine the extent of shoulder peak lengthening necessary.

When combined with Option 4.1 it is likely that there may be a case for up to 100 additional vehicles, beyond those provided in CP4, considering both main line and suburban services together. However, given that the CP5 timetable is at an early stage of development this will need to be reviewed.
9.8.4
Option 5.2 indicates that significant additional shoulder peak capacity is possible. In order to maximise the numbers of passengers travelling in the shoulder peaks, and hence alleviating crowding on the busiest high peak trains, passengers may need to be incentivised to switch from the times at which they currently travel to an earlier or later departure.

9.8.5
Many commuters could already benefit from existing cheaper fares if they travelled at different times of the day. This especially applies to those travelling on daily tickets, since “Off-peak” tickets offer a significant discount on “Anytime” fares. However, season tickets do not normally offer such opportunities for discounts, since the nature of the product makes such pricing more difficult. Even if further incentives were provided the evidence suggests that travel times for commuters are likely to remain focused in the high peaks, with pricing initiatives likely to only encourage small numbers to travel outside the 07.00 – 10:00 peak period. This supports survey observations of a strong “9 to 5” preference for both employers and employees, something that the RUS is not able to influence.

9.8.6
While moving passengers out of the 07:00 – 10:00 period is difficult, it is more feasible to incentivise passengers from the high peak hour to travel in the shoulder peaks. Evidence from stated preference surveys indicates that passengers, while willing to travel at less crowded times are only able, given the nature of their employment, to adjust their journey times by about half an hour.

9.8.7
The practicality of having different sets of ticket validity for travel at different times of the day, especially for season ticket holders, needs to be considered. Currently the technology is not readily available in terms of ticketing and ticket validation to facilitate differential pricing. However, the likely increase in the use of smartcard technology for ticketing may offer opportunities in this respect. For example, Oyster Pay As You Go (PAYG) ticketing was introduced on National Rail services within London zones 1-6 in January 2010. If Oyster PAYG validity is extended in future to stations farther out in Kent it would become more feasible to introduce a pricing structure that differentiates between travel in the high peak and shoulder peaks.

9.8.8
Another important consideration is the availability of less crowded services in the shoulder peaks. Passengers will only be encouraged to switch where travelling conditions are significantly better than those at the times when they would otherwise travel. The majority of the spare capacity in the morning peak is in the periods most distant from the high peak.

9.8.9
Southeastern’s recently implemented Service Level Commitment 2 (SLC2) timetable has increased capacity available in the shoulder peaks to a certain extent, and in the future the Thameslink Programme will also do so due to the rolling stock design, which will operate in fixed length formations. In addition, further capacity in the shoulder peaks could be provided, subject to operational viability, through implementation of Option 5.2 for either Thameslink services or other service groups. It is possible, therefore, that the additional capacity created by such interventions may warrant, in the long term, a differential pricing structure for shoulder peak travel.

9.8.10
The RUS supports any additional capacity in the shoulder peaks and the ongoing work regarding advanced ticketing technologies that would assist in encouraging passengers to use it. However, it does not consider that the opportunities offered will be of sufficient effectiveness to reduce the case for increasing capacity in the high peak. This leads to the need for consideration of further interventions.
9.9 Option 6 – providing further capacity on services running via HS1 to St Pancras International

9.9.1 The sections above confirm that there are only very limited viable options for increasing peak capacity to London on “classic” routes, and these are likely to have been exhausted in the early years of the RUS. A range of potential additional ways forward involving further expansion of the recently introduced St Pancras International services has therefore been identified, given that this approach allows an alternative means of providing extra capacity into London. These are now considered further in this section.

9.9.2 The recently introduced new timetable, implementing full operation of domestic services on HS1 for the first time, incorporates the following high peak services to St Pancras International:

- 2tph Rochester (6-car service, calling all stations except Ebbsfleet)
- 2tph Ramsgate via Medway (12-car service, running non-stop between Ebbsfleet and Chatham)
- 2tph Dover/Ramsgate via Ashford International (2 x 6-car services, joining into a 12-car service at Ashford International, not calling Ebbsfleet)
- 2tph Ebbsfleet to St Pancras International (6-car service)

9.9.3 The total provision is an 8tph service to St Pancras International with a total high peak hour capacity of 72 carriages.

9.9.4 The current timetable structure contains certain opportunities to provide increased capacity into central London without requiring a more intensive service to operate over the busiest section of HS1, from Ebbsfleet to St Pancras International. These options would involve longer trains or extending services to alternative destinations. Figure 9.3 illustrates the main opportunities.

9.9.5 The options initially considered are summarised as follows:

- Lengthening of the Rochester to St Pancras International service from 6-car to 12-car. The option is linked to the provision of 12-car compatible infrastructure between Gravesend and Rochester, based on the CP4 Delivery Plan commitment for Gravesend and the assumption that 12-car capability can be provided at Rochester as part of the East Kent Resignalling scheme (the costs of this work are included in the appraisal results)
- To address crowding on services in the Medway area, extending the Rochester trains to Faversham was considered, building on the above. This option would double St Pancras International services from Chatham and through the Medway towns. Importantly, this would be done without adding to congestion at key bottlenecks such as Rochester Bridge Junction, Gravesend or St Pancras International. However, it is noted that there may still be significant challenges in providing additional trains through the Medway towns, potentially requiring the substitution of suburban services
- Lengthening of the Ebbsfleet shuttle from 6-car to 12-car was considered, since this would provide additional capacity into London in the peak without needing additional capacity at St Pancras International or on HS1
- Building on this, extending the Ebbsfleet shuttle service to destinations further into Kent was assessed. The rationale for this approach was to maximise the benefits provided by valuable high peak paths on HS1. In addition, it was noted that there would have to be very high levels of future demand at Ebbsfleet to justify provision of a 12-car shuttle service, a factor which would be less of an issue if these trains commenced further back.
Diagram shows high peak services (London arrivals 0800-0859)

Key
- RUS baseline (December 2009 peak)
- Train lengthening (6 to 12-car) opportunities
- Rochester to Faversham extension
- Ebbsfleet shuttle to Maidstone West extension
- Ebbsfleet shuttle via Ashford extension
- Extra paths to St Pancras options

Figure 9.3 – Options for future development of peak HS1 domestic services
9.9.6 In connection with this last point several variants arose. Initial considerations included extending the Ebbsfleet shuttles to provide additional services from/to the Medway towns. However, this would have resulted in 6tph overall to St Pancras International routed via Rochester Bridge Junction. This option was therefore discarded prior to detailed analysis due to likely track capacity issues in this critical area. The next step was then to focus on locations that were not affected by this constraint. These were:

- firstly a service from Maidstone West via the Medway Valley line and Strood was considered. This would provide additional capacity at Gravesend and Strood and also a direct route between Maidstone and St Pancras International, avoiding the need for its residents to drive to Ebbsfleet or change at Strood. However, one potential disadvantage of this option is that unless the service was restricted to 6-car, major works would be required to facilitate 12-car trains on the Maidstone West route. Services would also operate relatively slowly over the Gravesend – Maidstone section.

- a second option involves the extending of the Ebbsfleet shuttle to run to/from or via Ashford International. This has the potential to provide a “turn up and go” peak service of 4tph from Ashford to St Pancras. However, there would be significant operational issues, primarily a doubling of domestic services on HS1 between Ebbsfleet and Ashford and a need to deal with more trains in the congested domestic platforms at Ashford International.

9.9.7 Beyond the options described above, if trains were still overcrowded, the next stage of options could consider whether more than 8tph domestic services could run on HS1 to St Pancras International. However, such an approach would require consideration of the interaction between domestic and international services, together with the relative merits of each. The international demand issues associated with such analysis are beyond the scope of this RUS. It is also noted that such an approach would be likely to put increasing pressure on the three Kent domestic platforms at St Pancras International, and the approach tracks leading up to them.

9.9.8 It is important to note that all of the options described in this section require additional rolling stock capable of operating on HS1, together with the necessary stabling and maintenance facilities. This could be trains similar to the Class 395s now in operation, but other alternatives such as double deck vehicles for services solely on HS1 may be worth exploring. Double deck trains would allow greater utilisation of the available capacity.

9.9.9 The options are possible ways of providing additional domestic capacity during peak times to St Pancras International. This approach, which is recommended by the RUS, needs to be considered in the context of the difficulties described previously in delivering any additional services to other London termini on classic lines.

9.9.10 Quantified economic appraisals for the options involving domestic trains using HS1 are provided in the following tables.
### Assessment of Option 6.1

**Lengthening of Rochester to St Pancras International peak services from 6-car to 12-car**

**Concept**
The Rochester – St Pancras International peak stopping services would be lengthened from 6-car to 12-car, increasing the number of carriages provided by this half-hourly operation from 12 to 24 in both the morning and evening high peak hours.

**Operational analysis**
Limited impact envisaged since no additional train paths would be required, however longer trains could require longer turnaround times at St Pancras International which might have a performance impact.

**Infrastructure required**
This scheme would require 12-car turnback capability at Rochester. The East Kent Resignalling scheme provides the opportunity to implement the necessary track layout changes at this site.

Ideally, Strood and Gravesend would also have 12-car capability, though this would not be absolutely essential since Class 395 vehicles are fitted with SDO. Some additional stabling capacity for the additional rolling stock would be required.

**Passenger impact**
Increased capacity and reduced crowding.

It is likely that lengthening of the Rochester to St Pancras International service from 6-car to 12-car would enable a call to be made at Ebbsfleet, potentially increasing peak services there from 4tph to 6tph. However, this would increase journey times for other passengers.

**Freight impact**
No impact anticipated.

**Financial and economic analysis**
This option has been tested against the CP5 timetable proposals described in Chapter 4. This includes implementation of the Thameslink Programme and assumptions regarding CP4 train lengthening.

The main cost of the option relates to the need to acquire and operate additional Class 395 or similar rolling stock. Two additional 6-car units would be required.

The following table outlines the appraisal results. The appraisal includes the capital cost of providing 12-car turnback capability at Rochester.

<table>
<thead>
<tr>
<th>60-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs (Present Value)</strong></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>5</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>28</td>
</tr>
<tr>
<td>Revenue</td>
<td>0</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td>33</td>
</tr>
<tr>
<td><strong>Benefits (Present Value)</strong></td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>21</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td>21</td>
</tr>
<tr>
<td>NPV</td>
<td>-12</td>
</tr>
<tr>
<td>Quantified BCR</td>
<td>0.6</td>
</tr>
</tbody>
</table>

**Link to other options**
Option 6.2 builds further on this option.

**Conclusion**
Lengthening the Rochester service to 12-car is not recommended in isolation as it represents poor value for money.
### Assessment of Option 6.2

**Extension of Rochester to St Pancras International peak service to start back from Faversham**

#### Concept

This option extends a lengthened St Pancras International to Rochester service to start back from Faversham.

#### Operational analysis

If undertaken in isolation this option would reduce congestion at Rochester as no turnback move there would be needed. However, it would increase congestion through the Medway towns, including at Gillingham and Faversham.

Based on the timetable currently in operation and existing infrastructure, it would only be possible to extend one of these services without removing others, due to capacity limitations prior to East Kent Resignalling.

A potential sub-option could be to curtail an equivalent number of peak Dartford lines services at Rochester rather than Gillingham. This would enable the St Pancras International service to be extended to Faversham without increasing the quantum of trains through Medway. However, further development of the post-Thameslink timetable is needed before it is known if this is necessary.

#### Infrastructure required

Unless other services were modified additional capacity through the Medway towns would be needed to implement this option.

The RUS has assumed that implementation of this option requires reduced headways between Rochester and Gillingham and enhanced capacity in the Gillingham area. Beyond Gillingham the assumption has been made that existing headways are sufficient.

#### Passenger impact

Allows a 4tph peak service from Chatham, Gillingham and Faversham to St Pancras International improving journey frequencies to north of London/Docklands and reducing crowding on other services.

#### Freight impact

None identified.

#### Financial and economic analysis

This option has been tested against the CP5 timetable proposals described in Chapter 4. This includes implementation of the Thameslink Programme and assumptions regarding CP4 train lengthening.

The following table outlines the appraisal results. Infrastructure enhancement costs have been included in the appraisal. Five additional 6-car units would be required.

<table>
<thead>
<tr>
<th>60-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>4</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>94</td>
</tr>
<tr>
<td>Revenue</td>
<td>-57</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>66</strong></td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>166</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>147</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td><strong>313</strong></td>
</tr>
<tr>
<td>NPV</td>
<td>247</td>
</tr>
<tr>
<td>Quantified BCR</td>
<td>4.8</td>
</tr>
</tbody>
</table>
### Assessment of Option 6.3  
**Lengthening of the Ebbsfleet to St Pancras International peak shuttles from 6-car to 12-car**

<table>
<thead>
<tr>
<th>Concept</th>
<th>All the Ebbsfleet high peak half hourly shuttle service to/from St Pancras International would be lengthened from 6-car to 12-car, increasing the number of carriages provided from 12 to 24 in both the morning and evening high peak hours.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational analysis</td>
<td>Limited impact envisaged since no additional train paths would be required. However, longer trains could require longer turnaround times at St Pancras International which may have a performance impact.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>Some additional stabling capacity for the additional rolling stock would be required.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>Increased capacity and reduced crowding from the Ebbsfleet region into London. The additional capacity could be expected to provide crowding relief on the classic lines east of Gravesend, since additional passengers would travel to Ebbsfleet to ensure they get a seat.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>No impact anticipated.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>Modelling results indicated no crowding on these shuttles, and therefore no quantifiable benefit in lengthening them. Consequently, no economic appraisal was undertaken.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>Options 6.4 and 6.5 build further on this option.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>This option is not recommended in isolation due to insufficient demand at Ebbsfleet.</td>
</tr>
</tbody>
</table>
Assessment of Option 6.4

Extension of Ebbsfleet shuttle to start back from Maidstone West via the Medway Valley line

Concept
This option extends the Ebbsfleet shuttle to operate from Maidstone West via the Medway Valley Line, Strood and Gravesend. The service would remain as 6-car due to infrastructure constraints in the Maidstone area.

Additional services to St Pancras International could be provided at Strood and Gravesend. However, the calling pattern would need to facilitate competitive journey times between Maidstone and St Pancras International and be consistent with a 6-car formation.

It is possible that, to avoid overcrowding, the 6-car service would not call at Ebbsfleet, with the 12-car Rochester service (extended to Faversham) calling instead, assuming Option 6.2 were implemented.

Operational analysis
This option would increase the pressure on network capacity between Gravesend and Strood.

Infrastructure required
May require power supply enhancement work on the Medway Valley Line. Costs not assumed in the appraisal results.

Passenger impact
This option would improve journey times between Maidstone and the north of London/Docklands. It would also facilitate additional trains to St Pancras International from Strood, Higham and Gravesend and provide crowding relief on services operating on the Maidstone East line.

Freight impact
This option would complicate the operation of any freight trains to the Grain branch in the morning and evening peak periods.

Financial and economic analysis
This option has been tested against the CP5 timetable proposals described in Chapter 4. This includes implementation of the Thameslink Programme and assumptions regarding CP4 train lengthening.

The following table outlines the appraisal results for a 6-car service.

<table>
<thead>
<tr>
<th>30-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs (Present Value)</strong></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>Nil assumed</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>44</td>
</tr>
<tr>
<td>Revenue</td>
<td>-45</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Benefits (Present Value)</strong></td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>38</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td>55</td>
</tr>
<tr>
<td>NPV</td>
<td>47</td>
</tr>
<tr>
<td>Quantified BCR</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Three additional 6-car units would be required.

Link to other options
Appraisal has assumed a 6-car service (ie. Option 6.3 would not be implemented).

Conclusion
This option appears to have a robust case and is therefore recommended for further development. It is potentially simpler to implement than Option 6.5 which follows, so may be appropriate as a medium-term element in the strategy.
### Assessment of Option 6.5

<table>
<thead>
<tr>
<th>Concept</th>
<th>Extension of Ebbsfleet shuttle to start back from Ashford International or beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building on Option 6.3, and as an alternative to Option 6.4, the 12-car Ebbsfleet to St Pancras International shuttle would be extended back via the main part of HS1 to start from Ashford International or further back. This would give a total of 4tph to St Pancras International from Ashford.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational analysis</th>
<th>This option would double the number of relatively slow services over the Ebbsfleet to Ashford section of HS1, resulting in an increased interaction between international (186mph) and domestic (140mph) services using the same tracks.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There would be an increased number of services using the congested Platforms 5 and 6 at Ashford International, with a need to cater for additional terminating services. As a result this is not believed to be achievable with existing infrastructure.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infrastructure required</th>
<th>Additional domestic platform capacity at Ashford station would be required.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The most realistic way of facilitating this would be to convert one of the international platforms to domestic use. There are Customs regulations and operational issues that would complicate this conversion, but a potentially viable scheme involving platform 4 has been identified.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Passenger impact</th>
<th>This option provides the following passenger benefits for passengers using HS1 services:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- additional peak capacity between Ashford International and London</td>
</tr>
<tr>
<td></td>
<td>- frequencies doubled to 4tph at peak times between Ashford International and London</td>
</tr>
<tr>
<td></td>
<td>- potentially allows direct trains from Ashford International to Ebbsfleet at peak times, for international connections</td>
</tr>
<tr>
<td></td>
<td>- potentially allows journey times from the Canterbury and Dover lines to be reduced, by avoiding the need for splitting and joining at Ashford International. However, this would then require 12-car trains to operate east of Ashford.</td>
</tr>
<tr>
<td></td>
<td>It is noted that this is the only option appraised in this chapter which has a realistic potential to alleviate crowding on the Tonbridge Main Line by 2020. This is due to the increased abstraction of passengers from that line to the additional St Pancras International services.</td>
</tr>
</tbody>
</table>

| Freight impact | Due to the additional trains in the Ashford International station area, this option could complicate the operation of any freight trains to the Channel Tunnel passing through the area in the morning and evening peak periods. |
Financial and economic analysis

This option has been tested against the CP5 timetable proposals described in Chapter 4. This includes implementation of the Thameslink Programme and assumptions regarding CP4 train lengthening.

The following table outlines the appraisal results. The infrastructure enhancement cost associated with converting one of the international platforms to domestic use has been included in the appraisal. It has been assumed that eight additional 6-car units would be required.

<table>
<thead>
<tr>
<th>60-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>14</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>195</td>
</tr>
<tr>
<td>Revenue</td>
<td>-106</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>27</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>131</strong></td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>207</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>138</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td><strong>345</strong></td>
</tr>
<tr>
<td><strong>NPV</strong></td>
<td><strong>214</strong></td>
</tr>
<tr>
<td><strong>Quantified BCR</strong></td>
<td><strong>2.6</strong></td>
</tr>
</tbody>
</table>

Link to other options

Appraisal of this option has included lengthening of the trains concerned as described in Option 6.3.

In addition, extra domestic platform capacity at Ashford International would deliver performance benefits as referenced in Option 13.

Conclusion

Since this is the only option in this RUS having the potential to provide meaningful crowding relief to the Tonbridge Main Line by 2020, it is recommended for implementation in a future Control Period.

However, this is subject to the provision of additional domestic platform capacity at Ashford, and further timetabling work regarding paths on HS1 between Ebbsfleet and Ashford. This will, in turn, be dependant on future plans for international traffic.
<table>
<thead>
<tr>
<th><strong>Assessment of Option 6.6</strong></th>
<th><strong>Run 10tph domestic trains at peak times to St Pancras via HS1</strong></th>
</tr>
</thead>
</table>
| **Concept**                 | This option is based on providing additional capacity to St Pancras, by increasing the quantum of domestic trains running on HS1 at peak times above the current 8tph. A potential 10tph domestic service specification could be as follows:  
  - 2tph to Ashford International and the Canterbury West line  
  - 2tph to Ashford International and the Dover line  
  - 2tph to Maidstone West via Gravesend  
  - 2tph to Faversham via Gravesend (stopping service)  
  - 2tph to Ramsgate via Gravesend (fast service).  
  All services, except that to Maidstone West, would be 12-car. This would be in addition to international services, the future level of which is outside the scope of this RUS so has not been quantified. |
| **Operational analysis**    | With three domestic platforms at St Pancras and assuming a 10-minute turnaround/5-minute platform reoccupation time, it should theoretically be possible to run up to 12tph into the station. However, running more than the planned domestic 8tph in the peak into St Pancras International is difficult because HS1 is shared with 186mph international services, leading to high levels of capacity utilisation. Whether this option is operationally viable is therefore likely to be dependant on the future level of international services. The additional trains through Medway and in the Ashford International station area would trigger the capacity issues as described in Options 6.2 and 6.5 respectively. |
| **Infrastructure required** | As described under Options 6.2, 6.3 and 6.5. In addition further infrastructure elsewhere may also be required to make such a level of service viable. |
| **Passenger impact**        | Would allow increased peak frequency, reduced crowding and direct trains to St Pancras from additional locations. |
| **Freight impact**          | Dependent on destinations chosen. |
| **Financial and economic analysis** | No economic appraisal has been carried out. |
| **Link to other options**   | Not relevant. |
| **Conclusion**              | Not recommended due to track and platform capacity constraints including interaction with international services. |
9.9.11
From the various options described in the preceding pages it can be seen that there appears to be a sound economic case for additional extra peak capacity on domestic services using HS1, focusing on solutions not requiring extra paths inwards of Ebbsfleet. The exact make up of the service pattern, and hence the number and type of additional vehicles required, will need further development in future refranchising processes to ensure that the most effective solution can be delivered.

9.10 Maximising the utilisation of HS1 services

9.10.1
The potential approach of providing extra commuter capacity on HS1 interacts with the need also to resolve Gap A on the Tonbridge and Chatham Main Lines. This is because passengers from many areas in Kent have more than one route to London available from which to choose. This factor is especially important in areas where there are significant numbers of railheading passengers (those driving to stations), since such passengers can often choose from more than one station.

9.10.2
In considering the interdependency between high peak capacity options, the following are particularly relevant:

- option groups 1 and 2 identified that very little extra capacity can be provided on the Tonbridge Main Line towards London Bridge, with no likelihood of additional services at the busiest times and most peak trains being 12-car already. It should also be noted that the Thameslink Programme does not resolve this issue, since the Kent to Thameslink services will merely divert services currently in operation to Cannon Street

- option groups 3 and 4 similarly identified that, beyond CP4, there will only be limited opportunities to respond to further growth on main line services via Bromley South, though more possibilities do appear to exist than for the above

- option group 6 identified that it should be both possible and beneficial to provide additional peak domestic capacity for services routed via HS1, building on Southeastern’s recent SLC2 implementation in December 2009. However, additional high speed rolling stock would be required.

It can be deduced from the above that a strategy for accommodating continued growth between the Kent RUS area and London should be focused primarily on utilising HS1 to a maximum extent, due to limited opportunities elsewhere.

9.10.3
With regard to the particular difficulties involved in increasing capacity on fast services to London Bridge there appears to be a need in the longer term to ensure that passengers are not unnecessarily using this route into London in preference to ones where it may be more practical to add capacity. This principally concerns the following:

- passengers from Ashford International or east thereof, some of whom could potentially use services via HS1 instead

- passengers on the Medway area to Cannon Street services, some of whom could also consider travelling to St Pancras International.

9.10.4
Existing passengers making the switch to HS1 services therefore free up capacity on trains using classic routes. Factors encouraging this switch therefore respond indirectly to Gap A on both the Tonbridge and Chatham routes. These factors will also be a particular issue during the long term engineering works at London Bridge being carried out under the Thameslink Programme, when capacity in terms of train paths available will be reduced.
9.10.5
The following interventions could be considered to maximise the numbers of passengers using HS1:

- developing an appropriate pricing policy for CP5 and beyond, to ensure loading levels are balanced between HS1 and other services
- maximising the accessibility of Ebbsfleet International station from the local area as this would encourage usage of the Ebbsfleet shuttle services, which will otherwise be relatively lightly loaded. This is discussed further in section 9.13.11
- improving connections between Stratford’s International and Regional stations, to ensure that passengers using this station can access the major office developments around Liverpool Street and Canary Wharf by changing at Stratford rather than at London Bridge.

9.11 Responding to Gap B – other options to improve train services

9.11.1
Section 8.3 described, in high level terms, the gap between the planned train services within the Kent RUS area and the need to provide a train service consistent with future levels of transport demand. However, this gap and associated options to resolve it is more readily described by a number of specific local examples which are presented in the following sections.

9.11.2
In the majority of cases which follow, the RUS has not been able to recommend bridging the gap by implementation of the option as described. However, there may be a scenario under which some of these options could become affordable if demand were to increase more than currently forecast. Such a scenario could arise if local planning policies achieved a significant modal shift away from road to rail. For this reason it is considered appropriate to publish the current appraisals in this RUS, allowing stakeholders seeking for them to be implemented to have an understanding of the likely level of change in demand required.

9.12 Option 7 – increasing off-peak frequencies

9.12.1
Increasing off-peak frequencies does not necessarily require strategic interventions at a RUS level, since such interventions are normally deliverable with committed infrastructure and rolling stock. These issues are generally considered by the Department for Transport (DfT) at the time of re-franchising. However, the RUS can be useful in informing the franchising authority and affected stakeholders in advance of the relevant issues. It has therefore carried out analysis on the more likely options, in order to inform stakeholders on the current viability.

9.12.2
In line with the strategic planning aspirations of the main local authorities, the RUS appraised the case for implementing the following off-peak options on the “classic” railway network:

- providing a 4tph service from the Maidstone East line, with 2tph to the City of London in addition to the existing 2tph to Victoria
- providing a 2tph service on the Redhill to Tonbridge line
- providing a 2tph service over the Tonbridge – Maidstone West line, to match the frequency between Maidstone West – Strood
- providing a 2tph service on the Marshlink route between Ashford International and Hastings.

9.12.3
Appraisals of the above options are provided in the tables which follow.
<table>
<thead>
<tr>
<th>Assessment of Option 7.1</th>
<th>4tph service on the Maidstone East line (all-day City of London service)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept</strong></td>
<td>This option provides a 4tph Maidstone East line to London service, by means of direct off-peak trains from the Maidstone East line to Blackfriars and beyond. This option is not a direct equivalent to reinstating the previous fast service to Cannon Street (withdrawn in December 2009 due to low demand levels and to make space for other service increases at Cannon Street), but has been chosen as it is likely to have a more realistic chance of proceeding. The RUS notes the likelihood of such an all-day service forming part of the Thameslink Train Service Specification, with a indicative 2tph Maidstone East to East Coast Main Line service. It is anticipated that this would be operated semi fast via the Catford Loop.</td>
</tr>
<tr>
<td><strong>Operational analysis</strong></td>
<td>Since these services would only be additional in the off-peak, no major operational constraints have been identified.</td>
</tr>
<tr>
<td><strong>Infrastructure required</strong></td>
<td>None identified.</td>
</tr>
<tr>
<td><strong>Passenger impact</strong></td>
<td>A 4tph Maidstone East line to London service would be provided. In addition, the option would enable passengers from the Maidstone East line to travel direct to Blackfriars, City Thameslink, Farringdon and St Pancras International throughout the day. It would also provide faster services from the Bromley South area to these stations during off-peak times.</td>
</tr>
<tr>
<td><strong>Freight impact</strong></td>
<td>This option could potentially impact on pathing for Channel Tunnel freight services, which use the Catford/Maidstone East route. However, this is considered to be relatively minor and resolvable.</td>
</tr>
<tr>
<td><strong>Financial and economic analysis</strong></td>
<td>This option has not been subject to economic appraisal. This is because implementation is unlikely to be considered in isolation, but will be driven by the train service specification being implemented upon completion of the Thameslink Programme.</td>
</tr>
<tr>
<td><strong>Link to other options</strong></td>
<td>None identified.</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>It is noted that this option appears likely to be implemented under the Thameslink Programme following the completion of works at London Bridge. No specific analysis by the RUS has therefore been carried out. The service described would be provided under the future “Do minimum” scenario described in Chapter 4.</td>
</tr>
</tbody>
</table>
### Assessment of Option 7.2

<table>
<thead>
<tr>
<th>Concept</th>
<th>This option provides a 2tph all-day service between Redhill and Tonbridge.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational analysis</td>
<td>This option would require additional trains to operate in the busy Redhill and Tonbridge areas, presenting potential performance risk to main line services.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>None identified.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>This option would double service frequencies between Redhill and Tonbridge based on current service patterns. Passengers for London using the additional train to Redhill would need to change.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>Limited impact in the Redhill and Tonbridge areas.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>This option has been tested against the current timetable, implemented in December 2008. This reduced the service frequency from the previous 2tph to the current 1tph. The following table outlines the appraisal results:</td>
</tr>
</tbody>
</table>

#### 30-year appraisal  

<table>
<thead>
<tr>
<th>Costs (Present Value)</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure Cost</td>
<td>Nil assumed</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>6.5</td>
</tr>
<tr>
<td>Revenue</td>
<td>-1.1</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>5.6</strong></td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>3.1</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td><strong>3.4</strong></td>
</tr>
<tr>
<td>NPV</td>
<td>-2.2</td>
</tr>
<tr>
<td><strong>Quantified BCR</strong></td>
<td><strong>0.6</strong></td>
</tr>
</tbody>
</table>

#### Link to other options

Option 8.5 attempts to improve the business case for this option by extending the possible second service in each hour to Gatwick Airport, a major traffic generator and attractor.

#### Conclusion

Not recommended at present due to insufficient demand and the operational difficulties described above.

A significant element of modal shift from road to rail would be needed to enable this option to be viable over the longer term.
<table>
<thead>
<tr>
<th>Assessment of Option 7.3</th>
<th>2tph service between Maidstone West and Tonbridge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept</strong></td>
<td>This option provides a 2tph all-day service between Maidstone West and Tonbridge, by extending Strood to Maidstone West services to Tonbridge.</td>
</tr>
<tr>
<td><strong>Operational analysis</strong></td>
<td>This option would require additional trains to operate in the busy Tonbridge area so may present a performance risk to main line services. It would be necessary that peak services would run no further than Paddock Wood as today.</td>
</tr>
<tr>
<td><strong>Infrastructure required</strong></td>
<td>None identified.</td>
</tr>
<tr>
<td><strong>Passenger impact</strong></td>
<td>This option would double service frequencies between Maidstone and Tonbridge. It would build on the improvements provided in the December 2009 timetable change, as since this time the Medway Valley line has continued beyond Paddock Wood to Tonbridge except during the weekday peak periods.</td>
</tr>
<tr>
<td><strong>Freight impact</strong></td>
<td>Limited impact in the Tonbridge area.</td>
</tr>
<tr>
<td><strong>Financial and economic analysis</strong></td>
<td>The following table outlines the appraisal results:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>30-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>0.0</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>10.6</td>
</tr>
<tr>
<td>Revenue</td>
<td>-2.6</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>8.6</strong></td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>7.2</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td><strong>8.0</strong></td>
</tr>
<tr>
<td>NPV</td>
<td>-0.6</td>
</tr>
<tr>
<td><strong>Quantified BCR</strong></td>
<td><strong>0.9</strong></td>
</tr>
<tr>
<td><strong>Link to other options</strong></td>
<td>Option 8.4 seeks to build on this option, by extending the service beyond Tonbridge.</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>Not recommended at present due to insufficient demand and the operational difficulties described above. A significant level of modal shift from road to rail would be needed to enable this option to be viable over the longer term.</td>
</tr>
</tbody>
</table>
### Assessment of Option 7.4

<table>
<thead>
<tr>
<th></th>
<th>2tph service between Ashford International and Hastings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept</strong></td>
<td>This option tests providing a 2tph all-day service between Ashford International and Hastings.</td>
</tr>
<tr>
<td><strong>Operational analysis</strong></td>
<td>No detailed analysis has been carried out. However, it is likely that this option would put considerable pressure on platform capacity at Ashford International and on the single line sections between Ashford and Hastings.</td>
</tr>
<tr>
<td><strong>Infrastructure required</strong></td>
<td>It is likely that this option would require additional platform capacity at Ashford and additional sections of double track railway between Ashford International and Hastings. Electrification of the route would not be required to deliver increased frequency of service.</td>
</tr>
<tr>
<td><strong>Passenger impact</strong></td>
<td>This option increases opportunities to travel and connectivity to the communities on the line. Areas such as Rye will potentially be attractive to London commuters via the High Speed line. This option seeks to test increasing frequencies to such areas. If the additional services were extended beyond Hastings, passengers further along the route would also benefit from a frequency increase.</td>
</tr>
<tr>
<td><strong>Freight impact</strong></td>
<td>No impact identified.</td>
</tr>
<tr>
<td><strong>Financial and economic analysis</strong></td>
<td>This option has been tested against the December 2009 timetable. The costs of any additional infrastructure requirements to allow a 2tph service over this route have not been included and could be significant. In the event that additional double track sections and new signalling were required, these would be at least £10 million. The following table outlines the appraisal results:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>30-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>Nil assumed</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>11.4</td>
</tr>
<tr>
<td>Revenue</td>
<td>-1.6</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>0.4</td>
</tr>
<tr>
<td>Total costs</td>
<td>10.2</td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>5.6</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>0.7</td>
</tr>
<tr>
<td>Total quantified benefits</td>
<td>6.3</td>
</tr>
<tr>
<td>NPV</td>
<td>-3.9</td>
</tr>
<tr>
<td>Quantified BCR</td>
<td>0.6</td>
</tr>
</tbody>
</table>

**Link to other options** None.

**Conclusion** Not recommended at present due to insufficient demand and the need for additional infrastructure.

A substantial increase in the overall travel market in this area would be required to enable this option to be recommended potentially linked to regeneration and new developments in the area. Ongoing use of the high speed services at Ashford International will strengthen the case as commuters relocate to the area, as would improvements to journey times if implemented (Option 9).
9.12.4
With regard to HS1 services, and building on the development of peak services as described under option group 6, the RUS seeks to provide an indication as to whether there is a case for implementation of the following:

- a 4tph off-peak service on the Ashford route to St Pancras International (assumed as 2tph Dover and 2tph Ramsgate via Canterbury West)

- a 4tph off-peak service on the Medway route to St Pancras International (assumed as a 4tph service to/from Faversham).

9.12.5
Whilst the RUS has no remit to make any assessment of the relative merits of potentially competing demands between international and domestic services in relation to the capacity available on HS1, a discussion of the issues regarding enhanced domestic off-peak services is provided in the tables below:

9.12.6
It is recommended that the issues described in Options 7.5 and 7.6 are kept under review as new demand patterns on HS1 domestic services become established.

9.12.7
The conclusion from this section is that there is in general no clear justification for the RUS to recommend increasing weekday off-peak service frequencies beyond the existing level of service, plus anticipated increments linked to Thameslink.

9.12.8
Notwithstanding the above it is noted that services at other off-peak times, especially at weekends on the busiest routes, have potential to improve as a result of the “Seven Day Railway” initiative. This is described further in section 9.21 relating to Gap D.
### Assessment of Option 7.5

**4tph all-day service on the Ashford route to St Pancras International**

<table>
<thead>
<tr>
<th>Concept</th>
<th>This option seeks to consider providing a 4tph all-day service between Ashford International and St Pancras International.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational analysis</td>
<td>This option would significantly increase the interaction between domestic and international traffic on HS1. It would also increase platform utilisation issues at Ashford International station.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>There would be an increased likelihood of additional platforms being required at Ashford International.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>This option would provide a 15-minute frequency service from Ashford International to St Pancras International.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>Not fully known, since the future use of HS1 for freight is currently unclear. However, assuming such services were limited to overnight operations, the impact of this option would be limited to interactions in the Ashford area.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>No detailed economic appraisal has been carried out. However, high level analysis has estimated that off-peak demand from Ashford International (and stations to east thereof) to London would need to increase fourfold to make this option viable.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>None.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Unlikely to be required prior to 2020.</td>
</tr>
</tbody>
</table>

### Assessment of Option 7.6

**4tph all-day service on the Medway route to St Pancras International**

<table>
<thead>
<tr>
<th>Concept</th>
<th>This option seeks to provide a 4tph all-day service between the Medway towns and St Pancras International.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational analysis</td>
<td>This option would significantly increase the interaction between domestic and international traffic on HS1. It would also increase the interaction between passenger and freight traffic in the Gravesend area and add to congestion issues in the Medway area.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>Dependent on performance modelling.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>This option would provide a 15-minute frequency service from Gravesend and the Medway towns to St Pancras International.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>This option would lead to an increased passenger/freight interaction in the Gravesend area.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>No detailed economic appraisal has been carried out. High level analysis has estimated that off-peak demand would need to more than double to make this option viable.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>None.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Unlikely to be required prior to 2020.</td>
</tr>
</tbody>
</table>
9.13 Option 8 – providing new journey opportunities

9.13.1
Chapter 8 identified that a number of locations within the Kent RUS area and destinations beyond, are not well connected by rail. This option seeks to test the provision of new services between such locations.

9.13.2
It will be reasonably apparent to the reader that, due to the historic geography of the railway network, there are limited opportunities to connect certain locations together without the construction of new lines. However, there are some pairs of locations which the railway network does run between, so the RUS has tested provision of direct trains between these locations.

9.13.3
Specifically, the economic analysis undertaken has sought to indicate whether there is a demand case for implementing the following:

- connecting Maidstone and Canterbury with a direct service. The specific option tested was to extend the Maidstone East line service beyond Ashford to Canterbury West
- connecting Maidstone and the Medway towns with a direct service. The specific option tested was to reverse the Medway Valley Line at Strood and continue through the Medway towns
- connecting the Medway towns and Sheerness-on-Sea with a direct service. This links to the above, since the new service through the Medway towns was assumed to continue to Sheerness. However, an alternative option of extending a Victoria to Gillingham service to Sheerness was also tested
- connecting Maidstone and Redhill with a direct service. The specific option tested was to combine the Medway Valley Line and Redhill – Tonbridge service into a single operation
- connecting Maidstone/Tonbridge and Gatwick Airport directly, building onto the above.

9.13.4
Appraisals of the above options are provided in the following tables:

<table>
<thead>
<tr>
<th>Assessment of Option 8.1</th>
<th>Extend Ashford International via Maidstone East line services to Canterbury West</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept</td>
<td>This option provides additional services between Ashford International and Canterbury West by extending Victoria – Maidstone East – Ashford International trains to Canterbury West.</td>
</tr>
<tr>
<td>Operational analysis</td>
<td>This option would require additional trains to operate in the busy Tonbridge area so may present a performance risk to main line services. It would be required that peak services would run no further than Paddock Wood as today. This option would potentially ease congestion in the Ashford International station area by reducing the number of terminating services. However, a robust method of terminating at Canterbury West would be required.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>An additional platform and track layout changes would be required at Canterbury West to implement this option. Note that extending the service to Ramsgate was considered as an alternative, avoiding these costs, but this scenario has a weaker case.</td>
</tr>
</tbody>
</table>
Passenger impact

This option would benefit passengers by increasing the service frequency on the Ashford International – Canterbury West route. It would also remove the need to change trains for journeys between Canterbury West and various locations, notably Victoria, Bromley and Maidstone.

Freight impact

None identified.

Financial and economic analysis

This option has been tested against the current timetable as introduced in December 2009, which curtailed all Maidstone East line services at Ashford International. However, many additional services are now in operation from Ramsgate and Canterbury to London via HS1.

The following table outlines the appraisal results for this option, including the estimated costs of the additional platform. No performance benefits in connection with the reduced number of terminators at Ashford have been included, as this is likely to be minor.

<table>
<thead>
<tr>
<th>30-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>12.9</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>6.9</td>
</tr>
<tr>
<td>Revenue</td>
<td>-4.0</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>16.7</strong></td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>10.2</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td><strong>11.8</strong></td>
</tr>
<tr>
<td>NPV</td>
<td>-4.9</td>
</tr>
<tr>
<td>Quantified BCR</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Link to other options

This option potentially assists with improving performance in the Ashford International station area, by removing terminating trains. This is considered further under option 15.2.

Conclusion

Not recommended at present as the costs of the additional platform at Canterbury West outweigh the benefits provided by the option. A significant element of modal shift from road to rail would be needed to enable this option to be viable over the longer term.
## Assessment of Option 8.2

### Combine Medway Valley line and Sittingbourne to Sheerness-on-Sea service into a single operation

#### Concept
This option seeks to test the extension of the Medway Valley line service to the Medway towns, by means of a reversal at Strood. Beyond Chatham the service would then continue onwards to the Sheerness branch, replacing the existing Sittingbourne to Sheerness-on-Sea service.

#### Operational analysis
This option increases train numbers in congested sections of the network, including Rochester Bridge Junction and the Medway towns. As a result, there would be major problems in developing this option to a state where it would be operationally viable.

#### Infrastructure required
This option would require reduced headways through the Medway towns. However, these are potentially achievable as part of the planned East Kent Resignalling scheme (as described in section 9.26.4). Alternatively, they might be justified separately by performance benefits not connected to this option. Additional crossovers at Strood would be required.

#### Passenger impact
This option would remove the need to change trains for journeys between Maidstone and the Medway towns and also between the Sheerness branch and the Medway towns. It would also increase the service frequency through the Medway towns for local users. Direct trains between Sittingbourne and the Sheerness branch would be removed; it is understood that this would remove links used by some school children.

#### Freight impact
There would potentially be an impact on freight traffic using the Sheerness branch. However, no additional traffic would be involved in this area so this is likely to be minor.

### Financial and economic analysis
The following table outlines the appraisal results:

<table>
<thead>
<tr>
<th>30-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs (Present Value)</strong></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>Nil assumed</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>34.1</td>
</tr>
<tr>
<td>Revenue</td>
<td>-7.5</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>29.3</strong></td>
</tr>
<tr>
<td><strong>Benefits (Present Value)</strong></td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>31.6</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td><strong>35.6</strong></td>
</tr>
<tr>
<td><strong>NPV</strong></td>
<td><strong>7.2</strong></td>
</tr>
<tr>
<td><strong>Quantified BCR</strong></td>
<td><strong>1.3</strong></td>
</tr>
</tbody>
</table>

Whilst this option delivers significant benefits these are not sufficient to enable it to be recommended. Even if it were operationally viable, the proposal would result in the poor value for money business case, even when the likely infrastructure enhancement costs are excluded.

#### Link to other options
This option is linked to Option 15.1, which would potentially provide extra capacity through the Medway towns.

#### Conclusion
This option is not recommended due to poor value for money.

Even if the BCR was higher, the option would involve short-formation trains on a congested section of the network, leading to inefficient utilisation of the infrastructure.
## Assessment of Option 8.3

### Concept
This option improves connectivity to the Isle of Sheppey, by extending the hourly Victoria to Gillingham stopping service to Sheerness-on-Sea, replacing 1tph from the Sittingbourne to Sheerness-on-Sea shuttle service.

### Operational analysis
Extending this service to Sheerness-on-Sea could create some timetable complexities. However, the option may alleviate constraints at Gillingham, by reducing the number of services that terminate there. This would be implemented without additional trains operating through Rochester Bridge junction and the Medway towns.

### Infrastructure required
Platform extensions may be required on the Sheerness branch as the service could be 12-car in CP4. However, this route is likely to be suitable for SDO, subject to the availability of suitable rolling stock.

### Passenger impact
This would provide direct trains from the Isle of Sheppey to London (albeit a stopping service) and facilitate direct local journeys between Sheerness-on-Sea and Chatham.

### Freight impact
There could be an impact on freight traffic using the Sheerness branch. However, no additional traffic would be involved in this area so this is would not be significant.

### Financial and economic analysis
The following table outlines the appraisal results:

<table>
<thead>
<tr>
<th>30-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs (Present Value)</strong></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>Nil assumed</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>16.9</td>
</tr>
<tr>
<td>Revenue</td>
<td>-3.1</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td>14.7</td>
</tr>
<tr>
<td><strong>Benefits (Present Value)</strong></td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>7.1</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td>8.4</td>
</tr>
<tr>
<td><strong>NPV</strong></td>
<td>-6.1</td>
</tr>
<tr>
<td><strong>Quantified BCR</strong></td>
<td>0.6</td>
</tr>
</tbody>
</table>

### Link to other options
None.

### Conclusion
This option is not recommended due to its high operating cost relative to benefits.
<table>
<thead>
<tr>
<th>Assessment of Option 8.4</th>
<th>Combine Medway Valley line and Redhill to Tonbridge line into a single operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept</td>
<td>This option seeks to test combining the Medway Valley line service and the Redhill – Tonbridge service into a through train. As a result the current Strood – Tonbridge and Tonbridge – Redhill – London services would be modified to a Strood – Redhill service, plus a Redhill – London service with an alternative point of origin elsewhere.</td>
</tr>
<tr>
<td>Operational analysis</td>
<td>This option has some operational benefits, since it would eliminate the need for reversals from both directions at Tonbridge. However, this would need to be balanced against the disbenefits of additional trains terminating at Redhill. The main timetabling consideration is that Redhill and Tonbridge are both congested parts of the network with heavy passenger loadings on London services. Non-London trains with low loadings (those considered under this option) therefore have to be fitted into the slots remaining after the busier trains have been pathed for maximum passenger benefit. Given the need for terminating capacity at Redhill the timing of the resulting service is unlikely to have much flexibility. As a result it is likely that the service would result in sub-optimal connectional opportunities at Strood (for St Pancras International), Tonbridge (for Charing Cross) and Redhill (for London Victoria/London Bridge).</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>Possible additional infrastructure at Redhill to enable the service to terminate.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>This option would remove the need to change trains for journeys between the Medway Valley line and stations such as Redhill. More importantly, this option would facilitate journeys between Maidstone and Gatwick Airport with a single change at Redhill. Whilst this is likely to be only slightly quicker than travelling via London Victoria the avoidance of the need to travel via central London may appeal to airport passengers travelling with luggage. However, demand for such journeys is low in comparison to demand to central London. Furthermore, to make this work operationally would require re-timing the trains to fit the available platform capacity at Redhill, which is likely to result in sub-optimal connections at Tonbridge and Strood. This factor would adversely affect the majority of passengers who use the Medway Valley Line service to access trains to London. In addition, through journey opportunities from the Tonbridge – Redhill route to London would be lost.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>None identified.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>No economic appraisal has been carried out.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>This option is linked to Option 7.2 which sets the strategy for the frequency over the Redhill – Tonbridge route.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>This option is not recommended, since the timetabling difficulties associated with congested sections of the network mean it is likely that more passengers would disbenefit from the changes than the small number of through passengers who would gain.</td>
</tr>
</tbody>
</table>
### Assessment of Option 8.5

**Provide new service between Tonbridge and Gatwick Airport**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Building on the analysis described under Option 7.2, this option seeks to test running an additional Redhill to Tonbridge line service, which would run through to Gatwick Airport.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational analysis</td>
<td>This option would require additional trains to operate in the busy Redhill, Tonbridge and Gatwick Airport areas. It is unlikely that this would be operationally viable with existing infrastructure, even in the off-peak period. There would be a performance risk to main line services at all of these locations.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>Additional infrastructure is likely to be required at Redhill and Gatwick, though this has not been included in the appraisal.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>This option would facilitate direct journeys between Tonbridge and Gatwick Airport, with many interchange opportunities from other routes. In the event of Options 8.2 and 8.4 also being implemented, it would also facilitate direct journeys to the airport from Maidstone and Medway.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>None identified.</td>
</tr>
<tr>
<td>30-year appraisal</td>
<td>The appraisal has modelled an additional Tonbridge – Redhill – Gatwick Airport train, including implementing Option 7.2. Due to the restricted access to the Brighton Main Line in the peak hours the service was modelled as off peak only.</td>
</tr>
<tr>
<td>Costs (Present Value)</td>
<td>£million (2002 PV)</td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>Assumed as nil</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>7.8</td>
</tr>
<tr>
<td>Revenue</td>
<td>-2.1</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td>6.2</td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>4.4</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Total quantified benefits</strong></td>
<td>5.0</td>
</tr>
<tr>
<td><strong>NPV</strong></td>
<td>-1.2</td>
</tr>
<tr>
<td><strong>Quantified BCR</strong></td>
<td>0.8</td>
</tr>
<tr>
<td>Link to other options</td>
<td>None</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Not recommended at present due the difficulties in rail capturing sufficient numbers of passengers to achieve appropriate value for money. Whilst it is recognised that there is significant highway demand from the RUS area to Gatwick Airport, the railway operators have had limited success in achieving a high model share. A significant element of modal shift from road to rail would therefore be needed to enable this option to be viable over the longer term. In addition, it would need to be shown that the proposed option was an effective use of scarce capacity on the Brighton Main Line.</td>
</tr>
</tbody>
</table>
9.13.5
To summarise the above analysis it can be seen that no additional direct rail journey opportunities have been shown to have a value for money economic case based on current forecasts of demand, even when socio-economic benefits are considered. As a result a greater than forecast element of modal shift from road to rail would be needed to enable any of the options considered in this category to be viable over the longer term.

9.13.6
Achieving a robust BCR for any of Options 8.1 to 8.5 is likely to require high levels of modal shift from road to rail, in turn requiring measures to reduce highway demand.

9.13.7
As an alternative to some of the options above, improved bus services might be a more viable option for some of the flows concerned. For example, a direct coach service to Gatwick already operates every two hours from Chatham, Maidstone and Sevenoaks, providing robust public transport to the airport. Integrated ticketing, timetabling and marketing of such services as an extension of the railway network could potentially be a way of increasing usage levels.

9.13.8
Continuing the theme of considering rail journey opportunities not provided for at present the RUS recognises that there are similar issues beyond those covered by the detailed analysis above. A high-level view of some particular issues is therefore provided in the paragraphs below.

9.13.9
As mentioned in Chapter 7, some stakeholders have sought clarity on whether direct journeys from the Marshlink line onto HS1 would be possible if the former were electrified. The RUS considers this impractical for two reasons. Firstly, the track configuration at Ashford is such that the only way such a service could operate would be to reverse twice at Ashford, a complex move for which capacity would not be available. This could only be alleviated by means of a new grade separated junction, for which the cost would be prohibitive relative to the potential level of benefit. Secondly, it is unlikely that such a service would make good use of the scarce capacity on HS1 due to significantly lower demand on the Marshlink line than other routes.

9.13.10
There are particular connectivity constraints regarding journey opportunities on the High Speed line, since whilst this provides excellent services to central London, interchange to the classic railway network is limited. To a certain extent some improvements would be provided by the potential Northfleet to Ebbsfleet pedestrian link since this would enable relatively unusual journeys, for example Woolwich to Ashford, to be made with a change onto an HS1 train. More importantly, this would allow connections to be made between suburban trains and international trains at this location. However, our analysis indicates that even when all such journeys are included it is unlikely that the demand for interchange in isolation would be sufficient to cover the significant infrastructure costs of the pedestrian link, so wider land use planning factors in this development zone are likely to need consideration to enable such a scheme to go ahead.

9.13.11
At Ebbsfleet, in the medium-term provision of feeder bus links from key interchange stations in Kent is therefore recommended for further consideration, since this is the most viable way to improve the linkages between HS1 and other parts of the railway network. For example, if there were sufficient demand, the following nearby stations could function as strategic feeders, which when combined with the existing “Fastrack” bus scheme, would provide access by rail to Ebbsfleet from all of the Kent RUS network:
- Sevenoaks, for passengers from the Tonbridge
- Swanley, for passengers from the Bromley area and other London suburbs
- Maidstone East, for passengers from mid Kent.

9.13.12
However, it is at Stratford where more fundamental opportunities exist, and the planned development of the area between the Regional and International stations will allow strategically important connections, including interchange to Crossrail and journeys between Kent and Essex without a need to travel via central London. The RUS notes that a high quality environment will be provided as part of the Olympic Park development so no further action needs to be recommended.

9.13.13
A further connectivity issue affecting the RUS area is that local journeys by rail between Ashford and east Kent and northern France (Calais and the surrounding area) are not currently viable, since there is no local public transport service from one end of the Channel Tunnel to the other. Whilst this issue is principally related to Channel Tunnel infrastructure, it is noted that there are no identified infrastructure constraints preventing the operation of such a service, subject to an operator being able to demonstrate a viable case. A local service would have provided robust alternative transport arrangements during the disruption to Eurostar services in December 2009.

9.13.14
Outline recommendations regarding the options considered under paragraphs 9.13.9 to 9.13.13 are summarised in Figure 9.4 below:

**Figure 9.4 – Further options for new journey opportunities**

<table>
<thead>
<tr>
<th>Option</th>
<th>RUS Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.6</td>
<td>Providing the East Sussex coast with a direct service onto HS1</td>
</tr>
<tr>
<td>8.7</td>
<td>New journey opportunities by linking Northfleet and Ebbsfleet stations</td>
</tr>
<tr>
<td>8.8</td>
<td>Provide bus links from key stations to Ebbsfleet</td>
</tr>
<tr>
<td>8.9</td>
<td>New journey opportunities created by development of the area between Stratford Regional and Stratford International stations</td>
</tr>
<tr>
<td>8.10</td>
<td>New journey opportunities between east Kent and northern France</td>
</tr>
</tbody>
</table>
9.14 Option 9 – reducing journey times

9.14.1 Reducing journey times can ensure that rail is well placed to capture demand between particular locations. It is also recognised that shorter journey times could assist with the regeneration of areas in Kent and the East Sussex coast.

9.14.2 The RUS seeks to provide an indication as to whether there is a case for reducing journey times for principal main line flows. Priority is being given to cases which would benefit the largest numbers of people, or be simplest in terms of implementation.

9.14.3 The main means by which journey times for the rail element of a journey can be reduced are:

- increasing the ruling linespeed over the route concerned
- removing localised speed restrictions or reducing their length (as an example speeding up the lowest sections from 20mph to 30mph has the potential to provide more of a cut in total journey times than a wider increase from 80mph to 90mph)
- introducing rolling stock with better acceleration or braking capability
- reducing the numbers of station calls made by a train
- ensuring that timetables accurately reflect the capability of the infrastructure
- reducing dwell times at stations, especially where connected to time consuming activities such as attaching or detaching carriages.

9.14.4 Journey time options are particularly relevant to high speed services once on the “classic” network east of Gravesend and Ashford International. This is because any slow sections on these routes will not maximise the benefits of using the high speed rolling stock.

Option 9.1 – Linespeed improvements

9.14.5 Journey time reductions provide the most benefits at locations where there are largest numbers of passengers on the trains concerned. In general, this means that journey time savings are most beneficial close to London. However, these are often the most expensive locations for infrastructure improvements.

9.14.6 The Draft RUS published a list of priorities for journey time reductions, reproduced as Figure 9.5 which was based on the societal benefits and the level of capital investment that could be supported by journey time savings. Since the publication of the draft, Network Rail has initiated a scheme to investigate potential journey time improvements based on, but not limited to, the routes identified in the draft.

9.14.7 Initially, the scheme has investigated the removal of Permanent Speed Restrictions (PSRs), prioritising those which would trigger amendments to running times on the affected routes. Additionally, the removal of differential speeds over short sections of track will provide operational and environmental benefits by eliminating preventable braking and acceleration. Certain ‘quick wins’ have been identified and are being progressed as bespoke projects or as part of a wider scheme, such as East Kent resignalling.

9.14.8 Some PSRs are more complex in nature and require significant adjustments to signalling design and operational considerations to remove. If an adequate business case is not available to progress with the removal or amendment of a PSR, the aspiration is retained and will be reviewed ahead of any planned renewal on the affected route in order to deliver in the most cost-efficient way.

9.14.9 Improvements to prevailing linespeeds on entire routes present significant issues. Prevailing linespeeds are governed by many
Figure 9.5 – Benefits associated with linespeed improvement schemes

<table>
<thead>
<tr>
<th>Main route considered</th>
<th>Infrastructure cost which could be supported for each minute of journey time saving (BCR=2.0)</th>
<th>Benefits calculated between stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria to Medway and north Kent Coast</td>
<td>£15.5m</td>
<td>Swanley and Farningham Road</td>
</tr>
<tr>
<td>St Pancras to Medway and north Kent Coast</td>
<td>£20.6m</td>
<td>Higham and Strood</td>
</tr>
<tr>
<td>Victoria &amp; Thameslink to Maidstone</td>
<td>£10.7m</td>
<td>Swanley and Eynsford</td>
</tr>
<tr>
<td>Charing Cross to Hastings</td>
<td>£7.1m</td>
<td>Frant and Wadhurst</td>
</tr>
<tr>
<td>St Pancras &amp; Victoria to north Kent Coast</td>
<td>£6.7m</td>
<td>Faversham and Whitstable</td>
</tr>
<tr>
<td>St Pancras to Canterbury &amp; Ramsgate</td>
<td>£5.2m</td>
<td>Ashford International and Wye</td>
</tr>
<tr>
<td>Ashford to Hastings</td>
<td>£1.0m</td>
<td>Ham Street and Appledore</td>
</tr>
</tbody>
</table>

Note: all figures shown in 2008 prices.

Factors, including gradient and curvature of track, composition of the track bed and signalling design. It is unlikely over long route sections that linespeed benefits alone will support significant capital expenditure, but such schemes may become cost effective when combined with renewal activities. In common with PSRs, these aspirations will be included in the scope of future renewals.

9.14.10
There are limited opportunities to reduce journey times through options such as introducing new rolling stock. For example, the diesel service on the “Marshlink” route has acceleration characteristics close to those of an electric train.

Option 9.2 – Review station stops

9.14.11
Reducing passengers’ overall journey times may also be possible either by:

- increasing the number of station stops, thereby reducing passenger wait time at stations between services, or
- by decreasing the number of station stops thereby minimising overall dwell time at stations and acceleration and braking time.

It should be noted that a reduction in station calls may not necessarily produce a journey time saving as timetabling faster services may not be possible and passengers may perceive an overall journey time increase due to reduced service frequency.

9.14.13
The calling pattern of services across the Kent RUS area was modified extensively in the December 2009 timetable change. Some stakeholders have expressed concerns regarding certain main line journeys, where additional station calls have been added, generally to improve journey opportunities. Station usage is routinely monitored as part of the timetable planning process, and calling patterns can be expected to be adjusted in future as appropriate.
9.15 Responding to Gap C – improving station accessibility

9.15.1
The station accessibility gap has been identified through the RUS process, as increasing numbers of passengers travelling on trains will lead to a corresponding increase in local demand for travel to stations. This will affect local decisions regarding car parking provision and bus integration, with a balance needing to be made between public and private transport options. In addition, modal shift polices will increasingly encourage station access via walking or cycling wherever possible. The specific solution for particular sites will depend on local circumstances and local planning policies.

9.15.2
Detailed recommendations for individual sites are best considered through local planning policies. However, the RUS provides the context regarding future demand levels, which should be accounted for by these policies.

9.15.3
The potential consideration of new stations has also been considered under this gap, as described under Option 11. Some specific issues regarding Rochester station have also been appraised in detail.

9.16 Car parking (Option 10.1)

9.16.1
There are several stations where car parks are at, or near, capacity at present. Some stations have committed schemes as identified in Chapter 4 which will increase car parking capacity. However, it is recommended that further car park increases would occur as demand levels dictate in the remainder in CP4.

9.16.2
As highlighted within the RUS, passenger demand will increase from the Ashford and Thames Gateway areas with the consequent additional pressure on car parking facilities. Ashford International station has several car parks in the vicinity which can absorb a significant degree of growth. However, car parks in the Thames Gateway area will need to be considered for expansion.

9.16.3
Both of these areas have recently benefited from the introduction of services via HS1, which are now stimulating new demand in addition to the background growth due to housing and employment trends. Other stations benefiting from HS1 services in east Kent are also likely to see a step-change in demand for car parking.

9.16.4
Stations not served by trains running on HS1 will also need to be considered for expansion where appropriate, though in most cases these will not see the same “step-change” in demand and the issue is therefore background growth, mainly due to new housing developments. However, stations which recently benefited from additional peak on-train capacity in the December 2009 timetable, for example Tunbridge Wells, Tonbridge and Sevenoaks, are likely to see an ongoing increase in demand for car parking during 2010 until travel patterns have fully adapted.

9.16.5
In some cases, extending car parks may not be physically possible or desirable, for example where additional parking spaces may stimulate rail heading, as outlined in Chapter 3. Providing additional parking spaces at stations with higher frequency, faster trains draws passengers away from rail routes with less frequent, slower trains. Car park expansion schemes should consider potential rail heading when developing the business case. Alternative solutions may be considered for passengers to access rail services including bus improvements, together with better walking and cycling routes.
9.17 Local bus (Option 10.2)
9.17.1 whilst increasing rail usage will lead to increasing pressure on bus services to stations, it is anticipated that bus operators, in conjunction with local authorities, will be able to enhance their services accordingly. This is assumed as likely to occur in the “Do-minimum” scenario so no specific intervention is recommended by the RUS.
9.17.2 it is also expected that joint marketing initiatives such as “PlusBus” will continue to be developed between bus operators and the rail industry. If targeted correctly, and combined with integrated timetables, such schemes have potential to increase the number of people using bus services to reach stations.
9.17.3 specific issues regarding access by bus to Ebbsfleet were discussed under option 8.8.

9.18 Access by foot and bicycle (Option 10.3)
9.18.1 one of the most common means by which stations are reached is passengers walking from their home. This mode of travel will clearly not be constrained by capacity. However, the following improvements are worthy of consideration:

- making walking routes more direct, for example by providing additional station entrances
- making walking routes safer, by providing improved highway crossings and infrastructure which deters crime.

9.18.2 an increasing number of passengers choose to cycle to and from their local station. in recent years, this has been supported by an improvement in the bicycle storage facilities at stations and the provision of cycle routes in most towns. as with bus and walking options, these are most appropriately addressed at a local level. planned schemes such as the central London bike hire initiative are also relevant, and government has recently announced funding arrangements for cycling facilities at stations elsewhere.

9.18.3 it would not be practical for a strategic document to identify and appraise specific schemes to improve station environs. These opportunities will be identified and delivered through local plans and regional strategies.

9.19 Relocation of Rochester station (Option 10.4)
9.19.1 following the publication of the Draft RUS, further investigations have been undertaken into the potential relocation of Rochester station. The initial conclusions of this analysis appear to suggest that there are potentially significant benefits in moving the station to a new site, adjacent to Corporation Street.
9.19.2 the principal reason for the station relocation would be to improve access to Rochester town centre. significant benefits would also be achievable due to the improved opportunity for interchange with buses at the new site, the possibility for a car park of larger capacity than that possible at the existing location and improved connectivity to the envisaged Rochester riverside development. in addition, there would be some improvements in overall walk time and higher quality station facilities. the new site would offer the opportunity for 12-car platforms, but this is unlikely to be the deciding factor as platform extensions are possible, although complex, at the existing station site.

9.19.3 however a significant drawback is that the new station site would only comprise two through platforms, with no obvious ability to provide turnback facilities. it would therefore be reliant on a timetable structure which did not require trains to turn at Rochester, or alternatively by modifying the existing station site to include a turnback siding. since either of these
approaches involves track layout and operational considerations, the RUS emphasises that the most practical time to relocate the station would be during the planned resignalling scheme.

9.19.4
The table which follows provides an indicative economic appraisal of the station relocation scheme, assuming implementation as part of East Kent Resignalling. The infrastructure costs shown are those related to the new station alone, with the assumption that other infrastructure costs\(^2\) can be covered through the implementation of Option 6.2.

<table>
<thead>
<tr>
<th>Assessment of Option</th>
<th>Relocation of Rochester station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 10.4</td>
<td></td>
</tr>
<tr>
<td>Concept</td>
<td>This option assesses the proposed relocation of Rochester station to a new site on Corporation Street.</td>
</tr>
<tr>
<td>Operational analysis</td>
<td>This option removes the turnback capability at Rochester station, as the new station is envisaged as having 2 platforms, compared to the existing 4-platform facility. Improved turnback capability would therefore need to be provided elsewhere in the Medway towns, probably at Gillingham as described in Option 6.2. As an alternative the existing Rochester station site could be retained as a turnback facility.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>A new 2-platform station would be provided at Rochester Corporation Street. Signalling headways east of Rochester would need to match those over Rochester bridge, so that all trains could continue beyond the new station. Enhanced turnback capacity would be required at an alternative location in the Medway towns.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>This option will improve access to the station for some passengers, by reducing walk time to the station and providing better car parking facilities. Integration with local buses would be improved. Conversely, walk times will increase for some passengers for whom the new station will be further away than the existing one. The new station is in a more central location within Rochester and could therefore be expected to generate additional rail journeys to the town centre. Passengers would also benefit from improved station facilities.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>Possible impact on freight traffic to the Sheerness branch, dependent on track layout.</td>
</tr>
</tbody>
</table>

\(^2\) Reduced headways between Rochester and Gillingham and enhanced turnback capability at Gillingham
### Financial and economic analysis

This option has been tested against the current timetable. The following table outlines the appraisal results:

<table>
<thead>
<tr>
<th>60-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost (excluding track and signalling works)</td>
<td>15.2</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>Nill assumed</td>
</tr>
<tr>
<td>Revenue</td>
<td>-13.9</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>4.6</strong></td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>12.6</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>2.3</td>
</tr>
<tr>
<td>Total quantified benefits</td>
<td>14.9</td>
</tr>
<tr>
<td><strong>NPV</strong></td>
<td><strong>10.3</strong></td>
</tr>
<tr>
<td><strong>Quantified BCR</strong></td>
<td><strong>3.2</strong></td>
</tr>
</tbody>
</table>

### Link to other options

This option is linked to others impacted by the East Kent resignalling scheme, and to Option 6.2 in particular.

If Option 6.2 were not implemented, or if the future timetable structure requires that other traffic start/terminate at Rochester, then the business case above would need to include the cost of providing enhanced capacity in the Medway area. It is likely that this would change the conclusion.

### Conclusion

This option is recommended for further development, subject to implementation at the time of the East Kent re-signalling works.
9.20 Option 11 – New stations

9.20.1
The Draft RUS described various proposals for new or expanded stations which may present improved access to the railway from a specific area. Through the consultation process, stakeholders indicated their support and concerns for the various schemes proposed. Network Rail has produced the Investment in Stations guidance which requires any proposal to fulfil a business case covering various operational and commercial criteria.

9.20.2
At the time of writing, no business cases have been sufficiently developed to recommend the development of specific new stations. However, the RUS has considered all these proposals in light of the operational and commercial considerations highlighted in the Investment in Stations guidance. Figure 9.6 provides an outline assessment of each proposal and a summary of the current position.

9.20.3
In addition to the criteria shown in Figure 9.6, signalling and other operational issues will need to be considered for any proposal. Such requirements have not been assessed at this stage for any of these proposals.

9.20.4
There is some interest from stakeholders in the possibility of constructing a new station in the Maidstone area on HS1. This would ease congestion on existing routes to London and significantly speed up services to the county town, though journey times to Ashford International would be slightly increased. Although such a facility is outside the geographic scope of this RUS and is not bound by Network Rail’s guidance, it has been assessed using the same criteria for consistency.
<table>
<thead>
<tr>
<th>Site</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thanet Parkway</td>
<td>Situated between Minster and Ramsgate stations. The station would provide parkway facilities for the Thanet area, which encompasses proposed airport expansion and business park development.</td>
</tr>
<tr>
<td>Appledore Parkway</td>
<td>Situated in the approximate area of the existing station between Ham Street and Rye stations. The proposal would provide improved facilities for Tenterden and Romney Marsh with connections to the High Speed line via Ashford.</td>
</tr>
<tr>
<td>Ashford South</td>
<td>Situated between Ashford International and Ham Street stations and adjacent to the Park Farm and Cheeseman’s Green housing developments. The proposal would provide connections to Ashford and beyond for residents on the new housing estates.</td>
</tr>
<tr>
<td>Westenhanger Parkway</td>
<td>Situated in the approximate area of the existing station, between Ashford International and Ham Street stations and adjacent to the Park Farm and Cheeseman’s Green housing developments. The proposal would provide connections to Ashford and beyond for residents on the new housing estates.</td>
</tr>
<tr>
<td>Wilting Farm</td>
<td>Situated on the HS1 to the north of Maidstone town centre. Although not on Network Rail infrastructure and therefore not covered by the New Stations Guidance the summary below provides an indication of opportunities and challenges.</td>
</tr>
<tr>
<td>Maidstone HS1</td>
<td>Situated on the HS1 to the north of Maidstone town centre. Although not on Network Rail infrastructure and therefore not covered by the New Stations Guidance the summary below provides an indication of opportunities and challenges.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational and performance issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the new station proposal consistent with the vision for the route set out in the route RUS?</td>
</tr>
<tr>
<td>■ Is the route section a current capacity constraint and/or performance risk?</td>
</tr>
<tr>
<td>■ Are there any overcrowding issues?</td>
</tr>
<tr>
<td>The site does not fulfil any strategic gap identified in the RUS, but the potential of this site would be realised should planned developments be completed and local travel plans encourage the use of the parkway as an alternative to existing town centre stations.</td>
</tr>
<tr>
<td>The route is used by an hourly 2-car diesel service. The RUS appraisal has not identified a case to increase frequencies on this route.</td>
</tr>
<tr>
<td>The station would serve existing domestic and high speed services, providing a range of destinations in London and connections within the RUS area and beyond.</td>
</tr>
<tr>
<td>The station would serve the main route to London and connections on the East Coastway route.</td>
</tr>
<tr>
<td>Is the railway used exclusively by one type of service, or a mixture (e.g. stopping, express, freight etc)?</td>
</tr>
<tr>
<td>Some alterations to existing stopping patterns would be needed. Stopping patterns at adjacent stations, notably Minster, would need to be reviewed.</td>
</tr>
<tr>
<td>All services currently stop at this station, so stopping patterns do not present any issues. The viability of this development would be maximised with efficient connections to high speed services at Ashford.</td>
</tr>
<tr>
<td>The additional station stop is not likely to provide operational problems, however it counter aspirations to reduce journey times along the entire route.</td>
</tr>
<tr>
<td>It would be anticipated that the station would serve high speed services. Alterations to existing stopping patterns would be needed to maintain journey times. This would be likely to involve a review of stopping patterns for both Folkestone stations.</td>
</tr>
<tr>
<td>A review of stopping patterns at intermediate stations on the High Speed line would be needed to ensure appropriate balance of capacity and journey time is maintained.</td>
</tr>
</tbody>
</table>

Figure 9.6 – New station proposals
### Commercial and economic issues

<table>
<thead>
<tr>
<th>Thanet Parkway</th>
<th>Appledore Parkway</th>
<th>Ashford South</th>
<th>Westenhanger Parkway</th>
<th>Wilting Farm</th>
<th>Maidstone HS1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is the likely net impact of the proposed new station on the revenues of other TOCs?</strong></td>
<td>The area is served by the proposed new station entirely within South Eastern franchise area. The extended journey time associated with additional station stops can impact negatively on revenue. This will counter the revenue benefits associated with the provision of a new station.</td>
<td>The route is served by the South Central franchise area, which connects to South Eastern services at Ashford International and Hastings. The provision of this new station may impact negatively on journey times to/from existing stations in Thanet (subject to stopping pattern).</td>
<td>The route is served by the South Central franchise area, which connects to South Eastern services at Ashford International and Hastings. The provision of this new station would provide new connection opportunities and should not affect the revenues of either TOC.</td>
<td>The area is served by the proposed new station entirely within South Eastern franchise area. The provision of this new station would impact negatively on journey times from other stations on the route.</td>
<td>The route is served by the South Eastern franchise area, which connects to South Central services at on the East Coastway route. The provision of this new station could impact negatively on journey times for high speed domestic and international services (subject to stopping pattern). A review of existing intermediate stations on the High Speed line would need to show the benefit of inserting an additional station stop.</td>
</tr>
<tr>
<td><strong>The route would be served by high speed services domestic and potentially international services.</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Location</td>
<td>RUS Conclusions</td>
<td></td>
<td></td>
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<tr>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thanet Parkway</td>
<td>The RUS notes the proposed developments in this locality and would welcome the development of this business case by proposers given the opportunities and constraints noted above.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Appledore Parkway       | The viability of improved parking at Appledore will be dependent on efficient connections with High Speed services at Ashford International.  
                          | Additionally, suitable incentives may be required for passengers to utilise the facility.  
                          | The existing low frequency service on this route would reduce the viability of improved facilities.  
                          | The RUS notes these issues and would welcome the development of this business case by proposers given the disbenefits noted above. |
| Ashford South Westenhanger Parkway | The viability of this station will be dependent on efficient connections with High Speed services at Ashford International.  
                                         | However, given the relatively short journey by road to the new station, the incentive to wait for connecting services would be drastically reduced.  
                                         | The existing low frequency service on this route would reduce the viability of improved facilities.  
                                         | The RUS notes these issues and would welcome the development of this business case by proposers given the disbenefits noted above. |
| Westenhanger Parkway    | It is unlikely that improved car parking and station facilities at Westenhanger would unlock significant new demand in the Shepway District area and would therefore not present a positive business case.  
                          | Additionally, a review of high speed stopping patterns would be a disbenefit for passengers in Folkestone and Dover.  
                          | The RUS notes these issues and does not propose further action unless a firm proposal is made given the disbenefits noted above. |
| Wilting Farm            | The RUS notes the proposed developments in this locality and would welcome the development of this business case by proposers given the opportunities and potential disbenefits noted above. |
| Maidstone HS1           | The RUS notes the potential benefit for the Maidstone area by providing new journey opportunities. However, the case for the new station will need to be proven to HS1 as it does not form part of the RUS geographic scope.  
                          | It is likely that the construction of a station on the High Speed line would be extremely costly. |
9.21 Responding to Gap D – evening and weekend services (Option 12)

9.21.1
As noted in the Draft RUS, the delivery mechanism to improve accessibility of the network is the national Seven Day Railway programme. The programme seeks to enable Train and Freight Operating Companies to operate the full working timetable every day, without routine route closures requiring diversion and/or bus substitution. Additionally, it also seeks to offer, where potential demand has been identified, new services where train paths are not currently offered, particularly at weekends and earlier and later services during weekdays.

9.21.2
The Office of Rail Regulation (ORR) has developed a network availability measure known as the Possessions Disruption Index (PDI) to monitor Network Rail’s implementation of the programme for the existing Control Period. There are separate measures for passenger and freight services, which will be supplemented by other indicators to support the delivery of the Seven Day Railway objectives. At the time of writing, disaggregated data for these measures are not available for the area covered by the Kent RUS.

9.21.3
Underpinning Network Rail’s commitment to achieve the regulatory target, routes have been categorised to define the level of resources available to meet the required outputs. Within the Kent RUS area, the routes that attract greatest resources are the Chatham Main Line between Victoria and Gillingham and the Tonbridge Main Line between Charing Cross and Ashford. On these routes the priority will be to ensure that weekend bus substitution is used where no practical alternative is available, and any diversion constitutes not more than 25% of end-to-end journey times. The 2012 Rules of the Route will be the first to be developed taking into account these principles.

9.21.4
In addition to the designation of priority routes, the RUS area will benefit from the emerging technological and operational improvements being developed nationally. Network Rail is implementing a range of measures to improve the planning of works, including the introduction of standard maintenance cycles to provide a greater certainty of when the railway will be unavailable. Technological improvements include the introduction of modular components to allow greater productivity within a planned possession. Options will be investigated on a line or route specific basis to explore means of running appropriate train services through operational and train planning initiatives such as single line working, and through non-infrastructure initiatives to allow a reduction in bus replacement where practical options exist to maintain a rail service.

9.21.5
When major infrastructure renewals are planned, the opportunity to deliver enhanced infrastructure to support the seven day railway will be identified and appraised. Potential enhancements include the provision of bi-directional signalling, new crossovers or additional turnback facilities. It is unlikely that network availability benefits will be able to cover the capital costs of such schemes, in which case performance and capacity benefits would be considered as well.

9.22 Responding to Gap E – freight capability

9.22.1
Issues associated with freight services in Kent are divided into those affecting the two major groups of traffic, those to/from the Channel Tunnel and those to/from the Thames Gateway. Options considered are now covered for each of these areas in turn.

9.23 Option 13 – International freight capability

9.23.1
The Kent RUS area serves as a rail freight “Gateway” from Europe via the Channel Tunnel to the whole of the UK. For this reason 35
freight train paths per day are legally protected, a level of capacity which the RUS considers to be more than sufficient to meet anticipated demand to 2020.

9.23.2
As a result of the above the RUS has assumed that the Freight Operating Companies (FOCs) will gradually gain modal share by filling up existing unused paths. However, the RUS has considered some further potential interventions which would enable more services to use the network, or facilitate more efficient operations, within existing capacity levels. The options considered relevant under this category were as below:

- use of HS1 for freight
- use of electric haulage on the diversionary routes via Redhill
- running longer freight trains on Channel Tunnel routes
- gauge enhancements via Catford/Maidstone East.

9.23.3
Use of HS1 for freight is envisaged at some stage in the short to medium term and therefore forms part of the “Do-minimum” scenario. However, this is most likely to involve flows which are new to the railway network, rather than any diversion of traffic currently operating on the “classic” network.

9.23.4
Consistency of operations is an important factor in rail freight. The normal Channel Tunnel freight route is via Catford and Maidstone East. There are various diversionary routes, the most important of which is via East Croydon and Redhill, given that this is cleared to W9 gauge (the alternative diversionary route via Sevenoaks is gauge constrained by the size of Sevenoaks tunnel). However, electrically hauled freight locomotives cannot currently operate over this route, due to power supply and signalling restrictions. As a result whenever the Catford/Maidstone East route is closed for engineering works, diesel haulage of Channel Tunnel freight is required. Given that this is operationally inefficient, a scheme to enable electric haulage via Redhill by enhancing the infrastructure is currently under development. As described in Chapter 4 the RUS is now working on the basis that this will go ahead as part of the CP4 Strategic Freight Network project.

9.23.5
Running longer international freight services via the Channel Tunnel routes would enable additional tonnage to be carried without requiring additional train paths. Operators have indicated aspirations for 1000m long trains on these routes in the long term. This would require longer loops, a probable increase in power supply and remodelling of many freight depots. In addition, there are a number of loops on the existing Channel Tunnel routes which are below the domestic target standard of 775 metres (121 Standard Length Units (SLUs)). However, current demand forecasts to 2020 do not indicate that this is yet a priority, so it is considered unlikely to be a requirement for the detailed period of this strategy.

9.23.6
As far as the longer term is concerned gauge enhancements to the main Catford/Maidstone East route beyond W9 are sought by the industry. Widening clearances at structures to the bigger W12 gauge would allow the carriage of larger containers. This is, however, again considered by the RUS to be a longer term issue and not relevant to the strategy to 2020, except as an important consideration when structures are rebuilt in the interim.

9.24 Option 14 – Thames Gateway freight capability
9.24.1 Freight traffic runs to/from several locations on the Kent side of the Thames Gateway area, and there is a degree of overlap with the South London RUS in this respect. The following main options for increasing freight capability and/or capacity were considered for this area:
9.24.2 Provision of a freight run-round facility at Plumstead is a potential option for increasing flexibility. This could enable access to Angerstein Wharf without a need for a routing via Slade Green, hence saving mileage. The RUS has concluded that this is likely to be required in the short term, due to the expected impact of Crossrail works at Abbey Wood as these are likely to block the only route currently available for significant durations. Of more relevance to this RUS, though still outside geographic scope, it is also noted that such a facility could also be used as a means of holding or reversing trains from the new Howbury Park terminal, improving flexibility.

9.24.3 As described in Chapter 4 the RUS is assuming that a loop on the Grain branch can be taken to be part of the “Do-minimum” scenario, facilitating approximately 5 extra freight paths per day above the 20 or so which can be accommodated on current infrastructure, though this scheme remains subject to affordability issues. In addition to the loop, significant benefits have also been identified in this area by improving existing day-to-day operational practices. Beyond this further infrastructure opportunities at the Grain end of the branch have been identified and further investigation of these is recommended.

9.24.4 The shortage of capacity across existing freight termini, and the locations of such terminals with respect to the markets they serve, is a significant issue, constraining opportunities for modal shift from lorry to rail freight. This is a factor which needs to be considered as part of any planning inquiry into potential new freight terminal developments, to ensure that opportunities to expand rail freight are developed. However the RUS has not sought to prioritise specific opportunities or proposals, since these will depend on individual traffic flows.

9.24.5 Major timetable changes provide a particular opportunity to improve the number of options for rail freight, especially where the complexity of the passenger timetable can be reduced, for example by moving to standard hour repeating patterns. The principle option being considered by the post-Thameslink timetable development process is to provide 4 standard hour freight opportunities in each off-peak hour via the West and South London Lines, two of which continue towards the Channel Tunnel (via Catford and Maidstone East) and two of which continue towards the Thames Gateway (via Lewisham and Dartford). Whilst there are significant issues regarding whether such a scenario can be robustly delivered, such paths would provide sufficient slots and a degree of flexibility for the forecast flows so the RUS recommends that future work uses this concept as a commencement point.

9.24.6 As far as the longer term is concerned gauge enhancements to the Grain branch to W10 were considered by the South London RUS, a capability which would allow 9’6” deep sea containers to be carried on standard wagons. Due to the very large number of bridges involved this is considered by this RUS to be a longer term issue and is therefore described later in Chapter 11, though it could potentially be investigated as a CP5 Strategic Freight Network scheme.

9.24.7 Also in the longer term, providing a new chord to connect the Higham area directly to the Grain branch (avoiding a reversal at Hoo) has been identified as a potential future opportunity. However, such a scheme is also considered unlikely to have a sound economic case prior to 2020 so is considered more relevant to Chapter 11.
9.25 Freight recommendations summary

9.25.1
Figures 9.7 and 9.8 summarise freight recommendations from the above sections.

**Figure 9.7 – International freight capability options**

<table>
<thead>
<tr>
<th>Option</th>
<th>RUS Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.1</td>
<td>Use of HS1 for freight</td>
</tr>
<tr>
<td>13.2</td>
<td>Use of electric haulage on the diversionary route via Redhill</td>
</tr>
<tr>
<td>13.3</td>
<td>Running longer freight trains on Channel Tunnel routes</td>
</tr>
<tr>
<td>13.4</td>
<td>Gauge enhancements via Catford/Maidstone East</td>
</tr>
</tbody>
</table>

**Figure 9.8 – Thames Gateway freight capability options**

<table>
<thead>
<tr>
<th>Option</th>
<th>RUS Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1</td>
<td>Provision of run-round capability at Plumstead</td>
</tr>
<tr>
<td>14.2</td>
<td>Increased capacity to the Grain branch</td>
</tr>
<tr>
<td>14.3</td>
<td>Construction of new terminal capacity</td>
</tr>
<tr>
<td>14.4</td>
<td>Timetabling solutions</td>
</tr>
<tr>
<td>14.5</td>
<td>Gauge enhancements to the Grain Branch</td>
</tr>
<tr>
<td>14.6</td>
<td>Construct new Higham to Grain chord</td>
</tr>
</tbody>
</table>
9.25.2
It can be seen from the above that, beyond the schemes anticipated to be delivered as part of the “Do-minimum” scenario associated with CP4 outputs, the RUS has not recommended further infrastructure interventions for freight services before 2020, preferring instead to concentrate on timetabling solutions. However, local consideration of freight terminal needs will be an important issue for any new flows.

9.26 Responding to Gap F – performance improvement (Option 15)
9.26.1
It is possible that train performance could be adversely affected by increased levels of traffic on a congested network, for example as a result of the following:

- additional trains and new traffic patterns arising from the recently implemented SLC2 timetable, primarily affecting the Medway area, the platforms at Ashford International station, the Ramsgate depot area and Tunbridge Wells
- new risk of delays spreading across different parts of the network after completion of the Thameslink Programme, together with significant alterations to the timetable structure. For example, this may make certain pieces of infrastructure critical to robust operations in a manner that does not necessarily apply today
- performance implications as a result of longer trains in the suburban area. This will especially concern 12-car operations into Charing Cross, since these will have reduced platform flexibility and may require longer turnaround times
- an anticipated increase in freight traffic to the Thames Gateway
- an increase in peak period crowding if Gap A cannot be resolved, leading to increased dwell times at stations.

9.26.2
RUSs can generally consider improvements in train performance to be the “day job” of the railway, ie. there may be no requirement for strategic level interventions as the issues concerned are being managed on an ongoing basis. However, given the likely traffic growth in certain congested parts of the network there is a specific need for the Kent RUS to consider this issue.

9.26.3
The following specific interventions to provide additional functionality in areas of congested infrastructure have been considered by the RUS. These are aimed at ensuring that trains can continue to run during service disruption, reducing the severity of major incidents. These are described in further detail in the following paragraphs:

- providing additional infrastructure capability in the Medway towns area during the East Kent Resignalling scheme
- providing additional domestic platform capacity at Ashford International, to alleviate performance constraints
- providing additional platform capacity at Canterbury West, to simplify the means of turning trains around and potentially relieve the Ashford station area
- providing additional crossovers in the Tonbridge area, to maximise platform flexibility
- optimising infrastructure in the Hoo/Grain area, to minimise the interaction between high speed services to St Pancras International and freight traffic to Thamesport
- making infrastructure modifications over the Orpington to New Cross four track section of route, principally to reduce the amount of line capacity taken up by the numerous fast/slow line crossing moves in this area.
9.26.4
Phase two of the East Kent Resignalling project will cover the section of route from Strood to west of Faversham and is treated by the RUS as a committed scheme, as described in Chapter 4. The enhancement elements are anticipated to deliver improved performance in the area concerned and beyond, though the extent of such improvements is too early to quantify at present.

9.26.5
The Ashford International station area is increasingly congested now the high speed services to St Pancras International have commenced. Figure 9.9 illustrates the current utilisation of each of the three island platforms, including the new services to St Pancras International.

9.26.6
It is likely that improvements to the track and platform layout in the Ashford International station area would enable an improved level of performance to be delivered. However based on the estimated £8.4 million infrastructure cost the RUS notes that there would not be a business case for such a scheme on performance grounds alone, so on economic grounds such a scheme would need to be linked to additional trains as described under option 6.5.

9.26.7
The Canterbury West route suffers from the lack of a simple method of turning trains around at Canterbury West itself, with a capacity-consuming shunt move being needed to move trains between the platforms. Where services are longer than 4-car, this shunt move obstructs St Stephens Road level crossing. This is one reason why, in general, trains are terminated at Ashford or Ramsgate instead.

9.26.8
An option which could be relevant to performance issues at both Canterbury West and Ashford International is to therefore to provide a new platform 3 at Canterbury West, together with

---

**Figure 9.9 – Ashford International platform utilisation**

<table>
<thead>
<tr>
<th>Platforms</th>
<th>Maximum tph</th>
<th>Summary of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 &amp; 2</td>
<td>7tph</td>
<td>Through Up trains to the Tonbridge route. These originate from the Canterbury West and Dover lines, and many of them need to combine portions here or attach additional coaches to avoid crowding in the London area. Terminating trains to and from the Tonbridge line. Terminating trains to and from the Hastings line. Trains shunting into depots.</td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>1tph</td>
<td>International trains which call at Ashford International.</td>
</tr>
<tr>
<td>5 &amp; 6</td>
<td>12tph since December 2009 (previously 8tph)</td>
<td>Through Down trains from the Tonbridge route. These then run to the Canterbury West and Dover lines, and many of them need to split here or detach coaches to avoid the provision of excess capacity beyond Ashford. Terminating trains to and from the Maidstone East route. Trains shunting into depots. Through up and down trains to and from the St Pancras International route. In the peaks these are formed of trains splitting and joining from the Dover and Canterbury lines</td>
</tr>
</tbody>
</table>
associated track and signalling works. This could potentially be linked to a timetable recast to improve performance in the Ashford area, by reducing the number of terminating trains there, with some extended to Canterbury. Such a scheme could be linked to the service improvements considered earlier under Option 8.1, noting that the extension of Maidstone East line services through to Canterbury West would have lower operating costs than extending these all the way to Ramsgate. However, at present the high costs (£12.9M) of the additional platform works at Canterbury result in the RUS being unable to recommend such a scheme. However circumstances could change in the future so the RUS does recommend that the land needed for the extra platform be protected from development.

9.26.9
Additional infrastructure in the Tonbridge area was considered to improve performance at this critical node and therefore on the route as a whole. In particular, investigation was made as to whether there may be a case for a new crossover to facilitate terminations from the east in platform 3, which would be useful for the Tonbridge – Strood service. However, given that Option 7.3 has been unable to recommend increasing above the current hourly frequency the cost of such of a scheme could not be justified on performance grounds alone.

9.26.10
As described under Option 1, crossing moves between the fast and slow lines are a significant constraint on the capacity of the London Bridge approaches. Infrastructure modifications over the Orpington to New Cross section are therefore a possible means of facilitating performance improvements. For example, faster crossovers at Parks Bridge Junction (north of Hither Green) may be beneficial, due to any existing performance problems being exacerbated by the low speed of the crossovers due to the curvature of the track in this area. Similar issues exist elsewhere. However, other than the planned double tracking of the Tanners Hill flydown, as described in Chapter 4, the RUS has not identified any specific viable improvements.

9.26.11
Figure 9.10 summarises the latest thinking regarding the options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Scheme</th>
<th>RUS Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1</td>
<td>East Kent Resignalling enhancements</td>
<td>Further development now underway.</td>
</tr>
<tr>
<td>15.2</td>
<td>Additional (domestic) platform capacity at Ashford International</td>
<td>Unable to be recommended at present on performance grounds alone. Linked to additional trains as described in Option 6.5.</td>
</tr>
<tr>
<td>15.3</td>
<td>Additional platform capacity at Canterbury West</td>
<td>Unable to be recommended at present on performance grounds alone. Linked to additional trains as described in Option 8.1. Safeguarding of the land requirements recommended.</td>
</tr>
<tr>
<td>15.4</td>
<td>Additional infrastructure in the Tonbridge area</td>
<td>Unable to recommended at present on performance grounds alone.</td>
</tr>
<tr>
<td>15.5</td>
<td>Infrastructure modifications in the New Cross – Orpington four track section</td>
<td>Double-tracking of Tanners Hill flydown anticipated as part of “Do-minimum” scenario. No further scheme identified.</td>
</tr>
</tbody>
</table>
9.27 Responding to Gap G – Options considered for the Hastings line (Option 16)

9.27.1
Chapter 4 outlined the RUSs expectations relating to the future development of the CP5 timetable structure, which will be introduced following the completion of construction work on the Thameslink Programme. This identified a “Do-minimum” scenario which is substitution of peak Tonbridge Main Line to Cannon Street services by Thameslink services to north of Blackfriars. Given that these services will be 12-car fixed formations they will be unable to operate from south of Tunbridge Wells due to power supply limitations.

9.27.2
The conclusion, resulting from the above assumption, is that Cannon Street services from the Hastings line will be withdrawn as part of the “Do-minimum” scenario, given that the Thameslink Programme is a committed scheme. This has led to significant stakeholder concerns as discussed in Chapter 7 and the identification of a gap as described in Chapter 9.

9.27.3
This gap has been identified as a result of a committed scheme, which the RUS must assume to be going ahead as planned. The “Do-nothing” scenario of leaving services as they are today has therefore not been considered by the RUS.

9.27.4
The options shown in Figure 9.11 have been identified, which appear to have potential to respond to the gap. The appraisal tables for each of these are provided in the following section.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.1</td>
<td>Upgrade power supply south of Tunbridge Wells to enable Thameslink services to be extended to Hastings.</td>
</tr>
<tr>
<td>16.2</td>
<td>Replace some peak Tonbridge Main Line to Charing Cross trains with trains from Hastings to Cannon Street.</td>
</tr>
<tr>
<td>16.3</td>
<td>Replace some peak Tunbridge Wells to Thameslink trains with trains from Hastings to Cannon Street.</td>
</tr>
<tr>
<td>16.4</td>
<td>Procure Thameslink trains in non-fixed formations.</td>
</tr>
<tr>
<td>16.5</td>
<td>Form all Charing Cross trains by attachments at Tunbridge Wells of fast and slow portions from Hastings throughout the peak.</td>
</tr>
</tbody>
</table>
Assessment of Option 16.1

Upgrade power supply south of Tunbridge Wells to enable Thameslink services to be extended to Hastings

Concept

Under this option power supply infrastructure between Tunbridge Wells and Hastings would be upgraded, to enable 12-car Thameslink services to run south of Tunbridge Wells, on the assumption that these will replace services to Cannon Street upon completion of works at London Bridge.

Operational analysis

The main operational constraint on the Hastings Line relates to trains terminating at Tunbridge Wells. Under this option fewer trains (2tph rather than 4tph) would be required to start/terminate at this location, freeing up capacity in the new turnback siding. It is likely that this capacity would be used to enable the attachment of carriages to Hastings to Charing Cross trains.

In addition there are also timetable constraints on the route due to the single track tunnels. However it is assumed that the 4tph Hastings line (2 fast, 2 slow) service would operate in the peak direction only so these are unlikely to prove insurmountable.

Infrastructure required

Major enhancements to the power supply infrastructure on the Hastings Line would be required. Given the current electrification system in this area the work involved is comparable to that of electrifying a non-electrified line.

SDO is assumed south of Tunbridge Wells so no platform extensions would be needed.

Passenger impact

The Hastings line would see a 4tph service at peak times (2tph Thameslink and 2tph Charing Cross). It is likely that the combined 4tph service would allow a pattern of semi-fast and stopping services, potentially reducing journey times to Hastings.

Freight impact

None identified

Financial and economic analysis

The capital cost of the infrastructure enhancements was estimated at £21.5M at 2006 prices. This level of capital cost does not have a robust business case (unless it enabled additional capacity to be provided into central London, which is considered unlikely).

The ongoing operating cost of extending 12-car trains south of Tunbridge Wells throughout the peak periods is estimated at £170,000 per annum. Given that there is no capacity requirement for trains of this length on this section of route this further weakens the business case.

The following table outlines the appraisal results:

<table>
<thead>
<tr>
<th>60-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>37.0</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>4.6</td>
</tr>
<tr>
<td>Revenue</td>
<td>-11.4</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>2.6</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>32.8</strong></td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>11.7</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>8.9</td>
</tr>
<tr>
<td>Total quantified benefits</td>
<td>20.6</td>
</tr>
<tr>
<td><strong>NPV</strong></td>
<td><strong>-12.2</strong></td>
</tr>
<tr>
<td><strong>Quantified BCR</strong></td>
<td><strong>0.6</strong></td>
</tr>
</tbody>
</table>

Link to other options

None identified.

Conclusion

This option is not recommended as it is not value for money.
### Assessment of Option 16.2

**Replace some peak Tonbridge Main Line to Charing Cross trains (post-Thameslink) with trains from Hastings to Cannon Street**

<table>
<thead>
<tr>
<th>Concept</th>
<th>This option assumes that some services to Cannon Street from the Hastings Line are retained after the London Bridge remodelling works, alongside a 4tph Tonbridge Main Line to Thameslink service. However, due to track capacity constraints services from the Tonbridge Main Line to Charing Cross would need to be reduced.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational analysis</td>
<td>Due to the planned track configuration on the London approaches fast line services (such as those from the Tonbridge Main Line) are best routed into Charing Cross, whilst services on the slow lines will be easiest to route into either Cannon Street or Thameslink. Hence this option would be likely to increase the number of crossing moves required on the London approaches, creating an additional timetable constraint and reducing train performance.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>None identified.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>Peak services from the Hastings Line to Cannon Street would be retained, including from south of Tunbridge Wells. However, other peak service levels on the Tonbridge Main Line to Charing Cross route would have to be reduced by the same number of trains to provide the capacity needed. This would reduce peak frequencies to Waterloo East/Charing Cross at Sevenoaks, Tonbridge and either Tunbridge Wells or Ashford</td>
</tr>
<tr>
<td>Freight impact</td>
<td>None identified.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>No quantified appraisal has been carried out.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>None identified.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>This option is not recommended, since the reduction in Charing Cross services from the Tonbridge Main Line would result in major dis-benefits to all Tonbridge Main Line to Charing Cross passengers, far in excess of those benefits provided by the Hastings to Cannon Street service.</td>
</tr>
<tr>
<td><strong>Assessment of Option 16.3</strong></td>
<td><strong>Replace some planned peak Tunbridge Wells to Thameslink trains with trains from Hastings to Cannon Street</strong></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Concept</strong></td>
<td>This option assumes that fewer than 4tph Tonbridge Main Line services to the Thameslink route would run following completion of the London Bridge works. As a result one or more of the existing four Tonbridge Main Line to Cannon street services could be retained.</td>
</tr>
<tr>
<td><strong>Operational analysis</strong></td>
<td>Section 8.8 in <em>Chapter 8</em> outlined the reasons why the RUS considers the replacement of existing Tonbridge Main Line to Cannon Street services with those to the Thameslink corridor is necessary.</td>
</tr>
<tr>
<td><strong>Infrastructure required</strong></td>
<td>None identified.</td>
</tr>
<tr>
<td><strong>Passenger impact</strong></td>
<td>Section 8.8 in <em>Chapter 8</em> outlined the reasons why the RUS considers the replacement of existing Tonbridge Main Line to Cannon Street services with those to the Thameslink corridor is necessary.</td>
</tr>
<tr>
<td><strong>Freight impact</strong></td>
<td>None identified.</td>
</tr>
<tr>
<td><strong>Financial and economic analysis</strong></td>
<td>No quantified appraisal has been carried out.</td>
</tr>
<tr>
<td><strong>Link to other options</strong></td>
<td>None identified.</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>This option is not recommended, since it would lead to significant problems in the suburban area and removes many of the benefits associated with providing Thameslink services from the Tonbridge Main Line.</td>
</tr>
<tr>
<td>Assessment of Option</td>
<td>Procure Thameslink trains in non-fixed formations to enable a Thameslink service to Hastings</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Concept</td>
<td>This option would see Thameslink trains procured in 4 or 6-car formations, such that they would be able to split and join at locations such as Tunbridge Wells. This would allow a portion of the anticipated peak Tonbridge Main Line to Thameslink trains to commence from Hastings.</td>
</tr>
<tr>
<td>Operational analysis</td>
<td>The main concern with this option relates to capacity in the Tunbridge Wells area. Opportunities to hold additional coaches for attachment in the station area are extremely limited, with the turnback siding seeing intensive use for Charing Cross trains.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>Additional infrastructure in the Tunbridge Wells area may be required to hold the coaches for attachment. In addition, this would be a major change to the Thameslink rolling stock strategy and future infrastructure such as planned depots beyond the RUS area would need to be reviewed.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>The Hastings line could see a 4tph service at peak times (2tph Thameslink and 2tph Charing Cross). It is likely that the combined 4tph service would allow mix of semi-fast and stopping services, potentially reducing journey times to Hastings. The key constraint is that lower capacity would be provided across the entire Thameslink network. This is due to on-train space being taken up by additional driving cabs and DDA compliant toilets which are required in all portions of a train which operate independently.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>None identified.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>No quantified appraisal has been carried out. Non-fixed formations would result in significantly different capital and operating costs across the entire Thameslink network. This is a much wider issue that the geography covered by this RUS so this has not been quantified.</td>
</tr>
<tr>
<td>Link to other options</td>
<td>None identified.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>This option has not been assessed in detail, since it is a wider issue that cannot be considered within the limited geographic scope of the Kent RUS.</td>
</tr>
<tr>
<td>Assessment of Option 16.5</td>
<td>Form all Charing Cross trains (post-Thameslink) by attachments of fast and slow portions from Hastings throughout the peak</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Concept</td>
<td>This option would see the 2tph Hastings to Charing Cross service formed of fast and slow portions which would attach at Tunbridge Wells. The option described is assumed by the RUS as peak only but could potentially be all day.</td>
</tr>
<tr>
<td>Operational analysis</td>
<td>This option would alleviate capacity constraints at Tunbridge Wells, since the turnback siding would only need to accommodate terminating services (2tph Charing Cross, 2tph Thameslink), and not the carriages needed to make Hastings to Charing Cross trains up to 12-car. However, the option will increase the constraints on the East Coastway with additional paths taken between Bo Peep Junction and Hastings that could adversely affect capacity in this area.</td>
</tr>
<tr>
<td>Infrastructure required</td>
<td>None required.</td>
</tr>
<tr>
<td>Passenger impact</td>
<td>Passengers from the Hastings area would have faster journeys to Charing Cross. Prior to Tunbridge Wells the fast portion could potentially call only at St Leonards Warrior Square, Battle and Wadhurst, with the slow portion calling at all stations. The trains would join at Tunbridge Wells then run fast from High Brooms to London Bridge. Passengers for the City of London would alight at London Bridge. Any consequential East Coastway alterations could adversely impact a significant number of passengers. Care has to be taken not to adversely impact passengers on this route.</td>
</tr>
<tr>
<td>Freight impact</td>
<td>None identified.</td>
</tr>
<tr>
<td>Financial and economic analysis</td>
<td>This option has been tested against the current timetable. The CP5 timetable structure, which will be introduced following the completion of construction work on the Thameslink Programme, is expected to further strengthen the business case. The following table outlines the appraisal results:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>30-year appraisal</th>
<th>£million (2002 PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Cost</td>
<td>Nil assumed</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>1.1</td>
</tr>
<tr>
<td>Revenue</td>
<td>-0.3</td>
</tr>
<tr>
<td>Other Government Impacts</td>
<td>0.1</td>
</tr>
<tr>
<td>Total costs</td>
<td>0.9</td>
</tr>
<tr>
<td>Benefits (Present Value)</td>
<td></td>
</tr>
<tr>
<td>Rail users benefits</td>
<td>1.4</td>
</tr>
<tr>
<td>Non users benefits</td>
<td>0.3</td>
</tr>
<tr>
<td>Total quantified benefits</td>
<td>1.6</td>
</tr>
<tr>
<td>NPV</td>
<td>0.8</td>
</tr>
<tr>
<td>Quantified BCR</td>
<td>1.9</td>
</tr>
<tr>
<td>Link to other options</td>
<td>The mix of fast and semi-fast services is linked to Option 9 which seeks to reduce journey times on this route.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>This option is recommended for implementation following completion of the London Bridge remodelling works. It would reduce journey times on the Hastings Line and provide an operationally robust solution to the Tunbridge Wells area.</td>
</tr>
</tbody>
</table>
9.27.6
The summary of the analysis above is that the options which would respond directly to stakeholder concern by retaining direct Hastings to Cannon Street services (16.2, 16.3) cannot be recommended as they would create major dis benefits to significantly larger numbers of other passengers. In addition, the options which provide direct Hastings to Thameslink route services (16.1, 16.4) are also unable to be recommended by this RUS for the reasons described.

9.27.7
However, the RUS is able to recommend that separate fast and stopping portions should exist in the future on all peak Hastings Line trains, as already happens to a limited extent today. If the recommendations are adopted the fast portion would provide an improvement of up to 10 minutes to the peak Hastings to London journey time. The trains would attach at Tunbridge Wells for the onward journey which would then be fast from High Brooms to London Bridge, Waterloo East and Charing Cross. Further improvements to the journey time could potentially be delivered by easing speed restrictions south of Tunbridge Wells as described in Option 9.

9.27.8
The provision of additional platforms at London Bridge under the Thameslink Programme will enable all Charing Cross trains to call at London Bridge. It is anticipated that passengers from south of Tunbridge Wells currently using Cannon Street would therefore alight at London Bridge instead. The redeveloped London Bridge station is located in an area of major growth and numerous onward transport options exist, including the short walk across the Thames to the City. Having peak Hastings to Charing Cross trains all calling at London Bridge will represent a significant improvement in journey opportunities and, in conjunction with improvements to journey times south of Tunbridge Wells, is considered to provide an appropriate service on this line, working within the constraints described.

9.28 Summary
9.28.1
This chapter has described the RUS conclusions regarding the options which have been investigated to address the gaps described in Chapter 8. This has included consideration of responses by stakeholders to the Consultation Draft where appropriate.

9.28.2
The combined impact of committed schemes and recommended options is brought together into an emerging strategy to 2020 in the next chapter, followed by consideration of issues in the longer term in Chapter 11.
10. Strategy to 2020

10.1 Introduction

10.1.1
The earlier sections of this document have described the railway infrastructure and passenger and freight services operating on it following the recent December 2009 timetable change. The Route Utilisation Strategy (RUS) moves on to describe further interventions already in progress but which have not yet been implemented (“the do-minimum scenario”), then describing the future demand forecasts to which the railway industry is working. Based on this background, Chapter 8 identifies a series of strategic “Gaps” between future supply and demand, whilst Chapter 9 focuses on the description and detailed appraisal of “Options” which seek to bridge those gaps during the next 10 years.

10.1.2
This chapter now brings together the conclusions from the RUS analysis into a detailed strategy to 2020. It starts by describing current expectations regarding funded schemes in Control Period 4 (CP4), broadly coinciding with Southeastern’s franchise expiring in 2014 and the start of reconstruction works at London Bridge associated with the Thameslink Programme. This section is based on the analysis of committed schemes in Chapter 4. It then moves on to detail further recommendations, which are in general unfunded at present, for Control Period 5 (CP5) based on the detailed analysis provided in Chapter 9.

10.1.3
The impact of the strategy on morning peak hour crowding to London is considered in detail, with PLANET modelling results provided for the 2010 baseline, 2020 “do-minimum” situation (committed schemes only) and 2020 if the recommendations of this RUS were implemented.

10.1.4
To aid readers with interest in specific areas, a summary table showing the envisaged impacts of the strategy on each of the key towns within the RUS area is provided at the end of the chapter.

10.2 Strategy for Control Period 4 and the remainder of Southeastern’s franchise period (to 2014)

10.2.1
The strategy for CP4 and the remainder of Southeastern’s franchise is based around ensuring that train services continue to run at a level consistent with growing passenger demand, whilst a major programme of investment – including the complex Thameslink Programme construction works at London Bridge – is underway.

10.2.2
As described in Section 4.2 additional capacity will be provided by the train lengthening programme, though due to the opportunities available this will be predominantly in the suburban area rather than the train services covered by this RUS. However, some limited interurban lengthening is expected, with all high peak services on the Tonbridge Main Line likely to be 12-car formations within the next few years. On routes to London Victoria further 8-car operations on the Maidstone East line and 12-car operations via Rochester are anticipated. Due to platform length constraints at critical sites such as Charing Cross all main line lengthening requires the use of Class 375 or similar rolling stock with Selective Door Opening (SDO), in turn leading to a cascade of Class 465/466 Networkers to the suburban area.
that any passenger demand growth arising from the post-recession economic recovery can also be appropriately catered for. In addition, it is an important consideration that any service changes at evenings and weekends must be consistent with passenger requirements.

10.2.6
The construction strategy for the eastern approaches to London Bridge is based on maintaining two independent two-track railways between the New Cross area and London Bridge (a pair of tracks to/from Charing Cross and a pair to/from Cannon Street) on all weekdays, ie. temporarily reducing the tracks available at peak times from the existing seven to four. Any infrastructure not required to operate these two-track railways will become part of the construction site. This will enable the major civil engineering works associated with the new “Bermondsey Dive-under” to be undertaken.

10.2.7
The reduction in eastern approach tracks will present a challenge, but to a large degree this is mitigated by the fact that both Charing Cross and Cannon Street already have two-track approaches on the western side of London Bridge at present. In very simplistic terms the eastern approach track construction strategy therefore increases the length of existing constraints, rather than introducing new ones in terms of overall train throughput.

10.2.8
However, it is the works in platforms 1-6 at London Bridge which will be the greatest challenge. The construction strategy envisaged here is to undertake the works in two phases, focusing initially on the Charing Cross side of the station and then moving on to start the

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1 29tph to Charing Cross, 25tph to Cannon Street
2 28tph to Charing Cross, 22tph to Cannon Street, 18tph to Thameslink
Cannon Street side only once the Charing Cross side is complete. In each of these phases the “two-track railway” approach would also apply through the relevant part of the station in addition to the eastern approaches.

10.2.9 With the above in mind the first phase of works will see a two-track railway in operation through the site of London Bridge station on the Charing Cross tracks, allowing various stages of construction work to take place in the space currently occupied by platforms 4 to 6. As a result the critical consideration is that no Charing Cross services will be able to call at the station for the duration of this period, this being for the following reasons:

- for most of this phase the two-track railway through the station site would not be adjacent to usable platform faces, due to the staging works associated with platforms (and pedestrian access to them) being rebuilt in new locations.
- even if there were a usable platform face, the extended track occupation times associated with inserting station calls on a two-track railway would reduce total capacity to Charing Cross from today’s 29 trains in the high peak hour to around 16 trains, which is clearly unacceptable. This reduction in capacity would be due to the time taken for each train on a single track to decelerate/accelerate from linespeed, the doors to open/close and the passengers to board/alight, with 16tph being the existing throughput of platform 6 at peak times today.

10.2.11 The critical requirement to ensure that passenger capacity into London during this period is maintained will be the suburban area platform lengthening works committed to in Network Rail’s CP4 Delivery Plan and described in Chapter 4. Subject to sufficient rolling stock resources this will allow a significant number of high peak suburban services to both Charing Cross and Cannon Street to run in 12-car formations. With respect to main line trains the lengthening of any short-formed peak services to 12-car will be needed, together with some lengthening in the shoulder peaks.

10.2.12 Whilst Charing Cross services will be unable to call at London Bridge during this period, trains will still be able to run through the station without stopping to Waterloo East and Charing Cross, albeit at a reduced level of no less than 24 trains in the high peak hour (compared to today’s 29 trains) due to the capacity of the eastern approaches. In addition, the temporary infrastructure will not allow for certain existing crossing moves to be made between tracks.

10.2.13 The combination of the above would result in a robust construction plan for the Thameslink Programme, with passengers seeing major improvements upon its completion in CP5.

Other considerations

10.2.14 A further point is that major works at Gravesend (track layout remodelling), Abbey Wood (a new Crossrail station) and through Medway (East Kent Resignalling) will potentially be ongoing during a similar timeframe to the London Bridge works. Detailed plans for integration of all these schemes remains under development at present, but this RUS notes the importance of the train service being planned in such a way that any “double-disruption” to rail users is avoided.
10.2.15
It is also emphasised that a particular opportunity is provided by the new services on High Speed One (HS1) to St Pancras International, since these provide alternative journey options for large numbers of passengers currently travelling via London Bridge. It is therefore essential that as much use as possible is made of these services during the London Bridge CP4 works. The following are recommended for St Pancras services, with implementation in advance of the start of London Bridge remodelling:

- ensuring that passengers understand the numerous journey opportunities available into central London via St Pancras, including benefits associated with the recently opened new London Underground ticket hall close to the Kent platforms. This includes several underground lines, enhanced Thameslink services (at least 15 tph at peak times) and many local bus routes
- improving the accessibility of Ebbsfleet to maximise the usage of the major train service opportunities provided by this new station. In order to avoid promoting travel plans which are contrary to modal shift policies this should include measures to encourage passengers to use public transport in addition to the station’s main role as a “parkway” station. The existing “Fastrack” bus service provides a good service from the local area but there may also be a case for services from other towns with fast road links
- encouraging passengers to use the interchange between Stratford International (where high speed services will call) and Stratford Regional stations. Such a link will be of use to passengers from Kent travelling to the Liverpool Street station area or to Docklands and this factor should be considered in post-Olympics land use planning for this area
- small scale incremental schemes to provide further journey time reductions on high speed services, to maximise the attractiveness of these services. Schemes which would benefit the maximum numbers of passengers include consideration of infrastructure enhancements to increase speeds in the Ashford – Canterbury, Ashford – Folkestone and Gravesend – Medway areas, plus minimising the time taken for splitting and joining of peak services at Ashford International.

10.2.16
Further RUS interventions recommended for implementation in CP4 are as follows:

- increasing capacity by alleviating specific constraints through the Medway Towns, as part of the East Kent Resignalling programme
- implementation of further incremental journey time improvement schemes as covered under Option 9 in the previous chapter, focusing on locations where speeds are slow at present and where increases would benefit the maximum numbers of passengers, for example the western end of the Maidstone East line and the northern end of the Hastings line
- improving walking routes and bus services to stations, as covered under Option 10
- providing additional station entrances at locations where doing so would provide walk time savings to significant groups of people
- increasing the capacity of station car parks to meet predicted demand, except at locations where this would be inconsistent with town planning policies in the area concerned.

10.2.17
Improvements to assist freight operators in CP4 are as follows:

- Continuing the move towards implementation of standard hour freight paths, as considered in Option 14.4,
in ongoing development of the Control Period 5 (CP5) timetable. In general terms this is likely to involve four freight paths in each off-peak hour via the West and South London Lines, two of which continue towards the Channel Tunnel (via Catford and Maidstone East) and two of which continue towards the Thames Gateway (via Lewisham and Dartford). Such paths would provide sufficient timetable slots for the envisaged flows.

- provision of a diversionary route for Class 92 electrically hauled traffic to the Channel Tunnel via Redhill, to avoid the need for these services to be diesel hauled when the usual Catford/Maidstone East route is closed.
- the possibility of the introduction of freight operations on HS1, albeit initially to a limited extent. These trains are likely to take advantage of the gauge and speed opportunities on HS1. As these cater for new international demand (rather than responding to a Kent RUS gap), such flows are outside the scope of this RUS, but they may interact with the strategy with respect to either timetable planning, depot strategy or other operational aspects.
- infrastructure enhancements to improve freight capacity and performance in the Thames Gateway area, possibly commencing with installation of a passing loop on the Isle of Grain branch as recommended by the South London RUS. This would increase capacity for freight beyond the current infrastructure limit of around 20 trains per day to around 25. It would also increase the reliability of passenger services to St Pancras International.
- Consideration of freight terminal developments where appropriate to individual flows.

10.3 Recommendations for Control Period 5 (to 2019) and the next Kent franchise

10.3.1
Beyond existing commitments, the RUS process is designed to inform the shape of the next Kent franchise. The Department for Transport (DfT) specifies train services as part of this process, and the industry would normally expect its specifications to draw from established RUSs.

10.3.2
The High Level Output Specification (HLOS) for CP5 (2014 – 2019) will not be published until 2012. Government’s detailed priorities for the railway in this period are not therefore fully defined at present, so there is uncertainty regarding the funding that can be expected to be available. It can, however, be expected that the strategy outlined in the “Delivering a Sustainable Railway” White Paper will continue, with an eventual doubling of passenger and freight demand across the network as a whole. With the White Paper in mind, the RUS can recommend further enhancements for Kent Main Line services in CP5, where there is evidence that these have a robust business case and are required to resolve a strategic gap.

Classic network – future franchise considerations

10.3.3
With respect to the “classic” network, timetable development and demand analysis has identified a small number of improvements to the service assumptions used in the Draft RUS. The current expectations regarding the high peak Main Line service in CP5 is shown in Figure 10.1.
<table>
<thead>
<tr>
<th><strong>Maidstone East line</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 tph Ashford International via Maidstone East to London Victoria</td>
<td></td>
</tr>
<tr>
<td>2 tph Maidstone East to London Victoria</td>
<td></td>
</tr>
<tr>
<td>2 tph Maidstone East to Thameslink corridor via Bromley South&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Chatham line</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 tph Ramsgate/Dover Priory (joining portions at Faversham) to London Victoria</td>
<td></td>
</tr>
<tr>
<td>2 tph Gillingham to London Victoria, calling at stations via Sole Street&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>3 tph Medway fast to London Cannon Street via the main line</td>
<td></td>
</tr>
<tr>
<td>2 tph Rochester to London Blackfriars calling at all stations to Bromley South&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Hastings line</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 tph Hastings to London Charing Cross&lt;sup&gt;4&lt;/sup&gt;, with fast &amp; slow portions joining at Tunbridge Wells</td>
<td></td>
</tr>
<tr>
<td>2 tph Tunbridge Wells to London Charing Cross</td>
<td></td>
</tr>
<tr>
<td>2 tph Tunbridge Wells to Thameslink corridor via London Bridge</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ashford (via Tonbridge) line</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 tph Paddock Wood or beyond to Thameslink corridor via London Bridge</td>
<td></td>
</tr>
<tr>
<td>2 tph Canterbury West or beyond via Ashford International&lt;sup&gt;5&lt;/sup&gt; to London Charing Cross</td>
<td></td>
</tr>
<tr>
<td>2 tph Dover Priory or beyond via Ashford&lt;sup&gt;6&lt;/sup&gt; to Charing Cross</td>
<td></td>
</tr>
</tbody>
</table>

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<sup>1</sup> Semi-fast via the Catford Loop to avoid conflicts in the Elephant & Castle area<br>
<sup>2</sup> Via the Catford Loop at peak times due to capacity limitations at Herne Hill<br>
<sup>3</sup> Via Herne Hill to avoid conflicts in the Elephant & Castle area<br>
<sup>4</sup> Service will call at London Bridge for access to the City<br>
<sup>5</sup> Carriages to be attached at Ashford International

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**10.3.4**<br> All the services shown are recommended to run at the maximum length for the capability of the route concerned. This will be 8-car on the Maidstone East line, 12-car on the Chatham Main Line and 12-car on the Ashford International via Tonbridge line. Tunbridge Wells services would all be 12-car, and services on the Hastings line would be made up to 12-car at Tunbridge Wells by joining fast and slow portions throughout the peaks.

**10.3.5**<br> The above recommendation would require further train lengthening in CP5. As considered in detail in Chapter 9 in the high peak this would predominantly be on routes to Victoria,
though there would also be significant benefits in lengthening shoulder peak trains on the Tonbridge Main Line. However, the bulk of the lengthening opportunities on the Kent route would be in the London suburban area, as recommended in the South London RUS. The Kent RUS analysis has identified a robust case for approximately a further 100 extra vehicles (Class 375 or similar) for the classic Main Line and suburban network, though the specific number cannot be confirmed until detailed development of the post-Thameslink timetable and rolling stock plan has progressed further.

10.3.6
Acquisition of additional units for use on the Kent RUS network would also require an equivalent level of new train berthing and maintenance facilities to be provided, since existing facilities are fully utilised at present. Due to limited land availability, the main opportunities for significant levels of extra berthing are considered to be at Tonbridge or Slade Green, so a decision would be needed on which of these, or a combination, represented the most appropriate location.

10.3.7
In the longer term, it is possible that a limited number of Maidstone East line to Victoria services could be 12-car towards the end of this period, with Selective Door Opening (SDO) in operation east of Swanley. Whilst Maidstone East station itself cannot economically be rebuilt for all train doors to open (as considered under Option 4.2 in the previous chapter), some limited platform extensions elsewhere on this route may assist with distributing passenger loadings evenly within trains.

10.3.8
Apart from the peak London services described above, with respect to service levels within the RUS area in CP5 there is not generally a pressing reason for the industry to make detailed recommendations at present. Issues such as off-peak service levels, especially on lightly used routes, are best considered in detail nearer the time. This will allow the most up to date information on usage levels to be understood, together with a better knowledge of the likely availability of subsidy to operate such services. However, it is emphasised that the analysis of Option Groups 7 and 8 in the previous chapter indicates that a degree of modal shift from road to rail is likely to be needed to make whole-scale improvements to non-London services viable.

10.3.9
It is anticipated that the DfT will commence the consultation process for the next Kent franchise in around 2012. This will provide the opportunity for further consideration of train service patterns.

Further opportunities on High Speed One (HS1)

10.3.10
Once the Thameslink Programme has been completed and the further train lengthening described above has been implemented, it is recommended that the bulk of any further additional capacity needed between the Kent RUS area and London is delivered via HS1, as considered under Option Group 6 in Chapter 9. The reasons for this are as follows:

- no realistic way has been identified of providing further additional Main Line capacity to London over any other route from the RUS area within this timescale, once all high peak trains and the busiest shoulder peak trains are running at full length
- HS1’s importance will increase as ongoing developments in the Docklands and Stratford areas take place. The route will provide interfaces with other transport schemes such as Crossrail at Stratford
- the 6-car trains in operation on HS1 in CP4 present a strategic opportunity to provide additional peak capacity from the RUS area to St Pancras International as they may be lengthened to 12-car without requiring major infrastructure enhancements
providing additional capacity on HS1 has potential to indirectly alleviate the crowding gap on “classic” routes, especially if additional services can be run to Ashford International.

10.3.11
This approach would require procurement of additional rolling stock to enable lengthening of most peak trains to St Pancras International to 12-car formations, together with the extension of the Rochester service to Faversham. More fundamentally, it is also recommended that the planned peak Ebbsfleet – St Pancras shuttle is extended back to commence from further within Kent, to maximise the usefulness of a valuable peak path on HS1. Options 6.4 and 6.5 consider two alternative ways of doing this in detail.

10.3.12
It is therefore proposed that the DfT considers the procurement of additional domestic vehicles for use on HS1. This is likely to involve vehicles similar to the Class 395 fleet, but alternatives such as double deck trains or third rail Intercity Express Programme (IEP)-compatible vehicles could also be considered. Between eight and thirteen 6-car sets would be required, depending on the chosen combination of options. As with “classic” services, construction of additional train berthing and maintenance facilities would also be necessary.

10.3.13
The highest level of benefits has been identified if the Ebbsfleet shuttles were extended to Ashford International or beyond (Option 6.5). Additionally this would provide significant crowding relief to the Tonbridge corridor, for which no other solution has been identified. However, this option is unlikely to be deliverable with the existing constrained track layout at Ashford International.

10.3.14
Resolving the issue above requires additional domestic platform capacity at Ashford and extension of paths over HS1 back from Ebbsfleet. Unfortunately, building any new platforms at this complex site would be problematic and expensive, and the associated costs would most likely result in the scheme not being economically viable. However, if capacity from the international platforms (which are not within the geographic scope of this RUS) were to be made available for domestic use, much of this cost could be avoided. Given the very limited use which is currently made of these platforms (five trains per day in each direction spread across both platforms), it is therefore recommended that the DfT consider whether the balance of capacity utilisation at these platforms is appropriate.

10.3.15
The alternative to the above is to extend the Ebbsfleet shuttle via Gravesend (Option 6.4). On this route running extra services via Rochester is not considered operationally viable so the RUS has investigated an option of continuing the high speed service via the Medway Valley Line to Maidstone West. This has lower benefits than running to Ashford and would not result in a fast journey time to Maidstone itself. However, this option has advantages in being operationally relatively simple to implement, as well as having been developed on the basis of seeking to minimise infrastructure costs. The option tested has been restricted to 6-car but a later extension to 12-car would be desirable, probably with Selective Door Operation (SDO) on the Medway Valley line.

10.3.16
Variants of the Ebbsfleet extension to Maidstone West option include partial implementation as far as Gravesend or Strood. These would incur some of the benefits and some of the costs, but have not been subject to detailed appraisals at this stage.

10.3.17
A summary of recommendations for HS1 domestic services in CP5 is given in Figure 10.2. The key factor is the recommendation for additional rolling stock.
10.4 Crowding mitigation from the RUS strategy

10.4.1
Chapter 6 forecast overall growth between 2008 and 2022 of 30 percent. However, this would not be evenly distributed, with higher than average rates of population growth in the Ashford and the Thames Gateway areas. Much of this growth would therefore be accommodated by – and some would be generated by – the new high speed domestic services, as recently introduced.

10.4.2
The PLANET South model, as described in Chapter 6, has been used to provide an assessment of how future train loadings will develop. However, it must be emphasised that this is a high level generalised model, covering the whole of the three hour peak period and therefore requiring care in interpretation.

Figure 10.2 – Recommendations for development of HS1 domestic services in CP5

1 Lengthening of the peak Rochester to St Pancras International service to 12-car and extension of these trains to start back from Faversham. This is likely to require additional capacity through the Medway towns for which there is likely to be a business case for implementation through the East Kent Resignalling programme. Alternatively, there may be some opportunities for peak London suburban services to start at Rochester instead of Gillingham, freeing up capacity for HS1 services through Medway.

2 Extension of the peak Ebbsfleet shuttles to start back from further within Kent, maximising the usefulness of a valuable peak path on HS1. Two alternatives are possible:
   - the RUS recommends extending the Ebbsfleet service to Ashford International or beyond as this has the highest level of benefits. However, it appears to be impractical unless the international platforms can accommodate an element of domestic use, or additional capacity at Ashford International is provided by some other means. It is also unclear at present whether the increased interaction between fast and slower services on HS1 would be viable.
   - an alternative to the above is extending the Ebbsfleet shuttle via Gravesend. The specific option appraised involved continuing to Maidstone West. This has lower benefits than the Ashford option but appears to be more practical in the short term. Services would be restricted to 6-car and would need a calling pattern appropriate to this train length.

3 Procurement of between eight and thirteen additional 6-car sets to deliver the above.

4 Further investigations into journey time reductions for high speed services once off HS1 itself. This especially applies to the existing slower sections of route, principally between Gravesend – Rochester and Ashford – Canterbury. In the medium-term it is envisaged that this would be delivered by a combination of raising speed restrictions, reviewing timetables and other factors, such as minimising the time required for activities such as splitting/joining.

5 The RUS recommends that implementation of this option is considered during the next Kent route franchise replacement process, for two reasons. Firstly, the new franchise would provide an appropriate delivery mechanism. Secondly, the timescale over which the recommendations would need to be implemented is dependant on the rate of demand growth over the next few years.

1 Power supply enhancement is likely to be required between Strood and Maidstone.
10.4.3 Capacity in the busiest high peak hour is the critical factor. Whilst this is not modelled directly by PLANET South, output from the model has been used to develop crowding forecasts for the high peak hour.

10.4.4 The PLANET simulations indicate that crowding will reduce relative to 2010 forecasts with implementation of the committed schemes on the Chatham Main Line, and on HS1. Crowding on the Tonbridge line is higher and only slightly alleviated, even with the implementation of the committed schemes. This suggests that the further interventions recommended by this RUS will be needed in CP5.

10.4.5 If the RUS strategy were to be implemented, crowding is expected to reduce significantly relative to the 2010 forecasts for both the Tonbridge and Chatham Main Lines, and much of the High Speed line. Figure 10.3 illustrates the high level results in terms of seat utilisation in the high peak hour at the busiest locations on the London approaches, for each of the three routes concerned.

10.4.6 While implementation of the committed schemes alone does reduce crowding to some extent, the forecast level of seat utilisation remains high. For this reason, it is emphasised that the reduction shown after the committed schemes cannot be assumed to be a reason to avoid further interventions. With overall growth of 30 percent it is considered that implementation of the RUS strategy in its entirety would be needed to maintain crowding on trains in the high peak hour at acceptable levels.

10.4.7 Modelling results indicate that the HS1 interventions recommended in this RUS would provide significant crowding relief and deliver high value for money. The Chatham Main Line crowding would be alleviated by today’s peak-only Rochester to St Pancras International trains being lengthened to 12-car and starting back from Faversham (Option 6.2), as well as some lengthening of services to Victoria (Option 4.1). The Tonbridge Main Line crowding would be alleviated by additional capacity from Ashford to St Pancras under Option 6.5, which is the only way identified to achieve this once all other services are 12-car. Services on HS1 would see increased loadings with the RUS strategy, due to the the peak extensions further within Kent picking up extra passengers. This would lead to some crowding from Ebbsfleet on the busiest trains, though the premium fare could be modified to balance loadings between routes.

10.4.8 Seat utilisation figures are presented in bands and Figures 10.4 and 10.5 show utilisation for both the base case and RUS strategy respectively. The bands shown give an indication of the likely level of standing in the high peak.

10.4.9 It should be emphasised that the PLANET model outputs are averages. Depending on individual train stopping patterns (and seat configurations), full use of seated or standing capacity may be reached at stations closer to or further away from London.

<table>
<thead>
<tr>
<th></th>
<th>High Speed line</th>
<th>Tonbridge Main Line</th>
<th>Chatham Main Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 base</td>
<td>129%</td>
<td>136%</td>
<td>134%</td>
</tr>
<tr>
<td>2020 committed schemes only</td>
<td>119%</td>
<td>130%</td>
<td>130%</td>
</tr>
<tr>
<td>2020 strategy</td>
<td>125%</td>
<td>124%</td>
<td>111%</td>
</tr>
</tbody>
</table>

Figure 10.3 – Seat utilisation across high peak hour
Figure 10.4 – 2020 Crowding forecast with committed schemes only

Key

Less than 20% - seats readily available
20% to 40% - standing infrequent
40% to 60% - standing infrequent
80% to 100% - routine standing
90% to 100% - routine standing
100% to 120% - exceeded seating capacity
More than 120% - At or near PiXC

Average volume to seat ratio - AM peak hour

Key

60% to 80% - frequent standing
40% to 60% - some standing
100% to 120% - exceeded seating capacity
20% to 40% - standing infrequent
80% to 100% - routine standing
Less than 20% - seats readily available
Figure 10.5 – 2020 Crowding forecast if RUS strategy implemented in CP5
### 10.5 Impact of RUS strategy on key towns

10.5.1

The strategy outlined above provides key towns within Kent with many significant benefits relative to today. These are outlined in Figure 10.6.

<table>
<thead>
<tr>
<th><strong>Maidstone</strong></th>
<th><strong>Benefits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all-day service to the Thameslink corridor route via Bromley South in CP5, in addition to the single existing peak service on this route and all day services to London Victoria</td>
</tr>
<tr>
<td></td>
<td>potential for peak services from Maidstone West to St Pancras International via the Medway Valley line and Gravesend, recommended for consideration during the 2014 franchise replacement process</td>
</tr>
<tr>
<td></td>
<td>potential for bus links to Ebbsfleet for International services</td>
</tr>
<tr>
<td></td>
<td>ongoing consideration of linespeed improvements west of Maidstone</td>
</tr>
<tr>
<td></td>
<td>most peak trains 8-car by end of CP4, subsequent possibility in the longer term of peak 12-car services to Victoria with SDO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Medway</strong></th>
<th><strong>Benefits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>most peak trains 12-car by end CP4</td>
</tr>
<tr>
<td></td>
<td>fast trains to St Pancras potentially all lengthened to 12-car, subject to consideration during the 2014 franchise replacement process</td>
</tr>
<tr>
<td></td>
<td>possible extension of the St Pancras to Rochester peak service to Faversham, to provide a 4thp peak service between the Medway Towns and St Pancras</td>
</tr>
<tr>
<td></td>
<td>opportunities for additional performance and capacity through East Kent Resignalling</td>
</tr>
<tr>
<td></td>
<td>potential relocation of Rochester station to a more convenient location for the town centre, with delivery integrated into the planned resignalling scheme.</td>
</tr>
<tr>
<td></td>
<td>consideration of linespeed improvements west of Strood for St Pancras International services</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Sevenoaks</strong></th>
<th><strong>Benefits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>most peak trains via Chelsfield 12-car by end CP4</td>
</tr>
<tr>
<td></td>
<td>4 fast peak trains via Chelsfield per hour to the Thameslink corridor</td>
</tr>
<tr>
<td></td>
<td>London Bridge calls on all Charing Cross services, for access to the City of London</td>
</tr>
<tr>
<td></td>
<td>potential for bus links to Ebbsfleet for International services</td>
</tr>
<tr>
<td></td>
<td>potential reduction in loadings south of Sevenoaks, due to passengers from East Kent transferring to St Pancras International services</td>
</tr>
</tbody>
</table>

There are, however, also some disbenefits which are also outlined, together with the mitigating measures proposed.
### Disbenefits and mitigation

- Charing Cross and Cannon Street services will be affected by the London Bridge reconstruction works.

### Tonbridge

#### Benefits

- most peak trains 12-car by end CP4
- 4 fast peak trains per hour to the Thameslink corridor
- London Bridge calls on all Charing Cross services, for access to the City of London
- reduction in loadings east of Tonbridge, due to passengers from East Kent transferring to St Pancras International services

#### Disbenefits and mitigation

- Charing Cross and Cannon Street services will be affected by the London Bridge reconstruction works.

### Tunbridge Wells

#### Benefits

- 2 fast peak trains per hour to the Thameslink corridor
- London Bridge calls on all Charing Cross services, for access to the City of London
- most peak trains 12-car by end of CP4

#### Disbenefits and mitigation

- Charing Cross and Cannon Street services will be affected by the London Bridge reconstruction works.

### Hastings

#### Benefits

- faster journeys to central London by fast limited-stop portions on all peak trains to Charing Cross and consideration of linespeed improvements throughout the route
- London Bridge calls on all Charing Cross services, for access to the City of London

#### Disbenefits and mitigation

- Charing Cross and Cannon Street services will be affected by the London Bridge reconstruction works.
- The Thameslink Programme will require a withdrawal of Cannon Street services, with replacement Thameslink services unable to operate south of Tunbridge Wells due to power supply constraints
- access to City of London maintained by above proposal

### Bromley

#### Benefits

- more peak trains to Victoria 12-car by the end of CP4, further lengthening in CP5
- potential reduction in loadings east of Bromley, due to passengers from Medway transferring to St Pancras International services
- mixture of stopping and fast services to the Thameslink corridor
<table>
<thead>
<tr>
<th>Location</th>
<th>Benefits</th>
<th>Disbenefits and mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravesham</td>
<td>fast trains to St Pancras International potentially all lengthened to 12-car, subject to consideration during the 2014 franchise replacement process</td>
<td></td>
</tr>
<tr>
<td></td>
<td>committed scheme in CP4 to remodel Gravesend track layout, with capability for longer trains and improved operability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>London Bridge calls on all Charing Cross services, for access to the City of London</td>
<td></td>
</tr>
<tr>
<td></td>
<td>possible future extension of Crossrail from Abbey Wood to Gravesend, subject to dual voltage rolling stock being used on Abbey Wood services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>potential for simple walking route between Ebbsfleet and Northfleet stations</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Disbenefits and mitigation</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charing Cross and Cannon Street services will be affected by the London Bridge reconstruction works</td>
<td></td>
</tr>
<tr>
<td></td>
<td>new capacity on St Pancras International services will provide significant mitigation</td>
<td></td>
</tr>
<tr>
<td>Ashford</td>
<td>potential for additional fast trains to St Pancras International in the longer term, however this is dependent on the future use of the international platforms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>London Bridge calls on all Charing Cross services, for access to the City of London</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Disbenefits and mitigation</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>sub-optimal track layout in the station area provides insufficient capacity for additional services and an ongoing performance risk. Potential for converting one of the international platforms to accommodate domestic use could alleviate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the post-Thameslink timetable may require a withdrawal of Cannon Street services, with replacement Thameslink services possibly not operating east of Paddock Wood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charing Cross and Cannon Street services will be affected by the London Bridge reconstruction works. New capacity on St Pancras International services will provide significant mitigation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>limited international trains, but fast domestic trains to Ebbsfleet for regular connections</td>
<td></td>
</tr>
<tr>
<td>Canterbury</td>
<td>potential ongoing improvements in services to St Pancras International</td>
<td></td>
</tr>
<tr>
<td></td>
<td>London Bridge calls on all Charing Cross services, for access to the City of London</td>
<td></td>
</tr>
<tr>
<td></td>
<td>consideration of linespeed improvements</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Disbenefits and mitigation</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>track layout at Ashford International restricts capacity, see above</td>
<td></td>
</tr>
</tbody>
</table>
### Folkestone

**Benefits**
- potential ongoing improvements in services to St Pancras International
- London Bridge calls on all Charing Cross services, for access to the City of London

**Disbenefits and mitigation**
- track layout at Ashford International restricts capacity, see above

### Dover

**Benefits**
- potential ongoing improvements in services to St Pancras International
- London Bridge calls on all Charing Cross services, for access to the City of London

**Disbenefits and mitigation**
- track layout at Ashford International restricts capacity, see above

### Margate

**Benefits**
- potential ongoing improvements in services to St Pancras International
- opportunities for additional performance and capacity through East Kent Resignalling
- consideration of linespeed improvements

### Ramsgate

**Benefits**
- potential ongoing improvements in services to St Pancras International
- opportunities for additional performance and capacity through East Kent Resignalling
- consideration of linespeed improvements

### Rye

**Benefits**
- consideration of linespeed improvements
10.6 Freight in CP5

10.6.1 Apart from emphasising the importance of paths for Thames Gateway and Channel Tunnel freight in all future timetable development work, the RUS has not made recommendations for further freight interventions in CP5, since there is insufficient evidence at present of either a capacity or a capability gap within such a timescale. However, it is likely that both these freight markets will continue to recover, with the latter potentially seeing developing traffic flows for a new specialised market via HS1. Modal shift policies to rail will become increasingly important and small scale freight interventions will be needed to allow specific flows to commence.

10.6.2 Beyond the above it is recommended that the planning process recognises the importance of freight terminal developments in facilitating a modal shift to rail, and the need for such terminals to be located on parts of the rail network with sufficient train path availability and an appropriate loading gauge.
11. Beyond 2020

11.1 Introduction

11.1.1 The previous chapter provided specific recommendations for implementation within the first 10 years of the Route Utilisation Strategy (RUS) period, covering up to 2020. These interventions have been considered using a detailed appraisal methodology, based on Department for Transport (DfT) guidance, enabling a suggested way forward to be outlined by this RUS to industry funders.

11.1.2 Beyond 2020 a quantified business case approach has not been used by the RUS, primarily because demand levels are more difficult to forecast. However, it is important to ensure that the strategy to 2020 is consistent with further developments in the longer term. This chapter therefore provides an indication of schemes which could potentially become relevant in due course, but where more detailed investigations would be required nearer to the time.

11.2 Consideration of future passenger demand

11.2.1 Government strategy as outlined in the 2007 White Paper “Delivering a Sustainable Railway” anticipates a doubling of passenger and freight traffic over the next 30 years. However, this is a national average and there will clearly be major variations in growth rates across the country.

11.2.2 The recommendations to 2020 are based on current DfT appraisal criteria. These criteria consider options on the basis of forecast demand across all modes, but they do not actively seek to facilitate a modal shift to rail. Beyond 2020 it is anticipated that modal shift policies will become increasingly important. This will require additional interventions – potentially including some which cannot be supported by existing criteria – primarily targeted at encouraging car drivers to switch to rail services, leading to a doubling of passenger numbers in a 30-year period.

11.2.3 Some probable trends affecting the Kent railway network are indicated below:

- the primary role of the railway in the RUS area will remain as serving the peak commuter market to London
- there will be established demand and ongoing growth to London from the Medway and east Kent areas as commuters relocate to take advantage of new journey opportunities via High Speed One (HS1). Furthermore, such areas will have increased economic activity due to better transport links with the capital
- more localised functions of the railway system within Kent will become increasingly important. For example, it is likely that land available for car parking in town centres will be very limited, so public transport will be increasingly used for short trips into town centres such as Maidstone, Canterbury, Medway and elsewhere
- the economic gap between the affluent central areas of Kent (such as Sevenoaks, Maidstone, Tunbridge Wells) and coastal areas such as Ramsgate, Dover and Hastings could potentially be closed, as the impacts of regeneration policies are realised. This increased economic activity around the coast has the potential to trigger extra journeys over relatively long distances
the impact of major developments at Ashford and in the Thames Gateway will become significant, as described below.

11.2.4
The detailed growth trends will be particularly sensitive to how the economy of Kent develops, together with trends in the major employment areas of central London. However, the peaks and troughs of the economic cycle do not necessarily need to be understood in detail when planning for the longer term.

11.3 Impact of major developments – Ashford and Thames Gateway

11.3.1
The planned population growth in parts of the RUS area, especially the two key development areas of the Thames Gateway and Ashford, will take place slowly over a number of years. The timing of railway projects over the longer term will therefore need to be linked to the rate of this growth.

11.3.2
The major development areas are particularly relevant to the new St Pancras International services. This feature creates an extra level of uncertainty at present, since both the baseline usage and factors affecting long-term demand currently require assumptions to be made.

11.3.3
However, even acknowledging a degree of uncertainty, it is likely that the key challenge over the 30-year period will be responding to the new demand generated by these significant growth areas.

11.4 HS1 capacity

11.4.1
The analysis undertaken suggests that population growth at Ashford will require additional commuter capacity to St Pancras International via HS1. This has led to a recommendation for further development of RUS Option 6.5, of extending the peak Ebbsfleet shuttle to Ashford, subject to a review of the future use of one of the international platforms at the station.

11.4.2
A key element influencing the longer-term strategy is the level of spare capacity that is likely to be available on HS1, including at the limited number of domestic platforms at St Pancras International station, and any possible competing uses. This will determine whether additional peak trains from the RUS area could be operated, should they be required in the future.

11.4.3
The RUS notes that increasing domestic service levels above the 8tph planned in the high peak in Control Period 4 (CP4) would be problematic. The principal constraints are:

- St Pancras station, with only three platforms available for domestic Kent services
- the station approaches, with conflicting moves being necessary to gain access to platforms
- on HS1 itself, where the high speeds involved means that trains need to run a long way apart. This is exacerbated by the significant speed differential planned between international (186mph) and domestic (140mph) trains.

Based on these factors the RUS has concluded that no spare peak domestic paths on HS1 can be assumed as deliverable, based on the information currently available. However, further analysis would need to be undertaken if this became a critical factor.
11.4.4
Freight services may be in operation on HS1 in the future, though this would be impractical in the periods when the peak passenger service is running and it is conceivable that such services would be entirely restricted to overnight.

11.4.5
The allocation of capacity on HS1 needs to take account of how international services are likely to develop. This is outside the remit of this RUS and is difficult to predict with accuracy. The future development of such services is sensitive to features such as:

- the strength of the British and European economies and features such as working practices and travel patterns
- the future price of aviation fuel, since HS1 international demand is in direct competition with short haul airlines. This is linked to possible environmental policies, the taxation system for airline fuel and the security regime, check-in times and reliability at airports
- whether new international rail services to destinations not directly served from London (for example Amsterdam or cities in Germany) are introduced on HS1 or whether destinations north of London are served.

11.4.6
Taking all these factors into account, there may be some long-term scope for increased use of HS1 for domestic commuter services beyond the current RUS recommendations. However, this cannot be assumed to be viable with the information currently available.

11.4.7
A potential alternative long-term scenario could involve Ashford commuters utilising International trains for travel to London, similar to numerous existing examples in Europe. However, there would be significant issues regarding customs regulations to overcome.

11.5 Thames Gateway growth
11.5.1
The RUS has noted the high levels of new housing growth and other development plans in the Thames Gateway over the coming years. This leads to a requirement for transport improvements throughout this area, a view which appears to be well understood by local stakeholders.

11.5.2
The committed schemes of most relevance are the new services to St Pancras International and the CP4 train lengthening programme. In addition, there will also be some knock-on impacts of the Thameslink Programme, with benefits arising from a potential increase in services to Blackfriars (via Bromley South).

11.5.3
For consideration in Control Period 5 (CP5) the RUS has presented further options for increasing capacity between the Thames Gateway area and London. The most significant involves amending the peak 6-car Rochester to St Pancras service to a 12-car Faversham to St Pancras service.

11.5.4
The combination of the significant growth anticipated and limited options recommended by this RUS to 2020 leads to the possibility that additional capacity from the Thames Gateway to London will be required in the longer term. A potential scheme is described in 11.6.

11.6 Crossrail extension to Gravesend
11.6.1
A significant scheme which would respond to the planned Thames Gateway growth is the potential extension of Crossrail beyond Abbey Wood to Gravesend. Whilst this scheme would primarily serve outer London and only reach the boundary of the RUS area it has potential to provide major benefits to the southern Thames Gateway as a whole. For example, passengers from Medway would benefit from
crowding relief as fewer Gravesend/Ebbsfleet passengers would use St Pancras International services and they would also benefit from the ability to access Crossrail services (to Canary Wharf, the City, West End and Heathrow) with a single change at Gravesend.

11.6.2
The safeguarding for the potential extension allows for additional tracks in the Slade Green – Dartford area (which may or may not be required, as alternative timetabling solutions for the Dartford area could also be considered) and a stabling/maintenance facility for Crossrail rolling stock at Hoo Junction. The existing two-track railways between Abbey Wood – Slade Green and Stone Crossing – Gravesend are considered to have sufficient capacity for the likely mix of Crossrail and Charing Cross and Cannon Street services. It is, however, likely that additional infrastructure in the Gravesend area would be needed, so the synergy with the CP4 train lengthening programme – which will provide an additional platform by 2014 – is particularly important.

11.6.3
A Crossrail extension would require these services to be operated by dual voltage rolling stock, since overhead electrification of the North Kent line would only be possible at prohibitive cost. This is an important factor to be mindful of when the Crossrail rolling stock for the Abbey Wood service is procured.

11.6.4
The RUS recommends further development of the potential Crossrail extension to Gravesend, for implementation beyond CP5. This is consistent with the recently published Transport Strategy from the Mayor of London.

11.7 Tonbridge Main Line

11.7.1
Unfortunately, the RUS has not been able to identify a substantive solution before 2020 to capacity limitations on the Tonbridge Main Line. Specific interventions in this area included in the strategy are therefore limited to CP4 lengthening of the small number of high-peak trains currently shorter than 12-car, shoulder peak lengthening and replacement of Cannon Street services with higher capacity trains to the Thameslink network.

11.7.2
None of the above will provide more than small scale capacity increments to this congested route, leading to a risk that crowding of trains could worsen, becoming a particular issue inwards of Orpington or Sevenoaks. In a high growth scenario it is therefore likely that there will be a crowding “gap” in this area in the future.

11.7.3
Resolving the above will require consideration of all services – both main line and suburban – through London Bridge. A potential scenario to increase capacity in the longer term has been identified and is described in section 11.8 on the next page.

11.7.4
It is also noted that potential interventions elsewhere would indirectly alleviate crowding on the Tonbridge Main Line, by providing some passengers with improved alternatives. This would particularly apply to the following:

- additional capacity from Ashford International to St Pancras International, in the event that Option 6.5 were implemented. This would mean trains from east Kent would have more space upon arrival in the Tonbridge area
- Journey time improvements (Option 9) and train lengthening (Option 4.3) on the Maidstone East line. This would encourage passengers living in certain areas to use this line in preference to stations such as Headcorn and Staplehurst
- train lengthening on the Uckfield line, since this route is an alternative route into London to the Hastings line from some areas
11.7.5
It is noted that station congestion at Charing Cross will be a constraint in a high demand scenario, though primarily driven by the suburban area. The RUS notes that a CP5 development scheme is likely to be appropriate at this constrained site.

11.8 Hayes branch conversion
11.8.1
The analysis in section 8.4 indicated that there is no opportunity for increasing main line services on the Tonbridge Main Line with the current network configuration. Any increase in main line services would be constrained by capacity of the Orpington – Tonbridge two-track section, fast to slow line crossing moves inwards of Hither Green and would require a corresponding decrease in suburban services to create space at London terminals. Given the growth identified in the South London RUS for the suburban area this would not be appropriate in isolation.

11.8.2
However, there could be an opportunity for one of the suburban routes to be taken over by another transport mode. The most obvious candidate for such a conversion is the Hayes branch, since this route does not operate beyond the London boundary and is self contained from Ladywell southwards. The long-term candidate schemes to facilitate such a conversion are:

- extension of the London Underground Bakerloo line towards Hayes. This is consistent with the various options for the potential extension of this route outlined in the Mayor’s Transport Strategy
- extension of the Docklands Light Railway (DLR) across Loampit Vale, with onward extension towards Hayes.

11.8.3
Based on the updated service assumptions described in Chapter 4, conversion of the Hayes branch would free up six train paths into central London in the high-peak. These train paths could therefore potentially be made available for other uses.

11.8.4
Use of the above capacity for additional Tonbridge Main Line trains would require service changes on the Orpington – Tonbridge two-track corridor, as no additional trains are possible over this section. However, there would then be an opportunity to reconsider the issues associated with the Sevenoaks – Cannon Street stopping service, as discussed previously under Option 1 (Chapter 9 paragraph 9.4.5).

11.8.5
If the service pattern were no longer constrained by London terminal capacity (due to the conversion of the Hayes branch to another mode) there would then be an opportunity to amend the Sevenoaks corridor stopping service such that it started back from Tonbridge and ran fast from Orpington to London, in addition to running extra stopping trains from Orpington to cater for the suburban demand. Figure 11.1 shows this service group in the RUS base (ie. following the London Bridge works) and how it could potentially be expanded into two separate services if additional paths into central London were available.

11.8.6
It can be seen in Figure 11.1 that the freeing up of London terminal capacity would enable an additional 2tph trains overall to operate to the Orpington/Sevenoaks/Tonbridge area. This is a reduction from the additional 3tph assumed in the Draft RUS, driven by the need to move to an even number of trains per hour pattern following the Thameslink Programme as now described in Chapter 4. The indicative service pattern shown has the following features:

- there would be no increase in trains operating over the two-track Orpington – Sevenoaks section, this being a critical consideration
## Figure 11.1 – Potential long-term options for Sevenoaks corridor

### RUS base assumptions (following completion of Thameslink Programme construction works)

- **2tph Sevenoaks – Charing Cross service, semi fast service, calling as follows:**
  - Dunton Green
  - Knockholt
  - Chelsfield
  - Orpington
  - Petts Wood
  - Chislehurst
  - Grove Park

  Service then runs fast to London Bridge
  Would run via slow lines between Orpington and Grove Park

  **Total service on route = 14tph**

### Long-term possibility assuming spare capacity in central London

- **2tph Tonbridge – Charing Cross service, fast lines service, calling as follows:**
  - Tonbridge (platform 4)
  - Hildenborough
  - Sevenoaks
  - Dunton Green
  - Knockholt
  - Chelsfield
  - Orpington

  Service then runs fast to London Bridge

  **Total service on route = 16tph**

- **2tph Orpington – Cannon Street or Charing Cross suburban service**

  Slow lines stopping service, calling as follows:
  - Petts Wood
  - Chislehurst
  - Elmstead Woods
  - Grove Park
  - Hither Green
  - Lewisham (potentially)

  Service then runs fast to London Bridge

  **12tph main line services**
there would be a 2tph increase in trains operating over the two-track Sevenoaks – Tonbridge section, which would require detailed consideration to identify if it is viable. Signalling changes in the Sevenoaks tunnel area would potentially be required.

use of platform four at Tonbridge has been assumed, since this platform sees little alternative use and onwards capacity on the Tunbridge Wells and Ashford routes is limited.

there would be faster journey times to London for passengers using the smaller stations between Orpington to Sevenoaks, together with crowding benefits arising from these trains not having to call in the London suburbs.

there would be crowding benefits to the London suburbs by slow line trains not needing to commence beyond Orpington.

there would be potential performance benefits, in connection with removing conflicting moves between main line and Hayes branch traffic at Parks Bridge Junction and with no interaction between main line and suburban services in the Orpington area.

there may be issues connected with increased turnback requirements on the slow lines at Orpington.

11.8.7 With the west Kent area using 2tph of the 6tph freed up from the Hayes branch, there would be 4tph available for other uses. The most likely use of these paths would be to respond to suburban area growth on the Greenwich, Bexleyheath and/or Sidcup lines.

11.8.8 Based on this section there is an emerging possibility of how a Hayes line conversion scheme could potentially aid capacity issues in both west Kent and southeast London in a long-term scenario. However, such a scheme would be a major undertaking and it needs to be recognised that the analysis presented above is somewhat simplistic in nature.

11.9 Elsewhere in Kent – delivering a modal shift to rail

11.9.1 Away from the Ashford and Thames Gateway areas, modal shift considerations are potentially more important than housing growth as a generator of demand.

11.9.2 With respect to the potential “doubling of passenger traffic” in the White Paper it is important to bear the following in mind:

the “doubling” is a national target and will not be evenly distributed. There will be some corridors with very high rates of growth and some areas where passenger numbers will change relatively little.

much of the contribution to the national target from the Kent RUS area will come from the early years of the RUS strategy through a combination of three already committed schemes. These are (1) the recent introduction of domestic services on HS1 (2) the CP4 train lengthening programme and (3) implementation of the Thameslink Programme.

some additional peak capacity is potentially available beyond committed schemes, including further classic network train lengthening and extra seats into St Pancras International if the options outlined in this RUS for lengthening and extending the Ebbsfleet shuttle are implemented.

beyond that there may be some limited further opportunities to provide additional shoulder peak period commuting capacity into London using a combination of HS1 and the classic network, but peak commuting capacity on the Kent main line network would remain far short of a doubling of today’s levels even if major investment were undertaken.

11.9.3 The conclusion from the above is that “doubling of passenger traffic” implies not just focusing on the London commuter market, since significant opportunities do exist to increase
railway usage for journeys not involving peak commuting to London. These include off-peak trips, evening and weekend travel and increasing the usage of the railway for travel into and between key towns within Kent. Although it has not been possible to make an economic case for implementing some of the interventions in this category within the early years of the RUS, longer term growth could enable them to proceed.

11.9.4 As a generalisation, doubling of passenger traffic implies significant modal shift to rail, since there is no reason to believe that this level of increment would be required either by population growth or by individuals making significantly more journeys than today. It is therefore likely that achieving this level of growth would require high numbers of car users in the area to switch to rail.

11.9.5 Modal shift to rail would be encouraged by a high quality service offer. Passengers are likely to have increasingly high expectations with regard to the overall travel experience. For example, the following features may become increasingly important:

- high levels of punctuality and reliability will be required, with ongoing reductions in minor delays and significant progress in minimising the number of severe delays or cancellations. Achieving this will require an improvement in infrastructure reliability, together with improvements in dealing with disruptive external events such as extreme weather conditions, trespassers and fatalities
- trains will need to be secure, clean and comfortable
- lower levels of crowding than today will be desired, with peak trains generally having Passengers In eXcess of Capacity (PIXC) conditions eliminated and off-peak trains offering sufficient space so that travellers in groups can sit together
- stations will require good passenger facilities, retail and refreshment facilities where appropriate, step free access throughout, sufficient convenient secure parking, cycle storage facilities and high levels of security
- integration of bus services into railway timetables will be expected, with high quality interchanges at key stations
- passengers will expect a consistent train service running seven days a week and late into the evening
- simple electronic ticketing will be essential, eliminating the need for passengers to queue at a ticket office
- journey times will need to be at least competitive with equivalent trips on other transport modes
- instantly available timetable and train running information is likely to be required, accessed remotely using mobile phone technology, with simple interfaces available for planning even the most complex journey, including onward travel beyond the railway station.

11.9.6 Where rail has a low modal share at present – principally on journeys not involving London – even a small shift to rail would significantly increase the overall rail travel market. For example, if 10 percent of all travellers between particular locations currently use rail then a relatively small reduction from 90 percent to 80 percent in the use of other modes would result in a doubling of rail use.

11.9.7 Modal shift will be unevenly distributed and will be concentrated in areas with the most success in achieving economic growth, locations where highway or parking capacity becomes constrained, on routes where a “step-change” in the travel experience can be achieved and at times, such as evenings and weekends, when the railway currently has a relatively low modal share. Prioritising the most promising proposed investment schemes is therefore an important ongoing priority.
11.10 Increasing freight

11.10.1
The trends in rail freight movements, as with those relating to passenger demand, are not simple to predict over the long term. Within Kent this is complicated by the need to consider both domestic and international issues, due to the important role of the Channel Tunnel.

11.10.2
Key demand issues for future rail freight in the Kent RUS area therefore include:

- the level of trade, and types of goods moved, between the UK and mainland Europe
- the charging regime for and impacts of highway congestion on road hauliers in the UK and northern Europe
- the charging regime for the Channel Tunnel and ferries across the English Channel
- infrastructure capability, capacity and service reliability for rail freight in the UK
- the development of terminals with appropriate capacity and capability for moving goods between road, rail and sea (where appropriate).

11.10.3
However, notwithstanding this uncertainty, it is anticipated that significant increases in freight flows can be expected over the long term. The combination of the existing protected Channel Tunnel freight paths and the timetable solutions recommended for the Thames Gateway under Option 14.4 are considered to provide extensive opportunities for extra trains to run. As a result the major issues in the longer term are likely to relate to infrastructure capability constraints rather than capacity, for example the presence of suitable terminals, limits on train lengths, gauge restricted routes, etc.

11.10.4
The RUS recommends that future timetable development projects should seek to provide the following off-peak paths in the timetable structure where possible, consistent with demand identified to 2030 through the industry Strategic Freight Network (SFN) programme and the Freight RUS:

- Channel Tunnel (via Maidstone East) 37tpd
- Thames Gateway (via Dartford) 16tpd, primarily compromising 13tph to/from the Isle of Grain. This would be increased with the Grain branch loop scheme as described under Option 14.2
- Hastings Line 4tpd
- Medway Valley line (via Dartford) 2tpd

This list excludes locations with less than one train per day and locations in the London area.

11.10.5
Beyond the above a key long-term consideration for rail freight in Kent is the extent to which new freight services use HS1. Whilst traffic can reach the Dagenham area using HS1 alone, substantial use of this route in the longer term is likely to be linked to the development of a high gauge route to the north, avoiding many of the current constraints in the London area. However, given that this is most likely to involve new traffic flows, for example high value perishable goods, rather than diversion of existing traffic it is considered unlikely that this would be a reason not to alleviate constraints on the “Classic” lines directly within the scope of this RUS.

11.10.6
Possible longer term enhancements to Thames Gateway freight include enhancing the route to the Grain branch to W10 gauge, allowing 9’6” deep sea containers to be carried on standard wagons. This will be an important consideration when any structures are rebuilt in the interim on the relevant routes. In addition, a further longer term scheme could be the provision of a new chord to connect the Higham area directly to the Grain branch, avoiding a reversal at Hoo.

11.10.7
A wider view of how to accommodate increasing levels of freight in the London area is being produced by the forthcoming London & South East RUS.
11.11 Consideration of environmental change

11.11.1 It is likely that climate change factors will become increasingly important considerations in future transport decision making. This will be relevant to several policy areas, for example:

- facilitating and responding to a modal shift from road to rail, for both passenger and freight services
- facilitating and responding to modal shift from air to rail, which is particularly relevant due to international services on HS1
- ensuring the rail industry’s carbon emissions are minimised
- responding to electricity supply policy, which is relevant to rail due to potential changes in coal train flows and rail flows to the nuclear power station at Dungeness (though this has not been safeguarded as a potential future new nuclear power station site)
- further electrification.

11.11.2 It is noted that environmental changes could potentially make instances of extreme weather more frequent. If this prediction materialises it would present challenges in terms of train performance and infrastructure durability.

11.12 Other potential long-term factors

11.12.1 In early 2009 the Mayor of London announced a study into the creation of a major international airport, as an alternative to the Government’s planned expansion of Heathrow. This would be located in the Thames Estuary, with the primary means of access by rail via HS1. Since these proposals are only at a very outline stage the RUS is not considering the scheme at present. However, if circumstances were to change it could be considered as a sensitivity test, since there would be a need to identify how the remainder of the strategy would be modified if it were to go ahead. Capacity at St Pancras International and on HS1 for the numerous additional services needed would clearly be a very major issue.

11.12.2 There is concern regarding the long-term future of the Folkestone – Dover line, due to coastal erosion of the chalk cliffs it runs alongside. It is highlighted that contingency plans for a major breach of this route may need to be prepared within the 30-year timescale. This could potentially include services being routed via a new chord at Canterbury.

11.13 Summary

11.13.1 This chapter has identified opportunities and challenges for the longer term.

11.13.2 As described the peak capacity issues beyond 2020 are likely to include the need to cater for increasing London commuter demand from key growth areas such as the Thames Gateway and Ashford. The RUS considers that this could be accommodated by means of a potential Crossrail extension to Gravesend, and the possibility of converting the Hayes branch to another transport mode. Lengthening and extension of HS1 domestic services has been recommended in previous chapters for implementation prior to 2020, but further use of HS1 may also need to be considered after this point, though it should not be assumed to have significant levels of spare capacity.

11.13.3 For non-London travel and demand away from the traditional commuting peak periods the key ongoing challenge will be facilitating a modal shift from road to rail. This is likely to require changes to car parking policy, fuel prices or highway charging to restrain traffic growth, with the RUS analysis suggesting that solely providing additional train services is unlikely to be successful in facilitating the step-change sought by policy makers.
12. Next steps

12.1 Introduction
12.1.1
This Route Utilisation Strategy (RUS) will become established 60 days after publication unless the Office of Rail Regulation (ORR) issues a notice of objection within this period.

12.1.2
The recommendations of a RUS – and the evidence of relationships and dependencies revealed in the work to derive them – form an input to decisions made by industry funders and suppliers on, for example, franchise specifications or investment plans.

12.2 Procurement of additional rolling stock
12.2.1
The assumptions for Control Period 4 (CP4) in this RUS assume additional rolling stock. The DfT’s rolling stock plan is currently being updated, but the key priorities are thought likely to be consistent with this RUS as follows:

- new dual-voltage rolling stock for the future Thameslink corridor routes, with a gradual introduction of vehicles likely in advance of Key Output 2
- new or cascaded rolling stock to enable Southeastern to operate longer trains as part of the CP4 capacity plan. This is principally in the suburban area, and it is noted that a particular feature remaining outstanding is a strategy for the 10-car Class 376 fleet on a 12-car railway.

12.2.2
Beyond the above, the RUS strategy of additional capacity to St Pancras International will be dependent on additional Class 395 or similar vehicles. Assuming that demand grows as forecast the procurement of such vehicles is the key RUS recommendation for Control Period 5 (CP5), with procurement potentially linked to re-franchising.

12.3 Re-franchising
12.3.1
Many of the recommendations in this RUS are associated with future franchise replacements. This will be linked to the re-franchising of the area currently operated by Southeastern and routes operated by First Capital Connect.

12.3.2
It is likely that the replacement franchises will be based on the post-Thameslink service pattern, and the process is likely to commence with Department for Transport (DfT) issuing Stakeholder Briefing documents in 2012.

12.4 London Bridge construction works
12.4.1
The significant challenge of the London Bridge construction works cannot be overstated. This will be a key issue affecting train services over a wide area for several years. Whilst Chapter 4 provides an indicative strategy, further refinement is ongoing and there is a degree of flexibility in terms of timings.

12.5 Safeguarding of land for longer term opportunities
12.5.1
This RUS (and/or the South London RUS in some cases) has recommended that land is protected for the following longer term heavy rail schemes relevant to Kent, even though at this stage they have not been proven for implementation. This list is not exhaustive, since there will be many other schemes of a more tactical nature which could also have land requirements.
- Extension of Crossrail beyond Abbey Wood to Gravesend (including additional tracks through Dartford, should this prove necessary)
- Extension of the London Underground Bakerloo Line to take over the Hayes branch
- Herne Hill flyover
- Charing Cross passenger congestion relief (potentially to involve a street level concourse at the Embankment end of the station).

12.5.2
Network Rail will discuss the implications of protecting the above land with the relevant planning authorities for each site.

12.6 Ongoing access to the network
12.6.1
This RUS will also help to inform the allocation of capacity on the network through application of the normal network code processes. Service patterns would in general be expected to be consistent with recommendations of established RUSs.

12.7 Review
12.7.1
Network Rail is obliged to maintain a RUS once it is established. This requires a review using the same principles and methods used to develop the RUS:
- when circumstances have changed
- when so directed by ORR
- when (for whatever reason) the conclusions may no longer be valid.
### Appendix A – Station usage and facilities

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### Appendix B – Glossary

<p>| <strong>AC</strong> | Alternating Current, as used in the overhead electrification system, predominantly north of the River Thames. |
| <strong>ATO</strong> | Automatic Train Operation. System allowing driver-less operation of trains. |
| <strong>ATOC</strong> | Association of Train Operating Companies. |
| <strong>BCR</strong> | Benefit Cost Ratio. |
| <strong>Capacity (of rolling stock)</strong> | Capacity is deemed to be the number of standard class seats on the train for journeys of more than 20 minutes; for journeys of 20 minutes or less different rules apply. |
| <strong>Capacity (of infrastructure)</strong> | The capacity of a given piece of railway infrastructure is an assessment of the maximum number or mix of trains which could operate over it. This is quantified more formally through a Capacity Utilisation Index (CUI). |
| <strong>Capacity (of stations)</strong> | The pedestrian capacity of a station is an assessment of the maximum number of passengers it can acceptably handle, given the station layout at the site concerned. |
| <strong>Chatham Main Line</strong> | One of the principal routes on the Kent RUS area, connecting London Victoria to Kent coast via Swanley, Chatham and Sittingbourne. |
| <strong>Class 395</strong> | Hitachi-built dual-voltage rolling stock that will be used for domestic services on the High Speed line. |
| <strong>Constraint</strong> | A term used in this document to describe the specific geographic locations where services operate at or close to the maximum practical level. |
| <strong>Control Period 4 (CP4)</strong> | The 2009-2014 period. |
| <strong>Control Period 4 Delivery Plans</strong> | Network Rail’s investment plans for the 2009-2014 period, as published on their website. |
| <strong>Control Period 5 (CP5)</strong> | The 2014-2019 period. |
| <strong>Crossrail</strong> | A new cross-London rail connection between Maidenhead and Heathrow in the west and Abbey Wood and Shenfield in the east. |
| <strong>DB Schenker</strong> | Freight operating company formerly known as English Welsh and Scottish Railway (EWS). |
| <strong>DC</strong> | Direct Current, as used in the third rail electrification system, being the predominant form of traction power on the Kent RUS network. |
| <strong>DDA</strong> | Disability Discrimination Act, relevant to the design of new vehicles and infrastructure |
| <strong>DFT</strong> | Department for Transport. |
| <strong>DLR</strong> | Docklands Light Railway. |
| <strong>DOO</strong> | Driver-Only Operation, ie. trains which operate without carrying a guard. |
| <strong>Down line</strong> | The line normally used by trains travelling away from London. |
| <strong>Dual voltage rolling stock</strong> | Rolling stock which is able to operate over both the DC and AC electrified networks. Such rolling stock is required for routes such as the Thameslink network and services routed from Kent onto HS1. |
| <strong>Dwell time</strong> | The time a train is stationary at a station. |</p>
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<th>East Kent Resignalling</th>
<th>Two-phased programme of work to replace signalling assets between Strood and Ramsgate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient Engineering Access</td>
<td>A generic term for an initiative aimed at establishing a more efficient access regime for the delivery of the required maintenance and renewal of the railway infrastructure, balancing engineering requirements with passenger and freight demand.</td>
</tr>
<tr>
<td>ELL</td>
<td>East London Line.</td>
</tr>
<tr>
<td>ELL extension phase 1</td>
<td>The extension of East London Line services onto the existing national rail network to West Croydon and Crystal Palace (via Sydenham), as currently under construction.</td>
</tr>
<tr>
<td>ELL extension phase 2</td>
<td>The extension of East London Line services onto the existing national rail network to Clapham Junction (via Denmark Hill).</td>
</tr>
<tr>
<td>ERTMS</td>
<td>European Rail Traffic Management System. A future railway signalling system, with equipment located in the driver’s cab, rather than at the lineside.</td>
</tr>
<tr>
<td>Fare elasticity</td>
<td>The effect of a change in fare on passenger demand.</td>
</tr>
<tr>
<td>FCC</td>
<td>First Capital Connect, the current operator of the Thameslink route.</td>
</tr>
<tr>
<td>Fixed formation</td>
<td>Rolling stock manufactured to a particular length which is not divisible into smaller units.</td>
</tr>
<tr>
<td>FOC</td>
<td>Freight Operating Company</td>
</tr>
<tr>
<td>Gap</td>
<td>Where the current or future railway does not or would not meet requirements expected by stakeholders, unless action was taken.</td>
</tr>
<tr>
<td>GOSE</td>
<td>Government Office of the South East.</td>
</tr>
<tr>
<td>Headway</td>
<td>The minimum interval possible between trains on a particular section of track.</td>
</tr>
<tr>
<td>High Speed One (HS1)</td>
<td>The new line from St Pancras International to the Channel Tunnel. Previously referred to as the Channel Tunnel Rail Link.</td>
</tr>
<tr>
<td>HLOS</td>
<td>The DfT’s High Level Output Specification, which has specified to Network Rail the outputs that need to be delivered within a Control Period.</td>
</tr>
<tr>
<td>IKF</td>
<td>Integrated Kent Franchise, as currently operated by Southeastern.</td>
</tr>
<tr>
<td>JPIP</td>
<td>Joint Performance Improvement Plan.</td>
</tr>
<tr>
<td>Junction margin</td>
<td>The minimum interval possible between trains operating over the same junction in conflicting directions.</td>
</tr>
<tr>
<td>Key Output 0</td>
<td>An initial stage in the Thameslink Programme, this term describes the changes implemented in March 2009 whereby termination of services at Blackfriars and at Moorgate (via Farringdon) was discontinued.</td>
</tr>
<tr>
<td>Key Output 1</td>
<td>An intermediate stage in the Thameslink Programme, this term describes the planned changes by December 2011 where 16tph capability will be provided over the Thameslink route, including a significant numbers of 12-car services.</td>
</tr>
<tr>
<td>Key Output 2</td>
<td>The final stage in the Thameslink Programme, this term describes the completion of the remodelling works at London Bridge, providing 24tph capability over the Thameslink route.</td>
</tr>
<tr>
<td>Loading gauge</td>
<td>Maximum dimensions to which a vehicle can be built or loaded without being at risk of striking a lineside structure.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>London Bridge remodelling</td>
<td>The extensive construction works required to allow implementation of Thameslink Key Output 2.</td>
</tr>
<tr>
<td>London Overground</td>
<td>The branding being used by Transport for London to describe their train operations over certain routes, including the planned ELL services.</td>
</tr>
<tr>
<td>LUL</td>
<td>London Underground Limited.</td>
</tr>
<tr>
<td>Marshlink</td>
<td>Ashford to Hastings line.</td>
</tr>
<tr>
<td>Morning high peak hour</td>
<td>This RUS has taken the morning high peak to be comprised of all services which arrive at a London terminal within the 08:00 to 08:59 period.</td>
</tr>
<tr>
<td>NPV</td>
<td>Net Present Value.</td>
</tr>
<tr>
<td>ORR</td>
<td>Office of Rail Regulation.</td>
</tr>
<tr>
<td>Option</td>
<td>The options as identified in this document aimed at addressing the highlighted gaps.</td>
</tr>
<tr>
<td>PDFH</td>
<td>Passenger Demand Forecast Handbook. A set of techniques and data for modelling passenger demand, including demand elasticities based on formal research.</td>
</tr>
<tr>
<td>Pathing time</td>
<td>Time added into the timetable, in addition to the normal running time between two points, to take account of the interaction with other trains. A particular example would be to allow for occasions when the train needs to be held at a red signal, whilst awaiting other traffic to clear.</td>
</tr>
<tr>
<td>PIXC</td>
<td>Passengers In eXcess of Capacity. This is a measure of crowding. It only applies to weekday commuter trains arriving in London between 07:00 and 9:59 and those departing between 16:00 and 18:59. The PIXC measure for a Train Operating Company (TOC) as a whole is derived from the number of passengers travelling in excess of capacity on all services divided by the total number of people travelling, expressed as a percentage. PIXC counts are carried out in Autumn each year, either by means of a manual count on a typical weekday, or (increasingly commonly) by the calculation of average loads derived from automatic passenger counting equipment fitted on trains. The DfT has set limits on the level of acceptable PIXC at 4.5 per cent on one peak (morning or afternoon) and three per cent across both peaks. The DfT monitors the level of PIXC across peaks (both individually and combined).</td>
</tr>
<tr>
<td>PLANET</td>
<td>A demand forecasting model developed by the former SRA, and now managed by DfT.</td>
</tr>
<tr>
<td>Possession</td>
<td>Where part of the infrastructure is closed to train services in order to carry out maintenance, renewal or enhancement works.</td>
</tr>
<tr>
<td>PPM</td>
<td>Public Performance Measure, expressed as a percentage of trains running on time compared to those scheduled to run.</td>
</tr>
<tr>
<td>RA</td>
<td>Route Availability – a system to determine which types of locomotive and rolling stock may travel over a route, normally governed by the strength of underline bridges in relation to axle-loads and speed.</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>Railsys</td>
<td>A modelling tool used to measure performance.</td>
</tr>
<tr>
<td>ROTP</td>
<td>Rules of the Plan. These are detailed timetable planning rules, covering such issues as dwell times, planning headways, junction margins, running times between key nodes for different types of rolling stock, etc.</td>
</tr>
<tr>
<td>ROTR</td>
<td>Rules of the Route. Defines the time when maintenance and renewal activity is planned to be carried out.</td>
</tr>
<tr>
<td>RPA</td>
<td>Regional Planning Assessment.</td>
</tr>
<tr>
<td>RUS</td>
<td>Route Utilisation Strategy.</td>
</tr>
<tr>
<td>Seven Day Railway</td>
<td>Network Rail initiative implementing techniques which will minimise the impact on passengers and freight of engineering work.</td>
</tr>
<tr>
<td>SDO</td>
<td>Selective Door Opening – a means of ensuring that only selected doors open when a train is stopped at a station, leaving closed any doors which overhang short platforms. Not all rolling stock is fitted with this facility, those types of rolling stock which are so fitted vary in the permutations of doors which can be kept closed in this way.</td>
</tr>
<tr>
<td>Seated load factor</td>
<td>The number of passengers on a train service expressed as a percentage of total seats available.</td>
</tr>
<tr>
<td>SEEDA</td>
<td>South East England Development Agency.</td>
</tr>
<tr>
<td>SEERA</td>
<td>South East England Regional Assembly.</td>
</tr>
<tr>
<td>Single Line Working</td>
<td>Use of single line for all traffic due to the closure of adjacent line for maintenance or other reasons.</td>
</tr>
<tr>
<td>Southeastern SLC2</td>
<td>Southeastern’s Service Level Commitment 2 plans for the December 2009 timetable change.</td>
</tr>
<tr>
<td>SL RUS</td>
<td>South London Route Utilisation Strategy.</td>
</tr>
<tr>
<td>SMG</td>
<td>The RUS Stakeholder Management Group.</td>
</tr>
<tr>
<td>TEMPRO</td>
<td>Trip End Model Presentation Program. Software application used by the DfT to provide detailed analysis of journeys undertaken throughout the country.</td>
</tr>
<tr>
<td>TfL</td>
<td>Transport for London.</td>
</tr>
<tr>
<td>Thames Gateway</td>
<td>Major housing and regeneration area within the Kent RUS area encompassing Dartford, Graveshams, Medway and Swale.</td>
</tr>
<tr>
<td>Thameslink Programme</td>
<td>Major programme of works, chiefly in the London Bridge area, that will improve capacity and offer cross-London journey opportunities.</td>
</tr>
<tr>
<td>TOC</td>
<td>Train Operating Company.</td>
</tr>
<tr>
<td>Tonbridge Main line</td>
<td>One of the principal routes on the Kent RUS area, connecting London Bridge corridor to Kent coast via Sevenoaks, Tonbridge and Ashford.</td>
</tr>
<tr>
<td>tpa</td>
<td>tonnes per annum.</td>
</tr>
<tr>
<td>tph</td>
<td>trains per hour.</td>
</tr>
<tr>
<td>Train path</td>
<td>A slot in a timetable for running an individual train.</td>
</tr>
<tr>
<td>TRUST</td>
<td>A computer system which records actual train running times at strategic locations.</td>
</tr>
<tr>
<td>TWA</td>
<td>Transport and Works Act.</td>
</tr>
<tr>
<td>Up line</td>
<td>The line normally used by trains travelling towards London.</td>
</tr>
</tbody>
</table>