

## **Joint Transportation Board**

**10<sup>th</sup> June 2014**

### **Kent – Gatwick Direct Rail Service**

One of the intended outcomes of the KCC Rail Action Plan for Kent (2011) was a proposed direct Kent to Gatwick Airport rail service. This is a project that has long been supported by Members of Ashford Borough Council through the old Transport Forum and other Groups. KCC engaged ARUP as Consultants to complete a business case for the introduction of a new hourly rail service from Kent to Gatwick Airport and this was completed in February 2014.

***Covering report to ABC's Transportation, Highways & Engineering Advisory Committee (THEAC) and full business case are attached as Appendix 1 to this report.***

In that report submitted to the THEAC Meeting on the 28<sup>th</sup> April 2014, it was explained that the business case had concluded that, although the proposed service did fit with strategic aims, it was not recommended to go ahead with the scheme. Full details of the reasons behind this are contained within the report attached at Appendix 1, but in summary the chief reasons for this recommendation were a poor Benefit/Cost Ratio and difficulties of implementation within the current infrastructure which would not make it a worthwhile project to progress.

The THEAC did accept that it was quite clear that the direct service was not going to happen, but felt that there were other options for alternative semi-fast services that could be brought forward and had not yet been investigated. During discussion at the meeting a Member made alternative suggestions for a wider investigation of matters. His comments are detailed in full below and it was agreed that these comments should be forwarded to KCC Officers for consideration.

*A Member said that whilst he accepted the findings of the report, he agreed that not all alternative avenues had been pursued. He said that ARUP had done a good job with their business case, but they had been constrained because they were only asked to assess a regular, all day new service. They had used existing ticket data and talked with train operators, but perhaps KCC could have asked a different set of questions which would have widened the brief towards options and what might be workable within existing resources. He considered they could have been asked to look at whether there could be more frequent Redhill to Gatwick services, which would increase opportunities and in turn perhaps there could be a future investigation into making journeys from Tonbridge to and from Gatwick more frequent or more usable. For example, if at weekends some existing journeys became just Redhill to*

*Tonbridge, there could still be a case to ask Southern to see if the hourly trains could run on to Gatwick at those times. Secondly, there may be scope for Gatwick-Redhill-Tonbridge services early hours and after 8pm on weekdays to fill in the gaps and permit people wanting to catch early flights from Gatwick to use the trains. His view was that KCC should concentrate on seeking extra journeys at marginal times, suited to aircrew members as well as passengers catching flights early or late in the day. This would at least lead to some improvements to Ashford services to Gatwick.*

*The Chairman said that he agreed with these comments and they should be discussed with KCC Officers, perhaps at the next JTB. He also considered there was a lack of fast services from Ashford to Tonbridge and this could also be examined to improve the overall situation. The Committee considered there should be better rail connectivity between Ashford and Gatwick and that there were multiple options which could be explored using existing infrastructure.*

In acknowledgement of these comments the following response was received from Stephen Gasche, Principal Transport Planner – Rail, KCC, which summarised KCC's position and was one that they considered a reasonable description of the most viable way forward.

**"The report commissioned by KCC and produced by ARUP considered the introduction of a through service between Ashford and Gatwick in accordance with the criteria set out by the Department for Transport (DfT) for possible inclusion in their service specification for the management contract which will determine the operation of the Direct Award for the Southeastern franchise area between October 2014 and June 2018. In presenting their findings, ARUP followed exactly the requirements of KCC, i.e. to establish whether or not a direct service would be viable in accordance with these DfT requirements.**

**It is not possible to add in extra services on either the Tonbridge - Redhill or Redhill - Gatwick routes; these are determined by their respective franchise specifications, and in both cases have already been determined by the specification for the new Thameslink, Southern and Great Northern (TSGN) franchise.**

**The best option available is therefore to seek, both directly by KCC and also through the Tonbridge - Reigate Community Rail Partnership (CRP), some adjustments to the timings of the existing Tonbridge - Redhill service once the Southern routes are subsumed into the new TSGN franchise from July 2015. Specifically, this could mean re-timing westbound journeys so that they provide official (i.e. 4 minutes+) connections into Redhill - Gatwick services, and re-timing eastbound journeys so that they provide official connections into Tonbridge - Ashford services. There are several instances at present where the official National Rail enquiry website does not show connections because they are 2 or 3 minutes rather than 4+ minutes.**

**This is the most practical way forward now, as these minor changes - if approved by the DfT - would create a more reliable journey between Kent and Gatwick for those passengers choosing to use this route."**

### **Conclusion**

The purpose for reporting this matter to the Joint Transportation Board is to ask the Board to consider its position going forward as to whether it would support the suggestion of pursuing adjustment to the timings of the existing Tonbridge to Redhill service as part of the new TSGN Franchise post July 2015, or whether to ask for other options to be pursued in attempts to improve the service.

**John Farmer will be present at the Meeting to update Members on the outcome of the review and answer questions.**

## **BRIEFING NOTE - Kent-Gatwick Direct Rail Service**

**By:** Stephen Gasche, Principal Transport Planner – Rail, KCC  
**To:** Ashford Borough Council, THEAC Meeting for 28 April 2014  
**Subject:** **Kent-Gatwick Direct Rail Service**  
**Date:** 22 April 2014

### **The business case was completed by ARUP in February 2014.**

ARUP had previously done work on the Surface Access to Gatwick Airport, commissioned by Gatwick Airport.

### **Project Overview**

- The base case is a proposal to introduce a new rail service from Kent to Gatwick Airport, and other destinations within Sussex. The proposal includes an hourly service with limited stops, running seven days a week, calling at Paddock Wood, Tonbridge, Edenbridge and Redhill.
- The extended case would include further services at either end (or both), to Canterbury West and Horsham (also calling at Three-Bridges and Crawley). However, there would be problems caused through this extension, due to unsuitable timetable clashes with HS1 at Canterbury West, and lack of capacity at the stations to operate without disrupting current services.
- It is assumed that the service would run with 4-car Class 377 Rolling stock, transferred from Thameslink, Southern, Great Northern. This therefore assumes no capital costs at the initiation of this proposed service.
- An assessment of work based journeys from Kent to Sussex has shown that it is not a common commuter route. Only 2% of Gatwick Airport staff travel from Kent. Therefore this scheme would not be initially expected to receive passengers switching from other modes of transport. Further examination of services which do run between Kent and West Sussex or Surrey shows that there is not the market for such trips to be available, as the commuter numbers are small, and the majority (82.9%) of Kent residents also work within Kent. It would appear that the market for such journeys is currently serviced by car use.
- It would appear from assessing ticket information from stations included within the proposed service that stations other than Gatwick Airport would be likely to benefit from the service. This would mean that smaller improvements would be more beneficial, for example to the rail services within Kent.
- There are constraints along the route of the proposed service which will impact on delivery. There is an 85mph speed limit between Tonbridge and Redhill. This route is also blocked to all traffic between 1.05am and

6.50am on Sundays for essential maintenance. The track layouts at Redhill and Tonbridge stations will also be restrictive as to the services which can pass through the station. All of these constraints need to be considered as part of the project.

- The proposed service is included in KCC's strategic plans (Rail Action Plan for Kent, KCC, April 2011).

### **Timetable Investigations**

- For the report, Network Rail's December 2013 timetable was used in order to understand current services through the stations being considered as part of the proposed scheme.
- It was agreed that there should be no disruption or change to current Southeastern services, and retiming considerations, especially with other Train Operating Companies (TOC), is beyond the scope of this study. However, over the period between now and proposed implementation of the new service, it is expected that there will be some changes to the timetable to be taken into consideration.
- The timetable planning work shows that it would be possible to allow the proposed service to operate in off-peak periods, creating a journey time from Ashford to Gatwick of just over an hour. However, the capacity is currently not available in peak-times. Off-peak paths to coincide with current operating timetables have been estimated, but the important peak-time services are currently impossible to map.

### **Financial**

- The Route Utilisation Strategy (RUS) published in 2010, looked into possibilities with the rail line and timetable considered within this proposal. For all possibilities the RUS considered, the costs involved outweighed any benefits realised (not just financial benefits considered).
- The proposal has been determined as not financially viable. The annual operating cost of the service has been estimated to be £7.5million (confidentially supplied by Southeastern). Due to the lack of potential rail passengers, the Benefit Cost Ratio (BCR) has been estimated at 0.19, and even with a doubling of passenger numbers, the scheme would still not breakeven on costs. However, this has only been estimated on Value for Money terms and has not taken into account non-monetary benefits, such as journey time reduction.
- Due to the shortfall in BCR and poor return, the DfT would not support the service in the forthcoming Direct Award to Southeastern, unless the revenue shortfall was supported by KCC.
- Service enhancements within Kent are likely to be more beneficial.

### **Key proposed milestones**

- The proposed commencement of this service would have been May 2018.

- Analysis forecasting has taken place up to 2028, to cover the first 10 years of the proposed service running. It has not considered any increase which may occur should a second runway be created at Gatwick Airport, as this is outside the scope of the report.

### **Conclusions from the report**

- It is concluded that, although the proposed service fits with strategic aims, it would not be recommended to go ahead with the scheme. Due to the poor BCR and difficulties of implementation within the current infrastructure it would not be a worthwhile project to progress further with.



Kent County Council  
**Kent-Gatwick Direct Rail Service**  
Outline Business Case  
Final Report

REP/224001-00/P01

Issue | 27 February 2014



This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.




Job number 234001-00

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# Document Verification

# ARUP

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## Executive Summary

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This report examines the case for introducing a new train service from Kent to Gatwick Airport, and other destinations in Sussex. This follows the diversion of the existing Tonbridge service from Gatwick Airport to London in 2008.

The proposed service would run every hour, 7 days a week, from Ashford to Gatwick Airport, calling at Paddock Wood, Tonbridge, Edenbridge, and Redhill. A case was also examined for extending the service to Canterbury East, and Three Bridges, Crawley and Horsham. It would be additional to the existing Southern all stations service from Tonbridge to Redhill.

The service would commence in May 2018, to coincide with commissioning of an additional reversing platform at Redhill.

The proposed service would be run by Southeastern, mandated by DfT as part of the Direct Award franchise extension due to commence in October 2014. This requires that the revenue risk for the service would be borne by Southeastern, and therefore the business case has been calculated on the basis of financial benefits only, rather than the more usual financial plus economic benefits.

Only new revenue generated by the service (not revenue abstracted from other current train services) has been considered.

The Outline Business Case has been constructed in accordance with standard DfT principles.

A timetable for the proposed service has been examined, using the current December 2013 timetable as its guide, and with the objective of not altering existing services in Kent, Surrey or Sussex. The new combined Southern and Thameslink franchise is likely to change the Brighton Main Line timetable, but no details of this are yet available.

Reversal at Redhill forms a major timetable constraint, even with the second reversing platform. An off peak hourly path in both directions has been identified, but no viable peak hour paths currently exist, and would require alteration of Brighton Main Line services. This may be feasible, but cannot yet be confirmed.

Extension of this hourly path to Canterbury and Horsham is not viable. At Canterbury West it conflicts with the existing St Pancras service, while reversal at Horsham is unlikely to be possible once additional Thameslink services also start reversing there. Again, more comprehensive retiming may be feasible but cannot yet be confirmed.

Analysis of current ticket sales confirms that intermediate station calls at Paddock Wood and Edenbridge would be likely to generate significant passengers, due to their current passenger levels.

However a review of the work based journeys from Kent to Sussex, whether by car, rail or bus, demonstrates that there is relatively little travel by any mode, and that the majority of residents in Kent work within the county. This is also true of Gatwick Airport, where only 2% of the workforce lives within Kent. While provision of a new direct rail service may stimulate such journeys over the longer term, there appears to be only limited potential to attract current commuters who would switch modes.

Gatwick Airport provides a more significant potential rail market, with Tonbridge, Canterbury and Tunbridge Wells being significant origin points.

However we have compared the level of rail patronage prior to 2008, when there was a direct Tonbridge to Gatwick Airport service, with current rail passengers travelling to Gatwick Airport. It is apparent that the impact of the diversion of the existing service to London, and the need now to change at Redhill, has had relatively little impact on passenger numbers – less than 10% of passengers appear to have been lost.

In turn these factors limit the number of new passengers who would be attracted by the new service. We expect the base service (Ashford to Gatwick) to attract 197,000 new passengers in the scheme opening year, and the extended service (Canterbury West to Horsham) to attract 310,000 new passengers. It is noteworthy that most of the additional passengers in the extended service are travelling between Canterbury and Ashford, and that other service options would better address this demand.

We calculate the costs of running the Ashford – Gatwick service 7 days per week to be £7.5m per annum, and the extended Canterbury West – Horsham service to be £10.8m per annum. Data for this was supplied by Southeastern on a confidential basis.

The service does not attract enough passengers to achieve financial viability. The Ashford – Gatwick service achieves a Benefit Cost Ratio of 0.19 (1.0 represents financial breakeven). The Canterbury West – Horsham service achieves a lower BCR of 0.18, due to the higher operating costs failing to be outweighed by the additional passenger revenues generated. Again the additional revenue is mainly generated by additional Canterbury to Ashford passengers rather than those making the core journey to Gatwick Airport.

In both cases the demand which would be generated by the new services is insufficient to cover the operating costs, and the services would run at a substantial loss. Attracting double the numbers of passengers forecast would still not achieve financial viability. The fact that there are very few bus services running between Kent and Sussex (and none that support work journeys) would tend to confirm our analysis of the relative weakness of the overall market the service seeks to satisfy.

If economic benefits were taken into account (such as journey time savings, reduced car use and carbon savings) the BCR figures would improve, though again would be unlikely to achieve viability.

If the second runway at Gatwick Airport were recommended by the Davies Commission substantial additional air passenger numbers would be generated. This might create an opportunity to re-examine the case for the new service.

# 1 Introduction

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Arup has been commissioned by Kent County Council to carry out a high-level study of the case for introduction of a new 60-minute interval direct rail service between Ashford International – Gatwick Airport – Three Bridges via Redhill, commencing between 2015 and 2020, and with optional extensions at either or both ends to Canterbury West and Horsham.

It is Kent County Council's aspiration that the service should be operated by Southeastern (London and Southeastern Railway Ltd.), mandated as part of the Department for Transport's (DfT) Direct Award for the revised Southeastern franchise, due to come into effect in October 2014.

This remit builds on other recent work previously carried out by Arup in the Kent/Surrey area directly for Gatwick Airport on its Airport Surface Access Study.

In order to facilitate the review of the proposed scheme's viability, this report is set out using the standard DfT approach, where business cases are developed in line with the UK Treasury's advice on evidence-based decision making, as described in the Green Book. We use its best practice five case model approach. Accordingly, Section 5 of this report is written in the context of these five models and the analysis described has been carried out to determine if the scheme:

- Is supported by a robust case for change that fits with wider public policy objectives – the 'strategic case'
- Demonstrates value for money – the 'economic case'
- Is commercially viable – the 'commercial case'
- Is financially affordable – the 'financial case'
- Is achievable – the 'management case'

In terms of the DfT's decision making process for transport projects, this study forms part of the scheme's Strategic Outline Business Case. The analysis focuses on forecasting the likely passenger demand for the new service, and establishes its outline operational viability in the background of other planned changes to the rail network (and passenger franchising) in the London, Kent, Surrey and Sussex areas over the next 5 years.

This document reports on the results and presents the findings in terms of the economic, commercial and financial case for the scheme.

## 2 Methodology

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Our approach has focused on three principal areas of analysis to support the Strategic Outline Business Case requirements:

- A review of the current Working Timetables and Timetable Planning Rules to establish the operational viability of the proposed service (and its variants) in terms of available train paths
- A review of the commercial implications of the proposed service by quantifying expected levels of demand and revenue and the operating expenditure required to provide that service
- Using the outputs of the above workstreams to establish the commercial and financial case for the proposed scheme.

### 2.1 Timetable review

We have used the December 2013 Network Rail Working Timetables and Network Rail's timetable planning documentation (principally the Timetable Planning Rules), to establish the availability of viable train paths along the line of route, and especially on the core route sections between Tonbridge and Redhill and between Redhill and Gatwick Airport. This is the current timetable.

As a proxy for the Class 377 rolling stock expected to be used if the scheme were to be implemented, we have used data for Class 375 rolling stock provided by Southeastern to determine sectional running times (the agreed times taken for rolling stock to run between nominated stations). In performance terms the two classes are identical.

We have consulted with Network Rail's Sussex route team. Specifically, our discussion has focussed on:

- Timing of the proposals for the remodelling of Redhill station to provide an additional Platform 0;
- Remodelling of Gatwick Airport to provide an additional Down Fast platform to provide improved turnback facilities for Gatwick Express services;
- Track alterations at Three Bridges in connection with construction of the new Thameslink depot; and
- The acceptability in principle of accommodating the proposed service pattern

We have carried out the operational modelling by reviewing existing and proposed passenger and freight services on the line of route and identifying spare route capacity. The results have also been used to comment on how robust the proposed paths for the new service are likely to be, and the potential reaction of other train operating companies (TOCs) to the additional service proposed.

This approach has also helped establish round trip times and rolling stock requirements to inform the business case.

It has been agreed with both Kent County Council and DfT that the proposed timetable plan should not require any change to services run by Southern, partly to avoid any disruption to the new Thameslink, Southern, Great Northern (TSGN) franchise which is currently being tendered, as consequent retiming considerations

elsewhere on the network are beyond the scope of this study. This same constraint has been adopted for other Southeastern services east of Tonbridge, again because of the potential retiming considerations across the network.

However, TSGN franchise bidders are being encouraged to submit revised timetable proposals, and the impact of new Thameslink service will in any event change the Brighton Main Line (BML) service pattern. Therefore the BML timetable is likely to change in the future, and we have assumed that in the 5 years before introduction of the proposed service, reasonable additional timetable alterations to accommodate it could be planned and implemented.

## 2.2 Commercial review

We have carried out a review of the commercial implications of the proposed service by quantifying expected levels of demand and revenue, as well as the operating costs required by Southeastern to provide that service. This has the goal of establishing the budget/funding cover for required for the project.

Southeastern has been very helpful in assisting this study, and has provided information on ticket sales data for the stations of interest to the study, sectional running times for their Class 375 rolling stock as previously noted, passenger loadings on the existing Tonbridge services and operating costs. This information is commercially confidential and has therefore been provided on a restricted basis, but the results are used in the analysis within this report.

As required by the DfT, a clear distinction is made between abstracted revenue generated from passengers transferring from existing rail services operated by Southern or Southeastern to the new proposed service, and completely new revenue coming from passengers transferring from other (non-rail) modes of transport. Abstraction from current train services cannot be used in the Business Case, as from DfT's standpoint the same amount of passenger revenue as now is generated. Therefore the case must rely on the amount of new traffic generated by mode switching.

The proposed service will run on existing rail corridors and will not involve any new stations or journey opportunities. The changes to the current service provision are an increased frequency, faster running times and elimination of changes en route.

The demand forecasting process has involved the application of demand elasticities to factors outside the direct control of the rail industry, and assessment of the results of initiatives assumed to be within the direct control of the rail industry. The principal external factors assessed include increases in Gross Domestic Product (GDP), the growth of Gatwick as a key airport (but not including provision of a second runway) and population growth within Kent, whilst the primary internal factors considered are rail journey times, service frequencies and rail fares.

Elasticity parameters are taken directly from the Association of Train Operating Companies' (ATOC) Passenger Demand Forecasting Handbook (PDFH) version 5, which sets out the standard industry demand forecasting methodology and demand growth factors.

Revenue data analysis has been based on the latest available rail industry LENNON data for 4 years up to November 2013. LENNON captures all station

ticket sales to all destinations, and as well as passenger journeys provides data on the average revenue yields per journey (important due to the variety of peak, off peak, child, railcard and promotional fares available).

The study has concentrated on traffic between the following key stations <sup>1</sup>

- Ashford (Kent)
- Canterbury (East and West)
- Dover Priory
- Edenbridge (Edenbridge and Edenbridge Town))
- Folkestone (Central and West)
- Gatwick Airport
- Horsham
- Margate
- Paddock Wood
- Ramsgate
- Redhill
- Three Bridges
- Tonbridge
- Tunbridge Wells

These stations are the principal calling points of the Base and Extended Case services, plus the major traffic generating points in East Kent.

Where the proposed Southeastern service runs on the same route as Southern trains, revenue is shared between the two operators using a system known as Operational Research Computerised Allocation of Tickets to Services (ORCATS) operated by the Association of Train Operating Companies (ATOC). Running a new Southeastern service will redistribute some of the existing revenue from Southern to Southeastern. The Southeastern revenue gained from this source has been ignored in our study as in line with DfT guidance we are only concentrating on the generation of new passenger journeys in addition to current patronage.

We have worked on generating operating costs for the new service and have been provided with data by Southeastern on a confidential basis. The data includes train crew costs, rolling stock lease costs, and traction power, maintenance and track access expenditure on a per mile run basis. Where Southeastern is not the station facility owner (SFO) the operator also has to pay a station access charge per train call to the other SFO. In all cases this is Southern, and the stations concerned are all those west of Tonbridge. For reasons of confidentiality only gross costs are set out in this report.

There are no capital costs required to provide additional facilities required to run the proposed service. The new platforms at Redhill and Gatwick Airport, and alterations at Three Bridges, are being funded for other reasons not principally to facilitate the proposed service. Special one-off cost items such as traincrew route

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<sup>1</sup> Where 2 stations are quoted this is because they are linked as a common destination in the railway ticketing system



training associated with the route from Redhill to Gatwick Airport were considered, but it was agreed with Southeastern that the cost was negligible and therefore at this stage of feasibility this element has been omitted.

## 2.3 Business case

Following the completion of the timetable and commercial review, the outputs have been used to prepare the Strategic Outline Business Case for the proposed scheme. In so doing, the costs and revenues from the new service are estimated over the life of the scheme (agreed as being 10 years) and Net Present Values (NPV) for the scheme are then calculated. As there are no capital costs to consider an overall NPV of 0 represents a case that covers all its operating costs. Positive values indicate a financial surplus, while negative values indicate that the service would run at a loss and would require support.

The business case described below does not consider the impacts of construction of a second runway at Gatwick Airport and the consequent additional increase in air passengers. For now this impact is ignored, and air passenger levels are assumed to grow in line with current predictions provided by Gatwick Airport Ltd. Given that the Davies Commission has included a Gatwick option in its Interim Report (published in December 2013) and may recommend it in its Final Report (due in Summer 2015) there may be a case at that time to re-examine the business case to reflect revised demand forecasts.

Normally the business case would also consider economic values such as value of time saved by using the new service, carbon dioxide production and vehicle operating costs. These would be added to produce a Benefits Cost Ratio (BCR). However this scheme is being treated differently.

At a meeting with DfT it was agreed that if the service is approved it will be included in the forthcoming Direct Award franchise requirements being negotiated with Southeastern. This requires that Southeastern take revenue responsibility for the provision of services outside the core franchise. DfT is not in a position to compensate non-monetised benefits under this arrangement. Therefore any service proposal must demonstrate to the franchisee's satisfaction that it will earn a positive financial return. In addition, Southeastern is already reviewing options for the deployment of the 25 additional units being transferred from Southern as part of the TSGN franchise arrangements, and it might be that other options prove more financially remunerative, which could influence the priority afforded to this option.

### 2.3.1 Outline approach to assessing Value for Money

At this stage, only the BCR values for the scheme have been estimated. An Appraisal Summary Table has not been provided. As required by DfT, this report details the BCR values in the form of a Value for Money (VfM) statement outlining the VfM category, and a summary of the present value of costs and benefits accruing as a result of the scheme. Non-monetised benefits and the key risks, sensitivities and uncertainties have not been considered in detail given the results of this exercise.

### 2.3.2 Options appraised

The following options have been appraised as part of the Strategic Outline Business Case:

- **Baseline Option (the Base Case):** a new 60-minute interval (limited stop) rail service between Ashford International and Gatwick Airport with calls at Paddock Wood, Tonbridge, Edenbridge, and Redhill;
- **Extended Services Option (the Extended Case):** Same as Baseline Option but with the extension of services to Horsham in the west calling at Three Bridges and Crawley, and Canterbury West in the east.

Figure 1. Class 377 4-car unit in Southern livery.



Credit: Hugh Llewellyn <http://www.flickr.com/photos/camperdown/6743408137/>

In all the options appraised, it is assumed that the new services will be operated using additional 4-car Class 377 rolling stock transferred from TSGN. Under the franchise arrangements supporting the new TSGN franchise due to commence in September 2014, 25 Class 377 units are to be cascaded to Southeastern as a franchise obligation. Southeastern is currently considering where these units should be deployed. It is assumed that if a convincing case can be made then sufficient units will be made available to resource this new service.

All the options are compared against a **Do Minimum** scenario which assumes that existing Southeastern and Southern services in the December 2013 Working Timetables continue. It is recognised that the new TSGN franchise, which amalgamates Southern's and First Capital Connect's (FCC) routes and services, is likely to involve a reshaping of all services on the BML, including running additional services. However it is likely that the current all stations Tonbridge to Redhill service will continue in one form or another during the study period.

### 2.3.3 Key Assumptions:

In compliance with guidance from the DfT, assumptions from WebTAG have been applied in the analysis carried out.

The key assumptions are the following:

- The appraisal period is 10 years from scheme opening - assumed to take place in May 2018
- Capital expenditure for Platform 0 at Redhill station is not included in the Business Case appraisal as it is a Network Rail committed scheme independent of this proposed new rail service
- Provision of the new service is to be procured through DfT Direct Award
- The demand to/from Gatwick Airport is identified separately from the demand from other station pairs expected to benefit from the scheme, and ignores the provision of a second runway
- The year on year growth for the two demand segments are treated differently: the growth for demand to/from Gatwick Airport is linked to the airport passenger forecasts developed by Gatwick Airport Limited and reported in its 2012 Master Plan; the growth for the other (regional) demand is linked to forecasts taken from the National Trip End Model (NTEM) and TEMPro (Trip End Model Presentation Program) software

These assumptions, along with other secondary assumptions, are specified in the Assumptions Register included in the analysis spreadsheet that accompanies this report.

## 3 Timetable Review

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Our review commences with an assessment of the access possibilities on the core corridor between Redhill and Tonbridge (as this is the most constrained section of the route), and then adds extensions to Gatwick and beyond and Ashford and beyond using the core paths identified.

Network Rail's route definitions change at Redhill. Redhill to Gatwick Airport and Horsham, and Tonbridge, Ashford and Canterbury West is the down direction. Routes towards Redhill are the up direction.

### 3.1 Current timetable

Prior to 2008 trains between Redhill and Tonbridge were run by Southeastern, reversing at Redhill and continuing to Gatwick Airport. In December 2008 the operation was passed over to Southern, and the service diverted and extended to run to either London Bridge or London Victoria during the day, but only to Redhill in the evenings and on Sundays.

Many routes in the south of England and elsewhere on the national rail network operate on a 'standard hours' basis, where a single hourly timetable repeats throughout the day, with strengthening at peak periods. This simplifies timetable planning and produces memorable timetables which passengers can understand, but does not necessarily optimise network capacity. For reasons discussed below this concept only partially applies to the Tonbridge to Redhill route.

All trains call at all stations (Redhill, Nutfield, Godstone, Edenbridge, Penshurst, Leigh and Tonbridge), with the exception of the 23.55 departure from Redhill, which calls only at Edenbridge and Tonbridge. All stations on the route are managed by Southern, with the exception of Tonbridge, which is managed by Southeastern.

Train services are provided by Southern, though in practice some are crewed by Southeastern drivers and conductors for diversionary route knowledge purposes.

Trains depart at the following times:

Table 1: Current timetabled departure times

Redhill depart			Tonbridge depart		
Mon - Fri	Sat	Sun	Mon - Fri	Sat	Sun
05.35	06.22 #	08.13	04.59 #	05.24 #	07.23
05.57	07.22 #	09.10	05.20 #	06.19 #	08.29
06.42 #	08.17 #	10.10	06.10 #	07.19 #	09.29
07.14 #	09.17 #	11.10	06.47 #	08.19 #	10.29
07.30 #	10.17 #	12.10	07.25 #	09.19 #	11.29
07.59 #	11.17 #	13.10	07.59 #	10.19 #	12.29
08.25 #	12.17 #	14.10	08.16 #	11.19 #	13.29
08.59 #	13.17 #	15.10	08.37 #	12.19 #	14.29
09.17 #	14.17 #	16.10	09.19 #	13.19 #	15.29
10.17 #	15.17 #	17.10	10.19 #	14.19 #	16.29
11.18 #	16.17 #	18.10	11.19 #	15.19 #	17.29
12.17 #	17.17 #	19.10	12.19 #	16.19 #	18.29
13.17 #	18.17 #	20.10	13.19 #	17.19 #	19.29
14.17 #	19.17 #	21.10	14.19 #	18.19 #	20.29
15.17 #	19.51	22.10	15.19 #	19.10	21.29
16.19 #	20.51	23.10	16.19 #	20.10	22.29
17.13 #	21.51		16.42 #	21.10	
17.39 #	22.55		17.21 #	22.10	
18.17 #	23.55*		17.49	23.17	
18.32			18.23 #		
19.04 #			18.51 #		
19.51			19.10		
20.51			20.10		
21.55			21.10		
22.55			22.10		
23.55*			23.19		

\* Indicates train calls only at Edenbridge  
# Indicates train runs to or from London Bridge or London Victoria

A number of conclusions can be drawn from this summary:

- The peak hour pattern of services is relatively random, with intervals varying between 16 and 34 minutes. This is driven largely by the availability of paths between Redhill and East Croydon, and to a lesser extent by the fact that some services join or spilt with Reigate services at Redhill.

- Daytime services run through to London, while evening services terminate or start at Redhill. Sunday services all run as a shuttle to and from Redhill
- There is more or less a standard hour departure time during the off peak day, and again in the evening though at different times. The standard departure times are different on Sundays.

For reasons explained below, this makes the creation of a standard path for an additional train between Redhill and Tonbridge extremely difficult, and impossible for a limited stop path.

While not within the scope of this study, it does appear to us that there is an opportunity to replan some of the departure times to a more standardised pattern to achieve a more memorable service pattern. There are practical considerations to this, and in particular the availability of turnback platforms at Redhill and Tonbridge, but nevertheless this would appear to deliver some commercial benefits for little or no operational cost and should be discussed with the new TSGN franchisee.

## 3.2 Infrastructure constraints

The core section of the corridor between Redhill and Tonbridge has a number of operational constraints imposed by the current infrastructure.

### 3.2.1 infrastructure and operations

The route crosses the boundary between the control areas of two of Network Rail's major signalling centres, at Three Bridges (covering most of Sussex) and Ashford (covering most of West Kent). This section of route has signals spaced at long intervals (the maximum is nearly 5 miles between Penshurst and Edenbridge). This results in extended headways.

Maximum permitted linespeed between Redhill and Tonbridge is 85 mph.

As a result of this Timetable Planning Rules require there to be a minimum headway of 7 minutes following a fast (limited stop) service, and 9 minutes following a stopping service (because of the additional time needed for trains to slow, stop at the station and accelerate). This cannot be improved without major resignalling work. At this time no such work is planned by Network Rail.

The route is blocked to traffic between 01.05 and 06.50 on Sunday mornings for standard engineering purposes, but otherwise is continuously open for traffic.

### 3.2.2 Station track layouts

Constraints are imposed by the track layouts at Tonbridge and Redhill stations.

#### 3.2.2.1 Tonbridge

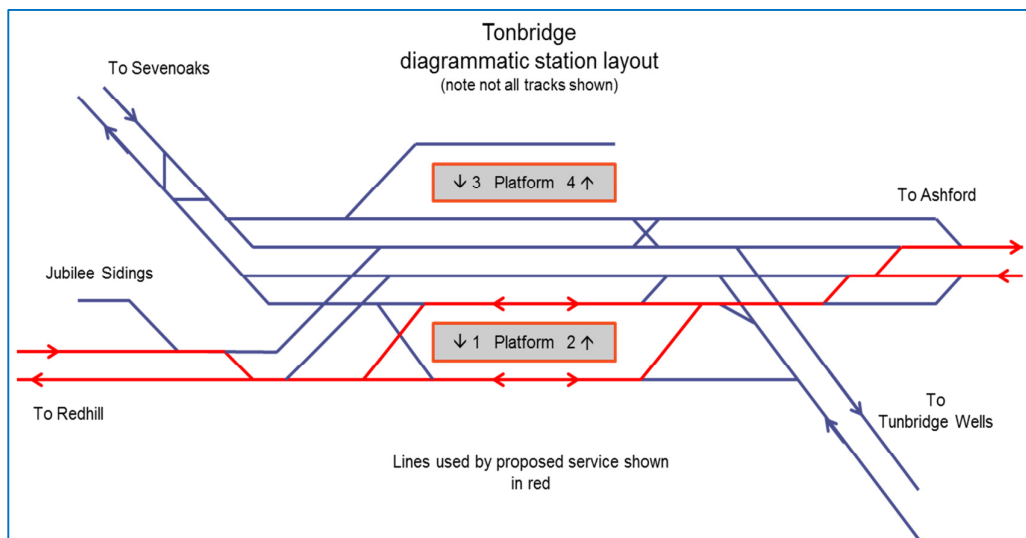
Tonbridge is situated on the South Eastern Main Line from London to Dover via Sevenoaks and Ashford. It is joined at the west end by the line from Redhill, while to the east the line to Tunbridge Wells and Hastings leaves.

The main line is provided with loops, each of which serves a platform. The Redhill line comes into the station on the up (south) side, and the London bound platform has a rear face to it (platform 1) to allow trains from Redhill to arrive and depart independent of main line train movements. This platform is also used by Medway Valley services running to and from Strood and trains from Tunbridge Wells. Trains can also run via platform 2, though this is also used by London bound trains. Trains from Redhill cannot gain access to platforms 3 or 4.

Redhill trains which terminate at Tonbridge usually run forward into the Jubilee Sidings at the west end of the station to stand clear of the main line during turnrounds.

Planning additional train services requires identification of times when Platform 1 or 2 is unoccupied, and for trains running towards Ashford a time when both the up and down lines to the east of the station are free of traffic. There are two sections of line which trains in both directions occupy, meaning that up and down Redhill trains cannot arrive or depart simultaneously. A diagrammatic view of the track layout is shown below, with the route taken by the proposed service shown in red.

Figure 2: Simplified track layout diagram – Tonbridge Station



### 3.2.2.2 Redhill

Redhill station is a congested location, with a relatively constrained track layout. Redhill is the junction between the Slow Lines of the Brighton Main Line (the Fast Lines avoid the station completely), and a branch to Reigate, Guildford and Reading to the west and Tonbridge to the east. Both these branches run into the station in a northerly direction, but Gatwick Airport is further south. Trains from the branches running to Gatwick therefore have to reverse at Redhill.

All trains which reverse must do so in either platform 1 or 2 on the up (west) side of the station. Platform 2 is also used for London bound main line services.

Tonbridge trains have to cross the entire track layout to reach the turnback platform, which constrains the available paths as no other trains can run while this move takes place. All trains in either direction would have to cross a portion of the Up Slow line, which forms a significant bottleneck. Access into platform 3 is not possible from either the Tonbridge or Gatwick directions.

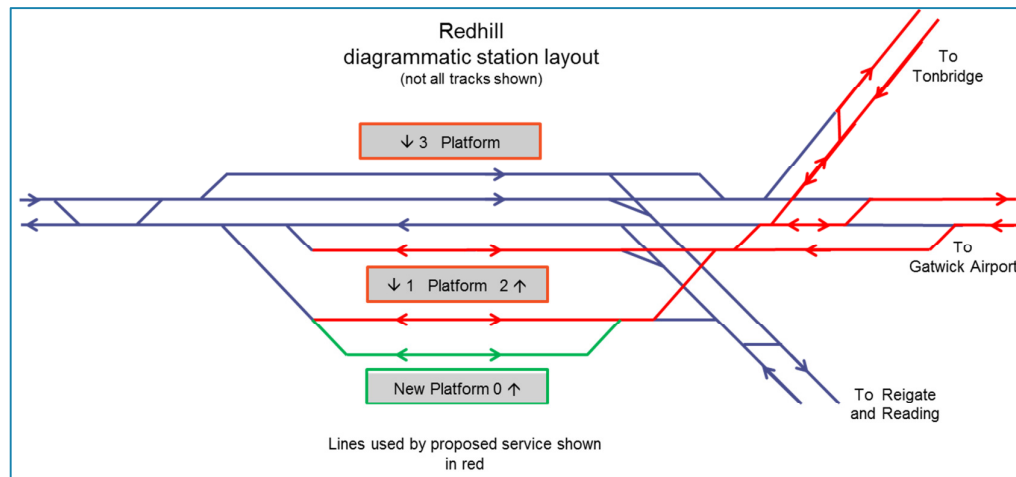
Currently First Great Western (FGW) runs a half hourly service between Reading and Redhill. Only one train per hour continues on to Gatwick. Network Rail's Route Utilisation Strategy (RUS) for Sussex, published in January 2010, identifies a lack of capacity between Redhill and Gatwick as the reason for the second service not continuing beyond Redhill.

In response Network Rail is planning to commission a new platform 0 to the west of the station, on rarely used freight infrastructure. This is primarily intended to provide additional capacity for FGW services, and should enable all their trains to run to and from Gatwick Airport. Though it will also be available for Tonbridge services this still requires that trains cross the entire throat, and therefore many of the operational constraints identified above remain.

A diagrammatic view of the Redhill track layout is shown below, with the routes taken by the proposed service shown in red, and the new platform 0 infrastructure shown in green.

Network Rail is planning to commission platform 0 in December 2017.

Figure 3: Simplified track layout diagram – Redhill Station



### 3.2.3 Gatwick Airport

The track layout at Gatwick Airport is being improved to allow Gatwick Express services to reverse on the Fast Lines (east) side of the station. This produces spare capacity on the Slow Line side of the station.

On the Slow Lines side (the Slow Lines lead to Redhill and would be used by the Tonbridge services) there is an additional platform face on the west side which is able to be used for reversing services. In addition there is direct access to 3



electrified carriage sidings to the south of the station. Network Rail's view is that this means that it would be possible to reverse Ashford services either in the station or in the adjacent carriage sidings.

Gatwick is a key interchange point with other lines to Eastbourne and Hastings, Brighton, Littlehampton, Bognor, Portsmouth and Southampton, and almost all trains call there. Therefore it is a far more important interchange point than Three Bridges.

### 3.2.4 Three Bridges

Three Bridges station will become much more important in the future, as the main rolling stock depot south of the Thames for Thameslink services will be located there. It will be particularly busy in the mornings and evenings with sets entering or leaving service. However the station track layout is not being altered, and is likely to become more congested in future. There is only one platform face (platform 1) available for reversing trains. In discussion, Network Rail expressed strong preference for the Ashford service not to reverse there, but to terminate at Gatwick Airport instead because of the potential conflicts.

We agree with this analysis. Gatwick also offers better connections than those available at Three Bridges, and has better capacity for reversing services.

In discussion with the client Gatwick Airport has therefore been adopted as the terminating point of the Base Case service.

## 3.3 Train service planning

The timetable proposed in this section is planned in strict accordance with Network Rail's Timetable Planning Rules, and without any alteration to existing train times. There could in fact be some additional flexibility to mitigate some of the constraints identified. This may be possible through the service replanning that will follow the award of the TSGN franchise. However this would be for the planning team at Southeastern to take forward if the service is adopted.

In our approach, we have first considered the availability of paths on the core Tonbridge – Redhill section, as this is the most constrained segment of the proposed service.

The journey time between Redhill and Tonbridge is 29 ½ minutes, calling at all stations, plus 1 minute of engineering allowance (additional running time to provide for speed restrictions imposed as a result of engineering works). The journey time in the return direction is 30 ½ minutes, plus normally 1 minute of pathing time (additional journey time to enable the train to be planned through constrained junction areas). The longer up journey time is due to the rising gradient towards Redhill on this section of route. Standard train planning principles mean timings are set at half minute intervals.

The running time for trains from Tonbridge to Redhill stopping only at Edenbridge is 20 minutes, a journey time saving therefore of 9 ½ minutes. The running time from Redhill to Tonbridge is 21 minutes.

To produce compliant paths the following rules have been used.

- The new service must leave Redhill or Tonbridge no less than 7 minutes before an existing all stations service

and

- The new service must arrive at Redhill or Tonbridge no less than 9 minutes after an existing service.

The client objective is to achieve a standard hour path wherever possible, to aid passenger memorability, and therefore to maximise the commercial benefits.

Analysis of each hour based on the rules outlined above suggests that the following off peak paths are available, departing from each end. The slots are assembled into groups of similar times and then colour coded for ease of reference.

Table 2: available slots between Redhill and Tonbridge

	Down path slots			Up path slots	
	Departures from Redhill			Departures from Tonbridge	
	From	To		From	To
	00:15	05:28		23:39	04:52
	06:17	06:35		05:40	06:03
	07:02	07:07		06:30	06:40
	07:50	07:52		07:07	07:18
	08:45	08:52		07:45	07:52
xx.39-xx.10	09:37	10:10	xx.39 - xx.12	08:57	09:12
	10:37	11:10		09:39	10:12
	11:37	12:10		10:39	11:12
	12:37	13:10		11:39	12:12
	13:37	14:10		12:39	13:12
	14:37	15:10		13:39	14:12
	15:37	16:12		14:39	15:12
	16:39	17:32	15:39	16:12	
	17:59	18:10		17:02	17:14
	18:52	18:57		17:41	17:42
xx.24- xx.44	19:24	19:44		18:09	18:16
	20:11	20:44		18:43	18:44
	21:11	21:48	xx.30 - xx.03	19:30	20:03
	22:15	22:48		20:30	21:03
	23:15	23:48		21:30	22:03

Standard daytime slots are available in the down direction between xx.39 (xx.37 if it is assumed the 16.19 Southern departure could be retimed to depart 2 minutes earlier) and xx.10, and in the up direction between xx.39 and xx.12.

Crucially however it will be noted that there are very few possible paths available in the morning or evening peak. This is because the peak Southern service increases to 2 trains per hour and the gaps between services vary.

The following explanation of how services for one of the windows are planned, and indicates that without disturbing existing services there is actually very little planning flexibility.

### 3.4 Planning weekday daytime off peak paths

At Redhill in the daytime off peak period there are only gaps available in the timetable to allow services to or from Tonbridge to cross the main line into platforms 0 or 1 at the following times past each hour:

Table 3: pathing slots  
at Redhill

Redhill	
from	to
xx.12	xx.14
xx.20	xx.28
xx.32	xx.34
xx.54	xx.58.5

Not all of these windows coincide with the available windows on the Tonbridge – Redhill sections. Extending the area further involves more difficulties. For example a train arriving at Redhill from Tonbridge between xx.20 and xx.28 would have clashed with the Strood service between Paddock Wood and Tonbridge, which reverses in platform 1 at Tonbridge between xx.55 and xx.04. Similar clashes have to be avoided with Tunbridge Wells services at Tonbridge, and BML services between Redhill and Gatwick Airport.

However analysis reveals that there are up and down paths available at the following times:

Table 4: Proposed core paths - daytime Mon - Sat

Core timetable paths							
Gatwick Airport	dep	xx.	45	Ashford	dep	xx.	23
Redhill	arr	xx.	52	Paddock Wood	arr	xx.	43
	dep	xx.	56		dep	xx.	44
Edenbridge	arr	xx.	06	Tonbridge	arr	xx.	51
	dep	xx.	07		dep	xx.	52
Tonbridge	arr	xx.	17	Edenbridge	arr	xx.	03
	dep	xx.	18		dep	xx.	04
Paddock Wood	arr	xx.	24	Redhill	arr	xx.	14
	dep	xx.	25		dep	xx.	20
Ashford	arr	xx.	47	Gatwick Airport	arr	xx.	26

The key features of the paths generated are:

- Journey time from Ashford to Gatwick Airport is 1 hour 3 minutes (as opposed to the current best time of 1 hour 35 minutes with 2 changes)
- Turnround times are 19 minutes at Gatwick Airport and 36 minutes at Ashford
- The rolling stock required to operate this service is three 4-car sets
- Using only spare paths there is no ability to deliberately time trains to connect with other services (such as to and from Tunbridge Wells). Where good connections occur they are primarily due to coincident timings.
- This appears to be the only feasible timetable for daytime operation

Examining the current timetable, it is apparent that the paths identified above could be fitted within the base service provided all day on Sundays, and also on Saturdays with the exception of the evening services, where the 19.51, 20.51, 21.51, 22.55 and 23.55 departures from Redhill clash with the Southern all station service. In that the Southern services are all shuttles between Tonbridge and Redhill, and that two units are used with long layover times at Tonbridge, it might be possible to run these services to alternative times, and possibly in line with the daytime service, assuming paths could be provided at Redhill. This would allow the Ashford service to run at a standard hour all through the weekend.

### 3.5 Creating the Extended Case timetable

Given that the Base Case service appears to be the only one which can be identified, we have used this to extend the paths beyond Gatwick Airport and Ashford.

Examination of the ability to extend the services using the above daytime off peak paths produces the following timetable

Table 5: Extended Case paths Mon - Sat daytime

Extended case timetable paths					
Horsham	dep	xx. 26.5	Canterbury West	dep	xx. 05
Crawley	arr	xx. 35.5	Ashford	arr	xx. 21
	dep	xx. 35.5		dep	xx. 23
Three Bridges	arr	xx. 38.5	Paddock Wood	arr	xx. 43
	dep	xx. 39.5		dep	xx. 44
Gatwick Airport	arr	xx. 43.5	Tonbridge	arr	xx. 51
	dep	xx. 45		dep	xx. 52
Redhill	arr	xx. 52	Edenbridge	arr	xx. 03
	dep	xx. 56		dep	xx. 04
Edenbridge	arr	xx. 06	Redhill	arr	xx. 14
	dep	xx. 07		dep	xx. 20
Tonbridge	arr	xx. 17	Gatwick Airport	arr	xx. 26
	dep	xx. 18		dep	xx. 27.5
Paddock Wood	arr	xx. 24.5	Three Bridges	arr	xx. 31.5
	dep	xx. 25.5		dep	xx. 32.5
Ashford	arr	xx. 47.5	Crawley	arr	xx. 36.5
	dep	xx. 49.5		dep	xx. 36.5
Canterbury West	arr	xx. 05	Horsham	arr	xx. 44

Given that there is no other suitable core path this effectively restricts the timetabling study to a check that there is no clash in these onward paths.

The key features of the paths generated are:

- Journey time from Canterbury to Gatwick Airport is 1 hour 21 minutes and to Crawley 1 hour 31 minutes
- Layover times are 42 minutes at Horsham and 60 minutes at Canterbury
- The rolling stock required to operate this service is five 4-car sets
- This appears to be the only feasible timetable for daytime operation that does not disturb existing services

The conclusion is that this timetable is unacceptable. It occupies 42 minutes at Horsham, where there is already maximum utilisation of the four platforms, and where at least 2 additional Thameslink services will in future turn round. The turnround time is also unacceptable at Canterbury West, partly due to its length, and partly because even if it were acceptable it would block the existing service from Charing Cross, which also reverses at the station.

The ideal timetable would restrict the turnround dwell at Horsham to around 15 minutes, and by arriving at Canterbury West 30 minutes earlier would provide enough time to reverse the service. This solution would reduce the number of sets required to four, with no worsening of the service provided. However, as demonstrated above, spare paths to permit such a service to run do not currently exist.

### 3.6 Peak paths

Peak paths are impossible to create at the moment for two reasons.

Firstly, the available paths between Redhill and Tonbridge do not permit a standard pattern of service, because of the varied peak hour paths occupied by the Southern all stations service.

Secondly, the available paths do not match the windows at Redhill which permit trains to cross the running lines to access Platforms 1 or 0. Therefore the required additional paths can only be created by retiming other services, particularly on the Brighton Main Line.

It might be possible to create some paths by running the trains as all stations services between Redhill and Tonbridge, as they would fit more easily into the gaps between the existing services. There is however no guarantee that hourly peak services could be resourced using the three sets available, and clearly journey times to Gatwick Airport would be 10 minutes longer in peak hours. Pathing between Tonbridge and Ashford is more straightforward and does not pose a major constraint.

### 3.7 Conclusion

The timetable planning work undertaken demonstrates that it is possible to create off peak paths that meet the service criteria required by Kent County Council. Journey time of just over an hour between Ashford and Gatwick Airport can be created.

However matching peak hour paths using only spare capacity are not available. This demonstrates that the desired timetable ought to be achievable, but only with further replanning of services, especially on the Brighton Main Line, and particularly of the stopping service between Redhill and Tonbridge, which already runs at variable intervals during the peak.

This may not be a particular problem. The various bidders for the TSGN franchise are already developing new timetable proposals to meet DfT's desired service plans for the new franchise following introduction of the wider Thameslink service. This will require wholesale retiming of services, particularly in the area around Redhill, and also of the Tonbridge services. Southeastern is due to be consulted on the proposals in May 2014.

It is expected that the bidders will seek to introduce a more standardised timetable repeating every hour.

Given that the service is intended to start in May 2018, there is opportunity to insert a requirement to incorporate an hourly semi fast service into the service planning specifications for the new Thameslink based plan, which permits adoption of reasonable turnrounds at both ends of the service.

The work carried out has demonstrated that, by shifting some of the constraints (in some cases only by a few minutes), this is achievable. In any case, the externally driven changes may already force reconsideration of the existing Tonbridge service as part of a new plan.

## 4 Commercial Review

### 4.1 Previous Studies

Network Rail's Route Utilisation Strategy (RUS) for Kent, published in January 2010, reviewed demand within Kent as a whole, and how rail network capacity and train services should be arranged in future to respond to growth trends and address areas of poor provision. The RUS is a cross industry document, and TOCs, freight operators and DfT all contributed to its creation.

The RUS looked at three linked service options of relevance to this report:

- Increase of frequency between Tonbridge and Redhill to 2 trains per hour
- Provide a new direct service between Tonbridge and Gatwick Airport
- Extend Medway Valley services beyond Tonbridge to Redhill

In each case the RUS found that the costs involved significantly outweighed the benefits generated, and that the options should not be proceeded with. It should be noted that the RUS considered both financial and economic benefits generated, whereas this report focuses solely on financial benefits.

### 4.2 Station data and current travel patterns

The number of passengers using each of the intermediate stations between Tonbridge and Gatwick varies. ORR data on total station usage shows the following data for the year 2011/12 (the most recent for which national data is available) compared to the previous year. Figures for Redhill and Tonbridge are included for information, but these stations are served by other routes and therefore total passenger numbers are considerably higher. The market share of each intermediate station is also shown:

Table 6: Passenger Numbers Tonbridge to Redhill

Stations	Total passengers 2011/2	Total passengers 2010/11	% change	% of intermediate market
Redhill	3,581,918	3,544,050	+1%	
Nutfield	108,454	99,230	+9%	23%
Godstone	75,876	74,154	+2%	16%
Edenbridge	196,914	204,801	-4%	42%
Penshurst	44,994	49,030	-8%	10%
Leigh	42,766	37,302	+15%	9%
Tonbridge	4,177,114	4,055,184	+3%	

Source: ORR

In addition Edenbridge is credited with a further 63,673 passengers who interchange with Edenbridge Town on the Uckfield to Victoria route. The data demonstrates clearly that Edenbridge is the most significant station on the route, with 4 out of 10 journeys on the route either starting or ending there, though it accounts for less than 50% of all journeys and is only the 17<sup>th</sup> busiest station in the study area. The drop in passengers is probably explained by a corresponding increase in passengers using Edenbridge Town station, and as with all station data there may in fact be some overlap of the two stations' data).

This data substantiates Kent County Council's view that if limited stop services are introduced they should be planned to call at Edenbridge, as the only large station on the route in terms of revenue lying in Kent. .

Following a review of ticket data, it becomes evident that between Tonbridge and Ashford International, Paddock Wood is also a principal origin or destination station for rail-based travel in terms of absolute patronage figures as the 10<sup>th</sup> busiest station in the study area (see Table 7 below). Upon further detailed review, its importance as a regional station is underlined in terms of rail trips originating from the other principal stations along the Tonbridge and Brighton lines of route and within the study area. As it represents an important trip generator, Paddock Wood has therefore been included as a calling station for the Base and Extended Cases.

Table 7. Ticket sales data for Principal Stations in Study Area

Origin Station	Total Trips (2012-13)
Brighton	7,879,179
Gatwick Airport	7,390,638
Haywards Heath	3,199,275
Tonbridge	2,713,756
Redhill	2,555,652
Tunbridge Wells	2,442,133
Ashford (Kent)	2,331,680
Horsham	1,779,492
Crawley	1,020,222
Paddock Wood	869,422
Ramsgate	664,263
Dover Priory	543,125
Three Bridges	465,934
Canterbury (East & West)	378,630
Margate	336,005
Folkestone (West & Central)	290,353
Edenbridge (joint with Edenbridge Town)	289,363

*Source: Arup analysis*



### 4.3 Proposed service journey impacts

While the main focus of the analysis has been on the primary stations along the Tonbridge and Brighton lines of route, we believe that the results capture the large majority of the potential demand for the proposed service will be for direct access to Gatwick Airport. This view is substantiated by results from our review of the 2001 Census journey-to-work origin-destination data<sup>2</sup> as well as Kent County Council's own assessment of the same dataset. A common conclusion to be drawn from the 2001 journey-to-work Census data is that Kent is relatively self-contained. The data show that an overwhelming proportion of Kent residents also work in Kent (82.9%), and that apart from London, a relatively small percentage of people work in other parts of the south east and beyond (only 3.6%). Further, ticket data suggests that a significantly greater proportion of rail patrons from stations between Redhill and Tonbridge travel a short distance to immediately adjacent stations or elsewhere in Kent rather than to stations in Sussex, the BML and points east. This trend can be surmised from the following table.

Table 8. Principal Destinations for Rail Patrons from Tonbridge 2012/13:

Origin	Destination	Total Trips
		337,183
Tonbridge	ASHFORD (KENT)	11,319
	BRIGHTON	2,599
	CANTERBURY BR	11,802
	DOVER PRIORY	2,044
	EDENBRIDGE BR	17,196
	FOLKESTONE BR	3,849
	HORSHAM	1,019
	MARGATE	886
	PADDOCK WOOD	40,161
	RAMSGATE	1,042
	REDHILL	17,901
	THREE BRIDGES	1,256
TUNBRIDGE WELLS	226,111	

Source: Arup analysis

It can be argued that part of this trend is due to the cessation of the through service to Gatwick in 2008, though the census data referred to above predates this.

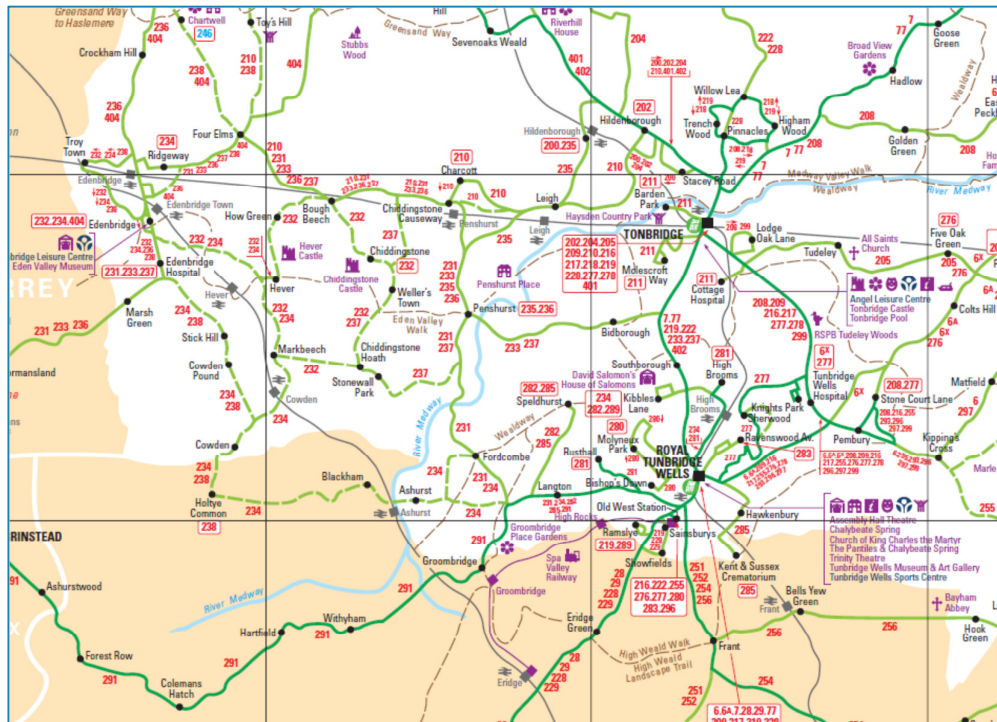
We have also observed that there are very few bus services operating between West Kent and Surrey or West Sussex. If it had been the case that the diversion of the rail service to run to London had frustrated a significant demand from public transport we would have expected that bus services would have been instituted to satisfy this demand.

From Edenbridge there is an hourly bus service (231/233) to Tunbridge Wells, and 3 services a day (236) to Gatwick Airport and Crawley, but the first departure of the latter is at 09.50 and is clearly not a service suitable for airport workers or

<sup>2</sup> Although 2011 Census data is now partially available, the origin-destination flows and journey-to-work information is still to be released. It is expected to be available from February 2014 and if produced in time will be included in the final report for this assignment.

airport passengers. There is an hourly service from Tunbridge Wells (291) to Crawley, but again the first through bus in the morning does not arrive at Crawley until 09.09 and is clearly too late for most work journeys.

Figure 4: Bus map showing connections between West Kent and E & W Sussex



Source: Kent County Council

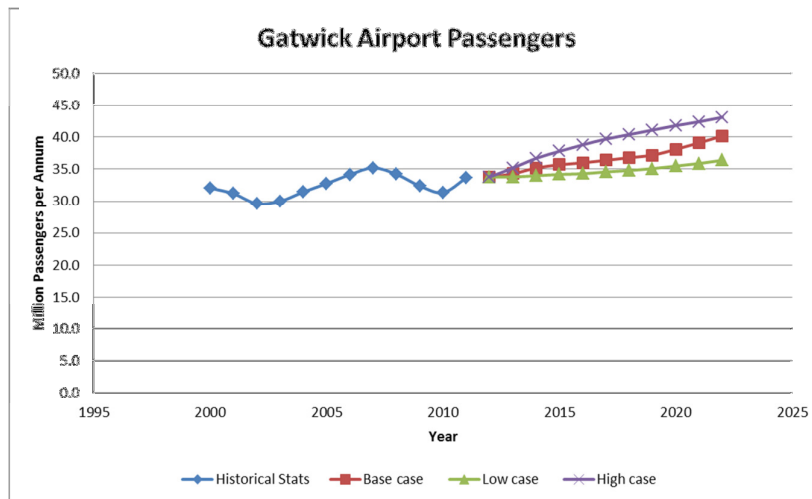
A key conclusion therefore is that, there is a relatively small journey to work market to be served between Kent and Gatwick or Crawley, and that all of this market must currently be car based. We describe a similar conclusion reached in the Gatwick Airport Rail Access Study in section 4.4 below.

## 4.4 Gatwick Airport

Gatwick Airport is clearly a major traffic generator within the study area, and with its own separate demand generation behaviours. 33.8 million passengers arrived and departed at the airport in 2012. This compares to 35.2 million passengers in 2007, while in the intervening period passenger numbers dropped by up to 3 million, mainly due to the impact of the recession on leisure travel. This indicates that some at least of the reduction in rail travel to Gatwick Airport station observed above is likely to have been driven by the reduction in air travellers.

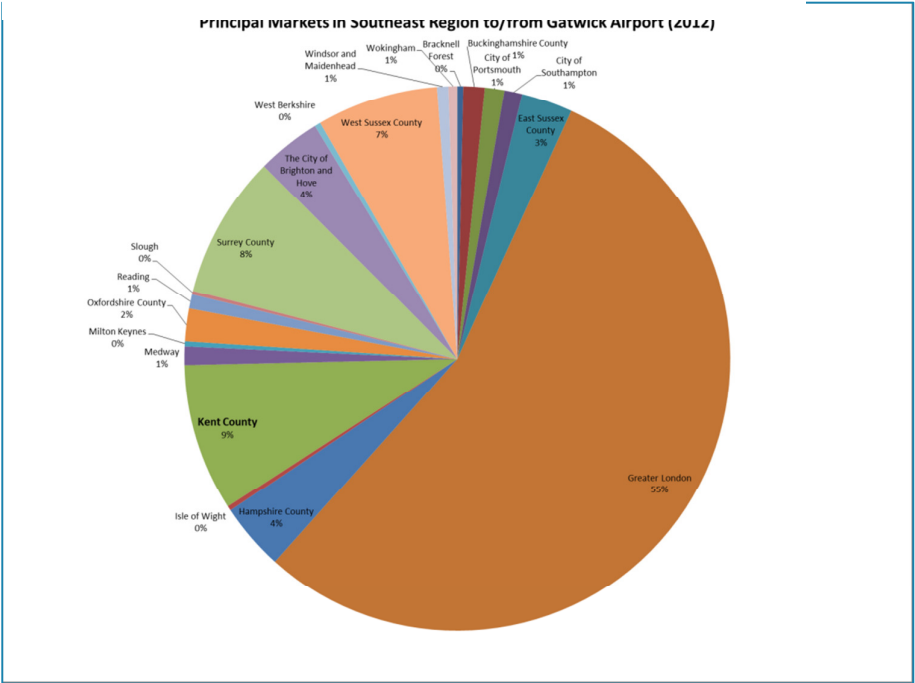
Airport travel is forecast to increase by around 1.8% per annum over the next 10 years (this ignores the impact of any second runway development, which is outside the study assumptions), and it can be reasonably expected that rail’s share of this market from Kent will remain stable over this period if the service continues.

Figure 5: Gatwick Airport passenger trends



Data provided by CAA suggests that 9% of airport passengers (2.2 million journeys) originate from Kent, which makes the county the second largest source of traffic after Greater London (55%), and just ahead of Surrey and West Sussex.

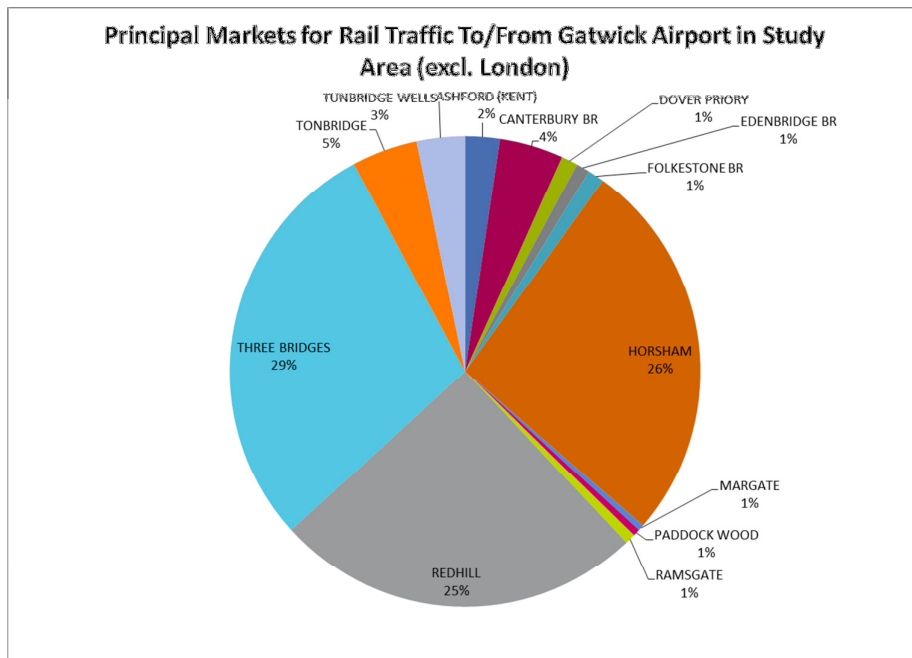
Figure 6: Source of Gatwick passenger journeys 2012



Source; CAA Passenger Survey Origin-Destination of Passengers at Gatwick Airport (2012)

We have also analysed the source of rail journeys to Gatwick Airport within the study area. It is apparent that the biggest generators are Tonbridge, followed by Canterbury and Tunbridge Wells. Significantly there is much less traffic from Edenbridge to Gatwick Airport. While the proposed rail service would have a significant impact on these journeys, the origin of demand is assumed to remain in the same proportion.

Figure 7: Gatwick Airport - rail journey origins



In terms of work journeys the 2012 Gatwick Rail Access Surface Study identifies that of the 23,000 employees working at Gatwick Airport fewer than 2% live in Kent, and equally only 3% of rail based work journeys to Gatwick Airport are from Kent. While the report acknowledges that provision of a direct rail service may increase the rail journeys, it does largely confirm the finding in section 4.3 that there are very few work based journeys from Kent to Gatwick Airport.

## 4.5 Demand Forecasting

In order to assess the business case for the scheme, the rail patronage has been forecasted to 2028 for both the Base Case (service between Ashford and Gatwick Airport) and Extended Case (Canterbury West to Horsham).

We have used the latest ticket data available to December 2013 as a starting point and then applying demand elasticities specified in the Passenger Demand Forecasting Handbook (PDFH) and the appropriate year on year growth rates. The

analysis period has been selected on the basis that it provides the forecasts over a ten-year period starting from the proposed scheme opening in 2018.

In respect of the year on year growth rates applied, as noted in the assumptions listed in Section 2.3.3, the Gatwick Airport demand has been treated differently from the regional demand as it is driven by leisure and business travel growth whilst the rest of the regional travel demand is predominantly generated by work based travel. There is evidence of strong school travel on the route, but focussed almost exclusively on travel to and from Tonbridge, which is already well provided for by current rail and bus services. We note that Kent County Council provides entitled pupils with free school travel on both rail and bus services.

Accordingly, the year on year growth in demand associated with Gatwick Airport has been linked with the projected growth in airport passengers as described in the airport's 2012 Master Plan, whilst that of regional rail trips are directly taken from TEMPro forecasts for the analysis period from 2014 to 2028.

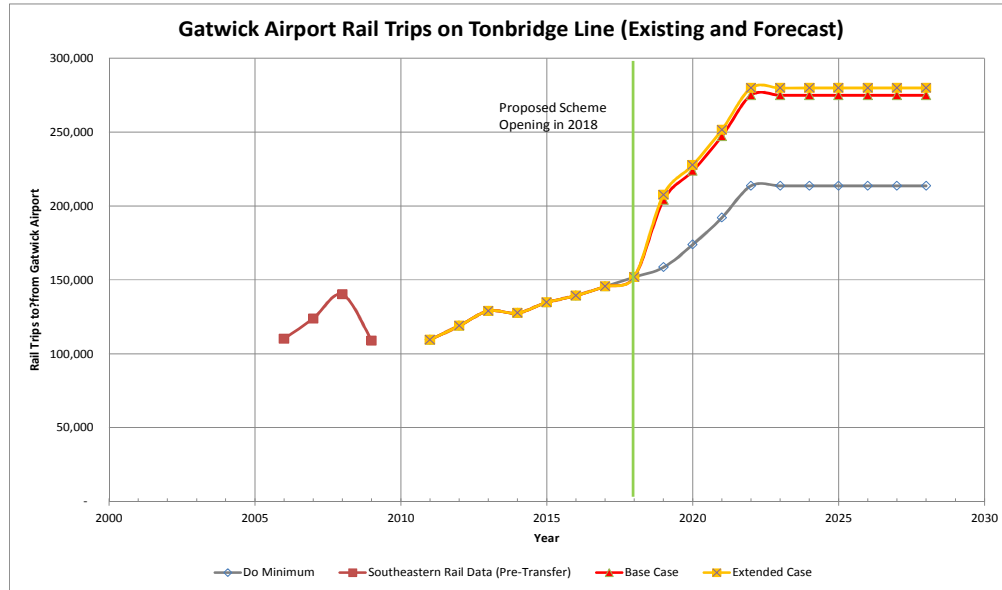
Figure 8 below displays the rail journeys to Gatwick Airport from stations in Kent recorded prior to the diversion of the service to London, those recorded in the last 4 years, and the demand growth forecast for the next 10 years. It will be seen that there has been a fall in passenger numbers following the diversion, though this coincided with the impact of the recession on air travel.

However current passenger levels are roughly the same as they were in 2008, and it would appear that the impact of the additional change on rail patronage has in fact been relatively minimal. This would appear to be a reflection of the relatively limited travel to work flows towards Gatwick Airport.

The results of the demand forecasting exercise for the Base and Extended Cases are illustrated and summarised in Tables 10-13 below. The additional demand for other regional journeys has been calculated using PDFH elasticity figures and using a Generalised Journey Cost model, which predicts how likely passengers are to be attracted to the new service based on the reduced journey times generated by the limited stops, and for journeys into Sussex the elimination of the interchange at Redhill. It is however noteworthy that there are relatively few current trips beyond Gatwick Airport to Crawley or Horsham, and that the interchange impact remains for journeys to and from other South Coast destinations.

Given the importance of distinguishing new from abstracted patronage, the tables also tabulate the forecasted new passengers drawn to the scheme as opposed to those generated by natural market growth and who would travel by train whether or not the proposed service is instituted.

Figure 8. Rail Patronage to/from Gatwick Airport (2006 to 2013 and forecast)



The demand results set out in the tables below suggest that the following new passenger journeys are generated by the proposed service.

Table 9: Additional annual passenger journeys generated 2018

Passenger flows	Gatwick Airport	Other Regional	Total Passengers
Base Case	45,482	151,415	196,897
Extended Case	49,095	260,536	309,631

In all cases the regional travel generated by the new service (some of which is between stations already served by the current Tonbridge to Redhill service) is significantly more important than that to Gatwick Airport. It should also be noted that almost all of the additional passenger journeys generated by the Extended Case are actually between Canterbury West and Ashford, rather than on the core route itself.





Table 11. New Rail Patronage for Proposed Scheme (Base Case)

	Market	Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	
<b>Δ in Rail Demand (i.e. BASE CASE - Do Minimum)</b>	<b>Gatwick Airport:</b>										<b>45,482</b>	<b>49,884</b>	<b>55,121</b>	<b>61,324</b>	<b>61,324</b>	<b>61,324</b>	<b>61,324</b>	<b>61,324</b>	<b>61,324</b>	<b>61,324</b>	
	Ashford		0	0	0	0	0	0	0	0	6,295	6,904	7,629	8,487	8,487	8,487	8,487	8,487	8,487	8,487	
	Canterbury		0	0	0	0	0	0	0	0	10,110	11,088	12,252	13,631	13,631	13,631	13,631	13,631	13,631	13,631	
	Dover Priory		0	0	0	0	0	0	0	0	2,140	2,347	2,594	2,885	2,885	2,885	2,885	2,885	2,885	2,885	
	Edenbridge		0	0	0	0	0	0	0	0	1,459	1,600	1,768	1,967	1,967	1,967	1,967	1,967	1,967	1,967	
	Folkestone		0	0	0	0	0	0	0	0	2,089	2,291	2,531	2,816	2,816	2,816	2,816	2,816	2,816	2,816	
	Horsham		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Margate		0	0	0	0	0	0	0	0	562	616	681	757	757	757	757	757	757	757	
	Paddock Wood		0	0	0	0	0	0	0	0	2,858	3,135	3,464	3,854	3,854	3,854	3,854	3,854	3,854	3,854	
	Ramsgate		0	0	0	0	0	0	0	0	1,006	1,104	1,220	1,357	1,357	1,357	1,357	1,357	1,357	1,357	
	Redhill		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Three Bridges		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Tonbridge		0	0	0	0	0	0	0	0	11,410	12,514	13,827	15,383	15,383	15,383	15,383	15,383	15,383	15,383	
	Tunbridge Wells		0	0	0	0	0	0	0	0	7,555	8,286	9,156	10,186	10,186	10,186	10,186	10,186	10,186	10,186	
	<b>Regional travel:</b>											<b>151,415</b>	<b>151,930</b>	<b>152,443</b>	<b>152,961</b>	<b>153,474</b>	<b>153,988</b>	<b>154,500</b>	<b>155,021</b>	<b>155,532</b>	<b>156,048</b>
	Ashford-Canterbury		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Crawley-Horsham		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Paddock Wood-Tonbridge		0	0	0	0	0	0	0	0	43,435	43,515	43,595	43,676	43,756	43,836	43,916	43,997	44,077	44,157	
	Edenbridge-Tonbridge		0	0	0	0	0	0	0	0	41,305	41,341	41,378	41,414	41,450	41,487	41,524	41,560	41,597	41,633	
	Three Bridges-Horsham		0	0	0	0	0	0	0	0	0	33	68	101	134	168	202	236	269	303	
	Three Bridges-Redhill		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Horsham-Redhill		0	0	0	0	0	0	0	0	4,510	4,511	4,512	4,514	4,515	4,516	4,517	4,518	4,520	4,520	
	Crawley-Redhill		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Paddock Wood-Tunbridge Wells		0	0	0	0	0	0	0	0	10,749	10,765	10,782	10,798	10,814	10,830	10,847	10,863	10,880	10,896	
	Ashford-Tonbridge		0	0	0	0	0	0	0	0	14,481	14,635	14,788	14,943	15,097	15,250	15,404	15,558	15,711	15,865	
	Tonbridge-Redhill		0	0	0	0	0	0	0	0	8,511	8,543	8,576	8,608	8,640	8,673	8,705	8,738	8,770	8,803	
	Crawley-Three Bridges		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Tonbridge-Canterbury		0	0	0	0	0	0	0	0	3,771	3,785	3,799	3,813	3,826	3,841	3,854	3,869	3,882	3,896	
	Ashford-Tunbridge Wells		0	0	0	0	0	0	0	0	5,375	5,430	5,485	5,539	5,595	5,650	5,704	5,760	5,815	5,869	
	Ashford-Paddock Wood		0	0	0	0	0	0	0	0	5,036	5,091	5,146	5,201	5,256	5,311	5,366	5,421	5,476	5,531	
	Edenbridge-Tunbridge Wells		0	0	0	0	0	0	0	0	1,832	1,831	1,831	1,831	1,830	1,830	1,829	1,829	1,828	1,828	
	Edenbridge-Redhill		0	0	0	0	0	0	0	0	4,763	4,766	4,770	4,773	4,776	4,779	4,782	4,786	4,789	4,792	
	Paddock Wood-Canterbury		0	0	0	0	0	0	0	0	1,815	1,818	1,820	1,824	1,826	1,829	1,831	1,834	1,837	1,840	
	Tunbridge Wells-Canterbury		0	0	0	0	0	0	0	0	768	770	770	772	772	774	774	776	776	778	
	Tunbridge Wells-Redhill		0	0	0	0	0	0	0	0	1,257	1,260	1,261	1,264	1,267	1,269	1,271	1,274	1,277	1,279	
	Ashford-Redhill		0	0	0	0	0	0	0	0	1,633	1,652	1,670	1,688	1,707	1,725	1,744	1,762	1,780	1,799	
	Folkestone-Tonbridge		0	0	0	0	0	0	0	0	699	700	701	702	703	704	705	706	707	708	
	Edenbridge-Paddock Wood		0	0	0	0	0	0	0	0	567	568	569	570	572	573	574	576	577	578	
	Redhill-Paddock Wood		0	0	0	0	0	0	0	0	380	381	382	383	385	386	387	388	389	390	
	Crawley-Ashford		0	0	0	0	0	0	0	0	114	114	116	117	118	119	121	122	123	124	
Three Bridges-Ashford		0	0	0	0	0	0	0	0	102	104	104	106	106	108	108	110	110	112		
Edenbridge-Ashford		0	0	0	0	0	0	0	0	184	186	188	190	193	194	197	199	201	203		
Ashford-Horsham		0	0	0	0	0	0	0	0	129	131	132	134	136	136	138	139	141	142		
											196,897	201,814	207,564	214,285	214,798	215,312	215,824	216,345	216,856	217,372	





## 4.6 Operating costs

Data on train operating has been supplied by Southeastern. The data is provided on a confidential non disclosable basis, because of the sensitivity of the detail of some of the charges such as lease and staff costs. However we have reviewed the costs and found them to be consistent with standard industry practice.

The categories of direct operating costs chargeable to the project are as follows:

- Rolling stock lease costs. All trains are formed of leased Class 377 4-car units. Three train sets are required for the core service and we have assumed four train sets for the Extended Case (this ignores the poor turnrounds at each end of the service discussed in section 3.5 above, and assumes that a more efficient timetable could be produced by more comprehensive retiming). The lease cost is the provision cost for the sets. Note that no allowance is made for spare sets to cover maintenance, which are assumed to be covered by the overall fleet requirements.
- Traincrew costs. Trains are assumed to be crewed by a driver and conductor. Each traincrew set can make two return trips per shift in the Base Case, but only one and a half trips in the Extended Case due to the additional running times. In this instance it is assumed for evaluation purposes that all crews are based at Tonbridge and work out and back to both Horsham and Canterbury West. Costs include any provision for overtime and Sunday working. Again no provision is included in the costs for spare crews provided to cover delays, sickness etc.
- Traction electricity costs. Network Rail supplies traction power to train operators calculated on a per service mile basis using standard parameters or charged through consumption metering. No credit for traction power regeneration has been assumed.
- Maintenance costs. Charged per mile of service running
- Station call costs. Trains calling at Southern managed stations (Edenbridge, Redhill and Gatwick Airport in the core case, plus Three Bridges, Crawley and Horsham in the Extended Case) will pay station access costs, calculated by dividing the total station operating costs by the number of train calls. Charges are not paid for stations owned and operated by Southeastern (Tonbridge, Paddock Wood and Ashford International in the Base Case plus Canterbury West in the Extended Case)
- Track access charges. Charged by Network Rail to cover the provision of infrastructure. Calculated on a per service mile run basis.

Using this data the cost for providing three units for the service, and running an hourly service 7 days per week for 18 hours per day Monday – Saturday (notionally 05.00 – 23.00) and 15 hours per Sunday (08.00 – 23.00) is shown in Table 14 below:

Table 14: Operating costs for the Base and Extended Cases  
(Based on scheme Opening Year)

	Base Case	Extended Case
Cost per week	£144,359	£208,247
Cost per annum	£7,506,684	£10,828,832

A cross check on the validity of these charges has been carried out. Using data supplied by Railway Industry Monitor, the average train running cost per mile for a generic South East train operator has been multiplied by the service miles run (13,189 miles per week). This figure includes all TOC overhead costs, and services comprised of longer rolling stock (on average 8 car units) across all operators. Using this methodology the suggested total operating cost per annum of the core service would be £20.9m per annum. In that this is approximately double the costs provided by Southeastern for a 4-car operation, but also includes London station operation, operational overheads and other additional overheads, this appears to provide reasonable validation of the charges against industry benchmarks.

## 5 Strategic Outline Business Case

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This section sets out the case for the proposed service, based on our assessments set out above, and expressed in terms of DfT's business case guidance, and the UK Treasury advice on evidence-based decision making.

### 5.1 Strategic Case

The proposed service is consistent with Kent County Council's transport strategy.

In 2011, Kent County Council published a Rail Action Plan to articulate its forward-looking strategy to ensure that the passenger rail franchises present in the county deliver a rail service that meets the needs of its residents and visitors, and continues to do so beyond 2014<sup>3</sup> when the Southeastern franchise is extended by Direct Award.

Specifically, the Rail Action Plan sets the legislative and regulatory framework which determines the structure of the rail industry and the way it affects Kent; assesses the operational performance of the existing Southeastern franchise; outlines the drivers for new rail service post 2014 to meet the future needs of economic growth in the county; and the describes Network Rail's committed plans to enhance some of the principal routes in Kent and thus improve journey times.

Kent County Council's overarching county-wide transport strategy has a strong rail focus and this is a stance which was encapsulated in two prior position papers released by the Council prior to the Rail Action Plan - Growth without Gridlock (December 2010); and Local Transport Plan for Kent 2011-2016 (LTP3) (draft for consultation, September 2010).

The proposed service lines up with the Rail Action Plan, and also with Gatwick Airport's Surface Access Strategy 2012-2030 and 2012 Master Plan, where the importance of rail as principal mode of transport is acknowledged.

### 5.2 Economic Case

There are undoubted economic benefits that would be generated by the adoption of the proposed service, such as decreased journey time, reduced carbon emissions generated by the transfer of journeys from private car to rail transport, and environmental benefits which would result from the reduction in car journeys.

However, as noted previously because the proposal will fall within the Direct Award between DfT and Southeastern, the project is required to deliver only financial benefits and must be demonstrably self-sustaining financially.

Therefore the economic benefits generated by the service have not been evaluated.

However, given the low additional passenger numbers generated by the proposed service it appears that even if economic benefits were taken into account it is unlikely that a satisfactory positive BCR could be generated.

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<sup>3</sup> The current Southeastern franchise has since been extended by the DfT to 2018.

## 5.3 Commercial Case

The demand forecasts produced in this study clearly demonstrate that there is a potential market created by the proposed service improvements, and that this market comprises discretionary and leisure travellers primarily headed to Gatwick Airport to catch a flight overseas, and work related passengers travelling a short distance within Kent County and to some stations along the BML.

Further, the introduction of a direct rail service to Gatwick Airport, or to Horsham in the Extended Case, also means that all travellers within Kent and those headed to/coming from towns across the south coast as far as Southampton will benefit from service improvements in the form of faster journey times and reduced changes.

However it has been noted that the diversion of the existing service between Tonbridge and Redhill to run to London rather than Gatwick Airport has had only a limited impact on overall ticket revenue from stations in Kent to Gatwick Airport, and the conclusion is that the impact of the requirement to change trains at Redhill has not been particularly severe, probably given the frequency of other services on the Brighton Main Line.

The principal flow to benefit from the Extended Case is between Ashford and Canterbury West. It would appear that there could be more efficient ways to satisfy this demand by running a domestic Kent service or an extension to London services terminating at Ashford.

## 5.4 Financial Case

We have calculated revenues for each of the cases using the demand forecasts for the Base and Extended Case as previously described in Section 214. Average fare yields of £14.19 for journeys to Gatwick Airport and £4.07 for other local journeys have been used in line with the ticket data analysed for 2013.

The Net Present Value and Benefit-Cost Ratio for the two variants of the scheme were calculated assuming a service life of 10 years and the following results obtained:

Base Case:

Present Value of Benefits (PVB)	£11,989,484
Present Value of Costs (PVC)	£62,430,124
Net Present Value (NPV) = PVB - PVC	-£50,440,640
BCR = (PVB/PVC)	0.19

Extended Case:

Present Value of Benefits (PVB)	£16,376,554
Present Value of Costs (PVC)	£90,059,118
Net Present Value (NPV) = PVB - PVC	-£73,682,564
BCR = (PVB/PVC)	0.18

In the Extended Case, the extension of the service to Horsham and Canterbury worsens both the NPV and BCR compared to the Base Case, and both variants of the scheme fall considerably short of financial sustainability when assessed from a purely financial standpoint and omitting non-revenue related (economic) benefits. The additional revenue generated by the Extended Case largely accrues from additional journeys between Ashford and Canterbury, for which a better operational solution is likely to be available.

In summary, the revenues, costs and shortfall per week and per annum are summed up in Table 15 below.

Table 15: Summary revenue and costs for each case

	Base Case	Extended Case
Generated Fare Revenue per week	£24,268	£33,801
Cost per week	£144,359	£208,247
<b>Estimated shortfall per week</b>	<b>-£120,091</b>	<b>-£174,446</b>
Generated Fare Revenue per annum	£1,261,930	£1,757,640
Cost per annum	£7,506,684	£10,828,832
<b>Estimated shortfall per annum</b>	<b>-£6,244,754</b>	<b>-£9,071,192</b>

The detailed calculations carried out to arrive at these figures are shown in Appendix B.

On the basis of the Business Case results it does not appear that there is a sound case to justify the introduction of the new service. The large negative value of the NPV suggests that even if passenger numbers generated by the new service were doubled there would still be a substantial loss. It is clear that DfT will not support a new service, and that Southeastern would not be willing to run the service without funding of the revenue shortfall by Kent County Council.

## 5.5 Management Case

Whilst this study goes some way in terms of informing the management case, it only provides the basic premise to build on as the scheme progresses to the Outline and Full Business Case stages which would follow our work.

Specifically, we have looked at developing an outline project plan with key milestones and progress, including the critical path. It is assumed that other aspects of the commercial case such as the approvals processes and detailed work



streams associated with the delivery of the scheme would be developed at a later stage.

## 6 Conclusion and Recommendation

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There is clearly a good strategic fit between the provision of a new direct and faster service between Ashford, Tonbridge and Gatwick Airport with the policies of both Kent County Council and Gatwick Airport Ltd. We have noted considerable statement of local support from other bodies within West Kent.

The Network Rail RUS reviewed options for increasing the service between Redhill and Tonbridge and extending a service to Gatwick Airport. Both failed to generate a positive BCR, even though the study took economic benefits as well as financial benefits into account.

Ticket data suggests that the majority of journeys between Redhill and Tonbridge are to Kent destinations rather than to Sussex. Studies of bus service provision provide the same picture. It therefore appears that any generation of rail journeys will come from switches from car use rather than other public transport modes.

There are relatively few work based journeys between Kent and Sussex, even when local commuting to Gatwick Airport is taken into account.

Gatwick Airport is a major demand generator, and airport volume is expected to grow at nearly 2% per annum, even without creation of a second runway (which is not assumed in this report). However ticket data suggests trips to other regional destinations would be far more important, generating 3 times as many passenger journeys. It also appears that passenger numbers to Gatwick Airport have not fallen significantly since diversion of the current service to London.

Creating a timetable for the new service is difficult given infrastructure constraints on the route. It appears that a suitable regular repeating hourly timetable can be created in the off peak periods, as well as at weekends, but that running the service in the peak periods may well be frustrated by capacity pressures at Redhill. With some service retiming (which may take place anyway after award of the new TSGN franchise) a peak hour service may well be possible, but not at the same standard hours.

Providing the new service will cost £7.5m per annum in the Base Case (Ashford to Gatwick Airport) and £10.8m in the Extended Case (Canterbury West to Horsham). The Extended Case service cannot be provided within the existing timetable constraints.

The new service would create 197,000 new journeys in the scheme opening year (transferred mainly from road) in the Base Case, and 310,000 journeys in the Extended Case. The latter case generates additional journeys mainly between Ashford and Canterbury West.

Revenue from the new services is generated by multiplying the additional journeys by average fare yields for equivalent current journeys.

Using this analysis the Benefit Cost Ratio for the Base Case is 0.19 and the Extended Case is 0.18. The break-even BCR rate is 1.0. Given the low results it is clear that even if passenger numbers were twice those forecast in this report, this would still provide a poor return, and would not be supported by DfT in its forthcoming Direct Award to Southeastern, unless the revenue shortfall were supported by Kent County Council.

Therefore, while the proposed service would appear to provide better strategic links between Kent and Sussex, as well as reduced journey times, the volume of new passengers who would use it is insufficient to generate enough revenue to cover the operating costs. In addition the service is relatively difficult to plan, given infrastructure and capacity constraints along the route.

We therefore conclude that the proposed service should not be progressed with, and that other service enhancements within Kent are likely to provide much stronger returns.

## **Appendix A**

### **Glossary of Terms**

<b>Term</b>	<b>Definition</b>
ATOC	Association of Train Operating Companies
BML	Brighton Main Line
ECS	Empty coaching stock
EMU	Electric multiple unit
LENNON	Latest Earnings Networked Nationally Over Night – ATOC’s ticketing based system that reports ticket data between stations and allocates fare revenues to each journey sold
ORCATS	Operational Research Computerised Allocation of Tickets to Services – computer systems used by ATOC to analyse all trains running within a specific timetable period and allocate revenue accordingly between TOCs
SFO	Station facility owner
TOC	Train operating company
TSGN	Thameslink, Southern, Great Northern

## **Appendix B**

### **Cost Benefit Analysis Calculations**



