Proposed New Passenger Station at Glyne Gap, Bexhill

Final Report

August 2013

Rother District Council

East Sussex County Council

LandSecurities

Mott MacDonald

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B	1 August 2013	John Taylor	Robert Fickling	Frank Shorter	Final Report	
C	19 August 2013	John Taylor	Robert Fickling	Frank Shorter	Final Report (with minor revisions)	

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Executive Summary

This report provides an overall summary of the ongoing study into a proposed new railway station at Glyne Gap, as well as reporting the business case for the station. The study has been commissioned by Rother District Council (RDC), East Sussex County Council (ESCC) and Land Securities Group PLC (Land Securities) in order to build on earlier studies which suggested, at an outline level, that there might be a case for the provision of a station at this site.

This report brings together the results of a number of reports produced for the new station at Glyne Gap, as follows:

- Stage 1 – Review of Existing Studies;
- Stage 2 – Infrastructure Assessment Report;
- Stage 3a – Demand Forecasting Report; and
- Stage 3b – Operational Assessment Report.

Following on from Stage 3, this Final Report also outlines the results of the business case of the scheme. The results of the business case for the central case are summarised below:

Analysis of Monetised Costs and Benefits	£ 000, discounted to 2010 prices, in 2010 market prices
PRESENT VALUE OF BENEFITS (PVB)	**£1,539**
PRESENT VALUE OF COSTS (PVC)	**£5,430**
OVERALL IMPACTS	
NET PRESENT VALUE (NPV)	**-£3,891**
BENEFIT TO COST RATIO (BCR)	**0.28**

The results show that although there are some benefits of the scheme this is far outweighed by the costs. Given that the business case for Glyne Gap shows a BCR of less than 1.0, we would not suggest proceeding with the scheme as it offers poor value for money. The central case forecast results in a BCR of 0.28, whereas the high growth forecast, based on additional housing in the local area, suggests a BCR of 0.49.

Increases to the planned number of houses in the Bexhill area is likely to impact on the business case for the station. Additional population levels would increase demand at the station. However, the increase in housing numbers would not increase rail demand on a pro-rata basis, given the impacts of distance to the station and on the fact that no all of the demand at Glyne Gap station is forecast

to come from local generated trips. As an example, an extra 100 houses in the proposed development area to the North East of Bexhill could increase rail trips from Glyne Gap station by only around 47 boardings per year (equating to less than 1 boarding per day).

It should be noted that the current station proposal assumes a one train per hour service which is imbalanced by direction; in effect the trains serve different origins/destinations to the west of Glyne gap. Westbound trains would terminate at Brighton, running via Eastbourne, Lewes and Falmer, whilst eastbound trains would originate at London Victoria, running via East Croydon, Lewes and Eastbourne. This nature of service is due to a number of operational constraints along the route, for example interaction with other services at Bo Peep Junction and on the Brighton Main Line.

Increasing the level of service at Glyne Gap to two trains per hour would increase the demand forecasts for the station. However, it should be noted that the catchments for Glyne Gap and Bexhill overlap, and any increased demand is likely to come at the expense of reduced demand at Bexhill – i.e. demand transfers from Bexhill to Glyne Gap. Increased demand at Glyne Gap would require appropriate car parking provision, therefore requiring additional car parking above that which is proposed.

Additionally, there will be more dis-benefits to through travellers along the East Coastway line by extended journey times on two trains per hour due to calling additionally at Glyne Gap. This would flow through the assessment as a reduction in revenue as travellers react to longer journey times by transferring to alternate modes of transport.

As previously noted two trains per hour at Glyne Gap is unlikely to be feasible, due to operating constraints. We would therefore recommend not pursuing the proposal for a new passenger station at Glyne Gap.

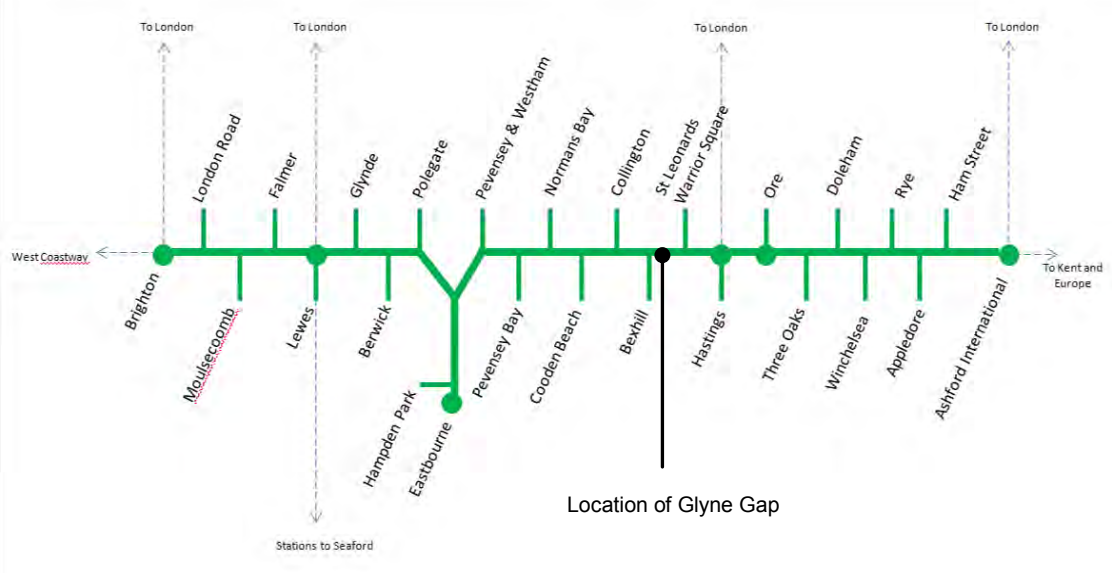
1 Introduction

1.1 Introduction

The study into the proposed new railway station at Glyne Gap has been commissioned by Rother District Council (RDC), East Sussex County Council (ESCC) and Land Securities Group PLC (Land Securities) in order to build on earlier studies which suggested, at an outline level, that there might be a case for the provision of a station at this site. In particular, the purpose is to inform RDC and ESCC's transport and land-use planning processes as to the desirability of planning strategy including the station.

The East Coastway is the main east-to-west railway along the South Coast in East Sussex, running from Brighton via Lewes, Eastbourne, Bexhill and Hastings to Ashford. This is shown in Figure 1.1 below and Appendix A.

Figure 1.1: East Coastway route between Brighton and Ashford



The East Coastway is served by three trains per hour along the section between Lewes, Eastbourne and Hastings, all provided by Southern who were awarded the South Central franchise in September 2009. This franchise is due to cease in July 2015, after which it will be absorbed into the greater Thameslink franchise, which also comprises Great Northern and part of the South Eastern franchises.

Mott MacDonald (MM) has been commissioned to assess the feasibility of a new station at Glyne Gap, near Bexhill on Sea. The proposed site

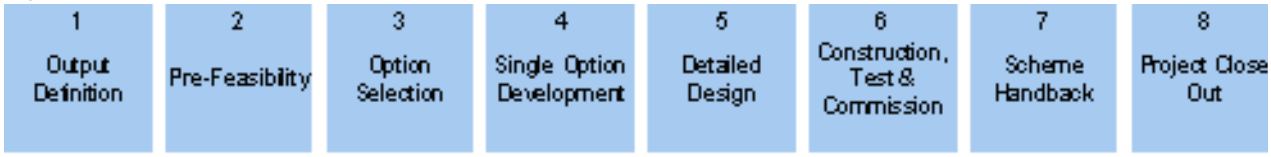
of Glyne Gap station would be located between Bexhill and St Leonards Warrior Square. Glyne Gap lies to the west of Bo Peep Junction, where the Hastings-London direct line diverges from the East Coastway line, therefore meaning that the new station would be served by only the East Coastway service. Earlier studies were undertaken in 2002 and 2004 which included site visits to identify physical constraints to the construction of a new railway station at this location.

This document is the Final Report referred to in Section 2.7 of our proposal document, providing a summary of all findings of the study, and using these findings to come to a conclusion as to whether there is a viable business case for a station at Glyne Gap.

1.2 The GRIP process

The Network Rail GRIP (Guide to Railway Investment Projects) process is clearly defined to take a project through a standard process of development. The eight stages of GRIP are set out in Figure 1.2 below.

Figure 1.2: The GRIP Process



The earlier studies effectively progressed the scheme to between GRIP1 and 2 levels, with capital costs quoted with an optimism bias of 66% in agreement with WebTAG Unit 3.13.1 as GRIP 1 Project definition level.

The new study seeks to refine the options and costings to GRIP2 level, which provides for capital costs improved in certainty to +/-30% in accuracy and optimism bias set at 50% for WebTAG assessment. GRIP2 is defined as “Pre-Feasibility” covering:

- Generate as many (station) options as possible;
- Set out the policy for dealing with risk, safety, and operations; and
- Discard options which obviously fail the tests set down in GRIP1.

Our methodology set out in this report meets the requirements of GRIP2 level assessment.

1.3 Previous studies into Glyne Gap station

Three studies into the proposed Glyne Gap station have been undertaken previously, one in 2000 by Steer Davies Gleave (SDG), and two by MM in 2002 and 2004..

A review of these previous studies is documented in Technical Note – Stage 1: Review and updating of existing studies. This report also discusses the main changes since the last study was undertaken in 2004 which were likely to affect the business case, including those on the railway itself, in the physical environment of the proposed station, in project appraisal, and in the regulatory framework in which the business case appraisals are carried out.

Table 1.1 below summarises briefly the main findings of the previous studies undertaken.

Study	SDG 2000		MM 2002[1]		MM 2004[2]	
Service level assumed	4 tph 'With Metro'	4 tph 'With Metro'	2 tph 'Without Metro'	4 tph 'With Metro'	2 tph 'Without Metro'	Notes
Capital cost	£1.036m		£1.0m		£3.3m	Including optimism bias, contingencies etc.; prices in nominal terms in year of report
Daily trips	767/607	772/612	538/427	855/695 †	640/517 †	Including/excluding trips abstracted from other stations (particularly Bexhill)
Implied additional rail journeys/yr	151,000*	153,000*	104,000 *	174,000 *†	129,000 *†	Net of abstraction from other stations
Additional revenue/yr	£191k	£193k*	£135k* [£330k]**	£610k*†	£450k*†	Net of abstraction from other stations
Benefit:cost ratio	3.8	n/a	[2.09]**	>2.0	>1.5	
Net present value	£2.873m	n/a	[£4.34m]**	>£7m	>£4m	NPV of benefits (i.e. benefits less costs)
Operating ratio	1.1	n/a	[1.53]**	n/a	n/a	i.e. ratio of revenue to operating costs

* These figures use an annualisation factor of 250, which effectively means that only the weekday usage and revenues are counted. This is consistent with SDG's methodology but MM also provide alternative figures using an annualisation factor of 312 to take account of weekend demand, with correspondingly higher annual revenue and ridership figures.

** While the main MM reports did not quote appraisal values (their main purpose being to verify SDG's forecasting methodology and calculations), a technical note dated 16 August 2002 reworked the forecasts and appraisal for the "non-metro" option. This found daily demand of 580/420, implied additional trips of 103,000 and annual net revenue £330,000 based on real-world net revenue figures provided by South Central. Assuming capital costs of £1m to £1.5m (and taking the upper value for appraisal purposes), the note found a benefit:cost ratio of 2.09, a net present value of £4.34m and an operating ratio of 1.53.

† Figures include additional demand from Bexhill College, which was not counted in the figures given in 2002 (and the May 2004 report). It should also be noted that the October 2004 figures are based on higher assumed average revenue per journey figures provided by South Central.

1 From MM technical note dated 16 August 2002

2 The main work was reported in May 2004 but the business case appraisal was added, together with slightly revised demand and revenue forecasts, in a presentation dated 7 October 2004. The revised figures are quoted here

All values given for trips and revenues above are base year forecasts for the scheme opening year, assuming that 100% of demand would be realised in the opening year. To calculate the benefit to cost ratio (BCR) the relevant costs and benefits were projected forward over the scheme appraisal period and the values for each year discounted back to the present day.

2. Infrastructure Assessment

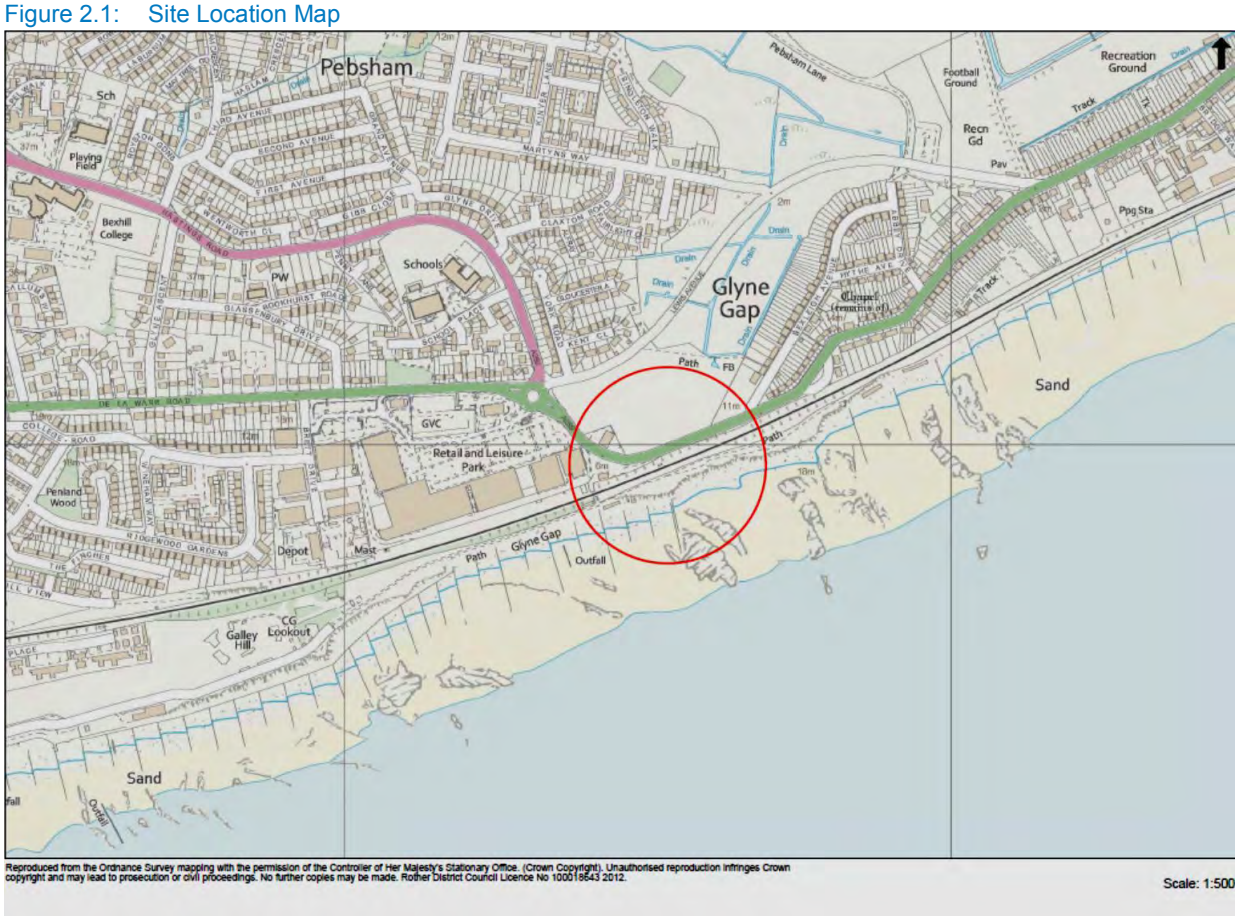
Stage 2 of the station study consisted of a detailed infrastructure assessment of the station site. Further details of the assessment are included in the Stage 2 – Infrastructure Assessment Report.

The general location of the station is shown in Figure 2.1. A site visit and desk study were undertaken in order to update the recommendations from previous studies. Photographs from the site visit are included as Appendix B.

The following elements were assessed:

- Overall location;
- Track gradient;
- Platforms;
- Pedestrian requirements;
- Station accessibility;
- Car parking provision; and
- Construction requirements.

Figure 2.1: Site Location Map



Consideration and cost for different levels of station provision at Glyne Gap have been examined, with different levels equating to differing levels of provision of facilities such as:

- Platform length
- Access routes;
- Waiting shelters;
- Staffing;
- Car/cycle parking;
- CCTV; and
- Passenger Information Systems.

The three options considered were:

- Basic station – Category F - small unstaffed as defined in Railway Group Standard GI/GN7616;

- Station with intermediate facilities – Category E/F small, partially staffed; or
- Station with full facilities – Category E small, staffed.

The preferred option was found to be a basic station of Category F, provided this was found adequate for the level of service proposed. This has been the option used in the business case development.

The Stage 2 Infrastructure Report outlines the potential infrastructure requirements and cost estimate, including a detailed breakdown of costs, for each of these options. A summary of the cost estimates for the three main options at GRIP2 level (+/- 30%) appears in Table 2.1.

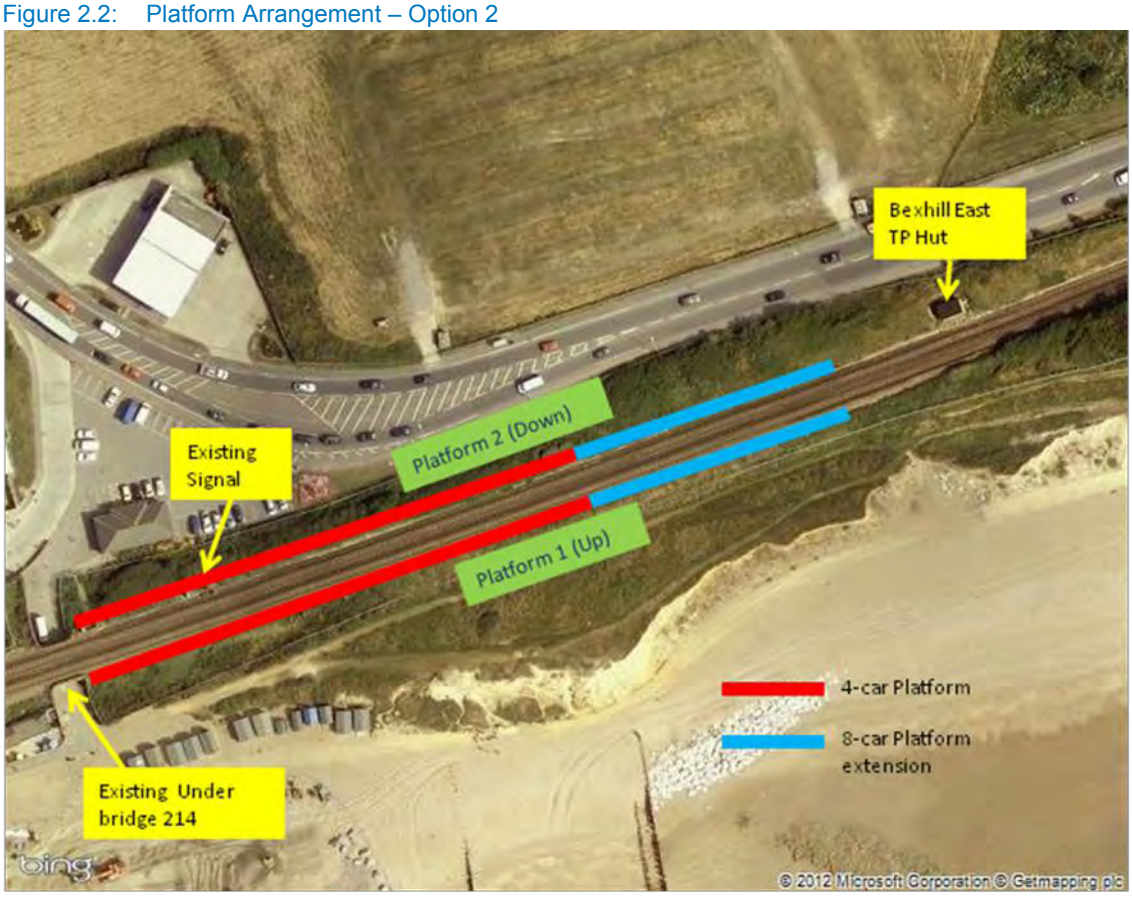
Table 2.1: Cost estimates

Option	Point cost estimate	Cost + 30% (GRIP2)	Cost + 50% optimum bias
Basic Station	£2,243,301	£2,916,300	£3,364,952
Intermediate Station	£3,116,637	£4,051,600	£4,674,956
Full Station	£4,394,835	£5,713,300	£6,592,253

A detailed breakdown of capital costs can be found in Appendix C, with operating costs included as Appendix D.

Stage 2 concluded that the basic option Category F station with ramped access would be suitable for the envisaged service of one train per hour. Car parking facilities have not been included with this option, but current levels of available car parking closely match predicted drive-up demand. This layout is shown in Figure 2.2 below.

Figure 2.2: Platform Arrangement – Option 2



Source: Final Report

Further details of land ownership in the Glyne Gap area are included in Appendix E.

3. Demand Forecasts

Stage 3a of the study refined and updated the previous demand forecasting work undertaken in 2000, 2002 and 2004, looking at comparator stations, similar to that proposed at Glyne Gap, to produce an isochrone based trip rate.

The trip rate calculation looked at demand within distance bands from the comparator stations to produce an average trip rate per 1,000 head of population. This trip rate was then applied to the population around Glyne Gap.

Potential demand at Glyne Gap from Bexhill College, and demand from the adjacent Ravenside Retail Park has been calculated. Consideration was also given to the impacts of new developments in the local area, particularly housing and employment developments to the north and east of Bexhill.

In addition to new demand, an assessment of abstraction was also undertaken. This looked at the number of people currently using Bexhill station and estimates the numbers who are likely to switch to using the new station at Glyne Gap.

The tables below present a summary of the base year demand forecast at Glyne Gap assuming that 100% of demand is realised in the opening year. Table 3.1 presents gross demand figures, demand new to rail at Glyne Gap; whilst Table 3.2 presents net demand figures, demand new to rail at Glyne Gap in addition to that which is abstracted from Bexhill.

Table 3.1: Demand at Glyne Gap, excluding abstraction assessment

	Daily	Annual
Walk-up boarders (local demand)	63	19,600
Drive-up boarders (local demand)	34	10,800
Other boarders	1	500
Ravenside Retail Park boarders	47	14,600
Bexhill College boarders	2	600
Boarders at Glyne Gap	**147**	**46,000**

Table 3.2: Demand at Glyne Gap, including abstraction assessment

	Daily	Annual
Walk-up boarders (local demand)	118	36,900
Drive-up boarders (local demand)	48	14,900
Other boarders	1	500
Ravenside Retail Park boarders	47	14,600
Bexhill College boarders	15	4,700
Boarders at Glyne Gap	**229**	**71,600**

This indicates that nearly 36% of demand at Glyne Gap is predicted to be existing journeys which are abstracted from Bexhill, giving no revenue benefit to either the station or the wider rail industry.

Revenue forecasts were also developed based on the 46,000 boarders per year forecast – not taking account of demand which is abstracted from Bexhill. This is based on revenue yields for Bexhill and suggests that £1,430 per day or £446,160 per year could be generated at Glyne Gap. This is based on the observed split of London / non-London journeys at Glyne Gap, which is thought to be a good comparator station in terms of service offering.

We have also investigated the impacts on through rail travellers, as a result of increased travel times due to stopping at Glyne Gap. This suggests that demand will reduce by 112 daily trips, with revenue reduced by £221 per day. This gives a net increase in revenue of £1,209 per day following the opening of Glyne Gap. This figure is correspondingly lower than the revenue figures generated at Glyne Gap, as the increase in journey time disproportionately impacts on short distance, lower yield journeys.

A brief comparison has been undertaken with the forecast demand and revenue with figures produced for the previous three studies. The new forecasts show lower demand than the previous studies, although higher revenue is now predicted.

4. Operational Assessment

Stage 3b of the study assessed the operational viability of the station. This focused in particular on the practical feasibility of stopping existing train services at the new station, and identifying any timetabling difficulties that doing so might present. The issues analysed were:

- Conflicts with other trains, for example at critical junctions such as Bo Peep Junction where the Glyne Gap stop would result in trains arriving at these locations at different times; and
- Turnaround times: where the slower journey resulting from additional station stops would mean that a train would no longer have sufficient time to form its return working.

The analysis has identified that a close to regular interval hourly service could be provided at a Glyne Gap station. However service origin/destination would be imbalanced with:

- westbound services running to Eastbourne, Lewes and Falmer, terminating in Brighton;
- eastbound services originating from London Victoria and running via East Croydon, Lewes and Eastbourne.

The service calling at Glyne Gap would be the all-stations service, with the current semi-fast Brighton-Ashford service unable to call due to operational and train capacity reasons.

The analysis has also shown that to achieve a higher frequency than hourly would require major re-timetabling – eastbound services every half-hour could be possible with little impact upon the timetable, but westbound this would not be possible.

The results of the analysis contained in this report have been carried through to the station demand forecasting and business case development, train service frequency being a key driver of demand.

Full details and an outline timetable at Glyne Gap can be found in the Technical note for Stage 3b: Operational Assessment, and also Appendix F.

5. Business Case

The Demand Forecasting Report summarised in Chapter 3 describes the base year (2012) demand forecasts at Glyne Gap. These have been used as the starting point to calculate future year demand forecasts, and these forecasts were used with the scheme capital and operating costs to calculate the monetised costs and benefits of Glyne Gap station.

5.1 Appraisal Methodology

The business case methodology has followed the guidance outlined in the Government's web-based transport appraisal guidance (WebTAG) for railway investment business cases, primarily contained in unit 3.13.1 "Guidance on Rail Appraisal". This has led to the following assumptions being applied:

- **Base Forecast Year:** 2012
- **Scheme Opening Year:** 2016 (as agreed with client)
- **Appraisal Period:** 60 years
- **Price Base:** 2010 market prices
- **Discounting:** 3.5% for 30 years, then 3.0% thereafter

We have also used a 'ramp-up' factor for demand, revenue and benefit calculations, based upon evidence contained in the rail industry Passenger Demand Forecasting Handbook (PDFH) in Table B12.1 of PDFH v5.1[3].

This assumes that not all demand, revenue or benefit will accrue in the opening year of the scheme, taking into account lag effects, with people changing their behaviour over a number of years – for example switching to using Glyne Gap vice Bexhill.

For the purposes of the appraisal we have assumed the following:

- Year 1 - 70% of demand/revenue/benefits realised in opening year;
- Year 2 – 85% of demand/revenue/benefits realised;
- Year 3 – 90% of demand/revenue/benefits realised;
- Year 4 and after – 100% of demand/revenue/benefits realised.

[3] Passenger Demand Forecasting Handbook version 5

Demand Forecasts

Future year forecasts were calculated by taking the 2012 base year demand forecasts and applying the relevant underlying growth factors as specified in PDFH for:

- Fares;
- GDP;
- Population;
- Employment;
- Car ownership; and
- Car fuel forecasts.

These were combined to create annual forecasts for 2016, the assumed opening year, and for each year until 2075 to allow for a 60-year appraisal period.

Demand growth is capped in 2033, 20 years beyond the current year for all growth factors with the exception of GDP and population. No specific guidance is given in WebTAG regarding cap years, but this is considered to be acceptable given that WebTAG unit 3.5.6 gives future year forecasts for population and GDP but not for other factors.

It should be noted that two growth scenarios have been developed. The first looks at the 'central case' growth and applies the above factors to base year forecasts. The second scenario is a 'high growth' scenario which realises the development of land close to the Hastings-Bexhill Link Road. Rather than apply higher growth factors, this scenario adds in generated trips to the station from these areas in addition to the central case growth factors.

Revenue Forecasts

Revenues per passenger were calculated using revenue per journey figures based on Bexhill MOIRA data (under the assumption that Glyne Gap journeys produce the same yield as those from Bexhill, as Bexhill and Glyne Gap would be priced very similarly). Revenue per journey for London and non-London journeys was assumed to be as per Bexhill However, Bexhill was not considered a suitable proxy for the London/non-London split, since the frequencies do not correspond to those at Glyne Gap. These proportions therefore have been assumed to be the same as Glyne, – which has no direct London service and only an hourly service.

This average yield has been applied to the new to rail demand forecasts only, since the abstraction of users from Bexhill will have no effect on revenue.

Rail fares are assumed to rise by 1% above the rate of inflation (RPI) for 20 years from now, after which no further changes are assumed, as specified in WebTAG.

5.2 Scheme Benefits

5.2.1 User benefits

User benefits take the form of time savings. In most rail schemes involving the improvement of an existing service, these are relatively simple to calculate: a comparison of the relevant generalised journey times (GJTs) generated by MOIRA for the "before" and "after" service levels shows the gain for each relevant origin-destination pair; multiplying this by the number of trips over that O-D pair gives the number of minutes saved. An adjustment is then applied such that existing rail passengers are assumed to enjoy the full benefit of that time saving, but new passengers attracted to the railway as a result of the improved service are assumed overall to enjoy half of the total number of minutes saved.[4]

Standard monetary values (detailed in WebTAG Unit 3.5.6) are then applied for each year to convert the total number of minutes saved into a financial value, according to the purpose of the journeys concerned. Values of time are also assumed to grow in line with forecasts included in WebTAG Unit 3.5.6 (dated October 2012).

In the case of Glyne Gap, there is no existing service and hence we have to assess the benefits separately to each of the following user groups:

- Demand from Ravenside Retail Park;
- Demand from Bexhill College, including trips extracted from Bexhill Railway Station and new-to-rail trips at Glyne Gap;
- Abstracted demand from Bexhill Railway Station – passengers currently using Bexhill but who will switch to using Glyne Gap;
- New-to-rail users at Glyne Gap; and
- Through-travellers – i.e. those rail passengers who currently travel on the section of railway between Bexhill and St Leonards Warrior

[4] In other words, those who would not otherwise have travelled by rail are assumed to enjoy half of the benefit – this convention is known as the "rule of a half".

Square (including, for example trips between Eastbourne and Hastings, or Ore and Brighton).

5.2.2 Non-user benefits

For a scheme of this type, non-user benefits come under two main categories: time savings to road users as a result of road decongestion (itself a result of some road traffic diverting to rail), and reductions in the social costs of car use – again a result of road traffic diverting to rail. Under the latter category, the following have been counted, in decreasing order of importance according to WebTAG valuations:

- Road accidents;
- Greenhouse-gas emissions;
- Local air quality;
- Road traffic noise; and
- Road infrastructure repairs.

5.2.3 Demand from Ravenside Retail Park

A comparison of journey times has been undertaken, enabling a journey time saving to be calculated. This has used a number of high level assumptions as follows:

- For car journey time
  - 15mph average speed for car
  - 5 minutes 'parking' time
  - 1 minute egress time to destination
- For rail journey time
  - Published station-station journey time
  - 7.5 minute access/egress time
  - 5 minute average wait time for service

These time elements are then weighted as per guidance in WebTAG unit 3.5.6. This assumes that waiting time is weighted as 2.5 times and walking is weighted as 2 times the in-vehicle time.

We have based revenues on those calculated within MOIRA for Bexhill. This has been split down by London and non-London trips. For the retail park we have assumed that all trips are 'non-London'.

In order to calculate external car costs we have calculated the number of highway kilometres saved per annum. We have assumed that all rail trips would transfer from car. This would seem acceptable for an out-of-town retail area. A summary of the benefit sources is provided in Table 5.1 below.

Table 5.1: Sources of benefit for demand from Ravenside Retail Park

	RAVENSIDE RETAIL PARK	
	Application	**Result**
Journey Time Savings	Change in journey times between before and after situation	**Increase** in journey times, giving negative impacts to users
Revenue	Apply average revenue for Bexhill (from MOIRA) for non-London trips	Treated as a **cost** to users but as a **benefit** of increased revenue to Train Operators
External Cost of Car Use	Assume 100% of trips transfer from car, apply station-station distance to calculate km change (as destination station of new rail trips is known from LOGIT model)	**Decrease** in highway kilometres, so marginal benefits to congestion, accidents and environment. Loss of indirect tax revenues to Government

5.2.4 Demand from Bexhill College

By comparing journey times to the college from Bexhill and Glyne Gap, we were able to develop a LOGIT model to calculate the potential level of abstraction to Glyne Gap. Time savings for those abstracting to Glyne Gap have then been used to calculate user benefits. Note that time elements have been appropriately weighted as per guidance in WebTAG unit 3.5.6.

The demand forecast also identified induced, new-to-rail demand at Glyne Gap. This demand is assigned the equivalent time savings per passenger as per those switching from Bexhill to using Glyne Gap, using the rule-of-a-half – i.e. they see half of the benefit per passenger. Only new-to-rail trips gain the revenue benefit; assuming that Glyne Gap and Bexhill are priced identically in terms of train fares there will be no net impact on revenue from abstracted trips.

For external costs of car use, those abstracting from Bexhill to Glyne Gap will see no benefits. We have assumed that of the new-to-rail trips at Glyne Gap 26% of trips transfer from car. In order to calculate the car kilometres saved, we have applied an average distance travelled from home-to-college derived from the original catchment area data. A summary of benefit sources is provided in Table 5.2 below.

Table 5.2: Sources of benefit for demand from Bexhill College

	BEXHILL COLLEGE	
	Application	**Result**
Journey Time Savings (for demand abstracted from Bexhill)	Change in journey times between before and after situation	**Decrease** in journey times, giving benefits to users
Journey Time Savings (for new-to-rail trips)	Apply above time saving as per rule-of-a-half	**Decrease** in journey times, giving benefits to users
Revenue	Apply average revenue for Bexhill (from MOIRA) for non-London trips. Only new trips get full revenue impact	Treated as a **cost** to users but as a **benefit** of increased revenue to Train Operators
External Cost of Car Use (for demand abstracted from Bexhill)	No change in vehicle kilometres	**No impact**
External Cost of Car Use (for new-to-rail trips)	Assume 100% of trips transfer from car, apply station-station distance to calculate km change (as destination station of new rail trips is known from LOGIT model)	**Decrease** in highway kilometres, so marginal benefits to congestion, accidents and environment. Loss of indirect tax revenues to Government

5.2.5 Abstracted Trips from Bexhill

A proportion of users of Glyne Gap station are forecast to be existing passengers who currently use Bexhill station. A LOGIT model was developed to identify which station demand within the overlap area between Bexhill and Glyne Gap would use.

A comparison of 'before' and 'after' journey times has been undertaken for those users who switch to Glyne Gap; the various time elements are weighted as per guidance in WebTAG unit 3.5.6.

We have assumed no change in revenues for abstracted demand. This assumes that Glyne Gap and Bexhill are priced identically in terms of train fares, resulting in no net impact on revenue from abstracted trips.

The change in vehicle mileage has also been calculated for these users. This number is split as follows:

- Walk to Bexhill switch to walk to Glyne Gap – no mileage change
- Drive to Bexhill switch to drive to Glyne Gap – mileage increase
- Drive to Bexhill switch to walk to Glyne Gap – mileage decrease

A summary of benefit sources is provided in Table 5.3 below.

Table 5.3: Sources of benefit for demand abstracted from Bexhill

	ABSTRACTED DEMAND	
	Application	**Result**
Journey Time Savings (for demand abstracted from Bexhill)	Change in journey times between before and after situation	**Decrease** in journey times, giving benefits to users
Revenue	No impact	**No impact**
External Cost of Car Use (drivers to Bexhill switching to drive to Glyne Gap)	Change in vehicle kilometres	**Increase** in highway kilometres, so marginal dis-benefits to congestion, accidents and environment. Loss of indirect tax revenues to Government
External Cost of Car Use (drivers to Bexhill switching to walk to Glyne Gap)	Change in vehicle kilometres	**Decrease** in highway kilometres, so marginal benefits to congestion, accidents and environment. Loss of indirect tax revenues to Government

5.2.6 New-to-rail trips at Glyne Gap

The benefits to new to rail demand at Glyne Gap has been analysed with reference to abstracted trips.

In terms of journey time savings, an average saving per passenger has been calculated for abstracted demand. This has then been applied to new to rail trips using the rule-of-a-half.

For revenue, an average yield per single journey has been calculated with reference to the revenue calculated by MOIRA for Bexhill. This has been split by London / non-London destinations with reference to journey splits at the comparator station at Glyne.

The full revenue per passenger is applied to new-to-rail trips. Note that the rule-of-a-half only applies to benefit calculations and not to revenues.

We have assumed that of the new-to-rail trips at Glyne Gap 26% of trips transfer from car. In order to calculate the car kilometres saved, we have applied an average distance travelled, calculated from MOIRA station-to-station distances for the comparator stations of Collington, Cooden Beach, Glyne, Pevensey and Westham and West St Leonards.

A summary of the benefit sources are provided in Table 5.4 below.

Table 5.4: Sources of benefit for new-to-rail demand

NEW TO RAIL DEMAND		
	Application	**Result**
Journey Time Savings	Time savings for abstracted demand applied using rule-of-a-half	**Decrease** in journey times, giving benefits to users
Revenue	Average London / non-London revenue yield applied to demand	**Cost** to users is balanced by increased revenue to Train Operators
External Cost of Car Use	Change in vehicle kilometres	**Decrease** in highway kilometres, so marginal benefits to congestion, accidents and environment. Loss of indirect tax revenues to Government

5.2.7 Through-traveller Impacts

By stopping trains at Glyne Gap the travel time for many through journeys using the route between Bexhill and St Leonards Warrior Square would be extended. This would reduce the attractiveness of the journey and results in reduced demand for journeys through Glyne Gap. This has been assessed using the MOIRA program which produces the following outputs:

- Demand change;
- Revenue change; and
- Journey time change.

These figures have been produced for the base year and growthed over the 60 year appraisal using the relevant growth factors. A summary of the benefit sources is provided in Table 5.5 below.

Table 5.5: Source of benefits for through travellers

THROUGH TRAVELLERS		
	Application	**Result**
Journey Time Savings	Change in journey times as a result of additional two minutes assessed using MOIRA model	**Increase** in journey times, giving negative impacts to users
Revenue	Impact of additional two minutes assessed using MOIRA model.	**Benefit** to users is balanced by decreased revenue to Train Operators
External Cost of Car Use	Assume 26% of lost railway demand transfers to car, resulting in an increase in highway kilometres	**Increase** in highway kilometres, so marginal dis-benefits to congestion, accidents and environment. Increase of indirect tax revenues to Government

5.3 Scheme costs

5.3.1 Capital costs

As discussed in Chapter 2, the construction costs for three options have been calculated. Only the basic station option has been assessed for the purposes of establishing a business case, since it was found that this option was adequate for the proposed level of service.

Costs were calculated for the following elements:

- Construction costs;
- Preliminary costs;
- Design costs;
- Testing and commissioning costs;
- Network Rail management costs;
- Sponsor costs; and
- Contingency costs.

A breakdown of costs can found in Appendix C. Costs have been assumed to be incurred during the four years prior to opening, in the appropriate proportion for each category.

5.3.2 Operating costs

An assessment of the operating costs for the preferred option has been undertaken. A breakdown of costs can found in Appendix D. Since the basic station is unstaffed, staffing costs are not required. It should be noted that within the appraisal maintenance costs are included within capital costs rather than operating costs.

5.4 Benefit to Cost Ratio (BCR)

From the above benefit and cost data for the scheme, the monetary values resulting were reduced to a common basis (2010 money), costs were converted from factor prices to market prices, and discounted for the 60-year appraisal to 2010 values.

From these, the total present-day value of benefits (to users and non-users, and to business as well as consumers) was divided by the total present-day value of costs, to give the BCR, expressed as a number such that a BCR of greater than one implies benefits exceeding costs, and a value of less than one implies that the scheme has net dis-benefits. As an alternative measure of a scheme's value for money, the

costs figure was also subtracted from the benefits figure to give the net present value (NPV) of the scheme.

5.5 Appraisal results

Table 5.6 summarise the various benefits and costs of the scheme under the central growth scenario.

Analysis of Monetised Costs and Benefits	£ 000, discounted to 2010 prices, in 2010 market prices
Noise	£5
Local Air Quality	£0
Greenhouse Gases	£28
Journey Ambience	£0
Accidents	£73
Economic Efficiency: Consumer Users (Commuting)	-£4,328
Economic Efficiency: Consumer Users (Other)	-£1,245
Economic Efficiency: Business Users and Providers	£5,651
Wider Public Finances (Indirect Taxation Revenues)	-£1,354
Option Values	£0
PRESENT VALUE OF BENEFITS (PVB)	**£1,539**
Broad Transport Budget	£5,430
PRESENT VALUE OF COSTS (PVC)	**£5,430**
OVERALL IMPACTS	
NET PRESENT VALUE (NPV)	**-£3,891**
BENEFIT TO COST RATIO (BCR)	**0.28**

It should be noted that consumer users see an overall dis-benefit, mainly as a result of revenue being treated as a cost to users. Business users will also see a dis-benefit for the same reason; business providers see an overall benefit, as revenue accrues as a benefit to the Train Operating Company.

It should also be noted that indirect taxation revenues *"which benefit the Government as a whole but do not directly affect the broad transport budget, are treated not as costs but as benefits"*[5]. As indirect tax is reduced it is treated as a cost and also a benefit to users. It is subtracted from the overall benefit level rather than added as the other benefits are.

[5] WebTAG Unit 3.5.1

In summary, the figures show that there are few benefits of the scheme, and the costs will exceed the benefits. A benefit to cost ratio of 0.28 has been calculated, which indicates that for every £1 spent on the scheme only £0.28 in benefits will accrue.

These figures indicate that overall the benefits to consumers are outweighed by the negative impacts. In particular one of the main sources of dis-benefits is a result of the time increase impacting on existing through-travellers on the route.

Note that the full economic assessment is provided in Appendix G.

5.6 Sensitivity test – impacts of high growth

As previously stated, a sensitivity test has also been produced. This looks at the impacts of higher population and employment growth in the local area, as detailed in Section 3 of the Demand Forecasting Report. Additional trips from these developments have been added to the 'new-to-rail' trips, with revenue and benefits applied appropriate. This increase in demand produces the following results summarised in Table 5.7.

Analysis of Monetised Costs and Benefits	£ 000, discounted to 2010 prices, in 2010 market prices
Noise	£8
Local Air Quality	£0
Greenhouse Gases	£45
Journey Ambience	£0
Accidents	£117
Economic Efficiency: Consumer Users (Commuting)	-£5,442
Economic Efficiency: Consumer Users (Other)	-£1,565
Economic Efficiency: Business Users and Providers	£7,652
Wider Public Finances (Indirect Taxation Revenues)	-£1,846
Option Values	£0
PRESENT VALUE OF BENEFITS (PVB)	**£2,660**
Broad Transport Budget	£5,430
PRESENT VALUE OF COSTS (PVC)	**£5,430**
OVERALL IMPACTS	
NET PRESENT VALUE (NPV)	**-£2,770**
BENEFIT TO COST RATIO (BCR)	**0.49**

Under the high growth scenario the benefits of the scheme are increased by approximately £1.1 million over the lifetime of the scheme. Note that the full economic assessment is provided in Appendix H.

5.7 Summary and Recommendations

Government appraisal of business cases of transport schemes is generally based in large part on BCR scores as a measure of their value for money (VfM), which they categorise as follows:

- "poor VfM" = where the BCR is less than 1.0;
- "low VfM" = where the BCR is between 1.0 and 1.5;
- "medium VfM" = where the BCR is between 1.5 and 2.0;
- "high VfM" = where the BCR is between 2.0 and 4.0; and
- "very high VfM" = where the BCR is above 4.0.

As the business case of Glyne Gap shows a BCR of less than 1.0, we would not suggest proceeding with the scheme as it offers poor value for money.

However, it should be noted that the current station proposal assumes a one train per hour service which is imbalanced by direction; in effect the trains serve different destinations. Westbound trains terminate at Brighton, running via Eastbourne, Lewes and Falmer, whilst eastbound trains originate at London Victoria, running via East Croydon, Lewes and Eastbourne. This is due to a number of operational constraints along the route, for example interaction with other services at Bo Peep Junction and on the Brighton Main Line

Increases to the planned number of houses in the Bexhill area is likely to impact on the business case for the station. Additional population levels would increase demand at the station.

One of the main constraints on forecast demand is the relatively poor service offered at Glyne Gap. Only one train per hour is assumed at the station, and this is due to operational constraints and interaction with other services around Bo Peep Junction and Hastings, as well as turn-around times at Hastings and Ore stations.

Increasing the level of service at Glyne Gap to two trains per hour would increase the demand forecasts for the station. However, it should be noted that the catchments for Glyne Gap and Bexhill overlap, and any increased demand is likely to come at the expense of reduced demand at Bexhill – i.e. demand transfers from Bexhill to Glyne Gap. Increased demand at Glyne Gap would require appropriate car parking

provision, therefore requiring additional car parking above that which is proposed.

Additionally, there would be greater dis-benefits to through travellers along the East Coastway line by extending journey times on two trains per hour due to calling additionally at Glyne Gap. This would flow through the assessment as a reduction in revenue as travellers react to longer journey times by transferring to alternate modes of transport.

As previously noted two trains per hour at Glyne Gap is unlikely to be feasible, due to operating constraints. We would therefore suggest not pursuing the proposal for a new passenger station at Glyne Gap.

6. Funding Sources

This section, detailing different funding sources, has been included in the report as required in the study brief. This is given below, notwithstanding the results of the economic assessment, which suggests that the scheme is poor value for money and therefore not worth proceeding with.

Although no funding sources specific to new stations exists, a number of government schemes provide funding for investment in transport and infrastructure, with local councils now having more freedom to make decisions in the best interests of their area. The Department for Transport last year announced its intention to devolve funding for local major transport schemes to local transport bodies(LTBs) from 2015.

LTBs will be voluntary partnerships between Local Authorities (LAs), Local Enterprise Partnerships (LEPs) and maybe other organisations.

Growing places fund

Glyne Gap station lies in the South East LEP area, which has access to the Government's Growing Places Fund (GPF), designed to push forward developments that may have stalled as a result of the financial climate to enable the creation of new jobs and homes. The Growing Places fund is allocated on a year-by-year basis and encourages applications for funding for predominantly capital spend on schemes that which promote the delivery of jobs and housing and maximise economic benefits.

The South East LEP are operating the fund as a revolving infrastructure fund allowing it to support additional schemes in the future, and it is envisaged to continue until at least 2020.

ERDF programmes

The European Regional Development Fund (ERDF) attempts to allow economic growth to be more evenly shared across the country and between industries. It is aimed at economic regeneration projects promoted primarily by the public sector. This involves:

- government departments
- local enterprise partnerships
- local authorities
- further and higher education establishments
- other public bodies
- volunteer sector organisations

ERDF helps projects which offer substantial benefits to the programme area and its communities. ERDF generally pays up to 50% of the eligible costs of a project. The remaining funding must be found by the applicant and can come from a range of public, private and voluntary sources.

ERDF is provided in geographically defined operational programme, including one for the 'South-East of England'. The area covered by the South East of England ERDF is shown in Figure 6.1.

Figure 6.1: South East of England ERDF area

The aim of this Operational Programme is to promote competitiveness in South-East England whilst contributing to reducing the region's ecological footprint. The current round of programmes started in 2007 and runs until the end of 2013, with a new round due to begin in 2014.

7. Conclusions and Next Steps

This study has refined the options and costings to GRIP2 level, defined as “Pre-Feasibility. The next stage of the process is GRIP 3 - Option Selection, which seeks to:

- Develop the surviving options further;
- Cost them out, test the risk;
- Discard options which now fail the tests set down in GRIP1 (including the cost test); and
- Set out the strategy for dealing with risk, safety, and operations.

As the business case of Glyne Gap shows a BCR of less than 1.0, we would not suggest proceeding with the scheme as it offers poor value for money. The central case forecast results in a BCR of 0.28, whereas the high growth forecast, based on additional housing in the local area, suggests a BCR of 0.49.

Increases to the planned number of houses in the Bexhill area is likely to impact on the business case for the station. Additional population levels would increase demand at the station. However, the increase in housing numbers would not increase rail demand on a pro-rata basis, given the impacts of distance to the station and on the fact that not all of the demand at Glyne Gap station is forecast to come from local generated trips. As an example, an extra 100 houses in the proposed development area to the North East of Bexhill could increase rail trips from Glyne Gap station by only around 47 boardings per year (equating to less than 1 boarding per day).

One of the main constraints on forecast demand is the relatively poor service offered at Glyne Gap. Only one train per hour is assumed at the station, and this is due to operational constraints and interaction with other services around Bo Peep Junction and Hastings, as well as turn-around times at Hastings and Ore stations.

Increasing the level of service at Glyne Gap to two trains per hour would increase the demand forecasts for the station. However, it should be noted that the catchments for Glyne Gap and Bexhill overlap, and any increased demand is likely to come at the expense of reduced demand at Bexhill – i.e. demand transfers from Bexhill to Glyne Gap. Increased demand at Glyne Gap would require appropriate car parking provision, therefore requiring additional car parking above that which is proposed.

Additionally, there will be greater dis-benefits to through travellers along the East Coastway line by extended journey times on two trains per hour due to calling additionally at Glyne Gap. This would flow through

the economic assessment as a reduction in revenue as travellers react to longer journey times by transferring to alternate modes of transport.

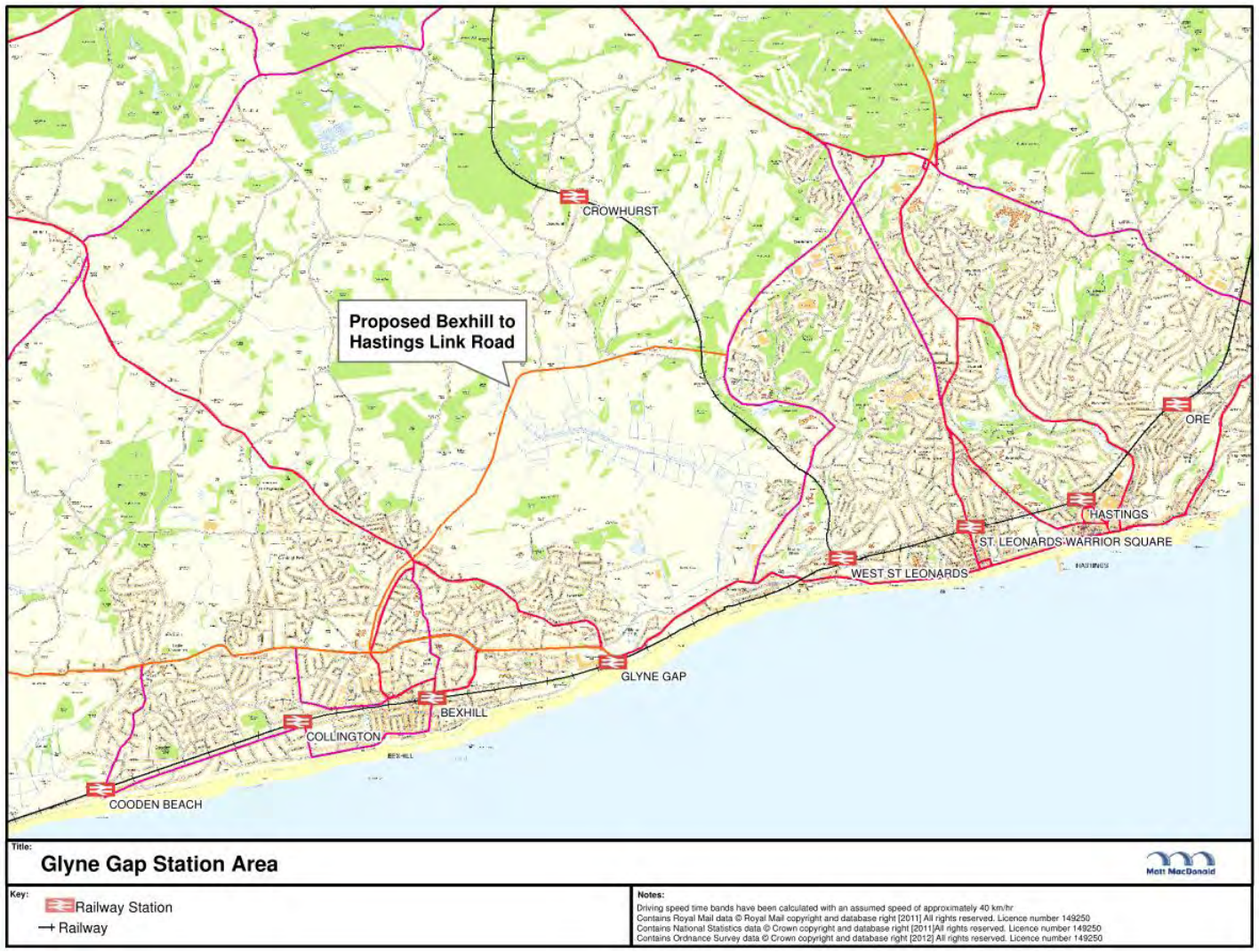
The only possible means of achieving a business case for Glyne Gap station in isolation would be to develop the station as a major Park and Ride site for Bexhill, with a level of service comparable to that at Bexhill and an associated downgrading of the current Bexhill station site to an hourly service. This would in effect be relocating Bexhill station to Glyne Gap, a prospect unlikely to achieve political or public support.

Given the above conclusions we would recommend that pursuing a new station at Glyne Gap should be dropped from further consideration.

Appendices

Appendix A. Location Map

Figure A.1: Location of proposed station at Glyne Gap



Appendix B. Photographs

Figure B.1: Existing cycle storage facilities, looking south

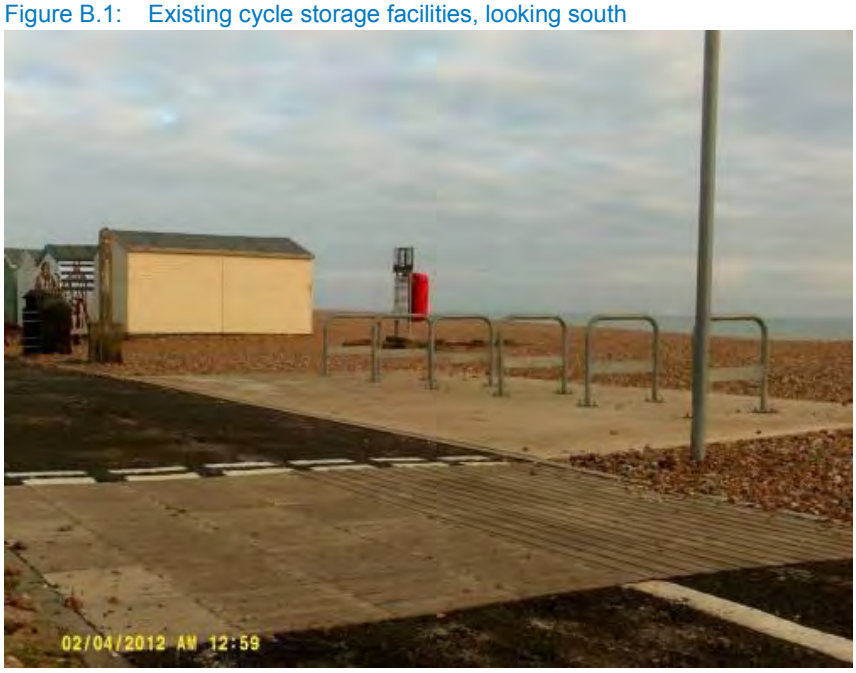


Figure B.2: Existing under-bridge no.214 south elevation (beach side)

Figure B.3: Existing under-bridge no.214 north elevation (retail park side)

Figure B.4: Existing retail access road looking towards A259, showing area grass adjacent to the leisure centre

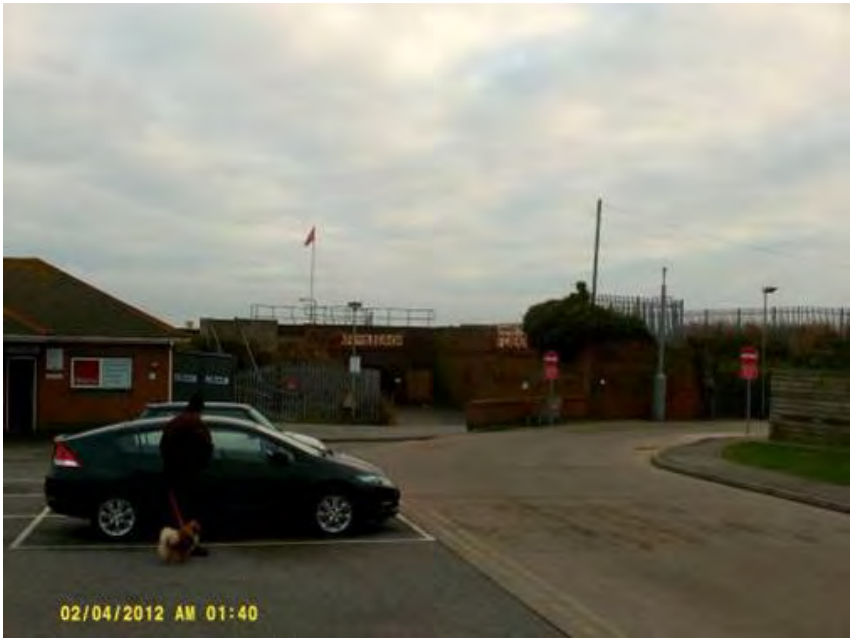


Figure B.5: Grassed area adjacent to existing leisure centre looking towards under-bridge no. 214

Figure B.6: Existing car park showing end of existing building and bus stop for Bexhill on A259

Figure B.7: Existing car park looking west toward Ravenside Retail Park

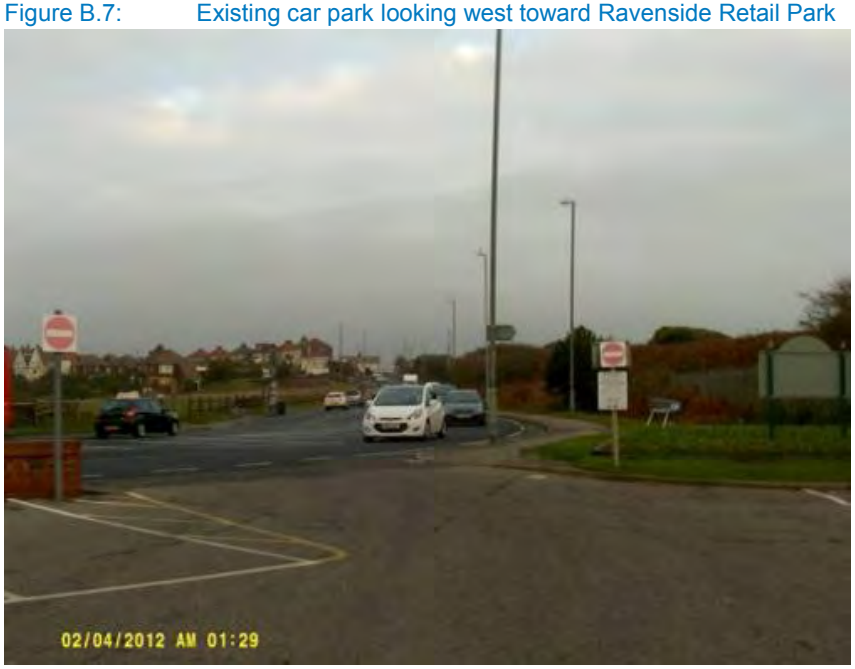
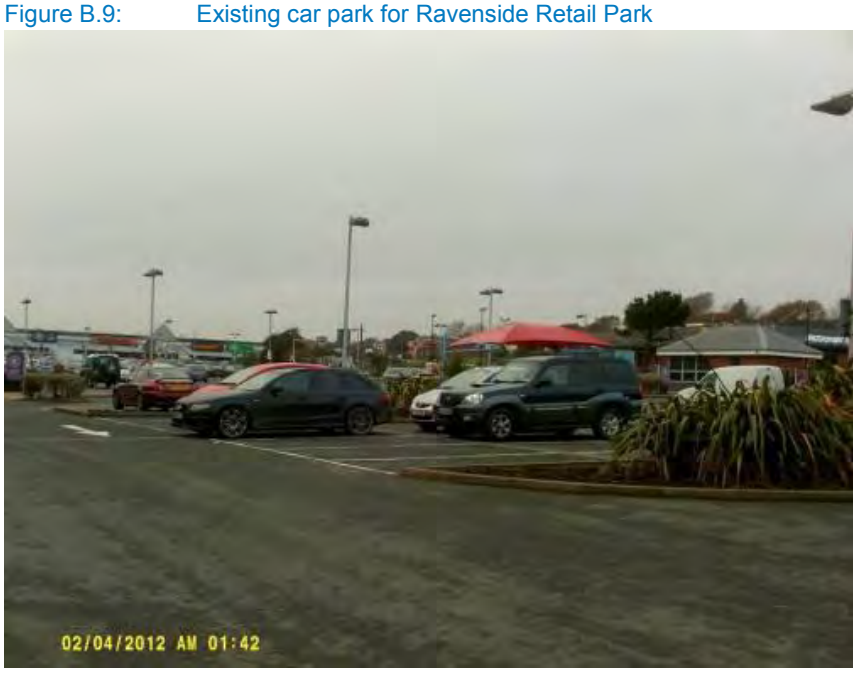


Figure B.8: Existing bus stop for Hastings on A259 north of the site

Figure B.9: Existing car park for Ravenside Retail Park



Appendix C. Capital Cost Breakdown

Rother District Council,
East Sussex County Council
and Land Securities Group PLC

GRIP 2 Estimate

New Passenger Station at Glyne Gap

Platform and Station Works

November 2012

Issue and Revision Record:

Rev.	Date	Originator	Checked	Approved	Description
00	27-Nov-12	Liam Shields	Melvyn Jones	Robert Walker	Draft issued for review / comment
01	28-Nov-12	Liam Shields	Melvyn Jones	Robert Walker	Minor alteration made

311776 - New Passenger Station at Glyne Gap
Platform and Station Works
GRIP 2 Estimate Summary

	Construction Costs (including Main Contractors OH & P @ 12.5%)	Prelims @ 20%	Design @ 10%	Test & Commission on electrical work only @ 10%	Network Rail / Management @ 10%	Sponsor @ 4%	Point Estimate Total	MAXIMUM +30%	MINIMUM -30%
Basic 84m Platform	**1,543,110**	308,622	154,311	21,223	154,311	61,724	**2,243,301**	**2,916,291**	**1,570,310**
Intermediate 166m Platform	**2,145,718**	429,144	214,572	26,803	214,572	85,829	**3,116,637**	**4,051,628**	**2,181,646**
Full 186m Platform	**3,015,286**	603,057	301,529	52,823	301,529	120,611	**4,394,835**	**5,713,286**	**3,076,385**

ESTIMATE BUILD UP

Project / Contract No.	**311776 - New Passenger Station at Glyne Gap**
Estimate Title :	**GRIP 2 Estimate**
Engineering Discipline:	**Platform and Station Works**
Base Date	**4Q 2012**
Estimate Revision:	
Date:	**28-Nov-12**

ITEM	DESCRIPTION	QTY	UNIT	RATE	TOTAL
	Construction of 2 new Basic Platforms each 84m long and associated works				
	General site clearance	1,680	m2	3.50	5,880
	General Excavation in embankments , depth n.e. 2m	3,360	m3	7.50	25,200
	Dispose off site excvated material	3,360	m3	48.56	163,162
					-
	Construct new light weight modular platform 3m wide, out of reinforced concrete deck planks on a steel or concrete frame spanning between reinforced concrete piles. Platform complete with all necessary fittings, fence, seats, waiting shelter etc	540	m2	726.00	392,040
					-
	Galvanised steel mesh skirt to platform	415	m2	0.00	incl
					-
	Pallisade fence 1.5m high to back of platform	168	m	0.00	incl
					-
	Gated stepped access at each end of platforms, for track access only	4	nr	0.00	incl
	"Paragon Anti -Vandal" Platform waiting shelter, complete with intergal seating	2	nr	25,000.00	50,000
					-
	Lighting columns at 20m centres to platforms, ramps and stairs	32	nr	2,600.00	83,200
					-
	2 number DDA compliant steel access ramps 2m wide, complete with none slip surfacing	420	m2	1,522.00	639,240
					-
	Set of steel access stairs, 2m wide to each platforms,	40	m2	1,284.00	51,360
					-
	Install Ticket machine, and all necessary cabling and power connections	1	nr	35,000.00	35,000
					-
	New DNO supply for platforms	1	nr	25,000.00	25,000
	Supply and install new feeder pillar and all necessary connections	1	nr	12,500.00	12,500
	CIS screen complete with clock	2	nr	7,031.00	14,062
	Help Point	2	nr	6,233.00	12,466
	Platform Signage	1	sum	4,000.00	4,000
	Long line PA System	12	nr	750.00	9,000
	CCTV	6	nr	3,500.00	21,000
	Total 84m Platform				**1,543,109.60**

ESTIMATE BUILD UP

	Project / Contract No.	**311776 - New Passenger Station at Glyne Gap**
	Estimate Title :	**GRIP 2 Estimate**
	Engineering Discipline:	**Platform and Station Works**
	Base Date	**4Q 2012**
	Estimate Revision:	
	Date:	**28-Nov-12**

ITEM	DESCRIPTION	QTY	UNIT	RATE	TOTAL
	Construction of 2 new Intermediate Platforms each 166m long and associated works				
					-
	General site clearance	3,320	m2	3.50	11,620
	General Excavation in embankments , depth n.e. 2m	6,640	m3	7.50	49,800
	Dispose off site excvated material	6,640	m3	48.56	322,438
					-
	Construct new light weight modular platform 3m wide, out of reinforced concrete deck planks on a steel or concrete frame spanning between reinforced concrete piles. Platform complete with all necessary fittings, fence, seats, waiting shelter etc	1032	m2	726.00	749,232
					-
	Galvanised steel mesh skirt to platform	808	m2	0.00	incl
					-
	Pallisade fence 1.5m high to back of platform	332	m	0.00	incl
					-
	Gated stepped access at each end of platforms, for track access only	4	nr	0.00	incl
	"Paragon Anti -Vandal" Platform waiting shelter, complete with intergal seating	2	nr	25,000.00	50,000
					-
	Lighting columns at 20m centres to platforms, ramps and stairs	40	nr	2,600.00	104,000
					-
	2 number DDA compliant steel access ramps 2m wide, complete with none slip surfacing	420	m2	1,522.00	639,240
					-
	Set of steel access stairs, 2m wide to each platforms,	40	m2	1,284.00	51,360
					-
	Install Ticket machine, and all necessary cabling and power connections	2	nr	35,000.00	70,000
					-
	New DNO supply for platforms	1	nr	25,000.00	25,000
					-
	Supply and install new feeder pillar and all necessary connections	1	nr	12,500.00	12,500
					-
	CIS screen complete with clock	2	nr	7,031.00	14,062
	Help Point	2	nr	6,233.00	12,466
	Platform Signage	1	sum	4,000.00	4,000
	Long line PA System	12	nr	750.00	9,000
	CCTV	6	nr	3,500.00	21,000
					-
					-
					-
					-
					-
					-
		Total 166m Platform			**2,145,718.40**

ESTIMATE BUILD UP

	Project / Contract No.	**311776 - New Passenger Station at Glyne Gap**
	Estimate Title :	**GRIP 2 Estimate**
	Engineering Discipline:	**Platform and Station Works**
	Base Date	**4Q 2012**
	Estimate Revision:	
	Date:	**28-Nov-12**

ITEM	DESCRIPTION	QTY	UNIT	RATE	TOTAL
	Construction of 2 new Full Platforms each 186m long and associated works				
	General site clearance	3,720	m2	3.50	13,020
	General Excavation in embankments , depth n.e. 2m	7,440	m3	7.50	55,800
	Dispose off site excvated material	7,440	m3	48.56	361,286
					-
	Construct new light weight modular platform 3m wide, out of reinforced concrete deck planks on a steel or concrete frame spanning between reinforced concrete piles. Platform complete with all necessary fittings, fence, seats, waiting shelter etc	1152	m2	726.00	836,352
					-
	Galvanised steel mesh skirt to platform	905	m2	0.00	incl
					-
	Pallisade fence 1.5m high to back of platform	372	m	0.00	incl
					-
	Gated stepped access at each end of platforms, for track access only	4	nr	0.00	incl
	"Paragon Anti -Vandal" Platform waiting shelter, complete with intergal seating	2	nr	25,000.00	50,000
					-
	Lighting columns at 20m centres to platforms, ramps and stairs	42	nr	2,600.00	109,200
					-
	2 number DDA compliant steel access ramps 2m wide, complete with none slip surfacing	420	m2	1,522.00	639,240
					-
	Set of steel access stairs, 2m wide to each platforms,	40	m2	1,284.00	51,360
					-
	Install Ticket machine, and all necessary cabling and power connections	3	nr	35,000.00	105,000
					-
	Construct new car park for 50 cars	1200	m2	100.00	120,000
					-
	Install new 1.8m pallisade fence to car park	260	m	100.00	26,000
					-
	Allowance for new access from road to car parl	1	sum	5,000.00	5,000
					-
	Install DDA compliant 16 person lifts complete with plant room	2	nr	110,000.00	220,000
					-
	Construct new steel framed lift shaft, complete with cladding and foundations	2	nr	100,000.00	200,000
					-
	New DNO supply for lifts and platforms	1	nr	25,000.00	25,000
					-
	Construct new Station Building/Ticket Office	50	m2	2,500.00	125,000
					-
	Supply and install new feeder pillar and all necessary connections	1	nr	12,500.00	12,500
					-
	CIS screen complete with clock	2	nr	7,031.00	14,062
	Help Point	2	nr	6,233.00	12,466
	Platform Signage	1	sum	4,000.00	4,000
	Long line PA System	12	nr	750.00	9,000
	CCTV	6	nr	3,500.00	21,000
		Total 186m Platform			**3,015,286.40**

311776 - New Passenger Station at Glyne Gap
GRIP 2 Estimate
Platform and Station Works
4Q 2012
28-Nov-12

ASSUMPTIONS REGISTER	
Ref:	***Assumption:***
	General
1	Base date of this estimate is 4Q 2012
2	All rates include O&P - 12.5%
3	Estimate range has been stated as +/- 40% for a GRIPlevel 1 estimate, these percentages will require a review when additional information becomes available
4	See comments in the estimate for further assumptions
5	Excavated arisings from piling works, pile caps and general site clearance for disposal assumed on average to be 75% inert and 25% Contaminated Non Hazardous.
6	In a number of instances we have had to make allowances due to lack of information. The cost of the items is provisional and will require firming up at a later date (see below and the estimate for details)
7	Where appropriate, rates have been uplifted using General Building Cost Inflation Indices
8	Ramps and stairs can be constructed in mid week days from rear of platform
	Civil Works
1	Establish Green Zone working environment, supply and erect safety barrier and blue netlon fencing the length of the proposed work
2	Site clearance taken to proposed work area
3	Ducts for E & P, S & T, C & W are less than 1m deep with a sand bed, average 3 ducts per trench
4	Allowance for connecting to existing drainage allowed for
5	Existing drainage has suitable capacity to outfall new drainage into existing
6	Assumed that on average only the top 2m of the embankment will need to be excavated and disposed of off site to enable the platforms to be constructed
	Telecoms
1	Cable for lighting and loudspeakers nominally taken as a loop to each of the platform, ramps and footbridge
3	Cable for CCTV, CIS, help point, telephone, ticket vending m/c and smart card reader nominally taken as a single cable to each item of equipment
	Platform Works
1	Assumed that the platform is 3m wide
2	Allowed for a dual handrail on the access ramp and stairs and that they are 2m wide
	Electrical & Power
1	Assumed that sufficient power is available to supply the needs of the platform and a new lifts in the case of the full 186m platform
	Information used
1	Glyne Gap Station: Draft Infrastructure Assessment and Recommendations Report received 22/11/12

311776 - New Passenger Station at Glyne Gap
GRIP 2 Estimate
Platform and Station Works
4Q 2012
28-Nov-12

EXCLUSION REGISTER

Ref:	***Exclusion:***
1	Excludes any allowance for Optimism Bias
2	Excludes VAT
3	Excludes 3rd party compensation costs
4	Excludes planning and approval charges
5	Excludes land purchases
6	Costs associated with Statutory Fees (e.g. HMRI, Local Authority, etc.) unless confirmed otherwise in the summary
7	Costs associated with taxes and levies, including VAT
8	Costs associated with licences and all associated costs and fees
9	Costs associated with changes in legislation and any form of applicable standards
10	Costs associated with changes in legislation, regulation and interpretation covering discriminatory, specific and general issues that may lead to design and cost changes
11	Allowances for adverse ground conditions / provisions for ground stabilisation unless specifically identified
12	Costs associated with phasing of works
13	Excludes spares
14	Christmas, Easter or Bank Holiday working
15	Service diversions unless specifically identified
16	Excludes possession management costs along with and 3rd rail isolation costs
17	Sunk costs
18	TOC/FOC Compensation costs
19	Excludes the cost of diverting existing services
20	No allowance has been included for any stabilisation work required to the embankments, this is subject to further site investigation work

Appendix D. Operating Cost Breakdown

New Passenger Station at Glyn Gap, Bexhill

Basic Option - 2 new 84m long Platforms

Operating, maintenance and renewals costs for 60 year period

Description	£/event	Total nr of Events	Total 60 year cost	Notes/ Assumptions	Event Frequency																																																												
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38	Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50	Year 51	Year 52	Year 53	Year 54	Year 55	Year 56	Year 57	Year 58	Year 59	Year 60
Electricity	2,000.00	60	**120,000**	Prov sum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Office / Admin	4,465.12	60	**267,907**	see detail for breakdown	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cleaning/Maintenance	13,975.00	60	**838,500**	see detail for breakdown	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ticket Machine Consumables	2,000.00	60	**120,000**	Prov sum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vandalism	5,000.00	60	**300,000**	Prov sum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Minor repairs to platform, ramps, shelters, fencing and signage etc	2,000.00	60	**120,000**	Prov sum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Major overall of ramps and access stairs - anti-slip flooring (allowance sufficient to cover any required works to the platform end stairs)	46,000.00	2	**92,000**	say 460m2 @ £100/m2 every 25 years																									1																									1										
Major overall of ramps and access stairs - grit blast and paint plus minor steelwork repairs (allowance sufficient to cover any required works to the platform end stairs)	96,250.00	2	**192,500**	say 460m2 x 1.5 = 690m2 @ £125/m2 for painting (say deck area x 1.50) plus £10k for steelwork every 25 years																									1																									1										
Major refurb to shelter, inc re-paint etc	5,000.00	6	**30,000**	say £2.5k/each x 2 nr shelters = £5k every 10 years										1										1										1										1										1										1
Major refurb to fencing	3,000.00	6	**18,000**	say re-place 20m @ £100/m plus minor repairs every 10 years										1										1										1										1										1										1
Patch repairs to surfacing	5,400.00	10	**54,000**	say 540m2 x 10% = 54 m2 @ £100/m2 every 5 years (not undertaken in years when re-surfacing takes place)					1					1					1					1										1					1					1					1										1					1
Re-surface platforms	48,600.00	2	**97,200**	say 540m2 @ £90/m2 every 25 years																									1																									1										
Maintenance of M & E and Lighting	1,100.00	60	**66,000**	0.02 men require per year (£50k salary) plus 10% for consumables	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lighting Renewals, luminaires only	12,800.00	5	**64,000**	say replace all 32 nr luminaires @ £400 every 10 years (not undertaken in years when column, cable + luminaires are renewed)										1										1										1										1																				1
Lighting Renewals, column, cable + luminaires	89,600.00	2	**179,200**	say replace all 32 nr lighting columns, cable and luminaires @ £2,800 every 25 years																									1																									1										
Ticket Machine Replacement	35,000.00	10	**350,000**	say replaced every 6 years on average due to exposure to the public						1						1						1						1						1						1						1						1						1						1
Feeder Pillar	15,000.00	2	**30,000**	say replace every 25 years																									1																									1										
Help Points - units inc allowance for any control centre or 'control' works	10,000.00	8	**80,000**	say replace both every 7yr due to exposure to the public @ £5k each = £10k per event							1							1							1							1							1							1							1							1				

Help Points - cabling	5,000.00	2	**10,000**	100m x 2nr = 200m @ £25/m including recover redundant cable = £5k every 25 yr																								1																									1										
CCTV - cameras inc allowance for any control centre or 'control' works	15,000.00	6	**90,000**	say replace all 6 nr every 10 years @ £2.5k include removal = £15k per event									1										1										1										1										1										1
CCTV - cabling	12,000.00	2	**24,000**	100m x 6nr = 600m @ £20/m including recover redundant cable = £12k every 25 yr																								1																									1										
PA - Speakers inc allowance for any control centre or 'control' works	7,200.00	6	**43,200**	say replace all 12 nr every 10 years @ £600 include removal = £7,200 per event									1										1										1										1										1										1
PA - cabling	3,600.00	2	**7,200**	20m x 12nr = 240m @ £15/m including recover redundant cable = £3,600k every 25 yr																								1																									1										
Real time CIS - display boards inc allowance for any control centre or 'control' works	12,000.00	6	**72,000**	say replace both every 10yr @ £6k each = £12k per event									1										1										1										1										1										1
Real time CIS - cabling	5,000.00	2	**10,000**	100m x 2nr = 200m @ £25/m including recover redundant cable = £5k every 25 yr																								1																									1										

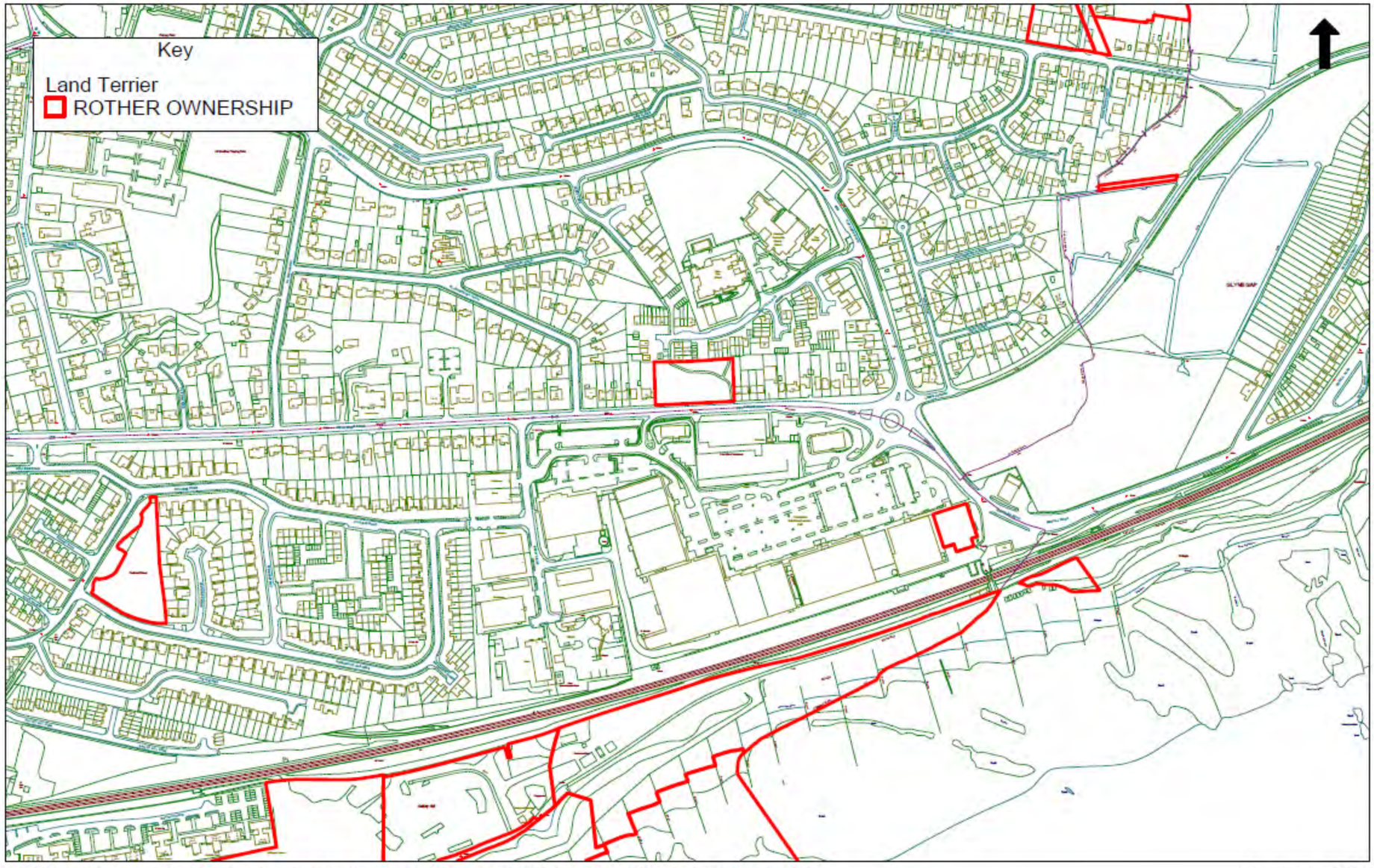
Total Cost	**3,275,706.98**
Add Prelims @ 15%	**491,356.05**
Overall Total for 60 years	**3,767,063.02**
Average cost per annum	**62,784.38**

Notes:-

a) No escalation is applied, base date 4Q12 as capex estimate
b) The cost per annum is based on a straight line division, a cashflow plot should be used to accurately forecast yearly spend.
c) Platform costs only - excludes infrastructure
d) Excludes Possession Management, Isolation Management and TOC/FOC compensation costs (assumed any work requiring possessions will be undertaken in RoR possessions or with other planned works at no additional cost)
e) 15% on cost included for prelims, general management and inspections on average (assumes that work is either undertaken or sub-contracted directly by Network Work)
f) Where provisional sums have been included these have been clearly identified in the estimate, further information would be required before we could price these with any degree of certainty

Appendix E. Land Ownership

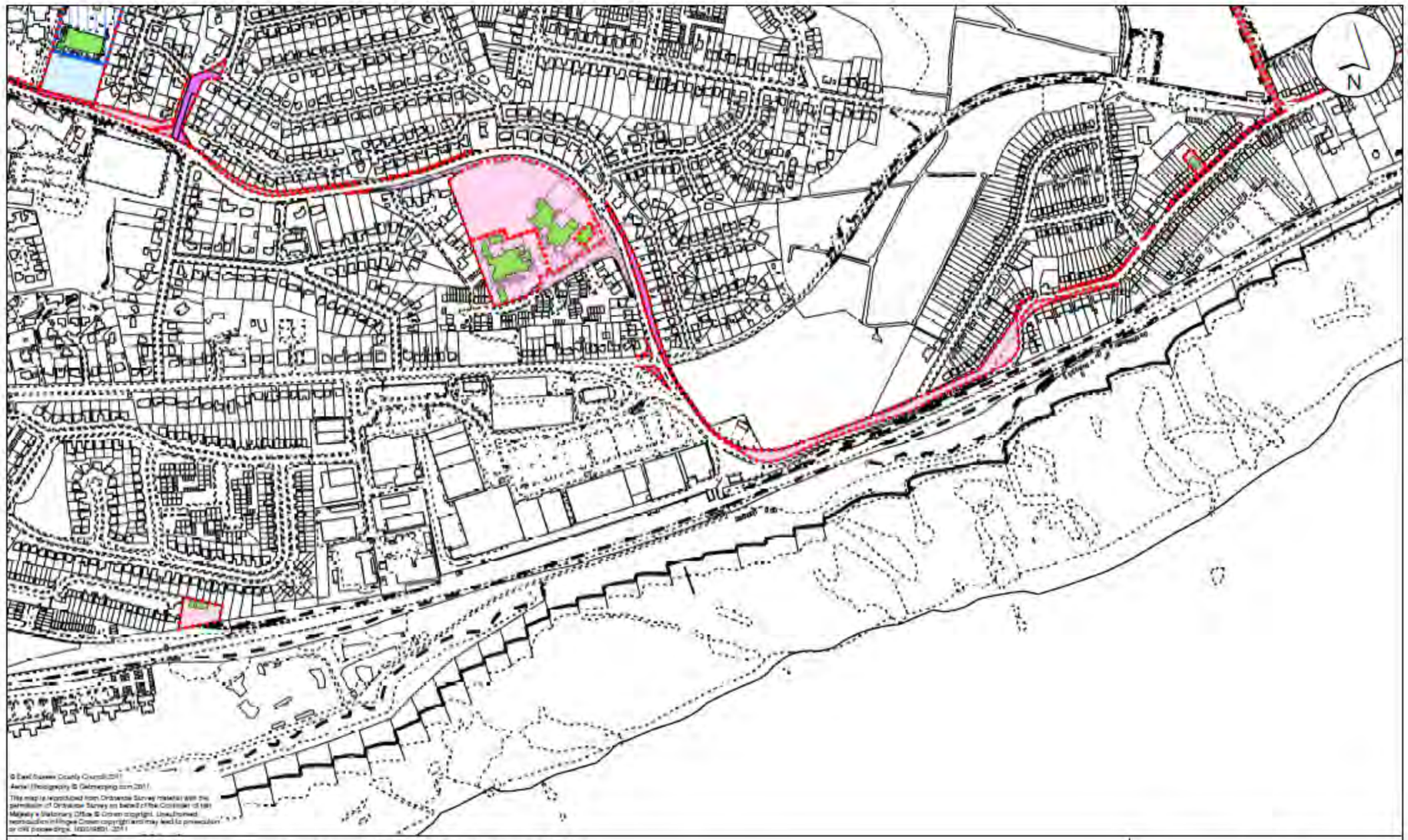
Figure E.1: Land owned by Rother District Council in the Glyne Gap area



Scale: 1:5000

TQ7608

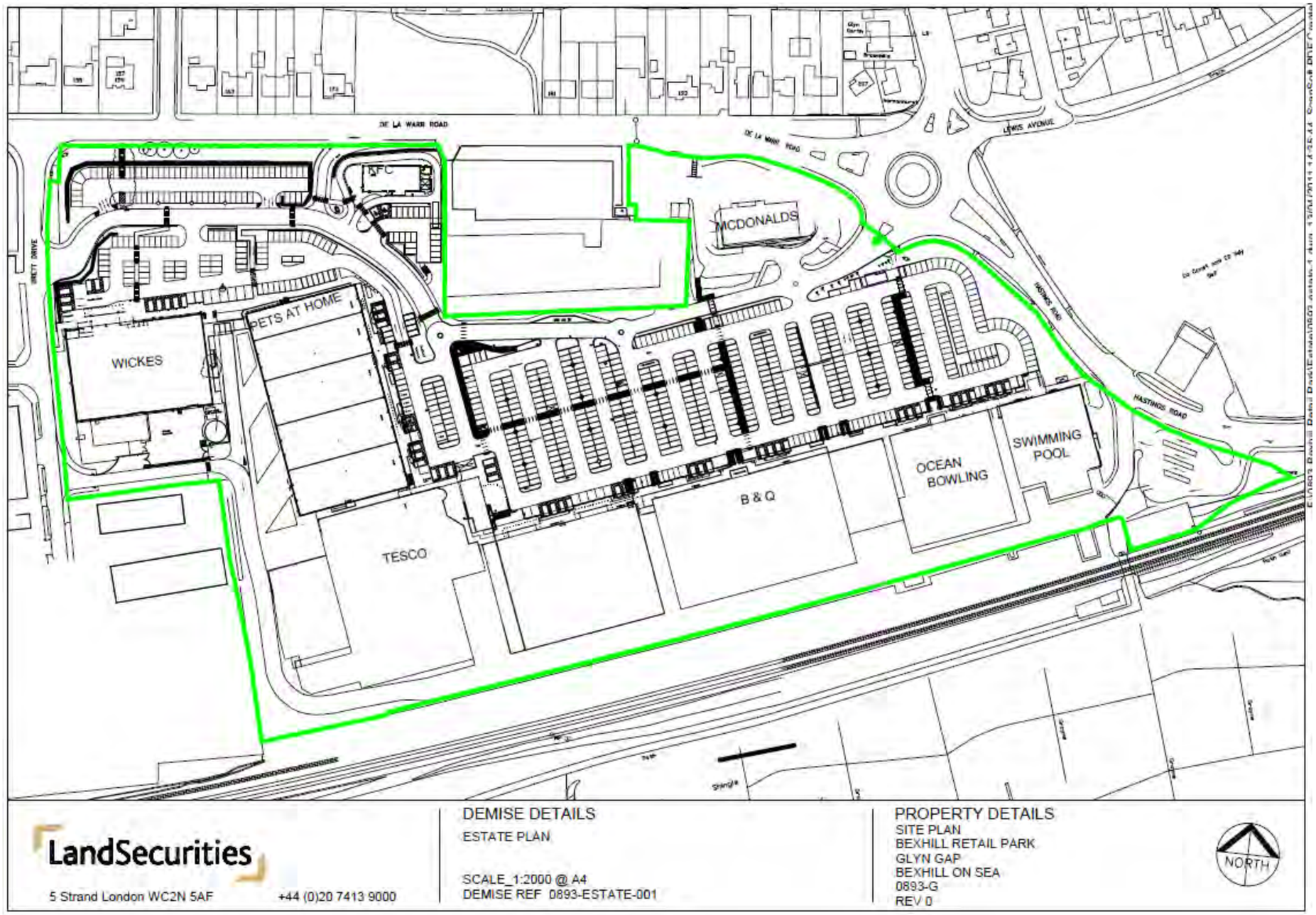
Figure E.2: Land owned by East Sussex County Council in the Glyne Gap area



Map Title:	Glyne Gap area; ESCC ownership		
Date:	9 April 2013	Map No:	SH/2
Scale:	1:6,500	Author:	.

East Sussex County Council

Figure E.3: Land owned by Land Securities in the Glyne Gap area



Appendix F. Details of Timetabling Assessment

Rules: timings and allowances used in assessment

		Headways*	Conn allwce	Turnaround Allowances	Dwell	Plat length
	London					
	Brighton					
SO590	Lewes					
SO590	Southerham Junction					
SO590	Glynde					
SO590	Berwick					
SO590	Polegate					
SO590	Willingdon Junction					
SO590	Hampden Park					
SO590	Eastbourne	3	4	4		
SO590	Hampden Park					
SO600	Willingdon Junction	AB		0.5		
SO600	Pevensey and Westham					116
SO600	Pevensey Bay					78
SO600	Normans Bay					80
SO600	Cooden Beach	AB				128
SO600	Collington S					80
SO600	Bexhill			6	1	254
SO600	St Leonards West Marina CSD					
SO600	St Leonards CET Point					
	Bopeep Junction			3		
	St Leonards Warrior Square	4-5	4			
	Hastings arr		4	3	1	
	Hastings dep					
	Hastings Park Sidings	AB		2		
	Ore	*No specific entries for Ore in SO200 so default values apply*				107

AB - headway is transit time plus 2 mins for signallers' actions
* These can be assumed to change when resignalling has taken place west of Bopeep Jn but present infrastructure is being used throughout this assessment

The standard headway as shown in 5.2.1 [reproduced above] is defined as the minimum planned interval between trains at their closest point in any route section as shown. Assumptions as to the capacity of any particular route section should not be made solely by the information contained within this sub-section.

Network Rail will expect operators to allow greater margins between trains, where possible, in order that the finished timetable is robust.

If operators time a series of trains at the minimum headway as shown, they are expected to allow an additional margin of either 2 minutes before another train is timed to follow, or 1 minute each for the next 2 successive trains. A series should normally be defined as a maximum of 4 successive trains.
Above is quoted from TPR

Standard timing allowances

Approaching bays/loops/crossovers	1/2 minute for approach control
Terminating times	add 1/2 minute to anything to terminate on a half minute
Connectional allowance	5 minutes
Standard dwell time	1/2 minute unless terminating and going forward ECS, where 1 minute to be used

Junction margins

Between all movements exc. as below	2 minutes
Resetting of route for departing service after arrival of conflicting inward service	1 minute
Re-occupation of platforms when change of direction or a conflicting move is involved	3 minutes

Turnaround times	2 cars	3 cars	4 cars	5 cars	6 cars	7 cars	8 cars	9 cars	10 cars	11 cars	12 cars
Class 313		4			5						
Class 377		4	4	4	4	5	5		6		6
Class 171	3	4	4	4	4		5				

Notes on above:

- Where no value is shown in table above, the default values below the table apply;
- Platform lengths only shown for Willingdon Junction – Bo Peep Junction section, plus for Ore. Value shown is shortest platform;
- Eastbourne turnaround time is 5 minutes for splitting moves, 6 minutes for joining, and an additional half minute for calling-on, i.e. for a train approaching an already occupied platform.;
- 0.5 minutes extra to be allowed at Willingdon Junction for Class 171;

- Bexhill turnaround time is 6 minutes if departing from same platform. Times are greater if shunting needed;
- London trains to be allowed 1 minute dwell time at Bexhill;
- Bo Peep Junction: 3 minutes between all conflicting moves;
- Hastings: 3 minutes to be allowed between conflicting moves over junctions; and
- 2 minutes is sectional running time from Hastings Park Sidings to Hastings station.

Notation in following sheets

In "conflicts" columns:	
-	No conflict identified at this location
X	Conflict identified here - see "notes" column
[X]	Conflict identified here but believed capable of resolution - see "notes" column
In "indicator" column:	
	No conflict identified as affecting this train - i.e. it can stop at GG
	Possible conflict affects this train but may still be able to serve GG as set out in notes
	Train affected by conflict such that it could not serve GG
Bo Peep Jn	Conflict at the junction itself, typically between a down Coastway train and an up train to Tonbridge
BPJ - HGS	Conflict arising due to insufficient headway left between trains on this section
Turnaround	Conflict arising due to insufficient time left at end point (Hastings or Ore) to form next service (or, on the "Up" sheet, from previous service)

Note that where no "turnaround time" conflict is identified, the next train that the working is understood to form is only given in the "notes" column on the "Down" sheet as it is not relevant to up trains terminating at Brighton, London etc.

"Predicted times" are the departure times that would apply if stops at Glyne Gap were inserted; these are shown in grey where conflicts would need to be resolved and not at all where conflicts do not appear capable of easy resolution. While based on the WTT, half-minutes are rounded to the NEXT whole minute in these columns. Predicted times that don't follow the basic rule of only adjusting times east of Bexhill are shown in bold italics.

Table F.1: Glossary of station codes and other abbreviations

Code	Meaning
BEX	Bexhill
BPJ	Bo Peep Junction*
BTN	Brighton
CHX	London Charing Cross
CST	London Cannon Street
EBN	Eastbourne
HGS	Hastings
LBG	London Bridge
ORE	Ore
SLQ	St Leonards Warrior Square
TON	Tonbridge
VIC	London Victoria
Other abbreviations:	
ECS	empty coaching stock
CS	carriage sidings

* This is not an official location abbreviation but has been used for convenience

Train ID	Times per current TT				Predicted times				Conflicts				Forms	
Headcode	Dep. origin	Origin	Destination	Arr. dest.	BEX	Glyne Gap	SLQ	Dest	Bo Peep Jn.	BPJ - HGS	Turnaround	Indicator	train	Notes
														BPJ: with 5H28 - that could be moved
1F64	22:47	VIC	HGS	00:50	00:41	00:44	00:50	00:52	[X]	-	[X]		5F64	Forms 5F64 to EBN @ 00:56 - would need to retime but probably feasible
														BPJ: with 5G03 - this could not easily be moved due to 5G03 forming 2G03 after 1 min dwell @ HGS and due to other ECS moves off St Leonards CS
														BPJ-HGS: again conflict with 5G03 and following ECS moves
2D89	05:15	EBN	HGS	05:41					X	X	-		1F05	Forms 1F05 to VIC @ 06:15
														BPJ-HGS: 5H94 6.5 mins behind but 5H94 could probably run 2 mins later if required.
														Forms 1F07 to VIC @ 06:49 - insufficient turnaround if arrived later
2D01	06:14	EBN	HGS	06:44	***06:33***	***06:36***	***06:41***	***06:44***	-	[X]	[X]		1F07	However: it may be possible for this to depart EBN 2 mins earlier at 06:12 assuming no conflict with 06:13 arrival of 2D06 from HGS (platform arrangement at EBN should allow this)
														BPJ-HGS: 1H04 from TON 5-7mins behind (though 1H04 has 1.5 mins pathing allowance and 2 mins dwell at HGS before departing for ORE so *may* be permissible - just).
														Forms 5D03 to sidings then 5F09 from sidings then 1F09 to VIC @ 07:20 - OK but *not* if 1F09 is also to serve GG and depart at 07:18, as this would leave insufficient turnaround time
														However: it may be possible for this to depart EBN 2 mins earlier at 06:31 assuming no conflict with
2D03	06:33	EBN	HGS	07:00	***06:49***	***06:52***	***06:58***	***07:00***	-	[X]	[X]		5D03	06:29 arrival of 1G02 from HGS (platform arrangement at EBN should allow this)
														BPJ: 1H95 to CST
														BPJ-HGS: 1H06 from TON
														Forms 1F13 to VIC at 07:38
														Unlikely this could depart EBN at 07:00 as would be close behind 1G09 (currently 10 mins behind at
2D05	07:02	EBN	HGS	07:32					X	X	X		1F13	PEV)
														BPJ: 1H68 to CHX
														Forms 2D08 to BTN @ 08:22
2F04	05:32	VIC	ORE	07:55					X	-	-		2D08	Cannot leave EBN earlier due to turnaround at EBN
2D09	07:38	EBN	ORE	08:15	08:02	08:05	08:11	08:17	-	-	-		1F17	Forms 1F17 to VIC @ 08:47
														BPJ: 1H72 to CHX
														BPJ-HGS: 1H10 from CHX
														Forms 2D12 to BTN @ 09:20
1F02	06:47	VIC	ORE	08:59					X	X	-		2D12	Cannot leave EBN earlier due to turnaround at EBN and Willingdon Jn constraints
2D11	07:52	BTN	ORE	09:16	09:03	09:06	09:11	09:18	-	-	-		1F21	Forms 1F21 to VIC @ 09:50
														BPJ: 5G16 to St Leonards CS - can probably move this
1F04	07:47	VIC	ORE	09:53	09:40	09:43	09:48	09:55	[X]	-	-		2D14	Forms 2D14 to BTN @ 10:22
														BPJ-HGS: Would need to move dated 5H16 - looks feasible
2D17	08:52	BTN	ORE	10:16	10:03	10:06	10:11	10:18	-	[X]	-		1F25	Forms 1F25 to VIC @ 10:50
1F08	08:47	VIC	ORE	10:54	10:41	10:44	10:49	10:56	-	-	-		2D16	Forms 2D16 to BTN @ 11:22
														BPJ-HGS: 1H24 from CHX currently 5 mins behind; platform 3 @ HGS re-occupied @ 11:17 but one
2D21	09:52	BTN	ORE	11:16	***11:02***	***11:05***	***11:10***	***11:17***	-	[X]	-		1F29	could potentially use platform 4. May be possible to leave EBN 1 min earlier at 10:39. Forms 1F29 to VIC @ 11:50
														BPJ: 5H21 to St Leonards CS can probably be adjusted to run later than 11:48
1F12	09:47	VIC	ORE	11:53	11:40	11:43	11:48	11:55	[X]	-	-		2D18	Forms 2D18 to BTN @ 12:22
														BPJ-HGS: 1H28 from CHX; may be possible to leave EBN 1 min earlier at 11:39.
2D23	10:52	BTN	ORE	12:16	***12:02***	***12:05***	***12:10***	***12:17***	-	[X]	-		1F33	Forms 1F33 to VIC @ 12:50
1F16	10:47	VIC	ORE	12:53	12:40	12:43	12:48	12:55	-	-	-		2D20	Forms 2D20 to BTN @ 13:22
														BPJ: 5H30 to St Leonards CS - can probably move this
														BPJ-HGS: 1H32 from CHX - could address this and 5H30 above by leaving EBN 1 min earlier at
														12:39 if possible.
2D25	11:52	BTN	ORE	13:16	***13:02***	***13:05***	***13:10***	***13:17***	[X]	[X]	-		1F37	Forms 1F37 to VIC @ 13:50
1F20	11:47	VIC	ORE	13:53	13:40	13:43	13:48	13:55	-	-	-		2D22	Forms 2D22 to BTN @ 14:22
														BPJ-HGS: 1H36 from CHX; may be possible to leave EBN 1 min earlier at 13:39.
2D27	12:52	BTN	ORE	14:16	***14:02***	***14:05***	***14:10***	***14:17***	-	[X]	-		1F41	Forms 1F41 to VIC @ 14:50
1F24	12:47	VIC	ORE	14:53	14:40	14:43	14:48	14:55	-	-	-		2D24	Forms 2D24 to BTN @ 15:20
														BPJ-HGS: 1H40 from CHX; may be possible to leave EBN 1 min earlier at 14:39.
2D29	13:52	BTN	ORE	15:16	***15:02***	***15:05***	***15:10***	***15:17***	-	[X]	-		1F45	Forms 1F45 to VIC @ 15:48
														BPJ: 1H63 to CST
														BPJ-HGS: 1H42 from CHX
														This train could not leave EBN earlier
1F28	13:47	VIC	ORE	15:57					X	X	-		2D28	Forms 2D28 to BTN @ 16:22
														BPJ-HGS: 1H44 from CHX; may be possible to leave EBN 1 min earlier at 15:39.
2D33	14:52	BTN	ORE	16:16	***16:02***	***16:05***	***16:10***	***16:17***	-	[X]	-		1F49	Forms 1F49 to VIC @ 16:50
1F32	14:47	VIC	ORE	16:53	16:40	16:43	16:48	16:55	-	-	-		2D30	Forms 2D30 to BTN @ 17:22
2D35	15:52	BTN	ORE	17:16	17:03	17:06	17:11	17:18	-	-	-		1F53	Forms 1F53 to VIC @ 17:50
														BPJ: 1H70 to CHX; cannot leave EBN earlier.
1F36	15:47	VIC	ORE	18:01					X	-	-		2D34	Forms 2D34 to BTN at 18:22
2D37	16:52	BTN	ORE	18:17	18:04	18:07	18:13	18:19	-	-	-		1F59	Forms 1F59 to VIC @ 18:50
														BPJ: 5H07; on certain dates (30 July - 10 Aug) has different timings which don't conflict; may be
														possible to adjust this move to St Leonards CS
1F40	16:47	VIC	HGS	19:00	18:46	18:49	18:59	19:02	[X]	-	-		2D38	Forms 5F40 to sidings then reverses to form 2D38 to BTN @ 19:22
														While no conflict, would be more robust BPJ-HGS if left EBN 1 min earlier @ 18:42
2D43	17:52	BTN	ORE	19:18	19:05	19:08	19:14	19:20	-	-	-		1F63	Forms 1F63 to VIC @ 1950
														BPJ: 5H94 to St Leonards CS - that can probably run 1-2 mins later
1F42	17:35	VIC	ORE	19:53	19:39	19:42	19:48	19:55	[X]	-	-		2D40	Forms 2D40 to BTN @ 20:22
														1H14 from CHX is close behind but within tolerances.
1F44	18:06	VIC	ORE	20:25	20:12	20:15	20:20	20:27	-	-	-		1F67	Forms 1F67 to VIC @ 20:50
														BPJ: 5G60 to St Leonards CS - that can probably run 2-3 mins later
1F48	18:47	VIC	ORE	20:53	20:40	20:43	20:49	20:55	[X]	-	-		1F69	Forms 1F69 to VIC @ 21:22
														1H20 from CHX is close behind but within tolerances, though 1F52 may need to lose part of the 2.5
														mins pathing allowance between SLQ and HGS
1F52	19:47	VIC	ORE	21:57	21:42	21:45	21:50	21:59	-	-	-		2D44	Forms 2D44 to BTN @ 22:22
1F56	20:47	VIC	HGS	22:51	22:42	22:45	22:51	22:53	-	-	-		2D46	Forms 2D46 to BTN @ 23:22
														BPJ: 5H26 to St Leonards CS - can be retimed
1F60	21:47	VIC	HGS	23:50	23:41	23:44	23:49	23:52	[X]	-	[X]		5F60	Forms 5F60 to EBN @ 23:55 - can probably be retimed

Train ID	Formed	Times per current TT				Predicted times				Conflicts				
Headcode	from	Dep. origin	Origin	Destination	Arr. dest.	Origin	SLQ	Glyne Gap	BEX	Turnaround	HGS-BPJ	Bo Peep Jn.	Indicator	Notes
1F78	5F78	05:07	HGS	LBG		05:05	05:08	05:13	05:17	[X]	-	-		Formed by 5F78 which will need retiming to allow 1F78 to depart 05:05
2D06	5D06	05:42	HGS	EBN	06:13	05:40	05:43	05:48	05:52	-	-	-		
1F05	2D89	06:15	HGS	VIC		06:13	06:16	06:21	06:27	-	-	-		
1F07	2D01	06:49	HGS	VIC						X	-	-		Formed by 2D01 arrival from EBN @ 06:44 - insufficient even if 2D01 does not stop at GG.
1F09	2D03	07:20	HGS	VIC		07:18	07:21	07:26	07:31	-	-	-		
1F13	2D05	07:38	HGS	VIC						X	-	-		Formed by 2D05 arrival from EBN @ 07:32 - insufficient time and 2D05 cannot leave EBN earlier.
2D08	2F04	08:22	ORE	BTN	09:45	08:20	08:27	08:32	08:36	-	-	-		
1F17	2D09	08:47	ORE	VIC						-	X	-		Current path only 5 mins behind 1H72 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D12	1F02	09:20	ORE	BTN	10:45	09:18	09:25	09:30	09:36	-	-	-		
1F21	2D11	09:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H76 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D14	1F04	10:22	ORE	BTN	11:45					-	X	-		Current path only 5 mins behind 5H17 HGS to St Leonards CS; not clear whether 5H17 can easily be moved - possibly not. Also impossible to leave ORE at current time and arrive EBN 2 mins later at 10:59 due to occupation at Willingdon Jn / EBN station.
1F25	2D17	10:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H80 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D16	1F08	11:22	ORE	BTN	12:45	11:20	11:27	11:32	11:36	-	-	-		
1F29	2D21	11:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H84 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D18	1F12	12:22	ORE	BTN	13:45	12:20	12:27	12:32	12:36	-	-	-		
1F33	2D23	12:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H88 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D20	1F16	13:22	ORE	BTN	14:45	13:20	13:27	13:32	13:36	-	-	-		
1F37	2D25	13:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H54 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D22	1F20	14:22	ORE	BTN	15:45	14:20	14:27	14:32	14:36	-	-	-		
1F41	2D27	14:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H58 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D24	1F24	15:20	ORE	BTN	16:45	15:18	15:25	15:30	15:34	-	-	-		
1F45	2D29	15:48	ORE	VIC		15:46	15:53	15:58	16:02	-	-	-		
2D28	1F28	16:22	ORE	BTN	17:45	16:20	16:27	16:32	16:36	-	-	-		
1F49	2D33	16:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H66 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D30	1F32	17:22	ORE	BTN	18:44	17:20	17:27	17:32	17:36	-	-	-		
1F53	2D35	17:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H70 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D34	1F36	18:22	ORE	BTN	19:45	18:20	18:27	18:32	18:36	-	-	-		
1F59	2D37	18:50	ORE	VIC		18:48	18:56	19:01	19:05	-	[X]	-		Current path only 5 mins behind 5H07 HGS to St Leonards CS - this can't run earlier as it in turn is pathed right behind 1H74 HGS to CHX, and can't run later as plat 3 at HGS needs to be vacated to allow arrival of 1H92 @ 18:54. However it appears possible instead to run 5H07 to Hastings Park Sidings (as it does anyway on certain dates) to return ECS to St Leonards CS later. NB 1F59 could not alternatively leave ORE at current time and arrive EBN 2 mins later, because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D38	1F40	19:27	HGS	BTN	20:44	***19:26***	***19:29***	***19:34***	***19:38***	[X]	-	-		Formed by 5D38 arrival implying turnaround time in HGS Park Sidings of only 9 mins - if this is acceptable, then no issue. Alternatively may be possible to arrive 2 mins later at EBN and resume current timings if 4-min turnaround at EBN is acceptable (should be for 4-car class 377). "Predicted times" are a compromise of leaving ORE 1 min earlier and arriving EBN 1 min later.
1F63	2D43	19:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H78 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
2D40	1F42	20:22	ORE	BTN	21:45	20:20	20:27	20:32	20:36	-	-	-		
1F67	1F44	20:50	ORE	VIC						-	X	-		Current path only 5 mins behind 1H82 HGS to CHX so cannot leave ORE/HGS earlier. Also impossible to leave ORE at current time and arrive EBN 2 mins later because of turnaround/attachment time required @ EBN to fit onward path to VIC.
1F69	1F48	21:22	ORE	VIC		21:20	21:31	21:36	21:40	-	-	-		See comment under predicted departure time from ORE.
2D44	1F52	22:22	ORE	BTN	23:46	22:20	22:27	22:32	22:39	-	-	-		
2D46	1F56	23:22	HGS	BTN	00:34	23:20	23:23	23:28	23:32	-	-	-		

Appendix G. Economic Assessment, assuming central growth

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	**ALL MODES**		**ROAD**		**BUS and COACH**	**RAIL**		**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**		**Passengers**	**Passengers**		
Travel time	£53,240		£556,420			-£503,180		
Vehicle operating costs	£0							
User charges	-£4,381,163					-£4,381,163		
During Construction & Maintenance	£0							
NET NON-BUSINESS BENEFITS: COMMUTING	-£4,327,924	*(1a)*	£556,420		0	-£4,884,343		
Non-business: Other	**ALL MODES**		**ROAD**		**BUS and COACH**	**RAIL**		**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**		**Passengers**	**Passengers**		
Travel time	£15,312		£160,032			-£144,720		
Vehicle operating costs	£0							
User charges	-£1,260,069					-£1,260,069		
During Construction & Maintenance	£0							
NET NON-BUSINESS BENEFITS: OTHER	-£1,244,757	*(1b)*	£160,032		0	-£1,404,789		
Business						**RAIL**		
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	£9,973			£104,226			-£94,254	
Vehicle operating costs	£0							
User charges	-£820,660						-£820,660	
During Construction & Maintenance	£0							
Subtotal	-£810,688	*(2)*	0	£104,226	£0	£0	-£914,914	
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	£6,461,892						£6,461,892	
Operating costs	£0							
Investment costs	£0							
Grant/subsidy	£0							
Subtotal	£6,461,892	*(3)*			£0	£0	£6,461,892	
Other business impacts								
Developer contributions		*(4)*						
NET BUSINESS IMPACT	£5,651,205	*(5) = (2) + (3) + (4)*						
TOTAL								
Present Value of Transport Economic Efficiency Benefits (TEE)	£78,524	*(6) = (1a) + (1b) + (5)*						

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2002 prices and values

Appendix H. Economic Assessment, assuming high growth