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# Dover BRT Study

## Dover District Council / Kent County Council

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# 1 Purpose of the Study

## 1.1 INTRODUCTION

1.1.1 The implementation of a "new form of fast bus service" currently being considered as a Bus Rapid Transit System (BRT) in Dover to support significant population growth related to forthcoming residential and commercial development at Whitfield has been put forward within the Dover Local Development Framework Core Strategy (para 3.59). This is seen as a regeneration Growth Point, necessary to reverse poor market image and rebalance the housing stock in the area providing appropriate sized dwellings of desired quality. This is set against the context of regeneration of central Dover, the water front area and the recent fruition of High Speed rail which provides significant improvements in journey time between London and Dover and is forecast to attract inward investment and improve economic prosperity and employment.

1.1.2 Since its embryonic consideration within the Dover Transport Strategy (2007), the BRT system has been the subject of a range of studies both directly and indirectly. Direct studies have been driven by the need to further consider potential route options and the need for improvements to existing infrastructure to both serve the BRT and complement the existing public transport offer. This has included the following studies:

- Whitfield Transport Strategy (September 2010, Peter Brett Associates);
- Bus Routing Strategy (July 2010, Atkins); and
- York Street Bus Interchange (May 2010, Atkins).

1.1.3 Dover BRT has also been featured in the recent DfT and Atkins publication "Delivering Sustainable Transport for Housing Growth – Case Studies from Local Communities" (Dec 2010) which details Atkins Bus Routing Strategy study (as funded under the Departments Strategic Studies Budget (SSB)). The publication identifies Dover District Council's plans for a BRT as a core example of how sustainable transport solutions are best developed during the early stages of planning and alongside housing growth. This is based on findings of four key studies which reviewed the following aspects:

- Route options between Whitecliffs Business Park and Dover Road;
- Infrastructure requirements in Whitfield;
- Consideration of a new Dover Town centre bus interchange at York Street; and
- Feasibility of implementing bus priority measures along Folkestone Road in support of a proposed Park and Ride site at Farthingloe.

1.1.4 Other studies have included consideration of a BRT system in the context of realising public transport solutions for proposed developments, each providing infrastructure proposals and patronage forecasts of the potential use of a BRT system associated with each development, should the BRT be routed to serve it. These are primarily;

- Dover Transport Strategy (October 2007, WSP UK Ltd);
- Dover Waterfront Park & Ride (June 2009, Peter Brett Associates); and
- Farthingloe Park & Ride First Stage Assessment (August 2010, WSP UK Ltd); and
- Growth without Gridlock – Kent Transport Strategy (December 2010. KCC).

1.1.5 Despite this range of independent studies, a cumulate assessment is yet to be given to the end state viability of a full BRT system or consideration of how a BRT system should be phased in its implementation.

## 1.2 STUDY PURPOSE

1.2.1 The purpose of this study is to provide an initial viability assessment of the route options currently identified. Financial viability is a function of infrastructure and operational cost as well as passenger demand for a BRT system. This is required to shape development proposals (including a review of Whitfield Urban Extension Masterplan SPD) and develop a clear pathway to bring the BRT system to fruition in a manner that is relevant to the forthcoming growth of Dover. In undertaking this, the following tasks have been undertaken;

- An assessment of proposed BRT routeing and operation (including use of existing infrastructure and incorporation of the BRT in the Whitfield Masterplan);
- A broad based assessment, utilising previous work, of costs/income for capital, revenue and recurring expenditure and an overview of the likely financial viability in the long term based on likely 'build out' of the various development plans and linkages with potential Park & Ride sites;
- Consideration of the likely costs of highway improvements needed for the BRT proposals;
- Assessment of the modal shift potential for BRT looking at a range of values dependent on type and frequency of the BRT proposals;
- Consideration of a ticketing strategy for the BRT; Liaison and consultation with Stagecoach, the primary local bus operator, to understand potential opportunities and risks on the local bus network associated with the development of BRT in Dover.

## 1.3 REPORT STRUCTURE

1.3.1 The remainder of this report is structured as follows:

- Chapter 2 provides an overview of Bus Rapid Transit systems and the approaches that have been adopted elsewhere, with regards to delivery and operation; :
- Chapter 3 outlines the various Dover BRT route options that have been developed within the range of direct and indirect BRT studies. For each route a Strengths, Weaknesses, Opportunities and Threats assessment has been undertaken of the operational element of the service;
- Chapter 4 details the development of the indicative financial viability spreadsheet model to be utilised as an ongoing management tool, which allows the testing of a wide variety of 'what if' options and scenarios;
- Chapter 5 presents an initial assessment of the BRT financial viability, through utilisation of the spreadsheet models with the current assumptions contained within it. This is used as a basis on which to further develop the concept of BRT in a manner that is consistent with the level of anticipated demand for the service. .
- Chapter 6 puts forward an approach to delivering the BRT system in Dover, in a phased manner that is supportive of development proposals coming forward.
- Chapter 7 discusses the issues associated with developing an appropriate ticketing strategy for the BRT, which would be 'integrated' with the existing public transport

service network. This suggests potential pricing structures and considers the interaction between local bus fare and car parking charges.

- Chapter 8 – identifies potential funding opportunities for both capital and operational costs associated with the BRT system.
- Chapter 9 – outlines the next steps in the short, medium and long term including necessary further studies.

# 2 What is BRT?

## 2.1 BRT DEFINITION

2.1.1 The UK's main promoter of Bus Rapid Transit (BRT) systems, BRTUK, define BRT as follows:

2.1.2 "A flexible, frequent, dependable bus transit system that combines a variety of physical and operating elements into a permanent and integrated system with a quality image and unique identity"

2.1.3 BRTUK go on to list a number of key features of a BRT system. These features are listed in the box below:

**Key Features of a BRT System**

- Clear and understandable system
- Distinctive branding and marketing
- Good integration with other transport modes
- Real time information
- High standards of information provision
- Efficient and user friendly ticketing
- High frequency, limited stop services
- Vehicles and infrastructure must be environmentally friendly
- Easy accessibility
- High quality, smooth riding, distinctive and attractive vehicles
- High quality, safe, secure and accessible stations
- Priority at traffic signals and priority over other traffic
- Priority over other vehicles in mixed traffic situations
- Significant segregation from other forms of traffic

2.1.4 In a crowded densely developed country such as the UK, BRT systems will not be able to tick all these boxes. Thus the term 'BRT Lite' has come into use for those projects which aim to provide as many features of the BRT ideal as possible whilst recognising that not all are achievable. These schemes are still marketed as BRT as they still provide a step change improvement in bus service provision.

2.1.5 Consequently, it may be more appropriate for Dover to develop a BRT Lite scheme rather than a full BRT scheme. Table 2.1 indicates which features are attributed to Full BRT and BRT Lite schemes.

**Table 2.1 Full BRT v BRT Lite**

| Features | Full BRT | BRT Lite |
|---|---|---|
| Clear and understandable system | ✓ | ✓ |
| Distinctive branding and marketing | ✓ | ✓ |
| Good integration with other transport modes | ✓ | ✓ |
| Real time information | ✓ | ✓ |
| High standards of information provision | ✓ | ✓ |

| | | |
|---|---|---|
| Efficient and user friendly ticketing | ✓ | ✓ |
| High frequency, limited stop services | ✓ | (✓) |
| Vehicles and infrastructure must be environmentally friendly | ✓ | ✓ |
| Easy accessibility | ✓ | ✓ |
| High quality, smooth riding, distinctive and attractive vehicles | ✓ | ✓ |
| High quality, safe, secure and accessible stops | ✓ | (✓) |
| Priority at traffic signals and priority over other traffic | ✓ | (✓) |
| Priority over other vehicles in mixed traffic situations | ✓ | |
| Significant segregation from other forms of traffic | ✓ | |

## GUIDED AND NON-GUIDED BUSWAYS

2.1.6 Some BRT systems operate with vehicle guidance technology. Guidance technology is mainly applied for six reasons:

1. To convey an image of public transport similar to light rail;
2. To minimise the width of the BRT corridor as guided vehicles are able to operate in closer proximity;
3. To achieve accessible and seamless boarding at stops/stations, as the guidance facilitates more precise 'docking' at stops;
4. To limit access to other bus services which do not meet the quality standards of the BRT (under UK legislation, it is difficult to discriminate against other bus services, but it is possible to require technical standards adherence through a 'Quality Partnership' which might achieve the same impact);
5. To limit access to the BRT corridor to other types of vehicle; and
6. To reduce land take (narrower corridor than non-guided busway).

2.1.7 Conversely, the main disadvantages of a guided busway are:

1. Infrastructure cost – a guided busway will be substantially more expensive than a segregated section of standard highway;
2. Vehicle cost – each vehicle using a guided busway will need to be equipped with guide wheels and other hardware, typically at around £5k to £7k per vehicle, based on UK examples;
3. Maintenance costs – these are generally likely to be higher than for standard highway;
4. Visual intrusion – most UK examples of guided busways indicate a greater degree of visual intrusion than is the case of standard highway infrastructure (examples are shown in Figures 2.1 below); and

5. Topography can be an issue for guided busways since ride quality is affected by alignment, surface regularity and variations in grade.

2.1.8 The section of busway proposed for Dover BRT between B&Q and Dover Road is likely to include only one stop, for Whitecliffs Business Park Phase 3. It is considered that, on balance, the section of route between B&Q and Dover Road does not justify a guided busway and the associated infrastructure for the following reasons:

1. The width of the proposed routeing does not need to be particularly narrow;
2. The proposed section of busway is only a small proportion of the entire route, and portraying an image similar to light rail would only be possible if the majority of the route was on guided track;
3. Preventing access to other vehicles is possible by other means such as rising bollards or bus gates;
4. The possibility of the image of the BRT being diluted by the introduction of competitive bus services to a much lower quality standard is remote; and
5. The business case for introduction and expansion of the BRT service would be strengthened by reducing the capital cost of the required infrastructure.

2.1.9 For these reasons a Guided Busway is not considered appropriate for the Dover BRT. In addition, a non-Guided Busway between B&Q and Dover Road would be no more visually intrusive than a Guided Busway.

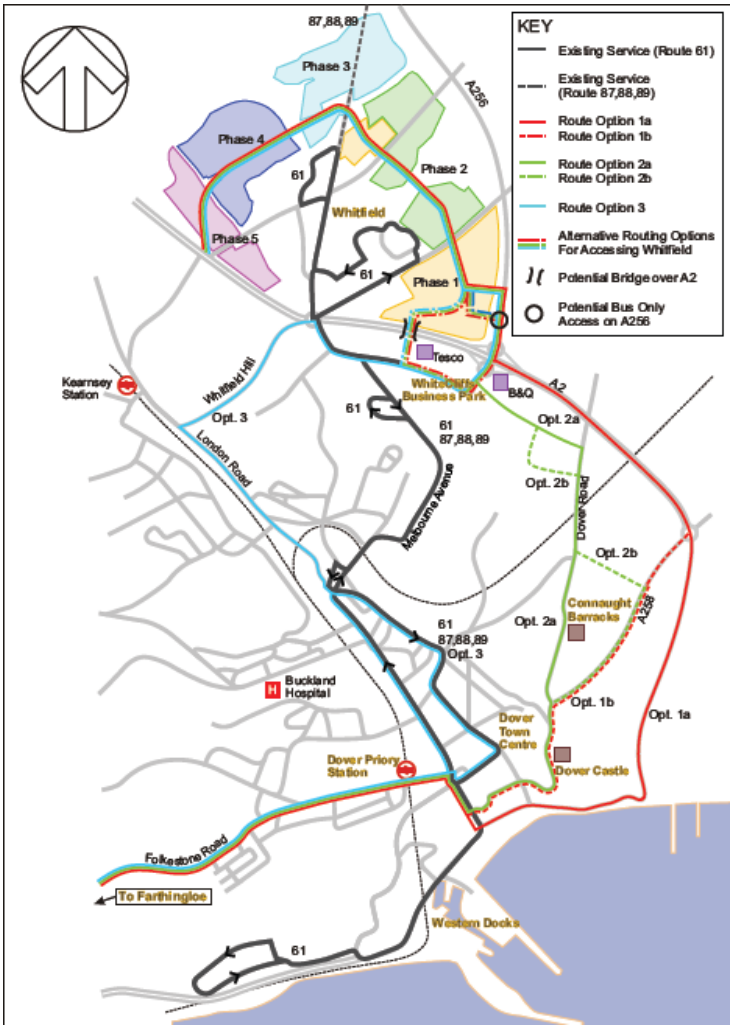
**Figure 2.1 Cambridge Busway**

# 3 Route Options

## 3.1 ROUTE OPTIONS

3.1.1 Since a BRT system for Dover was first proposed a number of route options have been suggested. This report considers all previously identified options. The routes assessed in this study are shown in Figure 3.1 and are described in detail below.

**Figure 3.1 Route Options**




3.1.2 The routes options considered are as follows:

- Existing Service: Route 61 – included as a comparator to assess the other route options against (Black Line)
- Route Option 1a: via A2 (Solid Red Line) – would operate on existing highway along the A2 between the Whitfield Development and Dover Town Centre.
- Route Option 1b: via A2/A258 (Dotted Red Line) – would operate on existing highway, but would come off the A2 at Guston Roundabout and travel along the A258 into Dover Town Centre, thus enabling Connaught Barracks and Dover Castle to be served.

- Route Option 2a: via Bus Only Link/Dover Road (Solid Green Line) – would require a new bus only link to be constructed between B&Q and Dover Road and Dover Road to be widened.
- Route Option 2b: via Alt. Bus Only Link + Link to A258: (Dotted Green Line) – a variation on Route Option 2a using an alternative bus only link alignment between B&Q and Dover Road and an additional bus only link between Dover Road and the A258. This option reduces the amount of Dover Road which requires widening.
- Route Option 3: via Whitfield Hill – (Solid Blue Line) – would operate on existing highway via Whitfield Hill and London Road.

3.1.3 A Strength, Weakness, Opportunity, Threat (SWOT) analysis has been conducted on the route options. The findings from the SWOT analysis are shown below:

| **Existing Service: Route 61** | |
|---|---|
| **Estimated Journey Time Whitfield Phase 1 to Dover Priory: 22 mins** | |
| **Strengths** | **Weaknesses** |
| ■ There is strong bus patronage already on this route (especially between Melbourne Avenue and the Town Centre). | ■ The route through Melbourne Avenue is currently traffic calmed and this, together with the frequency of bus stops, means the average speed of service 61 is relatively slow. |
| **Opportunities** | **Threats** |
| ■ Extending the existing service reduces the risk that there would not be sufficient revenue from the new development at Whitfield to cover the additional operational cost of serving it by bus. | ■ The existing route may not be attractive enough (in terms of journey time) for residents of new development at Whitfield.<br>■ It would be difficult to, credibly, rebrand route 61 as a BRT service. |

| Option 1a: via A2 | |
|---|---|
| **Estimated Journey Time Whitfield Phase 1 to Dover Priory: 17 mins** | |
| **Strengths** | **Weaknesses** |
| ■ The benefit of running via the A2 is that it provides a relatively quick route between the Whitfield Development and Dover Town Centre without the need for new infrastructure. | ■ The disbenefit of this route is that it does not pick up any patronage between Whitfield and Dover Town Centre.<br>■ This route would not serve Whitecliffs Business Park, unless a bridge to accommodate buses was to be constructed over the A2. |
| **Opportunities** | **Threats** |
| ■ There may be an opportunity to use this route for a peak period only service between the new development at Whitfield and Dover Priory Railway Station during the early phases of development at Whitfield, when a full scale BRT service may not be justified. | ■ Delays can occur on the A2 on its approach to the Eastern Docks when there are disruptions to the cross channel ferry service.<br>■ Should delays occurs on the A2 between the A256 and A258, the BRT service would not be able to avoid their impacts. |
| **Option 1b: via A2/A258** | |
| **Estimated Journey Time Whitfield Phase 1 to Dover Priory: 14 mins** | |
| **Strengths** | **Weaknesses** |
| ■ Option 1b is a variation on Option 1a, with the added advantage of also serving Connaught Barracks and Dover Castle | ■ This route does not serve Whitecliffs Business Park, unless a bridge to accommodate buses was to be constructed over the A2. |
| **Opportunities** | **Threats** |
| ■ If Option 1a was to be pursued, discussions will need to take place at an early stage to ensure Connaught Barracks is designed to allow Option 1a to enter the Barracks site from the A258 to enable the highest level of accessibility to the BRT service. | ■ Delays can occur on the A2/A258 Duke of Yorks Roundabout. It is proposed that a dedicated left hand lane is investigated on the A258 approach to Duke of Yorks Roundabout to reduce delay for BRT vehicles heading towards Whitfield in the PM Peak. Further junction design and testing would be required to demonstrate the deliverability of this proposal.<br>■ Should delays occurs on the A2 between the A256 and A258, the BRT service would not be able to avoid their impacts. |

| Option 2a: via Bus Only Link/Dover Road | |
|---|---|
| **Estimated Journey Time Whitfield Phase 1 to Dover Priory: 14 mins** | |
| **Strengths** | **Weaknesses** |
| ■ The main strength of Option 2a is that it provides a largely traffic free route between Whitfield, Whitecliffs and Dover Town Centre.<br>■ Option 2a also serves Connaught Barracks. | ■ This route, unlike Options 1 and 3, requires significant new infrastructure to be built.<br>■ This route would involve the purchase of third party land and would exit onto Dover Road within a line of established trees/vegetation. |
| **Opportunities** | **Threats** |
| ■ There is an opportunity that the bus only link between B&Q and Dover Road could use infrastructure already planned for Whitecliffs Phase 3. Therefore, only marginal additional cost would be incurred for the BRT scheme | ■ It may be expensive to secure land for widening of Dover Road and the success of this process would carry some risk.<br>■ Possible local opposition to the widening of Dover Road. Due to historical implications. |
| **Option 2b: via Alt. Bus Only Link + Link to A258** | |
| **Estimated Journey Time Whitfield Phase 1 to Dover Priory: 16 mins** | |
| **Strengths** | **Weaknesses** |
| ■ The main strength of Option 2b is that, like 2a, it provides a mainly traffic free route between Whitfield, Whitecliffs and Dover Town Centre. It also requires a shorter section of Dover Road to widened.<br>■ Option 2b also serves Connaught Barracks. | ■ This route, as with Option 2a, requires significant new infrastructure to be built.<br>■ This route would impact on an ancient scheduled monument – Fort Burgoyne. |
| **Opportunities** | **Threats** |
| ■ There is an opportunity that the bus only link between B&Q and Dover could use infrastructure already planned for Whitecliffs Phase 3. Therefore, only marginal additional cost would be incurred for the BRT scheme | ■ Same threats as Option 2a.<br>■ Additionally, providing a bus only link between Dover Road and A258 may not be possible in planning and land ownership terms |

| Option 3: via Whitfield Hill | |
|---|---|
| **Estimated Journey Time Whitfield Phase 1 to Dover Priory: 24 mins** | |
| **Strengths** | **Weaknesses** |
| ■ Option 3 does not require new infrastructure, serves the whole of Dover Town Centre and is marginally quicker than the existing Route 61, via Melbourne Avenue. | ■ Potential patronage along Whitfield Hill is substantially less than along Melbourne Avenue. |
| **Opportunities** | **Threats** |
| ■ Option 3 could replace part of Route 60 (between Dover Town Centre and B&Q) along Whitfield Hill, between London Road and Tesco. However, it would not serve Crabble (which Route 60 also currently serves). | ■ Option 3 would not be much more attractive than the existing Route 61 in terms of journey time and would collect less revenue. |

## 3.2 SUMMARY OF ROUTE OPTIONS

3.2.1 A comparison of estimated journey times between Whitfield Phase 1 and Dover Priory Station is shown in Table 3.1. The journey time for the existing service (22 minutes) is based on an average speed of 19kph. This average speed is based on the current timetable for Route 61.

3.2.2 Options 1a, 1b, 2a and 2b are expected to achieve a higher average speed than the existing service. The journey times for these options is based on an average speed of 25kph. The reason for this is that Options 1a and 1b operate on faster roads with fewer bus stops than the existing service and Options 2a and 2b include bus only sections.

3.2.3 It is estimated that Option 1b and 2a journey times between Whitfield Phase 1 and Dover Priory Station would be as low as 14 minutes, which equates to a 33% reduction in journey time. The next step for taking Dover BRT forward is to produce a Business Case for the scheme. This is described in more detail in Section 9.4. An important factor in quantifying the benefits of a BRT scheme is the Value of Time saving attributed to a reduction in journey time.

3.2.4 The average speed for Option 3 is expected to be only 1kph quicker than the average speed of the existing service, as this option does not include any bus only sections. Option 3 also operates along part of the route of an existing bus service (Route 60) and would most likely call at bus stops along this route. As the route distance for this option is longer than the existing service this results in the journey time for this service being greater than the journey time for the existing service. The extended journey time for Option 3 rules out this option for further consideration.

**Table 3.1 – Comparison of Estimated Route Option Journey Times**

| Route | Route Description | Estimated Average Speed | Estimated Journey Time Whitfield Phase 1 to Dover Priory Station |
|---|---|---|---|
| EXISTING | Existing (Route 61) | 19 kph | 22 mins |
| OPTION 1A | Option 1a (via A2) | 25 kph | 17 mins |
| OPTION 1B | Option 1b (via A2/A258) | 25 kph | 14 mins |
| OPTION 2A | Option 2a (Bus Only Link/Dover Road) | 25 kph | 14 mins |
| OPTION 2B | Option 2b (Alt. Bus Only Link + Link to A258) | 25 kph | 16 mins |
| OPTION 3 | Option 3 (Whitfield Hill) | 20 kph | 24 mins |

3.2.5 The SWOT Analysis described does not include an assessment of the financial viability of each of the route options. This is has been completed separately through use of a spreadsheet based model. The next section describes how this spreadsheet model has been constructed and what assumptions were made.

3.2.6 The SWOT Analysis compares all six options using a junction on the A256 to access Whitfield Phase 1. Alternative access points to Whitfield Phase 1 include a bus only junction on the A256 and a bus only bridge over the A2. These alternative access points are considered in more detail in Section 6.

# 4 The Spreadsheet Model

## 4.1 INTRODUCTION

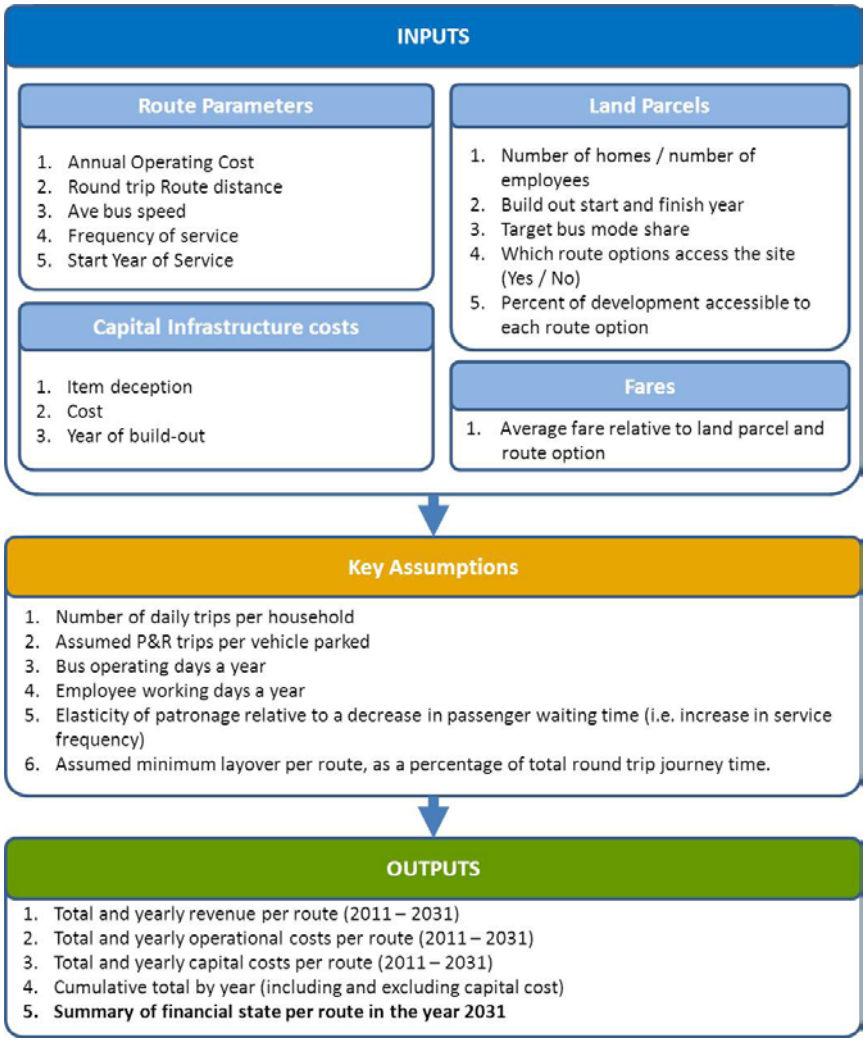
4.1.1 The spreadsheet model is a financial viability tool which enables the easy assessment of the relative performance of one BRT route option over another. The model aims to inform strategic decisions on route choice and indicates the likely funding shortfall where applicable - thereby helping to identify where financial support is required for both revenue and capital funding requirements.

4.1.2 The spreadsheet model aims to be transparent. Within this section of the report all data and assumptions within the model are set out and sources clarified. The model is automated in such a way that any manual changes to these assumptions or data will automatically result in the recalculation of the financial result. This informs the decision making process by estimating the impact of various policy decisions on the financial viability of BRT options. In particular, changes to development phasing, mode share, journey time, frequency, capital costs etc. can be easily and quickly tested.

## 4.2 OVERALL MODEL MECHANICS

4.2.1 The diagram below sets out the core model inputs, assumptions & outputs

**Figure 4.1 – Model Processes Diagram**



4.2.2 Looking at each of the model stages in turn an explanation of the model mechanics is detailed, with sources identified for data inputs and assumptions.

## 4.3 MODEL INPUTS

4.3.1 The model requires data inputs within 4 core areas, these include:

- Route parameters;
- Capital infrastructure costs;
- Land parcels specifications; and
- Average Fares.

4.3.2 An explanation of the data currently entered into the model for these 4 areas and how this data was derived is set out below.

### ROUTE PARAMETERS

4.3.3 For each of the route options requiring comparison, a set of parameters needs to be detailed, setting out each route's operational requirements. Within the 'Route Parameters' tab within the spreadsheet an input form is provided (see figure 4.2 below) for each of the route options, up to a maximum of 10 options. Inputs required for each route option include:

- **Annual operating cost**: This is an estimate of the total operational cost of each vehicle, including factors such as vehicle depreciation, driver hours, maintenance costs and fuel. From our experience a figure of £150,000 a year, per bus, is an acceptable base assumption (based on a figure range of £130,000 to £180,000) and this has been clarified following discussions with the local operator – Stagecoach. For a BRT service this figure is expected to be slightly higher in the region of £200,000 per year, per bus, due to the higher quality and more specialist nature of the vehicles. This assumption is considered to be at the upper range of likely costs and will therefore lead to a robust estimate of operating cost within the model. The local bus operator, Stagecoach, has suggested there would be a commercial case for using regular size single deck vehicle types (11-12m in length), rather than articulated buses, especially if the BRT service is expected to serve the existing residential areas of Whitfield (where large vehicles would be difficult to operate).
- **Round trip route distance:** This distance should be measured along the whole round trip route distance and ideally also include an additional 10% to account for possible diversions. Within the model, route option distances have been measured on Google maps using a pedometer application (http://www.gmap-pedometer.com/).
- **Estimated average speed of bus:** The average speed of a bus on each route is required in kilometres per hour (KPH). For existing services this has been calculated through looking at timetable information and comparing journey time with route distance. For new proposed routes speeds have been estimated based on the average speed of current local bus services with estimates of speed increases factored in for any bus priority and bus segregation from road traffic.
- **Base frequency of service:** This input is intended to represent the current service bus frequency (if an existing service) or the proposed service frequency of a new a service. To account for elasticity of patronage, relative to an increase in service frequency (i.e. a reduction in passenger waiting time) a second input box allows for an enhanced frequency of service to be entered. For example if the current

frequency is 20 minutes but the service option being modelled will increase this frequency to 15 minutes then 20 minutes would be entered into the 'Base frequency of service ' and 15 minutes entered into 'enhance frequency of service'. If a service is new with no current existing frequency of service then both the 'base frequency' and 'enhanced frequency' should be the same figure. Assumptions made in relation to elasticity are explained the 'Key Assumptions' section of this chapter'.

- **Start year of service:** To enable phasing of bus route options to be considered a start and finish date for each route option can be set through two drop down lists. The default for the spreadsheet is an end date of 2031 (in line with other Dover transport analysis and planning timeframes) but this can be altered by setting all route options to an alternative final year.

4.3.4 With the above inputs placed into the route parameter section of the spreadsheet model the model will automatically calculate:

- **Travel time** (including a minimal service layover – currently set at 10% of total journey time);
- **The number of vehicles required to operate the service** (based on service frequency, average speed and route distance; and
- **Excess time (over layover)**, which equates to the waiting time the bus is out of service (in addition to a minimum layover). This factor is intended to inform on efficiency with excessive wait time potentially corrected via adjustments in service frequency.

4.3.5 The above outputs are displayed in the 'Operation Calculation' section of the route parameter input box as shown in Figure 4.2 below:

**Figure 4.2 – Route Parameter Input Example**

| Option XXX | | | |
|---|---|---|---|
| **Operation Parameters** | **Annual Operating Cost** | **200,000** | per bus per annum |
| | **Round Trip Route Distance** | **25.4** | km (plz add 10% for poss diversions) |
| | **Estimated Ave speed of bus** | **25** | kph |
| | **Base Frequency of service** | **15** | min (Headway between buses) |
| | *Enhanced Freq of service** | ***15*** | min **(*MATCH BASE IF NO ENHANCE)** |
| | ***Start year of service*** | **2011** | |
| | *End year of service** | ***2031*** | Year **(*LEAVE AS 2031 IF NO FIXED END)** |
| ***Operation Calculation*** | Travel time + Layover | *67.056* | *mins* ***(Calculated)*** |
| | Number of vehicles | ***5*** | *vehicles* ***(Calculated)*** |
| | *Excess time (over layover)* | *7.944* | *mins* ***(Calculated)*** |

## CAPITAL INFRASTRUCTURE COSTS

4.3.6 To enable an indicative costing of each route option, the associated infrastructure for each route option needs to be considered and entered into the spreadsheet model. This information is inputted within the 'Route parameters' tab of the spreadsheet model and allows (under each route option) for a drop down list of potential infrastructure to be chosen from, and an associated year of implementation to also be chosen (see Figure 4.3). The list of potential infrastructure options, and prices (which is automatically associated with the infrastructure chosen) is set within the 'Reference Points' tab and can be altered or added to enable easy editing to any changes in prices or infrastructure items (see Figure below 4.4).

4.3.7 The infrastructure items associated with each route option have been selected based on previous work undertaken on Dover BRT, The list of items is not exhaustive and further infrastructure items, such as bus stops and passenger information terminals, could be added at a later date.

4.3.8 The costs associated with each infrastructure item are indicative only and have been estimated to allow route options to be compared. There has been no 'three-dimensional' design of any of these schemes and ground conditions, earth works, utilities diversions, land ownership etc. have not been included. Significant further work will be required to develop more reliable and accurate costs.

**Figure 4.3 – Associated Route Infrastructure Input Example**

| Option XXX | | | | |
|---|---|---|---|---|
| **Operation Parameters** | **Annual Operating Cost** | **200,000** | per bus per annum | |
| | **Round Trip Route Distance** | **25.4** | km (plz add 10% for poss diversions) | |
| | **Estimated Ave speed of bus** | **25** | kph | |
| | **Base Frequency of service** | **15** | min (Headway between buses) | |
| | *Enhanced Freq of service** | ***15*** | min **(*MATCH BASE IF NO ENHANCE)** | |
| | ***Start year of service*** | **2011** | | |
| | *End year of service** | ***2031*** | Year **(*LEAVE AS 2031 IF NO FIXED END)** | |
| ***Operation Calculation*** | Travel time + Layover | *67.056* | *mins* ***(Calculated)*** | |
| | Number of vehicles | ***5*** | *vehicles* ***(Calculated)*** | |
| | *Excess time (over layover)* | *7.944* | *mins* ***(Calculated)*** | |
| **Infrastructure** | Town Centre Junctions (Folkestone Roa | £600,000 | 2019 | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |
| | N/A | £0 | | Year of buildout |

**Figure 4.4 – Potential infrastructure improvements identified for route selection**

| Infrastructure Improvements | Total Estimated Cost |
|---|---|
| N/A | £0 |
| Bus Only Link (B&Q to Dover Road) | £1,000,000 |
| Alternative Bus Only Link | £1,200,000 |
| A2/A258 Junction | £100,000 |
| Link to A258 | £600,000 |
| Widening of Dover Road (North) | £600,000 |
| Widening of Dover Road (Middle) | £1,000,000 |
| Widening of Dover Road (South) | £1,000,000 |
| Town Centre Junctions (Maison Dieu Road/Castle Street) | £100,000 |
| Town Centre Junctions (Folkestone Road Roundabout) | £600,000 |
| Town Centre Junctions (3 junctions along Buckland Ave/Maison Dieu Road) | £250,000 |
| Bridge over the A2 | £5,000,000 |

4.3.9 The Dover BRT scheme is expected to require a number of infrastructure improvements to be made. In order to compare the financial viability of route options the estimated cost of these infrastructure improvements have been calculated. More accurate costs will only be available at Detailed Design stage. The calculation for the above estimated infrastructure costs (as listed in Figure 4.4) is set out below in Table 4.1.

**Table 4.1 Estimated Infrastructure Costs**

| Infrastructure | Distance (km) | Cost per km (£) | Cost (£) | Notes |
|---|---|---|---|---|
| Bus Only Link (B&Q to Dover Road) | 1.0 | 1,000,000 | 1,000,000 | Based on construction cost of £1m per km. |
| Alternative Bus Only Link | 1.2 | 1,000,000 | 1,200,000 | These costs may be paid for by Whitecliffs Phase 3 |
| A2/A258 Junction | | | 100,000 | Estimated cost of left hand lane on A258 arm |
| Link to A258 | 0.6 | 1,000,000 | 600,000 | Based on construction cost of £1m per km |
| Widening of Dover Road (North) | 0.3 | 2,000,000 | 600,000 | Based on construction cost of £1m per km and land value of £0.5m per acre (£1m per km) |
| Widening of Dover Road (Middle) | 0.5 | 2,000,000 | 1,000,000 | |
| Widening of Dover Road (South) | 0.5 | 2,000,000 | 1,000,000 | |
| Town Centre Junctions (Maison Dieu Road/Castle Street) | | | 100,000 | Costs taken from Dover Transport Strategy |
| Town Centre Junctions (Folkestone Road Roundabout) | | | 600,000 | |
| Town Centre Junctions (3 junctions along Buckland Ave/Maison Dieu Road) | | | 250,000 | |

**Figure 4.5 Location of Infrastructure Improvements**


4.3.10 In identifying the infrastructure cost estimates currently within the model, the following factors have not been able to be included:

- Noise effect on local residents – separate assessment required
- Effect on Local wildlife – separate assessment required
- Special Drainage arrangements – separate assessment required
- Utilities may exist which have to be moved – requires an audit of utilities in the area
- Land may need to be purchased - this cost has not been included (except for Dover Road Widening where estimates have been made)

4.3.11 The specific infrastructure improvements associated with each route option are shown in Table 4.2. The comparison of route options does not include the cost of providing a new bridge for BRT services, and pedestrians and cyclists, over the A2. If a new bridge was constructed it is estimated that this could cost in the region of £5m to construct, especially if land needs to be purchased and large amounts of earthworks are required each side of the A2.

4.3.12 The estimated cost of a bridge over the A2 was given to us by KCC as £3m, based on the actual cost of a similar bridge constructed for the Fastrack scheme. We considered this to be at the lower end of the likely range of costs and therefore £5m has been suggested to be a more suitable figure for budget purposes. Clearly a more accurate cost estimate for this major piece of infrastructure will be influenced significantly by it precise location, the cost of any land acquisition, location of services, ground conditions and the traffic management required on the A2 during construction.

4.3.13 The comparison of route costs also does not include the cost of the proposed York Street Interchange, as this scheme is considered separate to the BRT Scheme. However, should this scheme be further developed, and is considered to be integral to the BRT Scheme, its cost could be easily added to the model.

4.3.14 Table 4.2 shows Options 1a and 3 are assumed to require the least amount of new infrastructure, whilst Option 2a is assumed to require the most amount. Option 2a is assumed to include a new bus only link between B&Q and Dover Road and widening of Dover Road, as well as improvements to Town Centre junctions.

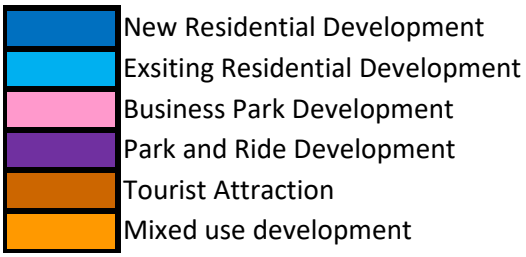
**Table 4.2 Infrastructure Required for Each Route Option**

| | **Option 1a** (A2) | **Option 1b** (A2/A258) | **Option 2a** (Bus Only Link/Dover Road) | **Option 2b** (Alt. Bus Only Link + Link to A258) | **Option 3** (Whitfield Hill) | **Option 4** (Existing 61 plus extension) |
|---|---|---|---|---|---|---|
| Bus Only Link (B&Q to Dover Road) | | | ✓ | | | |
| Alternative Bus Only Link | | | | ✓ | | |
| A2/A258 Junction | | ✓ | | | | |
| Link to A258 | | | | ✓ | | |
| Widening of Dover Road (North) | | | ✓ | | | |
| Widening of Dover Road (Middle) | | | ✓ | ✓ | | |
| Widening of Dover Road (South) | | | ✓ | | | |
| Town Centre Junctions (Maison Dieu Road/Castle Street) | | ✓ | ✓ | ✓ | | |
| Town Centre Junctions (Folkestone Road Roundabout) | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Town Centre Junctions (3 junctions along Buckland Ave/Maison Dieu Road) | | | | | ✓ | |

## LAND PARCELS SPECIFICATIONS

4.3.15 To enable potential revenue to be calculated for each route option a number of land parcels are detailed within the model with the ability to select the mode share and potential bus patronage likely from each. Within the 'Land Parcel' tab of the spreadsheet model, up to 20 land parcels can be inputted. For each land parcel a range of data is required for input which varies dependent on land use. Land uses currently considered within the model are set out below relative to the following key (which relates to the title colour of each land parcel input form).

**Figure 4.6 - Land Parcel Key (relative to land parcel input form title colour)**




4.3.16 As an example of inputs required, Figure 4.7 illustrates a land parcel input form for a new residential development. Inputs required include total number of residential units, start year of build-out, final year of build-out and target bus mode share. Once this data is entered, for each of the bus route options, the land parcel can be defined as being accessible to each proposed bus route (Yes / No) and if 'Yes' is selected then a percentage of the new homes can be assigned to the route. The assigning of a percentage is designed to allow for bus routes which pass through a development but are not fully accessible to all residences (the term 'accessible' being defined as within 400m of the bus routing) and hence may be accessible to only 50% of the total build-out house number.

**Figure 4.7 Land Parcel Input Example**

| | LAND PARCEL NAME: | Land Parcel xxx | | |
|---|---|---|---|---|
| 1 | Number of Houses | 1500 | Full Buildout total | |
| | Start year of buildout | 2011 | Year | |
| | Final year of buildout | 2019 | Year | |
| | Target bus mode share | 7.0% | Future development bus mode share | |
| | **Existing (Route xx)** | No | 0% | Dev % served by the route? |
| | **Route Option 1** | Yes | 100% | Dev % served by the route? |
| | **Route Option 2** | Yes | 50% | Dev % served by the route? |
| | **Route Option 3** | Yes | 100% | Dev % served by the route? |
| | **Route Option 4** | Yes | 70% | Dev % served by the route? |
| | **Route Option 5** | Yes | 100% | Dev % served by the route? |
| | **Route Option 6** | Yes | 100% | Dev % served by the route? |
| | Route 8 | No | 0% | Dev % served by the route? |
| | Route 9 | No | 0% | Dev % served by the route? |
| | Route 10 | No | 0% | Dev % served by the route? |

4.3.17 In terms of current data input, the spreadsheet model currently incorporates a range of new and existing residential areas and well as major employment sites; Park and Ride designated sites and the key tourist attractions. Land parcels have been selected under the following criteria:

a) A major area of revenue for the existing 61 service

b) Proposed new development in the Dover area

c) A major potential trip generator along the route of any of the proposed BRT routings currently collated.

4.3.18 Based on the above, the land parcels currently included within the model, their relative inputs, and the sources for these inputs are presented Table 4.3 below.

**Table 4.3 Land Parcel Inputs**

| New Development | New Dwellings | Start Year | Finish year | Bus Mode share | Source |
|---|---|---|---|---|---|
| Whitfield Phase 1 | 1520 | 2011 | 2019 | 7.0% | Phasing from Phasing Test 3 drawing. Mode share taken from Whitfield SPD |
| Whitfield Phase 2 | 1210 | 2019 | 2024 | 7.0% | |
| Whitfield Phase 3 | 1080 | 2024 | 2027 | 7.0% | |
| Whitfield Phase 4 | 1250 | 2027 | 2030 | 7.0% | |
| Whitfield Phase 5 | 690 | 2029 | 2030 | 7.0% | |
| Connaught Barracks | 500 | 2011 | 2020 | 3.4% | Phasing assumed. Mode share based on Castle Ward |
| Western Heights | 410 dwellings | 2011 | 2014 | 10.5% | Phasing taken from WSP report. Mode share from Town & Pier census. |
| Farthingloe Village | 800 dwellings | 2011 | 2018 | 4.5% | Phasing and mode share taken from WSP Farthingloe report |
| **New Development** | **Employees** | **Start Year** | **Finish year** | **Bus Mode share** | **Source** |
| Whitecliff Business Park Phase 1 | 410 employees | 2011 | 2031 | 6.2% | Mode Share taken from Journey to Work data for Buckland residents. Employee numbers based on employment area and average employees per sqm taken from TRICS |
| Whitecliff Business Park Phase 2 | 1755 employees | 2011 | 2031 | 6.2% | |

| | | | | | |
|---|---|---|---|---|---|
| Whitecliff Business Park Phase 3 | 1320 employees | | 2024 | 2031 | 6.2% | |
| **Existing Development** | **Bus Accessible Residences** | | **Start Year** | **Finish year** | **Bus Mode share** | **Source** |
| Whitfield (Existing) | 1623 | | 2011 | 2031 | 4.3 | Mode Share Taken from Whitfield Census. Dwelling numbers from ONS data and manual house count. |
| Melbourne Avenue | 1320 | | 2011 | 2031 | 13.0% | Taken from Journey to Work data for Buckland. Dwelling numbers from Manual Count |
| Buckland Avenue/ London Road | 817 | | 2011 | 2031 | 6.7% | Dwellings north of Buckland Ave within 400m mode share taken from Journey to Work data for Buckland. Dwellings south of Buckland Avenue within 400m taken from Journey to Work data for St Radigund's. Dwelling numbers from Manual Count. |
| Folkestone Road | 2750 | | 2011 | 2031 | 4.3% | Taken from Journey to Work data for Maxton, Elms Vale and Priory Ward. Dwelling numbers from ONS data |
| **New Development** | **AM Peak Trips** | **Annual Increase In Trips** | **Start Year** | **Finish year** | **Am Peak P&R Capture** | **Source** |
| Whitfield P&R | - | - | - | | | No data currently inputted |
| Farthingloe P&R | 300 | 6 | 2011 | 2031 | 35% | Data from report "Residential Led Mixed Use Development Farthingloe Village and Western Heights, Dover Sustainable Transport Strategy" Flows from Spreadsheet "Flows for Park and Ride with Port" |
| **Tourist Attraction** | **Annual Number of Visitors** | | **Start Year** | **Finish year** | **Bus Mode share** | **Source** |
| Dover Castle | 355000 | | 2011 | 2031 | 5% | Target Mode Share for BRT for Dover Castle |
| **New Mixed Use Development** | **Total all day bus trips** | | **Start Year** | **Finish year** | **Annual site operation** | **Source** |
| Bench Street / Wellington Docks | 3740 | | 2011 | 2031 | 300 days | Trip data taken from PBA Report "Dover Waterfront Park and Ride" June 2009.Flows include employment, residential and leisure trips. Phasing and timing of the proposed development is unknown. |

4.3.19 Relative to new development build-outs, it should be noted that the model assumes that build-outs are evenly divided between the start and finish build-out years. Start and finish years were provided by Dover District Council. In reality it is recognised that developments often start with only a small number of homes and 'ramp up' to a larger quantum, however using a simplifying assumption of an average build-out rate accounts for developments where the build-out rate is not known, and this assumption has a negligible impact in terms of final year financial outputs (2031). For employment sites the number of employee is assumed to be constant from the start year of the development to the final year of assessment (2031). For existing development the number of bus accessible dwellings is assumed as constant year on year from 2011 to 2031.

FARES

4.3.20 Within the spreadsheet model, specific fares can be set relative to route option and land parcel. This input is located within the 'Revenue' tab of the model and is set out relative to each route option as shown in Figure 4.8 below. Within the model a standard average fare of £1 has been used within the model for all journeys, based on the cost of a weekly ticket in Dover (£10). The local bus operator, Stagecoach, did suggest using an average fare higher than £1, as not all passengers use weekly tickets. However, a £1 fare has been used to emulate the 'worst case scenario'.

4.3.21 A premium fare is considered not to be appropriate as premium fares should only be introduced where there is an available choice between different public transport services. BRT is a mass transit system offering high quality, frequency and very large capacity - fares pricing needs to take this into consideration in terms of maximising usage and mode share.

**Figure 4.8 – Average Fare Revenue Input Example.**

| Option XXX | Year | Land Parcel 1 | Land Parcel 2 | Land Parcel 3 | Land Parcel 4 | Land Parcel 5 |
|---|---|---|---|---|---|---|
| | **Ave Fare** | **£0.85** | **£1.00** | **£1.15** | **£1.20** | **£2.00** |
| | 2011 | £25,099 | £0 | £0 | £0 | £0 |
| | 2012 | £50,197 | £0 | £0 | £0 | £0 |
| | 2013 | £75,296 | £0 | £0 | £0 | £0 |
| | 2014 | £100,394 | £0 | £0 | £0 | £0 |
| | 2015 | £125,493 | £0 | £0 | £0 | £0 |
| | 2016 | £150,591 | £0 | £0 | £0 | £0 |
| | 2017 | £175,690 | £0 | £0 | £0 | £0 |
| | 2018 | £200,788 | £0 | £0 | £0 | £0 |
| | 2019 | £225,887 | £35,293 | £0 | £0 | £0 |
| | 2020 | £225,887 | £70,587 | £0 | £0 | £0 |
| | 2021 | £225,887 | £105,880 | £0 | £0 | £0 |
| | 2022 | £225,887 | £141,174 | £0 | £0 | £0 |
| | 2023 | £225,887 | £176,467 | £0 | £0 | £0 |
| | 2024 | £225,887 | £211,761 | £54,251 | £0 | £0 |
| | 2025 | £225,887 | £211,761 | £108,501 | £0 | £0 |
| | 2026 | £225,887 | £211,761 | £162,752 | £0 | £0 |
| | 2027 | £225,887 | £211,761 | £217,002 | £65,625 | £0 |
| | 2028 | £225,887 | £211,761 | £217,002 | £131,250 | £0 |
| | 2029 | £225,887 | £211,761 | £217,002 | £196,874 | £120,557 |
| | 2030 | £225,887 | £211,761 | £217,002 | £262,499 | £241,114 |
| | 2031 | £225,887 | £211,761 | £217,002 | £262,499 | £241,114 |
| | **Total Rev** | **£3,840,075** | **£2,223,487** | **£1,410,515** | **£918,748** | **£602,784** |

## 4.4 KEY ASSUMPTIONS

4.4.1 Within the model a number of central key assumptions have been used, as shown in Figure 4.9 below and located within the 'Route Parameters' tab of the spreadsheet model. These central assumptions can be changed from this single location and these changes automatically update the final financial results.

**Figure 4.9 – Key Assumptions within Model**

| GENERIC INPUTS | | | |
|---|---|---|---|
| **Demand** | Residential trip rate generation | 8.0 | Daily total person trips per household (All trips - National Travel Survey) |
| | Park & Ride trip rate generation | 2.0 | Daily person trips per P&R user |
| **Revenue** | Bus operating days a year | 312 | Operating Days (Monday to Saturday, 52 weeks per year) |
| | Employee working days a year | 240 | Average working days a year |
| **Elasticity** | Wait time elasticity | -0.64 | (Source: TRL 'Black book' - Table 7.9) |
| **Layover** | Layover assumed per route run | 10% | Applied relative to round trip travel time |

4.4.2 Relative to each of the key assumptions the following inputs and sources have been used within the current version of the model:

**Number of daily trips per household**

- The National Travel Survey (2009) indicates ("Table 8.1 - Trips in progress by time of day and day of week: 2009") that 12% of all daily trips take place during the AM Peak hour. This therefore implies that the total number of all day trips is therefore (100 / 12) 8 times the number that occur in the AM Peak Hour. This calculation therefore provides an estimate figure of all day trips (in an average day) per household.

**Assumed P&R trips per vehicle parked**

- Based on our experience it has been assumed that each vehicle parking at the Park and Ride will result in one occupant making one trip out and one trip back to the Park and Ride. This therefore results in 2 bus journeys (per day) per AM peak vehicle trip captured into the park and ride.

**Bus operating days a year**

- As a standard for assessing all route options is has been assumed that the average bus operating days per route is 312. This is based on the assumption that each route will operate Monday to Saturday – 52 weeks a year.

**Employee working days a year**

- Considering weekends, bank holidays and minimum annual leave, it has been assumed that all employees will work an average of 240 days a year and hence employee land parcels will provide 240 days of bus patronage from bus mode share employees.

**Elasticity of patronage relative to a decrease in passenger waiting time (i.e. increase in service frequency)**

- Relative to the 'Route Parameter' inputs of the model, an Elasticity factor has been included to account for decreases in wait time attributed to increases in service frequency, for current bus services. The value used for this elasticity is taken from TRL's seminal bus research study "The Demand for Public Transport: A practical guide" (also known as the 'Black Book') which identifies overall wait time elasticity as -0.64 (Table 7.9 – Elasticity's in respect to wait time) based on research by Preston and James (2000).

It should be noted the model does not include an Elasticity factor for fares. Estimated demand does not reduce in the model if a higher fare is assumed.

**Assumed minimum layover per route, as a percentage of total round trip journey time**

- To enable realistic route journey times to be calculated, relative to proposed route options ,a minimal layover of 10% has been assumed (based on our experience) to account of potential traffic congestion and driver rest time between round trip bus journeys.

*4.4.3* ***In addition to these core assumptions one final overall assumption within the model has been to assume no inflation. This assumption has been made in order to maintain clarify of the origin of costs, within the model, and relates to both revenue and operational/infrastructure cost, which in broad terms still creates a balanced set of figures under which different route options can be directly compared to one another.***

## 4.5 MODEL OUTPUTS

4.5.1 The results of the model are displayed within the 'Results' tab of the spreadsheet model and aim to allow easy comparison between potential routes options tested. Within this tab the financial results of each route option and set out in detail, by year, but also summarised relative to the final financial balance of each option in the base year of 2031.

4.5.2 Figure 4.10 provides an example of the detailed summary output per route option which details, by year:

- Annual total revenue
- Annual route operating cost (total bus operation cost including depreciation)
- Annual capital cost (Infrastructure cost)
- Year total (Revenue minus operational and capital cost)
- Cumulative total

**Figure 4.10 – Example of Model Results Output Per Route Option**

| OPTION xx | | | | | |
|---|---|---|---|---|---|
| Year | Revenue | Operation Cost | Capital Cost | Year Total | Cum Total |
| 2011 | £635,306 | £750,000 | £0 | -£114,694 | -£114,694 |
| 2012 | £659,519 | £750,000 | £0 | -£90,481 | -£205,174 |
| 2013 | £683,732 | £750,000 | £0 | -£66,268 | -£271,443 |
| 2014 | £707,945 | £750,000 | £0 | -£42,055 | -£313,498 |
| 2015 | £732,157 | £750,000 | £0 | -£17,843 | **-£331,341** |
| 2016 | £756,370 | £750,000 | £0 | £6,370 | -£324,971 |
| 2017 | £780,583 | £750,000 | £0 | £30,583 | -£294,388 |
| 2018 | £804,795 | £750,000 | £0 | £54,795 | -£239,593 |
| 2019 | £829,008 | £750,000 | £0 | £79,008 | -£160,585 |
| 2020 | £829,008 | £750,000 | £0 | £79,008 | -£81,577 |
| 2021 | £829,008 | £750,000 | £0 | £79,008 | -£2,569 |
| 2022 | £829,008 | £750,000 | £0 | £79,008 | £76,439 |
| 2023 | £829,008 | £750,000 | £0 | £79,008 | £155,447 |
| 2024 | £829,008 | £750,000 | £0 | £79,008 | £234,455 |
| 2025 | £829,008 | £750,000 | £0 | £79,008 | £313,463 |
| 2026 | £829,008 | £750,000 | £0 | £79,008 | £392,471 |
| 2027 | £829,008 | £750,000 | £0 | £79,008 | £471,479 |
| 2028 | £829,008 | £750,000 | £0 | £79,008 | £550,488 |
| 2029 | £829,008 | £750,000 | £0 | £79,008 | £629,496 |
| 2030 | £829,008 | £750,000 | £0 | £79,008 | £708,504 |
| 2031 | £829,008 | £750,000 | £0 | £79,008 | £787,512 |
| **Total** | **£16,537,512** | **£15,750,000** | **£0** | **£787,512** | |

4.5.3 In overall summary Figure 4.11 provides an example of the final comparison table which allows direct comparison between route options relative to:

- Final total balance in 2031
- Maximum cumulative loss including capital (infrastructure costs)
- Maximum cumulative loss excluding capital (infrastructure costs) to allow for a direct comparison of route service operational cost vs. revenue.

**Figure 4.11 – Example of the Final Model Results Summary Table (Numbers shown are for illustration only)**

| FINAL SUMMARY | | | | |
|---|---|---|---|---|
| Route | Total Balance at 2031 | Max loss with capital costs inc | Max loss with capital costs exc | Route Discription |
| EXISTING | £250,000 | £0 | £0 | Existing (Route xx) |
| OPTION xx | -£11,500,000 | -£11,550,656 | -£10,950,656 | Option xx (via A2) |
| OPTION xx | -£11,000,000 | -£11,136,130 | -£10,336,130 | Option xx (via A2/A258) |
| OPTION xx | -£13,000,000 | -£13,337,581 | -£9,737,581 | Option xx (Bus Only Link/Dover Road) |
| OPTION xx | -£12,500,000 | -£12,537,581 | -£9,737,581 | Option xx (Alt. Bus Only Link + Link to A258) |
| OPTION xx | -£15,500,000 | -£15,445,910 | -£14,595,910 | Option xx (Whitfield Hill) |
| OPTION xx | £800,000 | -£331,341 | -£331,341 | Existing (Route xx) + Extension |
| ROUTE 8 | £0 | £0 | £0 | |
| ROUTE 9 | £0 | £0 | £0 | |
| ROUTE 10 | £0 | £0 | £0 | |

# 5 Comparison of Route Options

## 5.1 INTRODUCTION

5.1.1 This chapter details the results of an initial assessment of the BRT financial feasibility, through utilisation of the spreadsheet model with the current assumptions contained within it. As discussed previously, there are a number of variables which may change therefore this is used as a basis on which to further develop the concept of BRT in a manner that is consistent with demand for the service. It should be noted that the results of this initial financial viability assessment are designed to assist with strategic decision making. They are not at a level of detail sufficient to support a business case for investment.

5.1.2 The outputs from the spreadsheet are included in Appendix A. The summary results are presented in Table 5.1.

**Table 5.1 Comparison of Route Options**

| Route | Total Balance at 2031 | Max loss with capital costs inc | Max loss with capital costs exc | Route Description |
|---|---|---|---|---|
| EXISTING | £3,049,962 | £0 | £0 | Existing (Route 61) |
| OPTION 1A | -£9,344,702 | -£9,786,268 | -£9,186,268 | Option 1a (via A2) |
| OPTION 1B | -£8,471,824 | -£9,107,106 | -£8,307,106 | Option 1b (via A2/A258) |
| OPTION 2A | -£11,138,172 | -£11,989,924 | -£7,689,924 | Option 2a (Bus Only Link/Dover Road) |
| OPTION 2B | -£10,138,172 | -£10,989,924 | -£7,689,924 | Option 2b (Alt. Bus Only Link + Link to A258) |
| OPTION 3 | -£13,118,183 | -£13,154,931 | -£12,304,931 | Option 3 (Whitfield Hill) |
| OPTION 4 | £4,417,697 | £0 | £0 | Existing (Route 61) + Extension |

5.1.3 The table above represents a theoretical situation where each route option operates from 2011 to 2031. It illustrates the large amount of financial support a BRT scheme would require if it commenced operation as a full scheme from 2011. The reason for this is that the majority of potential passengers for the BRT are from new residential development that will not be completed until the last years of the 2011 to 2031 planning period.

5.1.4 The comparison of routes shows the following:

- Existing Route 61 and Option 4 (Revised Route 61) do not make a loss.
- Options 1 to 3 break even by 2031, but make significant cumulative losses before 2031. The highest being an cumulative loss (not inc. capital costs) of £12.3m on Option 3.
- Option 1b has the smallest negative Total Balance at 2031 (-£8.5m).

5.1.5 To ensure the amount of financial support required is minimised a phased approach to the introduction of the BRT scheme would be employed. A potential phased approach based on the findings above is discussed in the next section (Section 6).

# 6 Proposed Phasing and Sensitivity Tests

## 6.1 PROPOSED PHASING

6.1.1 Following a basic analysis of indicative costs and demand, WSP has considered, with help from and discussion with the BRT Steering Group, the balance between early investment and delivery of BRT services compared to the gradual increase in demand and the resultant revenue that this provides. The benefits of an early introduction of a full BRT scheme in terms of the impression of quality public transport services given to the public are clear, however the costs involved, as demonstrated in Table 5.1 above are very substantial, together with arguments about the value for money involved with the operation of a frequent service carrying very few passengers. As a result, it It is proposed, as an effective and more cost efficient solution, that Dover BRT is introduced in three phases. These phases are proposed to be as follows:

**Phase 1 (2011-18)**

- Extended Route 61 to Whitfield Development Phase 1 (15 min frequency)
- Peak Hour Shuttle between Whitfield Development Phase 1 and Dover Priory Station

**Phase 2 (2019–23)**

- Revised Route 61 terminating at Tescos (15 min frequency)
- BRT Service introduced between Whitfield Development Phases 1 and 2 (plus Existing Whitfield) and Farthingloe via new bridge over the A2 and via A2/A258 (15 min frequency)

**Phase 3 (2024-31)**

- Revised Route 61 terminating at Tescos (15 min frequency)
- BRT Service between Whitfield Development Phases 1 to 5 (plus Existing Whitfield) and Farthingloe via new bridge over the A2 and via a new Bus Link between B&Q and Dover Road (15 min frequency)

PHASE 1 (2011-18)

6.1.2 It is proposed that the BRT service is not commenced until 2019. The first phase between 2011 and 2018 corresponds with the buildout of Whitfield Development Phase 1. It is proposed that the existing 61 service is extending to serve Phase 1. This is expected to require one additional bus, which will require contributions from developers.

6.1.3 The revised 61 service could benefit from a rebranding exercise, and the possible introduction of new buses, which would make a positive statement regarding the provision of effective public transport services for the expansion of Whitfield.

6.1.4 Although the BRT service will not be operating in Phase 1 it is considered desirable to provide a direct link between Whitfield Phase 1, and the existing development, to Dover Priory Station from the first year of buildout. This is to ensure that new residents who plan to use the HS1 service to London get used to using public transport to access it. The peak hour shuttle would meet early morning departures from and late evening arrivals at Dover Priory Station.

6.1.5 The route of the peak hour shuttle is shown via the A2. The service would operate before 8am and after 6pm and therefore would avoid the busiest times on the A2. If this service still encountered traffic delays, an alternative route, such as via the A258, could be taken.

| **Features** | **Phase 1** |
|---|---|
| Significant segregation from other forms of traffic | |
| Priority over other vehicles in mixed traffic situations | |
| Priority at traffic signals and priority over other traffic | |
| High quality, safe, secure and accessible stops | (✓) – new stops provided within Whitfield |
| High quality, smooth riding, distinctive and attractive vehicles | ✓ |
| Easy accessibility | ✓ |
| Vehicles and infrastructure must be environmentally friendly | ✓ |
| High frequency, limited stop services | (✓) – limited stop on HS1 Shuttle Service |
| Efficient and user friendly ticketing | ✓ |
| High standards of information provision | ✓ |
| Real time information | ✓ |
| Good integration with other transport modes | ✓ - integration with HS1 services at Dover Priory Station |
| Distinctive branding and marketing | ✓ |
| Clear and understandable system | ✓ |

PHASE 2 (2019-23)


6.1.6 It is proposed that a BRT service is introduced in 2019. This would serve Whitfield Development Phases 1 and 2, existing areas of Whitfield, Whitecliffs Business Park, Connaught Barracks (from the A258), Dover Castle, Dover Town Centre, Dover Priory Station and Farthingloe.

6.1.7 One alternative that could be considered would be to serve the Farthingloe Development and Park & Ride by existing bus service 101/102, If this is the case the BRT Service would terminate at Dover Priory Station. This would reduce the operating costs of the BRT Service. However, in our costings, we have assumed that the various BRT options all extend through to Farthingloe.

6.1.8 If the BRT service does operate to/from Farthingloe, consideration will have to be given to the best way of serving Dover Priory Station whilst minimising the delay to the service between Farthingloe and Dover Town Centre.

6.1.9 The BRT service would use a new bus-only bridge over the A2, north of Tesco. This bridge would be constructed in 2018 ready to be used by the BRT service in 2019. The benefit of this bridge is that it connects the Whitfield Development with employment opportunities at Whitecliffs Business Park and with Tescos, whilst avoiding Whitfield Roundabout. In the longer term it would also be part of route between the Whitfield Development and Dover Town Centre which completely avoids the A2.

6.1.10 The BRT proposals do not require a bus only junction to be built on the A256, as shown in the Whitfield SPD Consultation Masterplan. Even if the BRT service was routed via the A256 it is not considered necessary to provide a separate bus only junction on the A256 as it would not be expected to provide substantial journey time savings. Introducing a new junction on the A256 would also mean unnecessary additional delay for general traffic using the A256. It is understood that Dover DC and the Highway Authority (HCC) do not support a bus only junction on the A256.

6.1.11 The BRT service would serve the proposed Public Transport Hub planned to be located within Phase 2 of the Whitfield Development.

6.1.12 The 61 service would be shortened to stop at Tesco, no longer serving Whitfield. This is because the BRT service would now be the main bus service between Whitfield and Dover Town Centre. Bus services 87, 88 and 89 would continue to provide a link between Whitfield, Dover Christ Church Academy, Melbourne Avenue and London Road enabling connections to schools and local facilities to be maintained.

| **Features** | **Phase 2** |
|---|---|
| Significant segregation from other forms of traffic | |
| Priority over other vehicles in mixed traffic situations | |
| Priority at traffic signals and priority over other traffic | (✓) |
| High quality, safe, secure and accessible stops | (✓) |
| High quality, smooth riding, distinctive and attractive vehicles | ✓ |
| Easy accessibility | ✓ |
| Vehicles and infrastructure must be environmentally friendly | ✓ |
| High frequency, limited stop services | (✓) |
| Efficient and user friendly ticketing | ✓ |
| High standards of information provision | ✓ |
| Real time information | ✓ |
| Good integration with other transport modes | ✓ |
| Distinctive branding and marketing | ✓ |
| Clear and understandable system | ✓ |

PHASE 3 (2024-31)


6.1.13 It is proposed that once Whitfield Development Phases 3, 4 and 5 start to be built out the BRT service is extended to serve them.

6.1.14 It is also proposed that in 2023 a bus only link is constructed between B&Q and Dover Road is widened. This will enable the route of the BRT service to be diverted via Dover Road from 2024 onwards. Operating via Dover Road will mean the service avoids the busy A2 route completely. The preferred routing would be that proposed which reduces the length of Dover Road requiring widening.

6.1.15 The 61 service would continue to be curtailed at Tesco, as in Phase 2.

6.1.16 The routes for each of the three phases are shown overleaf. The remainder of this section considers the level of financial contribution that will be required during each phase.

| Features | Phase 3 |
|---|---|
| Significant segregation from other forms of traffic | |
| Priority over other vehicles in mixed traffic situations | |
| Priority at traffic signals and priority over other traffic | (✓) |
| High quality, safe, secure and accessible stops | (✓) |
| High quality, smooth riding, distinctive and attractive vehicles | ✓ |
| Easy accessibility | ✓ |
| Vehicles and infrastructure must be environmentally friendly | ✓ |

| | |
|---|---|
| High frequency, limited stop services | (✓) |
| Efficient and user friendly ticketing | ✓ |
| High standards of information provision | ✓ |
| Real time information | ✓ |
| Good integration with other transport modes | ✓ |
| Distinctive branding and marketing | ✓ |
| Clear and understandable system | ✓ |

### WHITFIELD PARK & RIDE

6.1.17 The Whitfield Transport Strategy includes a Park and Ride in the south west corner of Whitfield (Phase 5). It is shown to be accessed by a new junction on the A2 to the west of Whitfield Roundabout.

6.1.18 An alternative location for a Park and Ride would be within Phase 1 of the Whitfeld Development close to the junction between the A2 and the A256.

6.1.19 The benefit of this alternative location is that it would be accessible from both the A2 (Canterbury) and A256 (Ramsgate). The proposed location in the south west corner of Whitfield would only be accessible from the A2.

6.1.20 Preliminary work was undertaken on the feasibility of a Park and Ride site at Whitfield as part of the Dover Transport Study (DDC, 2007). This work assessed the viability of a Park and Ride located within Phase 1 of the Whitfield Development close to the A2/A256 junction. This assessment showed there was insufficient demand to cover the costs of a bespoke Park and Ride service from this location, despite potential demand from both the A2 and the A256. However, the assessment did show there was merit in operating and Park and Ride with a local bus service, such as the proposed BRT service.

6.1.21 As the assessment undertaken as part of the Dover Transport Strategy showed the Park and Ride close to the A2/A256 junction was not financial viable in its own right, a Park and Ride in the south west corner location is expected to be even less viable as it would attract even less demand. For this reason we have excluded the Park and Ride as shown in the Whitfield Transport Strategy from our assessment.

6.1.22 No assessment has been undertaken as to whether it is possible to construct a Park and Ride with Phase 1 of the Whitfield Development. For this reason we have not included a Park and Ride in Whitfield at this location on the proposed BRT route. However, if a Park and Ride site were built in this location it could easily be served by the proposed BRT route. This would further enhance the financial viability of the proposed BRT service.

## 6.2 FINANCIAL CONTRIBUTION TO OPERATING COST

6.2.1 The peak hour shuttle service in Phase 1 and the BRT Service in Phases 2 and 3 both require financial support. The peak hour shuttle service requires £980,976 between 2011 and 2018. The BRT Service in Phase 2 breaks even in 2022, but requires £107,003 of support between 2019 and 2021. The BRT Service in Phase 3 breaks even in 2030, but requires £1,545,540 of support between 2024 and 2029.

6.2.2 Table 6.1 shows how contributions required vary by year. These calculations are based on an estimated buildout of houses in the Whitfield Development between 2011 and 2031.

In years where annual revenue exceeds operational cost no contribution is required. The difference between revenue and cost is not shown in these tables as they are intended to only show the level of contribution required.

**Table 6.1 Contribution Towards Operating Cost by Year**

| Phase | Year | No. of Households | Revenue | Operation Cost | Annual Contribution Required | Cumulative Contribution Required |
|---|---|---|---|---|---|---|
| 1 (Peak Hour Shuttle) | 2011 | 169 | £6,084 | £150,000 | -£143,916 | -£143,916 |
| | 2012 | 338 | £12,168 | £150,000 | -£137,832 | -£281,748 |
| | 2013 | 507 | £18,252 | £150,000 | -£131,748 | -£413,496 |
| | 2014 | 676 | £24,336 | £150,000 | -£125,664 | -£539,160 |
| | 2015 | 845 | £30,420 | £150,000 | -£119,580 | -£658,740 |
| | 2016 | 1014 | £36,504 | £150,000 | -£113,496 | -£772,236 |
| | 2017 | 1183 | £42,588 | £150,000 | -£107,412 | -£879,648 |
| | 2018 | 1352 | £48,672 | £150,000 | -£101,328 | **-£980,976** |
| 2 (BRT service via A2/A258) | 2019 | 1723 | £710,995 | £800,000 | -£73,918 | -£73,918 |
| | 2020 | 1925 | £751,827 | £800,000 | -£33,085 | -£107,003 |
| | 2021 | 2127 | £788,416 | £800,000 | £0 | -£107,003 |
| | 2022 | 2329 | £825,006 | £800,000 | £0 | -£107,003 |
| | 2023 | 2531 | £861,595 | £800,000 | £0 | -£107,003 |
| 3 (BRT service via bus only link) | 2024 | 3003 | £965,000 | £1,400,000 | -£419,912 | -£419,912 |
| | 2025 | 3273 | £1,013,471 | £1,400,000 | -£371,442 | -£791,354 |
| | 2026 | 3543 | £1,061,941 | £1,400,000 | -£322,972 | -£1,114,326 |
| | 2027 | 4126 | £1,165,098 | £1,400,000 | -£219,814 | -£1,334,140 |
| | 2028 | 4439 | £1,221,082 | £1,400,000 | -£163,831 | -£1,497,971 |
| | 2029 | 5097 | £1,337,343 | £1,400,000 | -£47,569 | -£1,545,540 |
| | 2030 | 5755 | £1,453,605 | £1,400,000 | £0 | -£1,545,540 |
| | 2031 | 5755 | £1,454,901 | £1,400,000 | £0 | -£1,545,540 |
| | | | | | Grand Total | -£2,633,519 |

## 6.3 INFRASTRUCTURE COSTS BY YEAR

6.3.1 It is assumed no new infrastructure is required for Phase 1. Phase 2 is anticipated to require a new bridge over the A2, improvements to town centre junctions and bus priority at A2/A258 Guston Roundabout. The design cost (20% of total) and construction cost (80% of total) for this infrastructure are expected to be incurred in 2017 and 2018 respectively. There is no 'rule of thumb' for the split between design cost and construction costs. The proportion of spend in Year 1, compared to Year 2 depends on a number of factors, including the level of supervision required. A 20:80 split is considered to be a reasonable estimate of the anticipated cost split.

6.3.2 Construction of the bridge is anticipated to begin during Phase 1, at the latest by 2018. It is assumed funding for the bridge would be secured during Phase 1, therefore there is no reason why the bridge (which also improves pedestrian and cycle access to Whitfield) could not be opened earlier than 2018. If the bridge is required before 2018 Dover DC could negotiate this with the developer.

6.3.3 Phase 3 is anticipated to require construction of a bus only link between B&Q and Dover Road and widening of Dover Road. The design cost and construction cost for this infrastructure are expected to be incurred in 2022 and 2023 respectively.

**Table 6.2 Infrastructure Costs by Year**

| Phase | Year | No. of Households | Capital Cost | Notes |
|---|---|---|---|---|
| 1 (Peak Hour Shuttle) | 2011 | 169 | £0 | |
| | 2012 | 338 | £0 | |
| | 2013 | 507 | £0 | |
| | 2014 | 676 | £0 | |
| | 2015 | 845 | £0 | |
| | 2016 | 1014 | £0 | |
| | 2017 | 1183 | £1,160,000 | 20% of Infrastructure Cost (Bridge of the A2, Town Centre Junctions, A2/A258 Junction) |
| | 2018 | 1352 | £4,640,000 | 80% of Infrastructure Cost (Bridge of the A2, Town Centre Junctions, A2/A258 Junction) |
| 2 (BRT service via A2/A258) | 2019 | 1723 | £0 | |
| | 2020 | 1925 | £0 | |
| | 2021 | 2127 | £0 | |
| | 2022 | 2329 | £640,000 | 20% of Infrastructure Cost (Bus Only Link, Widening of Dover Road) |
| | 2023 | 2531 | £2,560,000 | 80% of Infrastructure Cost (Bus Only Link, Widening of Dover Road) |
| 3 (BRT service via bus only link) | 2024 - 2031 | 3003 to 5755 | £0 | |

6.3.4 Other infrastructure costs not listed above, include the cost of providing Real Time Passenger Information (RTPI). If this was included it would be expected to cost around £200,000. This cost includes the RTPI Installation System, displays at bus stops and on-board bus units. The cost does not include provision of a control centre or ongoing maintenance.

## 6.4 SENSITIVITY TEST – HIGHER BRT MODE SHARE FOR WHITFIELD NEW DEVELOPMENT

6.4.1 The contributions towards operating costs shown in Table 6.1 are based on conservative assumptions regarding BRT mode share for Whitfield New Development. The calculations above were based on a mode share for BRT in the Whitfield New Development of 7%.

6.4.2 A sensitivity test has been conducted based on a higher BRT mode share in the Whitfield New Development of 10%. The Whitfield New Development will be expected to achieve a up to20% reduction in single car occupancy mode share (currently 75%). Not all of this shift (15%) will be to BRT, but a 10% BRT Mode Share for Whitfield New Development is considered to be achievable. In this scenario the BRT Service would not require any financial support during Phase 2 and the level of support required in Phase 3 reduces from £1,545,540 to £379,079.

**Table 6.3 Contribution Towards Operating Cost by Year – Higher BRT Mode Share**

| Phase | Year | No. of Households | Revenue | Operation Cost | Annual Contribution Required | Cumulative Contribution Required |
|---|---|---|---|---|---|---|
| 1 (Peak Hour Shuttle) | 2011 | 169 | £6,084 | £150,000 | -£143,916 | -£143,916 |
| | 2012 | 338 | £12,168 | £150,000 | -£137,832 | -£281,748 |
| | 2013 | 507 | £18,252 | £150,000 | -£131,748 | -£413,496 |
| | 2014 | 676 | £24,336 | £150,000 | -£125,664 | -£539,160 |
| | 2015 | 845 | £30,420 | £150,000 | -£119,580 | -£658,740 |
| | 2016 | 1014 | £36,504 | £150,000 | -£113,496 | -£772,236 |
| | 2017 | 1183 | £42,588 | £150,000 | -£107,412 | -£879,648 |
| | 2018 | 1352 | £48,672 | £150,000 | -£101,328 | **-£980,976** |
| 2 (BRT service via A2/A258) | 2019 | 1723 | £840,013 | £800,000 | £0 | £0 |
| | 2020 | 1925 | £895,971 | £800,000 | £0 | £0 |
| | 2021 | 2127 | £947,686 | £800,000 | £0 | £0 |
| | 2022 | 2329 | £999,401 | £800,000 | £0 | £0 |
| | 2023 | 2531 | £1,051,116 | £800,000 | £0 | **£0** |
| 3 (BRT service via bus only link) | 2024 | 3003 | £1,189,865 | £1,400,000 | -£195,048 | -£195,048 |
| | 2025 | 3273 | £1,258,553 | £1,400,000 | -£126,360 | -£321,407 |
| | 2026 | 3543 | £1,327,241 | £1,400,000 | -£57,672 | -£379,079 |
| | 2027 | 4126 | £1,474,053 | £1,400,000 | £0 | -£379,079 |
| | 2028 | 4439 | £1,553,474 | £1,400,000 | £0 | -£379,079 |
| | 2029 | 5097 | £1,719,007 | £1,400,000 | £0 | -£379,079 |
| | 2030 | 5755 | £1,884,539 | £1,400,000 | £0 | -£379,079 |
| | 2031 | 5755 | £1,885,835 | £1,400,000 | £0 | -£379,079 |
| | | | | | Grand Total | **-£1,360,055** |

## 6.5 SENSITIVITY TEST – HIGHER BRT MODE SHARE FOR WHITFIELD NEW DEVELOPMENT AND £1.40 FARE

6.5.1 A second sensitivity test has been carried out that applies a 10% BRT Mode Share for Whitfield New Development and a £1.40 fare for all BRT journeys in the model. Previously a £1 fare had been assumed. An average fare of £1.40 was initially suggested by the local bus operator, Stagecoach, but was not used in the main assessment as this was intended to show the 'worst case scenario'.

6.5.2 The level of support required for the Peak Hour Shuttle is not affected as separate assumptions have been made to calculate the level of revenue expected for this service. However, the BRT Service in Phases 2 and 3 are affected and now no longer require financial support in this scenario.

**Table 6.4 Contribution Towards Operating Cost by Year – Higher BRT Mode Share for Whitfield New Development and £1.40 Fare**

| Phase | Year | No. of Households | Revenue | Operation Cost | Annual Contribution Required | Cumulative Contribution Required |
|---|---|---|---|---|---|---|
| 1 (Peak Hour Shuttle) | 2011 | 169 | £6,084 | £150,000 | -£143,916 | -£143,916 |
| | 2012 | 338 | £12,168 | £150,000 | -£137,832 | -£281,748 |
| | 2013 | 507 | £18,252 | £150,000 | -£131,748 | -£413,496 |
| | 2014 | 676 | £24,336 | £150,000 | -£125,664 | -£539,160 |
| | 2015 | 845 | £30,420 | £150,000 | -£119,580 | -£658,740 |
| | 2016 | 1014 | £36,504 | £150,000 | -£113,496 | -£772,236 |
| | 2017 | 1183 | £42,588 | £150,000 | -£107,412 | -£879,648 |
| | 2018 | 1352 | £48,672 | £150,000 | -£101,328 | **-£980,976** |
| 2 (BRT service via A2/A258) | 2019 | 1723 | £1,176,018 | £800,000 | £0 | £0 |
| | 2020 | 1925 | £1,254,360 | £800,000 | £0 | £0 |
| | 2021 | 2127 | £1,326,761 | £800,000 | £0 | £0 |
| | 2022 | 2329 | £1,399,162 | £800,000 | £0 | £0 |
| | 2023 | 2531 | £1,471,563 | £800,000 | £0 | **£0** |
| 3 (BRT service via bus only link) | 2024 | 3003 | £1,665,811 | £1,400,000 | £0 | £0 |
| | 2025 | 3273 | £1,761,974 | £1,400,000 | £0 | £0 |
| | 2026 | 3543 | £1,858,137 | £1,400,000 | £0 | £0 |
| | 2027 | 4126 | £2,063,675 | £1,400,000 | £0 | £0 |
| | 2028 | 4439 | £2,174,863 | £1,400,000 | £0 | £0 |
| | 2029 | 5097 | £2,406,609 | £1,400,000 | £0 | £0 |
| | 2030 | 5755 | £2,638,355 | £1,400,000 | £0 | £0 |
| | 2031 | 5755 | £2,640,169 | £1,400,000 | £0 | **£0** |
| | | | | | Grand Total | **-£980,976** |

# 7 Fares Strategy

## 7.1 GENERAL OVERVIEW

7.1.1 Current legislation affecting England (Transport Act 1985 and subsequent Acts and amendments, in particular the Transport Act 2000 and the Local Transport Act 2008) largely precludes local transport authorities from determining fare levels on local bus services when the latter are operated on a commercial basis, and not under the aegis of a contractual arrangement.

7.1.2 Should a new or existing bus service need to be contracted by a local transport authority, where it is not deemed to be capable of commercial operation i.e. it requires subsidy payments to cover shortfalls between revenue generated and operating costs, it is possible for the contracting authority to determine the precise fare levels or set a maximum level, for example. However, even in this case, such action should not be seen as 'inhibiting competition' with commercial bus services (section 92(1) Transport Act 1985).

7.1.3 The Local Transport Act 2008 introduced new and revised arrangements for voluntary and non-voluntary arrangements between local transport authorities and bus operators. As far as arrangements to determine fares are concerned, one change was for Voluntary Partnership Arrangements (VPAs) to include a maximum fare requirement, if agreed by all parties without breaching competition law. However, any agreement to set fare levels generally would only be possible where only a single bus operator is involved.

7.1.4 The only scenario in which a local transport authority is able to determine fare levels generally is where an area is designated as subject to a Quality Contracts Scheme (QCS). Services within this QCS area would normally be provided through Quality Contract arrangements to be determined by the local transport authority. In order to apply a QCS area, there must be a demonstrable public interest case. Although the powers to apply quality contracts have been in existence since the Transport Act 2000, no local transport authority has yet introduced such a scheme, as the operational and financial ramifications are very considerable.

## 7.2 FARES STRATEGY FOR A BRT SERVICE

7.2.1 Firstly, if a new BRT service is operated on a commercial basis, the fares strategy will largely be dictated by the bus operator concerned, although there may be opportunities for a mutually agreed approach through a VPA. If, however, the BRT service is provided under contract to the local transport authority, that authority will be able to determine fare levels, provided that the fares determined do not unduly inhibit competition (for example, if the BRT fare were to be considerably cheaper than that applying on a directly parallel commercial bus service).

7.2.2 In some circumstances, BRT services may be perceived as a premium service, which are provided over and above the general bus service network. In those circumstances, it is logical to consider the application of premium fares to reflect the higher quality of service. However, in the case of the proposed BRT service in Dover, this would not be the case, in that the BRT service is seen as an integrated part of the public transport network, and the only bus service available for many residents of Whitfield, for example. Thus fares for the BRT service should be in line with the current norm for the area.

## 7.3 CURRENT FARES IN DOVER AREA

7.3.1 The current fares structure in Dover for services operated by Stagecoach in East Kent is a conventional one based on single fares with a discount available for return fares. Typically, such discount is about 8%, for example the alternative to two 60p single fares would be a £1.10 return fare. For longer journeys, the most economic fare for regular passengers would be the megarider, which costs £10 for 7 days unlimited travel in the Dover/Deal area. Assuming use over 5 days only, this equates to a daily single fare of £1.

7.3.2 Additional discounts are available on megarider tickets for 4 weeks, 13 weeks or 52 weeks. In terms of general bus fare levels in the South East of England, these fares can be considered to be lower than average.

7.3.3 Although the fares for children are not discounted prior to 8.45 AM on schooldays, children in years 7 to 11 can currently take advantage of the Kent Freedom Pass, which allows free travel at any time of the day for an annual cost of £50.

## 7.4 PARK AND RIDE

7.4.1 Park and Ride bus provision is usually by means of a discrete bus service connecting outlying car park/parks with the town centre. Some park and ride services provide free parking, with a bus fare charged to users, some charge for parking, with a free bus service provided, whilst a small minority charge for both parking and travel by bus.

7.4.2 The balance of costs for using park and ride services needs to be carefully considered against the cost and availability of conventional parking facilities in town centres. If the costs are such that using town centre car parks are cheaper than the park and ride service, and availability of spaces is not a restraint, usage of the park and ride facility will be greatly reduced.

7.4.3 Park and Ride schemes have been criticised in the past for offering particularly low fares when compared with standard bus fares for the area. In some cases there has been abstraction from local bus services, as local residents use the lower cost park and ride facility. Particular care needs to be taken in designing park and ride schemes in order to avoid this type of problem.

7.4.4 In the case of the two Dover schemes under consideration as part of the BRT service business case (Fathingloe and Whitfield), both sites are adjacent to significant new building developments, and the BRT service is thus multi-functional. As such, the fares strategy needs to be thought through carefully. The two options would be to permit free parking at the park and ride sites and then apply the standard bus fare for park and ride users, or to charge a fee for car parking and permit free use of the BRT service. If the BRT service is operated on a commercial basis, there would need to be some type of reimbursement arrangement for the bus operator to receive revenue for carrying park and ride users free.

7.4.5 Park and Ride, in order to be a financially sustainable option, must form part of an overall parking strategy for the area. The supply of parking spaces, their location, the prices charged and the differentials between short stay and long stay usage are all critical factors which need to be integrated into a coherent strategy, in order for not only park and ride, but also BRT to be fully successful.

7.4.6 In order to minimise abstraction from PT services, especially the BRT, a carefully thought-through parking strategy is required, which balances long and short stay parking, under and over capacity and pricing. The success of such a strategy would be threatened if parking charges were not entirely under the control of DDC.

## 7.5 DOVER PRIORY STATION

7.5.1 If a new Car Park at Dover Priory was specifically designed to serve Long Stay Rail Commuters, especially those people who currently live outside the Dover built-up area, we do not believe this would have an adverse impact on the BRT. However, the provision of large scale short stay parking provision in the centre of Dover would have a significant impact on the usage of a BRT service, in particular the Park and Ride element, which could be non-viable as a result. The issue of parking provision in town centres is a very emotive topic. Great care will need to be taken to achieve a balance between the requirements of commercial investors and developers and the requirements of the planning and highway authorities for encouraging non car trave and ensuring that the BRT service is commercially successful without recourse to subsidy.

## 7.6 DOVER BRT FARES STRATEGY

7.6.1 The most important points to note for a fares strategy for the Dover BRT are thus:

- The BRT service should be fully integrated into the existing public transport network of local bus services;
- Where the BRT service is the main all-day public transport service between Whitfield and Dover Town Centre, the fares structure should be similar to those applicable to local bus services in Dover, with no premium fare being charged;
- The BRT service should be designed to integrate with local bus services, and should minimise abstraction of passengers and revenue from them;
- Through fares should be encouraged, in order to optimise usage of the BRT;
- Current multi-modal fares, such as PLUSBUS should be retained and developed further, and used to encourage visitors to Dover's attractions to use public transport services. (PLUSBUS is a cheap bus pass (like a travelcard) that can be bought with a train ticket at any National Rail station booking office, by phone or online. It provides unlimited bus travel around the whole urban area of the origin and/or destination town of the relevant train journey, including to and from the rail station.);
- If the BRT service is operated on a commercial basis, it should form part of a Voluntary Partnership Agreement, which might include stipulations on maximum fares to be charged;
- If a special commuter peak-hours only service should be instigated between Whitfield and Dover Priory Station, it would be acceptable to charge a premium fare, which would reflect the quality of service provided, as well as minimising the risk of abstraction from other local bus services; and
- Finally, the majority of fares schemes mentioned in this section are either commercially determined, or rely on central or local government subsidy, and are thus subject to future changes which cannot readily be determined. However, the principles outlined should be retained, as far as is feasible.

# 8 Funding Opportunities

## 8.1 BACKGROUND TO FUNDING FOR BUS SERVICES AFTER THE COMPRESHENSIVE SPENDING REVIEW (OCTOBER 2010)

8.1.1 Previously bus services have been able to receive support from central government through a number of subsidies, either directly to the operators (such as Bus Service Operators' Grant), via grants to local authorities to top up their own revenue funding (e.g. revenue support grant), and grants which local authorities bid for which allow flexibility for local authorities to specify what that funding will pay for (e.g. Kickstart funding). The different grants are detailed in the following table, with specific details given below:

**Table 8.1 – Past Sources of Bus Funding**

| Previous sources of bus service support | 2007/08 Funding (Millions) |
|---|---|
| Bus Service Operators' Grant (DfT) | 413 |
| Revenue Support Grant (CLG) | 330 |
| Rural Bus Subsidy Grant (DfT) | 56 |
| Challenge and Kickstart (DfT) | 11 |
| Concessionary Fares (DfT)* | 725 |
| Funding for London's buses | 650 |
| Capital spending by local authorities | 300 |
| Total: | 2,480 |

**Concessionary Fares represent a subsidy to eligible bus passengers rather than a subsidy to bus operators.*

8.1.2 **Bus Service Operator Grants (BSOG)** formerly Fuel Duty Rebate came into force on 1 May 2002 to include community transport services under their new eligibility criteria which previously included only registered local bus services. There are various conditions for the payment that need to be satisfied in any claim.

8.1.3 Authorities receive **Revenue Support Grant** for transport via the wider local government financial settlement. This grant is intended to even out differences in authorities' balance of local needs and resources across all service responsibilities.

8.1.4 **Urban & Rural Bus Challenge** initiatives and the **Rural Bus Subsidy Grant** enable local authorities to bid for a proportion of a 'pot' of funding which is shared amongst the authorities with the most innovative schemes or particular needs.

8.1.5 In addition to the above**,** a **Green Bus Fund** has been set up to support bus companies and local authorities in England by helping them buy new low carbon buses. Its main purpose is to support and hasten the introduction of hundreds of low carbon buses across England. 24 winners are sharing £30 million from the 2009 scheme which is helping to support the purchase of 350 new low carbon buses. In 2010 a new £15 million second round was launched resulting in 14 winners and helping to support the purchase of around 170 new low carbon buses in England.

## 8.2 BUS FUNDING IN LIGHT OF THE SPENDING REVIEW

8.2.1 In light of the spending review the landscape of funding has changed. The new Coalition Government has not ring-fenced the transportation budget, and as part of its 4 year review has reduced transport resource (revenue) spending by 21% in real terms but with only an 11% cut in the capital spending budget.

8.2.2 In order to achieve these cuts the Bus Service Operator Grant (BSOG) will be cut by 20% from 2012-2013 to achieve a reported £300m saving (a much lower cut then some feared) and local transport revenue funding will be also cut by 28% over the four years covered by the spending review. The DfT has also promised a further announcement "in due course" on the "long term future distribution of bus subsidy"

8.2.3 As part of the drive to localism, 26 grant steams for local authorities will now be reduced to four from the net financial year. The remaining streams include local sustainable transport fund (capital and revenue); major schemes (capital); block funding for highway maintenance (capital); and block funding for small transport improvement schemes (capital).

## 8.3 FUNDING OPPORTUNITIES AVAILABLE TO DDC AND KCC

8.3.1 Although the current funding landscape is still being developed, funding options are beginning to present themselves which may be worth Dover considering in regard to the BRT proposals. These include:

- **Local Sustainable Transport Fund** - Authorities will be able to bid for a share of the £506 million local sustainable transport fund (a mixture of capital and revenue funding) for support for packages of transport interventions that support the economic growth and reduce carbon emissions.
- **Second Generation Regional Funding Allocation** - A less bureaucratic successor arrangement to the Regional Funding Allocation procedure will be developed, in which the DfT expects Local Enterprise Partnerships to play an important role.
- **Regional Growth Fund** - DfT is contributing a third of the funding for the 1.4bn Regional Growth Fund for which bids from "Local transport schemes which unlock sustainable economic growth" will be eligible. This fund is intended to be particularly targeted at areas hardest hit by public sector cuts.

8.3.2 The Local Sustainable Transport Fund is anticipated to be more appropriate for small scale schemes where limited amounts of capital funding are required. The Regional Growth Fund is considered to be a more appropriate potential funding source for Dover BRT and it is believed that the Dover area would be eligible for this fund.

8.3.3 In addition, given the above pressures on public sector funding, an alternative avenue for investment in public transport is to identify new ways in which to encourage private investment. The main mechanism looks to still be via the traditional developer contributions (via Section 106 Agreements - Town and Country Planning Act, 1990 and Planning and Compensation Act 1991) associated with applications for new development. However, other areas of potential private sector funding should be investigated in order to encourage growth, specifically in relation to Accelerated Development Zones (also known as Tax incremental Funding) and Community Infrastructure Levy.

## ACCELERATED DEVELOPMENT ZONES

8.3.4 Accelerated Development Zones (ADZs) are a UK variant of the method of Tax Increment Financing (TIF) which has been used in the US since the 1950s. It has been proposed as an efficient way of funding developments and local infrastructure where traditional capital financing has not been forthcoming.

8.3.5 This model looks to be a key funding mechanism for future commercial development and has recently received considerable press coverage over the last month with support from business leaders. Nick Clegg MP, the Deputy Prime Minister, recently stated that there will be reforms on current rules regarding council borrowing which allow this financing initiative to happen. Essentially this means that central government will enable local councils to be able to keep their business rates locally rather than having to divert them back to central government. This then provides revenue and capital for future development. However, a willing lender is needed as part of the model to share the risk, by supplementing business rates, if the scheme is not successful and business rates do not increase.

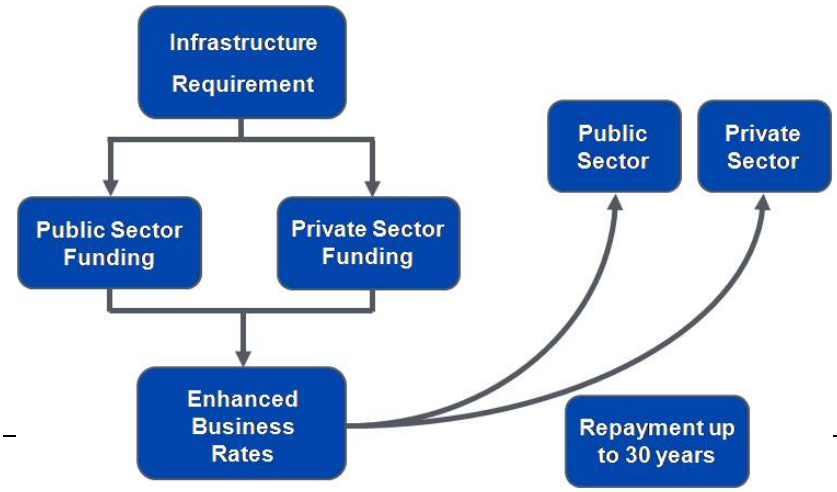
8.3.6 For an ADZ to be put in place there has to be agreement that a specified area is suitable. This will require negotiation with the government and the conditions for creating the zone will be determined by the relevant legislation.

8.3.7 Once an ADZ is agreed, developments are proposed and funded through debt. This has taken one of two forms; either the public body borrows the money up front, or the developer pays the cost of the development.

8.3.8 Once the developments have been constructed any increase in the business rates are given to the public body, which then either pays off their debt or hands it to the developer to reimburse them for the costs they have incurred as a result of paying for the developments (depending on which funding mechanism has been used).

8.3.9 After a certain number of years (defined when the ADZ is originally set up, but usually in the region of 20 to 30 years) or after the debt is repaid (whichever is sooner) the business rates cease to be diverted. Any debt that is still left is now the responsibility of the body holding it to pay it off out of its own funding streams. If the developer pays and reclaims the rates method of payment has been adopted then it is dependent upon the agreement reached with the developer whether the rates continue to be diverted once the developer's expenses have been recouped.

**Figure 8.1 – LABV mechanism**



8.3.10 Overall, Accelerated Development Zones lend themselves to commercial development schemes in town centres and retail/business parks. Therefore in relation to Dover BRT, the use of an ADZ initiative would not provide a solution for delivering the residential development of Whitfield. However, in the longer term this model might be considered in relation to commercial development within Dover.

### COMMUNITY INFRASTRUCTURE LEVY

8.3.11 Before the election the Community Infrastructure Levy (CIL) was intended to be a new charge which would allow local authorities in England and Wales to be empowered by enabling them to charge on most types of new development in their area.

8.3.12 At its core the CIL represented a charge that each local authority could set on the basis of pounds per square metre on any developments gross internal floor space (but not via alternative metrics such as on a per dwelling, or per habitable room basis, in the case of residential development). This charge had to be set based on economic viability and infrastructure planning, with evidence of these provided.

8.3.13 Different local authorities could set different CIL charges, they may even set differential rates within their area, but full documentation of the evidence behind the charge needed to be checked by an independent examiner. The regulations that local authorities needed to comply with in regards to the CIL charge were numerous and complex and a public consultation process was in the process of being undertaken before the charge come into force.

8.3.14 Following the election, the future of the Community Infrastructure Levy looked uncertain. However, on 18th November 2010 Greg Clark MP, the Decentralisation Minister, confirmed that the Community Infrastructure Levy, as introduced by the previous Government, would be continued because it, “provides a fairer system to fund new infrastructure”.

8.3.15 The key difference to CIL, under the Coalition Government, is that the levy will be reformed to ensure neighbourhoods share the advantages of development by receiving a proportion of the funds councils raise from developers. These funds will be passed directly to the local neighbourhood so community groups can spend the money locally on the facilities they want, either by contributing to larger projects funded by the council, or funding smaller local projects like park improvements, playgrounds and cycle paths.

8.3.16 In addition to CIL, on the 9th July 2010, the governments housing minister announced a potential alternative to encourage housing growth. This alternative comes in the form of Councils in England being offered extra money for every new built home, as part of a government programme aimed at easing housing shortages

8.3.17 Under the new homes bonus scheme the Government will match the council tax raised on each new built house for a period of six years (so for a Band D house this would equate to £1,400 a year). Full plans are still expected to be published following the spending review, however it has been confirmed that Local Authorities will have control over how to spend the money.

# 9 Next Steps

## 9.1 CURRENT POSITION

9.1.1 This study has provided an initial financial viability assessment of a BRT system for Dover, linked to forthcoming development plans. The study has proposed a potential phased approach through variation of the route at key stages, and has forecast (based on the assumptions within the spreadsheet model) that the BRT will operate commercially when Dover's growth agenda has been fully implemented in 2031.

9.1.2 To bring the BRT scheme forward and to develop further this strategic study the following next steps are recommended;

- Preliminary design of the full BRT service and each phase of its delivery;
- Whitfield Urban Expansion Supplementary Planning Document (SPD); and
- Development of Full Business Case.

## 9.2 BRT ROUTE PRELIMINARY DESIGN

9.2.1 Following approval of the recommend approach to the phased delivery of the BRT scheme, each BRT route section will need to be investigated and designed in detail. Preliminary design for these BRT route sections should be undertaken to assess the build-ability of infrastructure associated with all sections of the BRT and identify the following:

- Ground condition, ground water, contamination etc (Geo-technical Survey);
- Landownership assessment;
- Utilities assessment and requirement for diversions;
- Highway constraints;
- Safety concerns;
- Indication of cost; and
- Bridge structure (loading and type assessment).

9.2.2 It is recommended that the preliminary design is undertaken in the near future to inform the business case where an accurate indication of costs are required.

## 9.3 WHITFIELD URBAN EXPANSION SPD

9.3.1 The Whitfield Urban Expansion SPD, and supporting transport strategy, should be updated and refined to reflect the proposed phased approach and routeing strategy for the BRT (assuming that the phased delivery proposed within this report is formally approved by DDC as Planning Authority, KCC and the HA as Highways Authorities). By detailing the approach that is to be adopted and the assessment that has been undertaken, a clear, tangible and transparent platform for seeking contributions for required capital and revenue costs associated with the delivery of the BRT system can be provided.

9.3.2 The financial spreadsheet model that has been developed provides a useful tool for assessing any forthcoming changes to development expansion and, subsequently, the approach required to tackle any implications for capital and revenue contributions.

9.3.3 It is clear that an initial phase of BRT and local bus access for Whitfield Phase 1 should include an extension of the existing bus service 61. This means that efficient access via Whitfield Roundabout and potentially bus priority measures along relevant routes should be demonstrated as part of the early SPD delivery phases. As the 61 serves the current Whitfield village, connectivity between the old and new settlements will need to be maintained throughout the build out process.

9.3.4 BRT routeing is greatly benefited by the delivery of the proposed A2 bridge. In terms of viability, accessibility and attractiveness for passengers, the bridge is the most important infrastructure component of this scheme. The design and delivery of the bridge needs to be demonstrated within the SPD or its supporting evidence. There are options for the precise design and location of the bridge, including the potential to connect directly with Tesco or White Cliffs and the preferred design needs to be identified and agreed.

9.3.5 The three requirements identified above, are key elements of delivering a successful bus service and BRT for the Whitfield new community. To summarise the requirements identified were:

- Ensure connectivity between the old and new settlements in Whitfield
- Demonstrate there is adequate capacity at Whitfield Roundabout
- Deliver a bridge over the A2, to allow effective routing and priority of the BRT via the White Cliffs area and beyond

9.3.6 As a BRT system is considered to be an essential element of Dover's growth (by the Planning and Highways Authorities and their Partners), the WUE SPD should ensure that the deliverability of these three requirements is evidenced. This should include a funding strategy and implementation plan where funds and land availability are certain.

9.3.7 In addition, it is also clear that the long term, phased implementation of a BRT service for Dover will require a period of revenue support. As originally suggested, as part of the Dover Transport Study, a mechanism for securing this pump priming funding is required. The Transport Strategy suggested a developer contributions formula could be one way of fairly apportioning cost to the level of trip making impact generated by development parcels. The coalition Government's confirmation of the continuation of the Community Infrastructure Levy scheme provides a legislative framework for developing such a funding stream for BRT. The Whitfield SPD needs to refer to this funding requirement and the details of a CIL based scheme need to be investigated by DDC in partnership with developers and land owners.

9.3.8 From this initial assessment of BRT route options and viability, there appears to be little or no benefit associated with the bus only access onto the A256 currently proposed in the transport strategy which supports the SPD. Discussions with Stagecoach and the wider BRT Steering Group support this view, with the most attractive/likely routeing options requiring access across the A2 via a new bridge or via Whitfield roundabout. As highlighted above, it is the A2 bridge which has greatest benefit for the BRT scheme and therefore, it is recommended that available funding is directed to this scheme as a priority.

## 9.4 DEVELOPING THE BUSINESS CASE

9.4.1 In support of any applications for funding of the BRT it is recommended that a full Business Case is undertaken for the Dover BRT scheme. This is likely to be a key requirement of the Regional Growth Funding process (described in Section 8.3) and the Business Case is likely to need to contain the following:

- Strategic Setting;
- Identification of Problems and Issues;
- Scheme Aims and Objectives;
- Scheme Details;
- Consultation;
- Scheme Costs (based on preliminary design);
- Delivery Programme;
- Risk Assessment;
- Evaluation of Scheme Benefits;
- Access to New Developments;
- NATA Assessment (including Appraisal Summary Tables); and
- Monetised Cost and Benefits.

9.4.2 The full business case will assess the strategic fit, deliverability and economic case of the BRT scheme. It will also serve to demonstrate the appropriateness of the Dover BRT scheme and will assist in securing future funding through both private and public sector sources. The Business Case would consider the wider context of the planning and regeneration of Dover, improving employment opportunities and access to Dover Town Centre.

9.4.3 Discussions have already taken place with the main bus operator in Dover (Stagecoach) and they have expressed a willingness to continue to work with DDC and KCC to develop a BRT scheme for Dover.

Appendices, Figures & Tables