

Option Assessment Report for Cambourne to Cambridge Better Bus Journeys

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EXECUTIVE SUMMARY

Glossary

Catchment area	The widest potential area within which any alignment may be created on the corridor
Corridor	The land between Cambourne and Cambridge
Full Outline Business Case	A full appraisal of a single option
High Quality Public Transport (HQPT) (infrastructure)	Primarily segregation providing the highest levels of speed, reliability and capacity – resulting in ‘fast frequent and reliable’ journeys.
Infrastructure	The physical measures that are used by Services
Off line	Not on highway corridor
On line	On highway corridor
Options	Choices between corridors (north, central or south)
Recommended Option	Catchment Area for option 3A (or if necessary Catchment Area for option 3)
Route	A particular way or direction between places Cambourne and Cambridge
Scheme (1)	The final option to be put forward for approval
Scheme (2)	The entirety of the Steps to achieve the Scheme (1) – the totality of the project
Segregation	Dedicated public transport infrastructure separate from other traffic
Services	The operation of vehicles along infrastructure
Specific route alignment	The proposed line of the infrastructure
Step	A stage of the Scheme
Strategic Case	Section of Strategic Outline Business Case considering the need for a Scheme
Strategic fit	Compliance with policy objectives
Strategic Outline Business Case	The combined output of Step 2 – appraisal of a series of Options

1. This Option Assessment Report (OAR) assesses and summarises a range of technical information for the Cambourne to Cambridge Better Bus Journeys Scheme. The scheme aims to deliver new High Quality Public Transport infrastructure. The objective of the scheme is to achieve improved connectivity and reduced congestion between residential and employment areas while improving the quality of life in Greater Cambridge and ensuring environmental sustainability is central to design criteria.
2. The current Step identifies and recommends an option to meet this objective and is concluded by the production of this report and supporting material. The next Step is to take the Recommended Option forward for further detailed scheme development.
3. This report is subdivided into 2 parts.
4. **Part 1** provides the background to the appraisal work by setting out the overall context of the proposed scheme and describing the previous analysis conducted on a range of options that have been subject to stakeholder engagement including extensive public consultation. This includes the following key headings:
 - Scheme objectives;
 - The Greater Cambridge City Deal - “City Deal” - context;
 - The local context;
 - The methodological approach; and
 - A detailed description of the Options.
5. **Part 2** of the report sets out the main aspects of the option appraisal undertaken to and considers the following outcomes:
 - The 5 Transport Assessment Guidance ‘cases’ for appraising the investment implications for each Option:
 - Strategic Case (including a wider economic assessment)
 - Economic Case (including an environmental assessment)
 - Financial Case
 - Commercial Case
 - Delivery Case;
 - These 5 cases together form the Strategic Outline Business Case which contain the detail of the appraisal;
 - The overall weighting of the 5 cases in the City Deal context;
 - Identification of a recommended option
 - The key attributes of the Recommended Option ; and
 - The next steps for further assessment and single option development to specific route alignment as part of the overall scheme progression following selection of a Recommended Option.

6. The scheme underwent early option sifting in 2014 which resulted in City Deal Board agreement (in June 2015) for 6 Options to be published for public consultation which was carried out in October 2015. The consultation on the 6 options made clear a number of key issues around the public acceptability of the options as well as a number of potential alternatives. While there was significant support for public transport and cycling improvements along the corridor this was balanced by the possible environmental effects and the cost of off line infrastructure.
7. The public consultation outcomes formed part of the ongoing option appraisal process at Step 2. This has now been concluded and presented in a Strategic Outline Business Case in which 5 Options for different levels of infrastructure interventions between Cambourne and Cambridge were appraised as well as new Park & Ride locations close to Madingley Mulch roundabout.
8. The Strategic Outline Business Case appraisal uses the Department for Transport WEB based Transport Appraisal Guidance (TAG) to develop 5 cases for investment against which the options are assessed. These Cases are based on the Treasury Green Book investment criteria for public investment decisions. The 5 Cases are Strategic, Economic, Management, Commercial and Finance and each focusing on specific aspects of the Strategic Outline Business Case which in total represents the overall appraisal.
9. At this Step of the scheme development process, given that the focus and resources are on ensuring the right strategic decision to select a recommended option for further detailed development, the main due consideration is given to the strategic fit of each option. The more detailed analysis which forms the other 4 cases will be more fully addressed once an option has been selected.
10. In that context the Strategic Outline Business Case has concluded that the option with the highest strategic policy fit is that which best meets the scheme objectives is Option 3 as modified by Option 3a. Option 3 was modelled to represent a segregated bus infrastructure intervention for its whole route between Cambourne and Cambridge, running to the south of the existing road and is the highest performing option against strategic fit. This conclusion is based on the high degree of compliance with local policy objectives including both transport and planning policies and the high economic benefits as expressed through Gross Value Added to the national economy
11. The TAG method also recognises the importance of reflecting the local context and specific concerns that may be of strategic importance to decision makers. As such officers have also identified that Option 3 could be amended to allow for the section west of Madingley Mulch to be routed alongside the old St Neots Road rather than an entirely new route through open countryside

to the south. This option has not been modelled but an outline engineering assessment does point to potential feasibility of this option as retaining high strategic benefits as with Option 3 but with possible lower environmental effects and costs . This Option (3a) is recommended to be explored more fully as part of the next Step of work.

12. Option 3a represents segregated reliable and high speed public transport links to and from key growth sites. Option 3a is a potentially viable variation of Option 3 with potential to optimise costs and benefits through detailed scheme development and as such it would be the option taken forward for further consultation during Step 3, subject to confirmation of viability. Should Option 3a not prove viable, Option 3 is the Recommended Option.
13. The option Catchment Area Maps indicate the area within which a specific alignment would be assessed during the next Step of further detailed scheme development.
14. The Recommended Option best served by the proposed Park & Ride located to the south east of Madingley Mulch roundabout which is therefore the recommended site for that facility. Up to 2000 car parking spaces and significant cycle provision may be provided at this facility.
15. The Economic, Management, Commercial and Finance cases do not significantly differentiate between the options. At this stage of assessment there is no overwhelming evidence in the Economic Case (which captures direct transport/economic and environmental costs and benefits) to strategically differentiate between any options. Given the significant amount of further detailed work necessary to develop these cases as part of Step 3 Full Outline Business Case, the high level assessments for each would be subject to significant refinement.
16. With the Recommended Option approved, Step 3 will produce a Full Outline Business Case for a specific route alignment within the catchment area indicated in the Catchment Area Maps. The Full Outline Business Case will involve further public consultation in Summer 2017 on the basis of the catchment area for the Recommended Option with specific route alignments specified.
17. Environmental and engineering assessment including modelling and transport planning will also form part of the next stage of work in order to refine the Economic Case including a revised Benefit Cost Ratio. Step 3 will conclude in November 2017 when a recommended specific route alignment will be presented to the City Deal Board for agreement to obtain statutory approvals.
18. Public consultation and stakeholder engagement continues to inform the ongoing development of the scheme. Strong support for public transport and

cycling improvements on the corridor has been weighed against the significant concerns regarding the potential environmental effects of new infrastructure on the green belt. As such, in addition to the extensive existing statutory and local policy requirements, the scheme will be guided by design criteria that will be applied to option design development.

19. A Local Liaison Forum is now established and will play a key role in further detailed scheme development.

PART 1: BACKGROUND – SETTING THE SCENE

Introduction

1. The Option Assessment Report (OAR) summarises and assesses a range of technical information for the Cambourne to Cambridge Better Bus Journeys Scheme and identifies a Recommended Option. The OAR sets out the key decision making criteria used to determine the Recommended Option as proposed in the City Deal Executive Board Report dated 13th October 2016.
2. The OAR forms part of a set of documents, which together comprise the Strategic Outline Business Case for the selection of a Recommended Option for further detailed scheme development. These documents are as follows:
 - City Deal Board Report dated 13th October 2016– sets out the decision sought from City Deal Executive Board and the overall officer recommendations
 - Appendix to Board Report - Option Assessment Report – this report, which integrates and assesses the key conclusions from the technical work
 - The Background Papers to the Board Report – these contain the details of the technical analysis and include the following: TAG Cases each with an executive summary:
 - Strategic Case including a wider economic assessment
 - Economic Case including an environmental assessment
 - Financial Case
 - Commercial Case
 - Delivery Case
 - Technical Notes and Draft Technical Notes dealing with specific issues and assisting in the broader understanding of issues as highlighted in the OAR are appended to the OAR. These are as follows:
 - **A428 Park & Ride locations TN1**
 - **Contra Flow Bus Lanes on Madingley Hill TN2**
 - **Considerations for Catchment Area Maps TN3**
 - **Local Liaison Forum Resolutions and Project Board response TN4**

3. The OAR considers both the transport appraisal and the wider economic assessment outcomes within an overall City Deal decision framework.

Objectives of the Scheme

4. The Cambridge to Cambourne Better Bus Journeys scheme objective is to deliver new high quality public transport infrastructure to achieve improved connectivity and reduced congestion between residential and employment areas and improving quality of life.
5. This connectivity and reduced congestion is key to delivering growth in Cambridge and South Cambridgeshire in line with the Greater Cambridge City Deal objectives. The western area of the city, and existing and proposed new settlements to the west, contain both housing and employment development areas which will generate increased demand on the transport network. The Local Transport Plan (LTP), the Transport Strategy for Cambridge and South Cambridgeshire (TSCSC), and the Cambridge and South Cambridgeshire Submitted Local Plans envisage enhanced transport infrastructure by non- car modes to provide sustainable transport links to address this increased demand. Without this planned mitigation, this growth will have an adverse effect on highway congestion levels and journey times affecting quality of life and potentially constraining further growth.
6. This scheme therefore seeks to deliver a high quality public transport solution which:
 - Delivers the integrated planning and transport strategy as set out in the local planning and transport policies
 - Achieves modal shift from cars to public transport and active modes, such as walking and cycling
 - Provides segregated congestion free capacity for buses as part of an integrated public transport network;
 - Connects current and potential major employment sites in and on the edge of the city (including Cambridge Science Park, University West Cambridge site, North West Cambridge, the Cambridge Biomedical Campus / Addenbrooke's Hospital); Bourn and Cambourne;
 - Removes or reduces the need for private transport for travelling in and out of the city centre;
 - Intercepts car traffic into Cambridge from the A428 and routes that feeds into it;
 - Provides high quality public transport, defined as frequent, fast and reliable journeys; and

- Is compatible with emerging proposals from the linked Western Orbital scheme, which is being considered as part of a separate study and integrated with other emerging City Deal proposals such as City Centre Access Study incorporating demand management measures
 - Improves quality of life and environmental sustainability in Greater Cambridge.
7. Quality is defined as the extent to which infrastructure can deliver 'fast, frequent and reliable' public transport journeys and therefore provide a genuine alternative to the private car. This reflects the LTP policy objectives for transport improvements along the corridor. The LTP also sets out the objective of providing the right infrastructure on corridors to encourage commercial operators to provide high quality services.

Summary: The scheme must deliver a qualitative step change in public transport to support economic growth and its success should be measured against this primary objective.

The City Deal Context

8. The Greater Cambridge city region¹ is one of the fastest growing parts of the UK and this high rate of growth is expected to continue. The Submitted Cambridge and South Cambridgeshire Local Plans envisage growth between 2011 and 2031 of 33,500 new homes (equating to a 25% rise in population) and 44,000 new jobs.
9. Nationally the significance of the city region is recognised by the National Infrastructure Commission (NIC) which has been tasked with unlocking growth, housing and jobs in the Cambridge – Milton Keynes – Oxford corridor. The NIC has recently undertaken a 'call for evidence' to gain views on how this growth can be best facilitated. The consultation submissions from the Local Enterprise Partnerships covering the corridor emphasised the role of both regional and local transport infrastructure investment to support economic growth.²
10. The Greater Cambridge City Deal is a unique opportunity to secure the future of Greater Cambridge as a leading UK and global hub for research and technology, support economic growth and improve quality of life for residents of Cambridge and South Cambridgeshire.
11. The City Deal recognises that the partner authorities have worked closely together on the new local plans and associated transport strategy and have aligned plan-making processes to achieve the benefits of what amounts to a single overarching development, infrastructure and delivery strategy for Cambridge.

¹ The area covered by the districts of Cambridge and South Cambridgeshire.

² <http://www.semlep.com/news/2016/cambridge-milton-keynes-oxford-growth-corridor/>

12. The additional work undertaken by the local planning authorities in 2015 concludes that the Submitted Local Plans represent “a sustainable development strategy for the wider Cambridge area that meets objectively assessed housing needs in a way that supports the successful economy and provides a pattern of development that will give genuine opportunities for residents of new developments to live in a sustainable way. Many will benefit from new settlements that provide a wide range of services and facilities and, with significant new public transport measures on the two corridors involved akin to the successful Guided Busway, the opportunity to move around the area by sustainable modes of transport.

13. The City Deal will through investment in infrastructure, will make it easier to travel in, out and around Cambridge and South Cambridgeshire by public transport, cycle or on foot. For stability in car trips to be seen in the period to 2031 with the population growth envisaged in the Local Plans, the proportion of people driving to work would need to fall to around 47% from the current level of around 60%.

14. The City Deal vision for a comprehensive sub-regional infrastructure network is represented in **Figure 1**, which draws on the key components of the development strategies in the submitted Local Plans and the Transport Strategy for Cambridge and South Cambridgeshire, and reflects the emerging City Deal schemes.

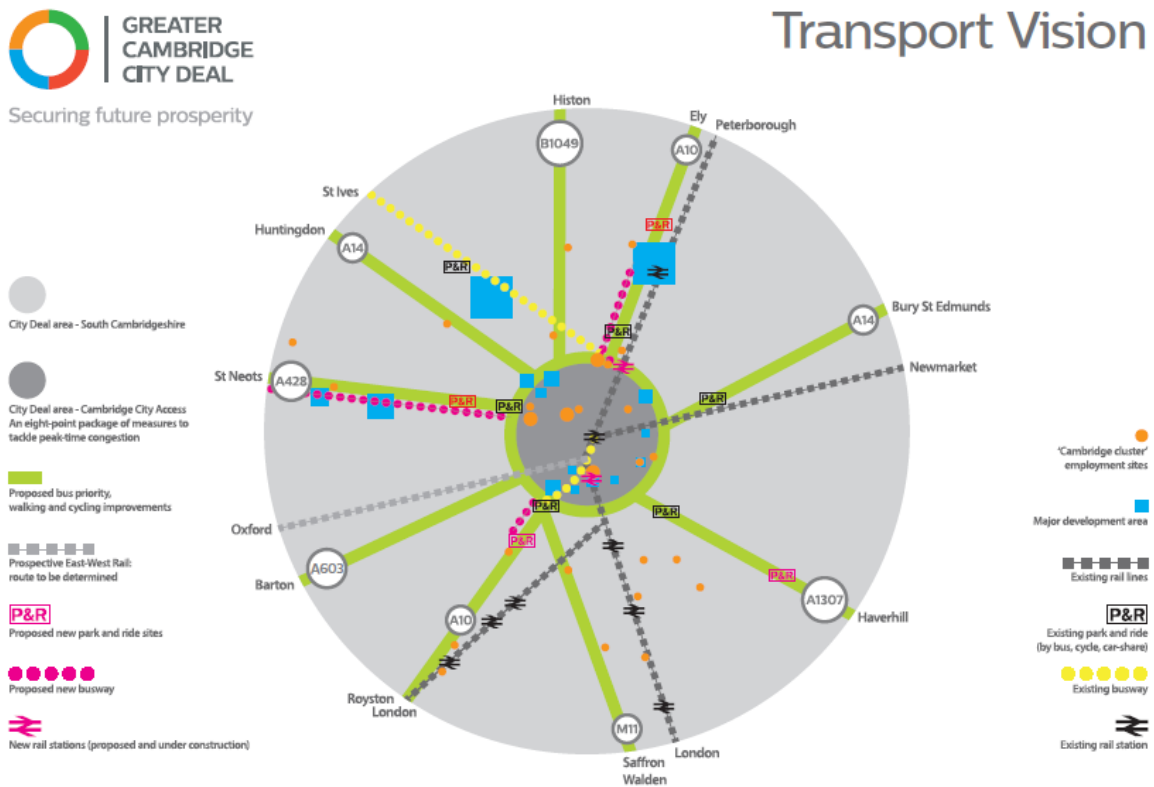


Figure 1: The City Deal Vision for Greater Cambridge

15. The interrelationship between infrastructure and growth as envisaged by the City Deal is summarised in **Figure 2** below:

Supporting sustainable economic growth
in Cambridge and South Cambridgeshire

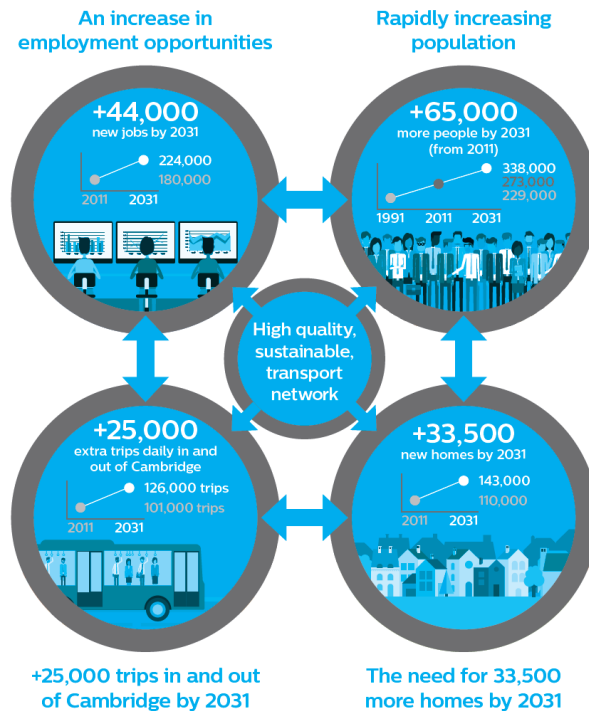


Figure 2: The City Deal supporting sustainable growth

16. The City Deal is subject to a mechanism, whereby £400m of Central Government funding in the 10-15 years after 2019 is dependent on the delivery of significant economic impacts through the prioritised spending of an initial £100m of funding over 2015-19.

17. The City Deal agreement with central government aims to achieve additional economic benefits through devolved funding to a partnership of local authorities and other partners with the following objectives:
- to nurture the conditions necessary to enable the potential of Greater Cambridge to create and retain the international high-tech businesses of the future;
 - to better target investment to the needs of the Greater Cambridge economy by ensuring those decisions are informed by the needs of businesses and other key stakeholders such as the universities;
 - to markedly improve connectivity and networks between clusters and labour markets so that the right conditions are in place to drive further growth;
 - to attract and retain more skilled people by investing in transport and housing whilst maintaining a good quality of life, in turn allowing a long-term increase in jobs emerging from the internationally competitive clusters and more university spin-outs.

18. These key objectives have been summarised into an option approval criteria as to how options:
- Support business investment and confidence;
 - Represent targeted investment where business needs it;
 - Link effectively key growth sites;
 - Support the transport infrastructure and quality of life.
19. In order to implement these objectives through investment the City Deal includes a framework which quality assures the decision making process³. This framework provides information for the Board's key considerations in prioritising investment decisions. At the highest level schemes will need to demonstrate the following attributes:
- **Value for money** – value for money measured as a return on investment based upon an adjusted Benefit Cost Ratio (BCR) including Wider Economic Benefits (WEB's) and Gross Value Added (GVA)
 - **Environmental and social distributional impact** – potential benefits and adverse impacts. This means the impact on different demographic groups.
 - **Contribution to objectives** – Transport Strategy objectives Local Plan and LEP objectives
 - **Deliverability** – affordability, practicality, key risks, key milestones and stakeholder/public support
20. At the option assessment stage for prioritised schemes for each Tranche of funding, the assurance framework provides a more detailed set of requirements which is discussed in Part 2 of the OAR.

Summary: Greater Cambridge is a key sub-region for national growth and the City Deal seeks to harness and support the growth in Cambridge and the surrounding region South Cambridgeshire through delivering sustainable infrastructure. The City Deal is based on long term local decision making within the context of an assurance framework that emphasises the strategic focus of investment for economic return. The City Deal requires that investment decisions are considered against how they contribute to the following issues:

- **Support business investment and confidence;**
- **Represent targeted investment where business needs it;**
- **Link effectively key growth sites;**
- **Support the transport infrastructure and quality of life.**

³ Cambridge City Deal Assurance Framework

The Local Context – The need for a scheme

21. The City Deal should be seen in the context of local policies to deliver growth which underpinned the decision to apply to Central Government for City Deal status. The key local policies should be understood as a coherent expression of the overarching aims and objectives of the partner authorities.
22. The City Deal supports delivery of the strategy set out in the Submitted Cambridge and South Cambridgeshire Local Plans through investment in transport infrastructure, housing delivery and skills. Likewise, the Submitted Cambridge and South Cambridgeshire Local Plans will support the City Deal commitments by speeding the delivery of new homes and jobs.
23. The LTP commits to:
- Extend the busway network to serve major new developments and employment sites.
 - Develop high quality public transport corridors along key routes with priority at key junctions, helping to reduce journey times.
 - Achieving modal shift from cars to public transport and active modes, such as walking and cycling
24. The Transport Strategy for Cambridge and South Cambridgeshire (TSCSC), prepared in parallel with the Submitted Local Plans, was adopted by Cambridgeshire County Council in March 2014. The strategy provides a plan to manage the rising population and increase in demand on the travel network by shifting people from cars to other means of travel including cycling, walking and public transport. It envisages a range of infrastructure interventions on the St. Neots and Cambourne to Cambridge corridor as a key part of the integrated land use and transport strategy, responding to the levels of planned growth⁴.
25. The TSCSC focus of public transport intervention along the corridor is busway/ High Quality Public Transport Infrastructure⁵. Its requirements are reflected in the Long Term Transport Strategy⁶, which forms part of the LTP. Policies in the Submitted South Cambridgeshire Local Plan⁷ reflect this, requiring high quality segregated public transport improvements between the A428 /A1303 junction and inner ring road, and measures to

⁴ Transport Strategy for Cambridge and South Cambridgeshire Page 5-23 St Neots and Cambourne to Cambridge corridor

⁵ Cambridgeshire Long Term Transport Strategy 2015 Figure 4.1, (page 4-9)

⁶ Cambridgeshire Long Term Transport Strategy 2015 figure 4.3 (page 4-7)

⁷ Submission South Cambridgeshire Local Plan 2014 Policy SS/6 New Village at Bourne Airfield, Policy SS/8 Cambourne West.

ensure bus journeys between Cambourne / Bourn Airfield and the A428 / A1303 junction are direct and unaffected by any congestion suffered by general traffic on the Cambourne to Cambridge corridor, to ensure the sustainability of planned developments.

26. As such there is a strong emphasis in the suite of local transport and planning policies (LTP, the Transport Strategy for Cambridge and South Cambridgeshire, and Submitted Local Plans) on sustainability and connectivity of homes, jobs and services through the provision of high quality public transport.
27. In terms of cycling/pedestrian links, adopted policy recognises that there is great potential in this corridor to enhance multi-modal journeys by enhancing the links between cycling/pedestrian routes and public transport. This would increase mobility choice for people, reduce congestion and negate the need for extensive car parks at stations, as well as reducing the likelihood of residential streets being clogged with commuter cars.
28. In January 2015 the City Deal Executive Board agreed the prioritisation of schemes for Tranche 1 of the City Deal funding. The A428-A1303 corridor from Cambourne to Cambridge was selected as a priority scheme in line with the Greater Cambridge City Deal vision to secure economic growth and quality of life, whilst allowing ease of movement between key employment and residential sites.
29. The City Deal Executive Board determined that the corridor scheme may be delivered in two tranches. Tranche 1 (to 2020) will include the part of the corridor which runs from the A428/A1303 junction at Madingley Mulch roundabout, east to Cambridge city centre. Tranche 2 or 3 (up to 2030) would include the part of the corridor which runs from Caxton Gibbet roundabout east to Madingley Mulch roundabout.
30. This responds to the important role that the A428 corridor plays in the development strategy for Greater Cambridge that is contained in the Submitted Local Plans, and in particular to the proposals for a new settlement at Bourn Airfield and a major extension to Cambourne at Cambourne West.
31. There are a total of 8800 dwellings planned at strategic growth sites in the corridor, including development at St Neots.
32. At the Cambridge end of the corridor, North West Cambridge will provide up to 3000 new homes (1500 homes for its key workers, and 1500 homes for general sale) with accommodation for 2000 students, 100,000 square metres of research facilities and a local centre with a primary school,

community centre, health centre, supermarket, and hotel. In addition Darwin Green will provide approximately 1780 homes in Cambridge and 1,000 in South Cambridgeshire. West Cambridge is an existing strategic employment allocation. Further intensification of development on the site is proposed. This could provide up to 15,000 employment places on the site.

33. The A428 corridor links with related orbital corridors in and around Cambridge. 15,000 new jobs are planned for Cambridge Biomedical Campus which will also house the relocated Papworth Hospital. The campus will eventually have a working population of around 30,000, making it one of the largest biomedical sites in the world. Further employment growth is likely to continue in areas such as Cambridge Science Park. There will also be future opportunities at Cambridge Northern Fringe East around the new railway station.
34. During the Local Plan Examinations, the Inspectors wrote to the Councils outlining a number of areas for further work. One of the areas related to the deliverability and feasibility of sustainable transport options to support new settlements⁸. The Councils responded with further evidence of the deliverability and feasibility of transport measures on the corridor. Therefore the Cambourne to Cambridge busway scheme is an important element to ensure new developments planned in the corridor have the infrastructure they require to make them sustainable developments
35. In addition to future growth the prioritisation of the corridor by the City Deal Executive Board also recognises the current congestion issues at peak times. Modelling for the City Centre Access Study has demonstrated that Madingley Road has seen increases in traffic between 2004 and 2014. The key current conditions on the corridor can be summarised as:
- long delays on the eastbound A1303 up to the Madingley Road Park & Ride (P&R) site;
 - bus delays on Madingley Road in both the AM and PM peak
 - significant journey time variability along the single carriageway sections of the corridor, particularly eastbound in the morning peak and westbound in the evening peak
 - low traffic speeds in both peaks, particularly approaching / at key junctions;
 - during the AM peak 80% of route length from A428 / A1303 junction to M11 J13 is subject to queues;
 - the average delay in AM peak is 18 min between A428 / A1303 junction and Queen's Road / Northampton Street, with the average delay in AM peak being 10 min between St Neots and Caxton Gibbet; and

⁸ Cambridge Local Plan and South Cambridgeshire Local Plan Examinations Letter from the Inspectors to the Councils dated 20 May 2015 regarding Preliminary Conclusions

- significant knock on impact of interaction between P&R, M11 and other traffic that exacerbates congestion.
36. The planned growth in the corridor has the potential to add to the already high levels of congestion in and around Cambridge. On the A428 corridor there are a number of areas where increased traffic levels would have significant detrimental effects, particularly Madingley Rise and Madingley Road.
37. Transport modelling forecasts that car trips on the A1303 corridor towards Cambridge will increase by 45% in the morning peak hour; 70% in the inter-peak period; and 50% in the evening peak period between 2011 and 2031.
38. The model also predicts that congestion on Madingley Road would remain relatively unchanged in the morning peak as the road is already at capacity and therefore unable to accommodate additional traffic. This is *without* the predicted impacts of any potential demand management measures in the City Centre as a result of the City Centre Access Study. Additional traffic would result in additional queuing as well as applying additional pressure to other routes into Cambridge.
39. The prioritisation by the City Deal Executive Board of work on a scheme for the whole corridor responds to the current and predicted traffic issues in this area and the significance of delivering a high quality public transport scheme to support the development strategy in the submitted Local Plans. The section of the corridor between the M11 and the inner ring road has been identified as requiring urgent intervention and as such has already been identified by the Local Enterprise Partnership for Growth Deal funding of up to £9m subject to an accepted business case.

Summary: The A1303 area of the corridor is close to or at transport capacity. The local and national policy and planning framework supports effective sustainable transport scheme intervention along the corridor to address existing demand and to meet predicted transport challenges arising from growth, and reduce the impact on adjacent corridors thereby supporting future strategic development.

Work done at earlier Steps of the scheme

40. The scheme has been taken forward in 4 technical Steps which reflect the approach to scheme development supported by TAG. The principal objective of this method is to inform and test the options in a methodological step by step basis. A mixture of disciplines is required including transport planning, transport modelling, engineering, planning, property, environmental and economic assessment.
41. TAG states that all new proposals should be subject to comprehensive but proportionate assessment, wherever it is practicable, so as best to promote public interest. There are usually trade-offs to be made between resources invested in data collection and analysis, and the pursuit of more accurate results. **Table 1** summarises the process and the current stage of the scheme development.

Step 1	Identify potentially feasible Options	
Step 2	Identify Options for further single scheme Option development on the basis of an Outline Strategic Business Case	← Current stage
Step 3	Present a Full Outline Business Case for a recommended alignment to proceed to statutory approval	
Step 4	Seek formal consent to construct	

Table 1: Project Development Steps

42. At Step 1 during 2014 all the potentially feasible options for public transport infrastructure interventions along the corridor were considered through a comprehensive appraisal which can be summarised as followed
- an initial brainstorming and package generation process, in which 21 individual elements were combined to generate a long list of 34 potential Options;
 - an initial sifting process involving refining the grouping of the elements into Options followed by further analysis and sifting;
 - a number of workshops during which the Options underwent further evaluation, and three additional Options were subsequently added to the shortlist; and
 - a more detailed Option assessment process using the TAG Early Assessment Sifting Tool (EAST) which ultimately sifted the shortlist down to a proposed new Park and Ride location close to the Madingley Mulch Roundabout , with three Recommended Option for

bus priority measures to the west of the new P&R location, and three to the east.

43. On 5th June 2015 at the commencement of Step 2 the Executive Board agreed to consult on the 6 short listed Options, 3 in each Tranche. The public consultation presented nominal corridor routes as Options, ('North', 'Central' and 'South') in order to engage the public as widely as possible with the issues and link them to the key City Deal transport objectives.

44. The corridor Option routes were divided into east and west of Madingley Mulch roundabout in line with the prioritisation of the eastern section of the scheme in Tranche 1 City Deal funding, with three Options for the eastern section described as Area 1, and three for the western section described as Area 2. In addition, potential Park & Ride locations were proposed close by Madingley Mulch roundabout and included in the consultation. The Options presented at public consultation are set out in **Figure 3** below.

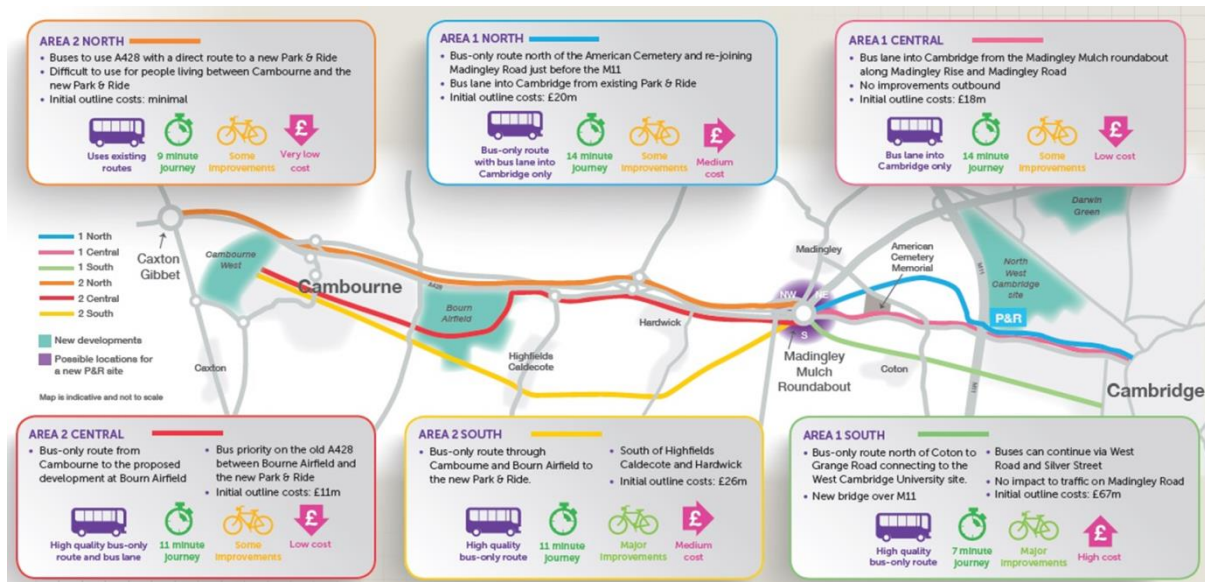


Figure 3: Options Presented for Public Consultation in 2015

45. In October/ November 2015 a public consultation was undertaken on the Options. The public consultation was extensive. 13,000 leaflets containing the survey and 30,000 postcards were produced. Over 8,000 leaflets and 20,000 postcards were delivered to those who lived along the A428 corridor, whilst the others were distributed at a variety of local outlets, as well as through informal exhibitions. Eleven events were held between Tuesday 27th October and Thursday 19th November, gathering a combined attendance of over 300 members of the public. 2,193 surveys responses were received.

46. The results of the public consultation were presented to the Executive Board in March 2016. The headline results of the consultation were as follows:
- 70.3% of respondents agreed in principle to better bus journeys between Cambourne and Cambridge.
 - Over 50% of respondents indicated that they were often in slow or stationary traffic between the Madingley Road Roundabout and the M11 junction.
 - Just over a quarter (29.5%) indicated that they travelled between Cambourne and Cambridge on a daily basis.
 - 77.2% of respondents indicated their usual mode of travel was by car as a driver
 - 'Factors making bus travel a better alternative to the car:
 - 'Reliable journey times' was cited as being key by 50.7% of respondents.
 - 'faster journey times' was cited by 44.3% respondents, and
 - 'more buses per hour' cited by 43.1% of respondents.
 - When asked about current travel methods between Cambourne and Cambridge 25.5% indicated they used the bus;
 - 66.3% of respondents felt it was important or very important that cycling and pedestrian facilities are improved within this scheme;
 - Options Area 1 Central and Area 2 Central received majority support (66.8% and 58.1% respectively);
 - Options Area 1 South and Area 2 South received majority opposition (65.5% and 58.2% respectively) as did Option Area 1 North (57.8%);
 - From comments and communications sent in separately to the survey, the most opposition was seen for Area 1 South, due to the damaging effect it might have on Coton and the landscape of the area;
 - 176 responses gave direct additional comments to the six Options supplied within the consultation (8.0%);
 - The most frequently commented issue focused on the significance of green spaces and the landscape of the area – and the impact that each proposal might have on existing locations. 270 comments referred to this (12.3% of all survey respondents);
 - 46.1% of respondents approved of a new Park & Ride site near the Madingley Mulch roundabout, with 28.3% against the suggestion. A high proportion had no preference about its specific location (45.8%).
47. In addition to the comments, a number of alternative proposals were submitted during the public consultation offering modifications of the Options or different strategies to achieve similar objectives.

48. In the report to the City Deal Executive Board in March 2016, it was explained that some proposals were out of scope of the project, although some may be considered as part of other City Deal schemes in development.
49. Those proposals considered relevant to the project scope were assessed in order to determine their suitability for inclusion within the detailed analysis necessary to complete Step 2.
50. One alternative proposal – the BOLD initiative (“a bold approach to Cambridge’s transport problems”) was considered to have potential benefits and was therefore included in the modelling assessment set out in this report as Option 4 (see Table 3). The summary of the response to all relevant proposals received during the public consultation are set out in the **Table 2** below:

Proposal received from public consultation	Response
Alternative P&R locations	<p>A number of alternative proposals were received for P&R locations along the corridor.</p> <ul style="list-style-type: none"> • Scotland Farm; • North of Cambourne; and <p>Transport Hubs at</p> <ul style="list-style-type: none"> • Cambourne; • Bourn; • Between Highfields and Caldecote. <p>Further assessment concluded that Madingley Mulch is the location best situated at a point on the network where corridor congestion begins, and therefore is well placed to encourage car users to switch travel modes. It is also relatively close to the center of Cambridge, and therefore would likely benefit from reasonable operating costs.</p> <p>Transport hubs are not considered unfeasible on grounds of first principles in addition to main P&R site but the specific location, capacity and access arrangements could only be considered as part of the next Step of assessment on a Recommended Option</p> <p>Technical Note 1 sets out consideration for a P&R in more detail.</p>
Specific route alignment north of Cambridge Road and new bridge	This proposal was not considered suitable for further assessment. In this case the infrastructure would not directly link into the City Centre without first passing through significant constraints such as the second

across M11 north of J13	P&R site at Madingley Road. The overall costs of providing a new bridge across the M11 north of J13 would not be outweighed by possible benefits
Specific route alignments east of J13 M11	These proposals of routes into Cambridge from the M11 will be considered as part of any Recommended Option further scheme development at Step 3. This would include considering connectivity with West Cambridge.
Tidal bus lane for Option 1 Central	This proposal was included in early assessment of the highway Options to explore potential transport opportunities of single lane running. However further analysis indicated that introduction of a tidal bus lane would have significant safety, maintenance and townscape impacts for a limited benefit to journey times during PM periods. A Technical Note 2 has been provided as an Appendix to this paper.
Option 4: 1 central and 1 north with a route through West Cambridge (known as the BOLD proposal)	This hybrid Option of on and off highway interventions was initially assessed as having the potential to achieve a high level of segregation without the need for a new bridge over the M11, as a result it was included in the assessment as Option 4 set out in Part 2 of this report
Smart Traffic Management at Madingley Rise	This proposal specified providing additional queuing areas at Madingley Hill in conjunction with programmed traffic signals on the highway that would hold back traffic and manage its release in line with conditions in the City Centre. It is considered that this approach does not align with City Deal objectives because it does not provide enhanced connectivity nor capacity to accommodate for growth. High quality public transport is best served by providing a P&R and bus infrastructure. This proposal was not taken forward as part of this project.
Closing Madingley Hill to through-traffic	This proposal requires significant modification of the Girton interchange to be feasible. It is outside the scope of this public transport infrastructure scheme. As such this proposal has not been considered as part of this scheme assessment

Table 2: New Proposals raised in 2015 Consultation and response

51. The public consultation on the high level options formed only part of the wider stakeholder engagement and the scheme will continue to be informed by engagement with all stakeholders on an on-going basis. Stakeholders are involved in the study, to help shape decisions in the public benefit.

52. A Local Liaison Forum (LLF) was formed in March 2016 as part of this process. Wide participation and public consultation is a key factor in gaining public support and gauging acceptability for proposals.
53. The LLF has provided Resolutions for consideration by the Project Board and these Resolutions have been responded to as set out in **Technical Note 3**.

Summary: Options were developed methodically and have been subject to public consultation, the results of which have informed the appraisal during this Step of the scheme development. Most support received during the October/ November 2015 public consultation was for on-line Options and most objections was to off-line Options. Over 70% of respondents supported the need for public transport improvements along the corridor and less than 20% considered that nothing needed to be done. From the initial public consultation the following key concerns were raised in relation to off line Options:

- **Highest level of opposition was to the southern off line Options.**
- **Concerns included environmental impact on Coton and the West Fields.**
- **High cost was also mentioned as a consideration**

Officers will use the public consultation process and ongoing stakeholder engagement to ensure that detailed proposals take into account concerns.

Further project development work post public consultation

54. As part of Step 2 and the ongoing technical assessment, the conceptual options presented for public consultation and those received that merited further consideration underwent further appraisal. To achieve this, 5 Options were established for assessment for the complete corridor from Cambourne to Cambridge as set out and illustrated in **Table 3**.
55. Option 3a has also been included in Table 3. Option 3a has been considered on an early engineering basis to potentially offer a viable variation to Option 3. This option would use the established transport corridor adjacent to St Neots Road, and could potentially be designed to provide a similar level segregation and high quality public transport to Option 3 but with a reduction in cost over providing an entirely new corridor between Cambourne and Madingley. This responds to concerns raised during public consultation. At this point Option 3a has not been modelled separately as a standalone Option but in part within Option 3 and 5.

56. Maps have been prepared that show an indicative catchment area for each option that illustrates the area within which potential specific route alignments will be identified and presented at a further public consultation as part of the next Step. These catchment area maps there have the potential for a number of possible alignments during the next Step which need to be assessed against constraints including the following :
- Planning
 - Policy
 - Environmental
 - Property
 - Engineering
 - Transport
 - Social and Economic
57. At the end of the next Step a specific route alignment within the catchment area and Full Outline Business Case will be presented to the Executive Board
58. A Technical Note describing how the option catchment areas are defined, taking account of the constraints is presented in **TN4**
59. For each option, the level of infrastructure intervention has been classified as:
- a. High – a significant degree of offline segregation for all or the majority of the route with integral cycle improvements
 - b. Medium - a hybrid of both on and off highway measures such as a stretch of busway combined with an on road bus lane and
 - c. Low - conventional highway improvements such as bus lanes
60. All 5 Options modelled include a new P&R in the vicinity of the Madingley Mulch Roundabout as shown in **Figure 3**. The recommended location for the P&R will be generally determined by selected option.

		<p><i>route connection between Cambourne and Bourn Airfield</i></p> <ul style="list-style-type: none"> <i>• The segregated route then runs alongside the old A428 to Madingley Mulch roundabout (this is a variation of Option 3 that provides the benefits of a segregated route but uses the existing road corridor).</i> <i>• From here, direct access to a new segregated dedicated bus route running north of Coton and parallel to Madingley Road and Madingley Rise to new bridge over the M11.</i> <i>• Route continues to Grange Road, with a connection to the West Cambridge University site (the alignment could be south of or within West Cambridge)</i> 	<p><i>roundabout using St Neots Road corridor.</i></p>
<p>Option 4 (BOLD)</p>	<p>Medium</p>	<p>AREA 1 Hybrid + AREA 2 Central</p> <ul style="list-style-type: none"> • A new segregated bus route linking Cambourne and the proposed Bourn Airfield new settlement. • The route continues along St Neots Road with bus priority measures in place to the A1303 / A428 junction. • A new Park & Ride site is provided at Madingley Mulch roundabout (Site 2). • From here, a new off line segregated bus route going northeast from the A1303 / A428 junction, connecting in to Madingley Road just west of the M11. • Services would use the existing bridge to cross the M11 and then enter the 	

		West Cambridge site, before continuing south and east to Grange Road on a new offline dedicated bus route running parallel to Madingley Road	
Option 5	Medium	<p>AREA 1 South + AREA 2 Central</p> <ul style="list-style-type: none"> • A new offline segregated bus route linking Cambourne and the proposed Bourn Airfield new settlement. • The route continues along St Neots Road with bus priority measures in place to the A1303 / A428 junction, new Park & Ride provided at Madingley Mulch. • From here a new offline dedicated bus route running north of Coton and parallel to Madingley Road and Madingley Rise to new bridge over the M11 • Route continues to Grange Road, with a connection to the West Cambridge University site (the alignment could be south of, or within, West Cambridge). 	

Table 3: Description of Options

61.3 potential locations for a P&R at Madingley Mulch were also assessed as part of this stage of work. These locations are set out in Figure 4

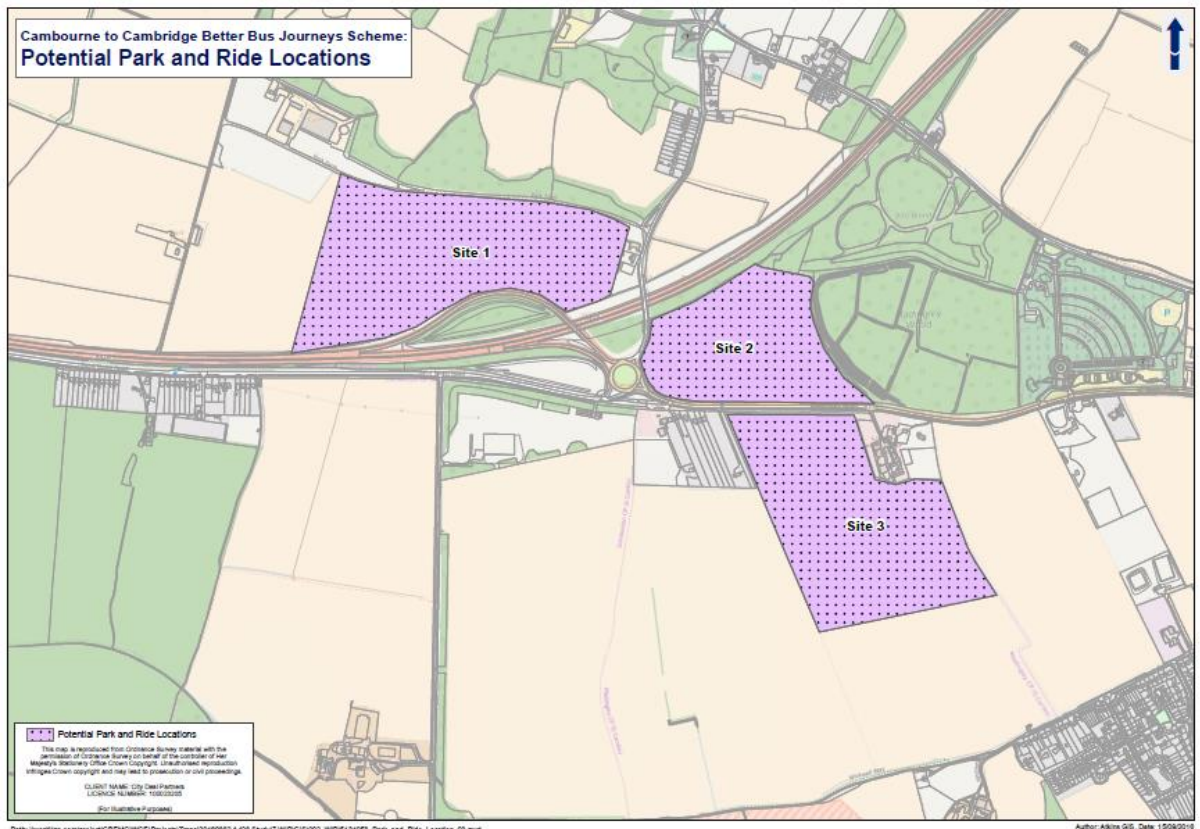


Figure 4: Potential P&R locations assessed

62. For the purposes of strategic modelling a specific location for the proposed P&R near Madingley Mulch roundabout was assigned. It was considered reasonable that a single location with potential capability for any Option would be sufficient for strategic level appraisal as such Site 2 was selected. It was acknowledged that the offline route to the south would require buses to cross over Madingley Road twice), and would provide the easiest access for the majority of vehicles in the AM peak. This site was deemed to be the most flexible and therefore taken forwards for the appraisal

63. The constraints for the location of the Park & Ride are the similar as those for the linear options. The key strategic consideration of the P&R location is the extent to which it operates effectively with each option.

Summary: 5 Options and 3 Park & Ride location in the vicinity of Madingley Mulch Roundabout were taken forward for further assessment.

PART 2: ASSESSMENT – THE TECHNICAL OPTION APPRAISAL

Introduction

1. The City Deal partnership has an assurance framework, specifically agreed with Government, to ensure that overall value for money is secured. All schemes promoted will be assessed to ensure they deliver value for money where the economic benefits of the scheme exceed the costs of investment and maintenance, contribute to City Deal, Local Plans and Local Enterprise Partnership objectives and can be delivered on time and to budget. The approach to assessment is therefore to support the City Deal objectives and complying with its assurance framework.
2. Since the public consultation in 2015, further appraisal undertaken for the 5 options and P&R in the vicinity of Madingley Mulch Roundabout, to inform the determination of a Recommended Option. In summary the approach to the assessment was as follows:
3. TAG assessment which considers direct costs and benefits of transport schemes and organises these under 5 cases for investment, which are:
 - The Strategic Case (including a wider economic assessment)
 - The Economic Case (including a wider environmental assessment)
 - The Commercial Case
 - The Management Case
 - The Financial Case
4. These 5 cases reports together with individual supporting detailed technical documents constitute a Strategic Outline Business Case which is brought together in this OAR.
5. This Strategic Outline Business Case informs an overall assessment against the City Deal objectives in order to arrive at Recommended Option.
6. It is important to emphasise that any selected option would undergo further analysis and refinement at the next Step of work.

Details of the Assessment

7. The January 2015 report the City Deal Executive Board option prioritisation decision was informed by an assessment using the DfT's Early Assessment and Sifting Tool (EAST) methodology. This DfT tool, which is primarily transport focused, was supplemented by a more wide ranging economic prioritisation exercise in which the housing and growth impact of interventions were considered. As such from the earliest stage of consideration of City Deal transport schemes the assessment has been holistic and focused on the core economic rationale of the City Deal programme.
8. TAG is the standard method used by the Department of Transport for the appraisal of transport infrastructure options, principally using strategic modelling and its outputs. This method prioritises transport investment by use of national appraisal criteria.
9. TAG is a toolkit which aims to consider all relevant economic, social and environmental outcomes of an intervention with a value for money and deliverability framework. The toolkit consists of software tools and guidance on transport modelling and appraisal methods, that are applicable for highways and public transport interventions. These facilitate the appraisal and development of transport interventions, enabling analysts to build evidence to support business case development and inform investment funding decisions.
10. It is important to note that TAG is intended to be applied to specific circumstances and to recognise that the application of TAG at a national level may differ in some ways from its application to the local context. TAG itself recognises this within its guidance notes. Paragraph 1.1.5 of Senior Responsible Officer TAG guidance also sets out that the appraisal output can be supplemented for the purposes of decision-making with specific additional wider investment criteria, to better reflect the circumstances of the scheme being considered. This would apply, for example, to investment criteria relevant to the objectives of the City Deal in so far as they may differ from standard national growth assumptions.
11. The Strategic Outline Business Case introduces a way of identifying the overall benefits and costs as a ratio for each Option, known as the Benefit Cost Ratio (BCR) with both the denominator (costs) and numerator (benefits) expressed in monetary terms. The BCR forms only one part of the assessment and is subject to change during each Step of the scheme development. The BCR will have the highest degree of refinement at the Step of the scheme development where most detail is assessed.
12. Business cases are developed in line with HM Treasury's advice on evidence-based decision making set out in the Green Book and use its best practice Five Case model approach. Essentially, analysts are required to

develop a business case giving due consideration, and providing evidence on:

- The Strategic case: demonstrating the case for change and strategic fit delivered by the proposal, providing a clear rationale for the proposed investment. The Strategic Case will also include the wider Gross Value Added (GVA) different levels of intervention may deliver to the local and national economy. This goes beyond the normal technical transport approach, recognising the wider objectives of the City Deal and the economic benefits that will be brought to Greater Cambridge by new housing and jobs and the transformational change that high quality sustainable transport solutions can bring.
- The Economic case: assessing the Value for Money of the proposal. This considers all impacts delivered, and analyses whether the proposal presents good value for tax payers' money; The Economic Case also includes measurement of the environmental costs and benefits of each Option
- The Financial case: analysing the financial profile of the investment, and identify funding and accounting issues;
- The Delivery case: demonstrating that project planning (phasing and delivery of implementation), risk management and stakeholder engagement has been addressed; and
- The Commercial case: demonstrating that financial implications, risks of proposed commercial deal, risk allocation and transfer have been addressed in the proposed procurement strategy

13. The Executive Board as an investment board should consider the evidence in all five cases when making an investment decision in respect of the Recommended Option. The degree of detail contained within the Strategic Outline Business Case may vary depending on the level of investment or risk proposed to ensure that the appraisal process is proportionate.

Outcomes of Assessment

A. Strategic Case

14. The Strategic Case sets out the vision for Cambridgeshire of ambitious growth and high quality of life. The Strategic Case discusses the strategic and policy context in which this vision may be met and provides an assessment of how the options for the Cambourne to Cambridge better bus journeys scheme address the transport and wider policy requirements of Cambridgeshire and the City Deal to achieve this vision.

15. The overarching strategic focus, built from Local Plans and Strategies, is summarised in the City Deal Assurance Framework⁹ strategic goals. These are:
- To nurture the conditions necessary to enable the potential of Greater Cambridge to create and retain the international high-tech businesses of the future;
 - To better target investment to the needs of the Greater Cambridge economy by ensuring those decisions are informed by the needs of businesses and other key stakeholders such as the universities;
 - To markedly improve connectivity and networks between clusters and labour markets so that the right conditions are in place to drive further growth; and
 - To attract and retain more skilled people by investing in transport and housing whilst maintaining a good quality of life, in turn allowing a long-term increase in jobs emerging from the internationally competitive clusters and more University of Cambridge spin-outs.
16. The City Deal have rationalised the transport aspects of these objectives in their Strategic Economic Plan¹⁰ (SEP) into a number of key themes, such as:
- ensuring that the future transport network is fit for an economically vital high growth area,
 - working with partners to facilitate improvements to key routes;
 - ensuring linkage with national transport investment decisions; and
 - identifying scalable interventions that open up access to significant growth locations.
17. The SEP vision for transport focuses on the transport contribution to sustainable growth and economic prosperity. In terms of public transport, the SEP highlights the need for more sustainable transport options such as increased bus use and active travel, noting that new developments such as those at Bourn Airfield could achieve a high public transport mode share. The focus on public transport provision is a requirement to deliver high quality sustainable transport links that offer an alternative to the private car¹¹.
18. The vision set out in the SEP is built from Local Plans and the Transport Strategy for Cambridge and South Cambridgeshire (TSCSC).
19. In the Submitted City of Cambridge Local Plan 2014, 'Policy 5: Strategic transport infrastructure' identifies a need to promote sustainable transport and pedestrian and cycle priority. In terms of public transport, the Policy notes a need to ensure new development in Cambridge is linked through High Quality Public Transport (HQPT) routes, frequent services and cycle

⁹ Greater Cambridge City Deal: Cambridge City Council; Greater Cambridge Greater Peterborough Enterprise Partnership; Cambridgeshire County council; South Cambridgeshire District Council; University of Cambridge: Draft document

¹⁰ Greater Cambridge Greater Peterborough Economic Partnership, Strategic Economic Plan

¹¹ Ibid.

ways to the city centre, railway station and employment centres. 'Policy 80: Supporting sustainable access to development' notes that development on the edge of the city and urban extensions are supported by HQPT linking them to the city centre and employment centres. The Policy notes that for a HQPT system to be successful, it needs to be efficient, reliable and attractive and 'free from other traffic, where possible, in order for them to deliver on reliability and speed of journey.'

20. The Submitted South Cambridgeshire Local Plan 2013 is consistent with the Cambridge Local plan in terms of the need for high quality public transport. It makes specific reference to public transport on the A428 with reference to the proposed Bourn Airfield development, noting that significant improvements in public transport would include a segregated bus link between Cambourne to Bourn Airfield and measures to ensure that bus journeys between 'Caldecote / Highfields and the junction of the A428 and the A1303 is direct and unaffected by any congestion suffered by general traffic.'
21. Taken together the two Submitted Local Plans highlight a requirement for HQPT supported by direct walking and cycling routes and that in order for these new public transport services to offer an attractive alternative to the car, there is a need to ensure that the services are not affected by congestion caused by general traffic.
22. In terms of delivery, the Transport Strategy for Cambridge and South Cambridgeshire (TSCSC) supports the growth and development vision set out in the Local Plans. With reference to the A428, 'Policy TSCSC 21: Planning obligations for Bourn Airfield and West Cambourne' indicates a requirement for the following:
 - Segregated bus links between the A428 and the M11;
 - A1303 / A428 outer Park & Ride capacity;
 - Direct, segregated high quality pedestrian/cycle links to west Cambridge, Papworth Everard, Highfields, Hardwick, Caxton, Bourn, Caldecote, Comberton, Bar Hill and Dry Drayton;
 - Any mitigation measures needed at the junctions of the A428 with the A1303 and A1198;
 - Delivery of funding of any measures required to mitigate the traffic impact of the developments on Bourn, Caldecote, Toft, Comberton and Barton; and
 - A smarter choices package including residential school and workplace travel planning for a busway between West Cambourne and the junction of the A1303 and A428.
23. Other key related policies highlight a number of requirements for Public Transport, Walking and Cycling:
 - 'Policy TSCSC 1: The strategy approach' notes that 'The backbone of the strategy will be a high quality passenger transport network of bus, guided bus and rail services, fed and complemented by comprehensive pedestrian and cycle networks. Highways capacity enhancements will

ensure that traffic can move efficiently in appropriate locations without interfering with passenger transport corridors.'

- 'Policy TSCSC 8: Improving bus services' notes that 'The County Council will work with partners and passenger transport operators to develop an improved and integrated network of HQPT.'
- 'Policy TSCSC 9: Access to jobs and service's notes that the transport network needs to be efficient and effective with HQPT and cycle network routes near major employment, education and service centres.
- 'Policy TSCSC 12: Encouraging cycling and walking' makes a number of suggestions to improve capacity and also notes that where feasible, pedestrian and cycle facilities will be provided alongside HQPT and new road infrastructure (citing the Busway facilities as a standard example).
- 'Policy TSCSC 15: Managing travel demand' highlights that measures for managing demand could include reallocation of road space to be used by passenger transport, pedestrians and cyclists.

24. Overall it is clear that there is a consistent and direct relationship between the Submitted Local Plans, Transport Strategies and the City Deal priorities. As well as defining specific corridor objectives related to new developments, they all indicate a need to provide HQPT and walking and cycling improvements in order to offer an alternative to the private car. The Submitted Local Plans indicate that consideration should be given to attempting to ensure that public transport services are not affected by general traffic.

25. The Strategic Case also includes an assessment of the Wider Economic Benefits (WEBs) that can be attributed to an investment in appropriate public transport infrastructure, which are central to the Strategic Outline Business Case for undertaking the City Deal scheme. The City Deal objectives give rise to different considerations to conventional TAG standard metrics, in particular the delivery of additional economic growth over the period to 2031. These wider ranging benefits move beyond the direct user benefits which are captured within the standard Economic Case approach.

26. The City Deal reflects a wider approach to devolution and local control of investment decisions and seeks to promote economic growth building on the Cambridge 'phenomenon'. As such a more holistic concept of 'return on investment' based on wider benefits applies to investment decision.

27. A number of City Deal agreements are underway across the UK and those authorities who are similarly prioritising investment recognising the link between transport infrastructure and wider economic growth. City Deal authorities have therefore used assessment methods to ensure that wide ranging economic benefits are captured when considering investment decisions. This involves capturing the key economic benefits, namely jobs and Gross Value Added (GVA), being enabled directly and indirectly through investment in public transport infrastructure provision.

28. GVA is a measure of economic output (the value of goods and services produced) in a local or regional economy. In terms of wider economic benefits, the standard methodology in the Economic Case for a transport scheme focuses only on the economic benefits directly related to transport user benefits. However, a transport infrastructure intervention that seeks to unlock economic growth would clearly have wider effects as it assists or directly enables new development to take place and new jobs and GVA to be created. These benefits need to be captured in order that the full effects of the intervention can be appraised. Although these benefits cannot be directly reflected in the Economic Case, this approach accords with the HM Treasury Green Book which sets out that all benefits should be captured by the appraisal. It should be noted that the DfT is currently developing new transport assessment guidance on appraisal of these wider benefits.
29. Given the high level of employment and housing growth planned in the submitted Cambridge and South Cambridgeshire Local Plans to 2031 and beyond, which the City Deal is aligned to support, an approach to decision-making which takes into consideration such wider benefits would ensure that the potential contribution of a proposed transport scheme to economic growth and to delivering the key City Deal objectives was fully considered.
30. The Strategic Economic appraisal builds upon the direct benefits captured within the Economic Case assessment by assessing the wider economic benefits of the scheme associated with development along the corridor. In summary the following impacts are assessed for each of the High, Medium and Low intervention levels (as defined in paragraph 55): Option:
- **Land utilisation benefits** contributing towards bringing forward development along the corridor including new residential development, and the creation of jobs and the associated GVA. These benefits are assessed and considered additional at a Greater Cambridge level and a key part of the strategic case for the scheme.
 - A proportion of these benefits are then considered net additional to the UK economy (i.e. would not be simply accommodated elsewhere in the UK) given the nature of the Greater Cambridge economy that to a significant extent competes on an international stage.
 - **Access to more productive jobs** – the remaining GVA benefits derived from those jobs created in Greater Cambridge which support existing UK residents to access more productive jobs than they may currently hold (that is jobs that generate higher GVA). TAG contains guidance on this in Unit A2.1, and the analysis aims to be consistent with this whilst also bringing local data and considerations into the analysis.
 - **Reductions in spatial inequalities and structural unemployment** – the welfare benefits associated with any jobs created in areas with high levels of deprivation and reductions in long term structural unemployment

- **Option and non-use values** - the benefits relating to the value residents place on having access to opportunities due to the schemes (Option values) and that they may place on a public transport service even if they never intend to use it (non-use values). TAG includes recommendations on their quantification, although they are not always a core component of scheme appraisal.

31. The assessment of the WEB's places significant emphasis on the strategic economic context of Greater Cambridge and how the scheme will improve connectivity and networks and thereby contribute towards enabling the new wave of innovation led growth that City Deal investment seeks to deliver. As set out above this accords with the local and national policy framework.

32. The WEBs are based on combining:

- a qualitative appraisal of the intervention levels (High, Medium and Low, as defined in paragraph 59 in Part 1) for the options against the City Deal strategic objectives across a number of key channels via which the scheme is likely to influence economic growth given the identified transport benefits; and,
- Attributing a level of growth from those development sites most likely to be impacted by the scheme and wider city centre development to the highest performing Option (from the qualitative appraisal). This has involved a detailed review of the Local Plans, housing and employment developments planned and the growth targets and the transport benefits under each Option from the transport modelling work.

33. The WEBs assessment has considered the extent to which the different levels of intervention contribute toward achieving these targets along the Cambourne to Cambridge Corridor. The High and Medium scheme Options (Hybrid and Segregated, respectively) are identified as likely to deliver the most benefits in terms of supporting business investment and growth and labour market mobility. However, the High (Segregated) scheme Option is expected to deliver the highest level of economic benefits since it also contributes to the longer term strategic aims of Greater Cambridge in terms of promoting a positive image and perceptions and investment in capacity for post 2031 growth.

34. Based on combining land utilisation analysis and transport demand modelling, the WEBs assessment estimates that the total attributable proportion of remaining B-use (Business/Industrial/ Storage/Distribution) jobs in Greater Cambridge, to the highest performing segregated Option, is in the region of 800 jobs and housing in the region of 900 dwellings between 2016-2031. This is a significant level of attribution but is based on the strong linkages between development sites and the scheme, especially in the case of Bourn Airfield and Cambourne and the strategic objective of the scheme to improve West to East connectivity to Cambridge and other cluster sites. This also reflects the analysis undertaken as part of the Transport Economic Assessment Report earlier prioritisation work informing the 15th January 2015 corridor prioritisation.

35. From this, as detailed in Table 4, wider economic benefits have been calculated for the High (Segregated), Medium (Hybrid) and Low (on highway) intervention levels. A significant level of wider economic benefits have been calculated for the High and Medium Options, compared to the Low (on highway) measure, based on quantitative analysis of the transport benefits against each intervention level and how the maximum level of growth attributed to the scheme is likely to differ.

Benefit	Option		
	Low (On highway)	Medium (Hybrid) Option	High (Segregated) Option
GVA benefits – <u>Greater Cambridge level</u> (£s in discounted 2010 factor prices)			
Direct jobs	189	606	786
Direct GVA per annum	5.2	17.5	22.6
TOTAL GVA	155.7	526.2	679.3
GVA benefits – <u>UK level</u> (£s in discounted 2010 factor prices)			
Land utilisation – net additional jobs to the UK	38.4	129.7	167.5
Move to more productive jobs within the UK	7.0	23.7	30.6
TOTAL GVA	45.4	153.4	198.1
Welfare benefits – <u>UK level</u> (£s in discounted 2010 market prices)			
Reduction in spatial inequalities	0.28	0.93	1.21
Alleviation of unemployment	0.06	0.22	0.28
Option and non-use values	0.00	29.76	29.76
TOTAL WELFARE	0.33	30.92	31.25

Table 4: Wider Economic Benefits (£Ms rounded to 2010 discounted values and prices) over 30 year period

36. The WEBs for the three types of intervention, to align with transport guidance, are presented at three different levels –GVA benefits to Greater Cambridge, GVA benefits net additional to the UK economy and a range of welfare benefits. The benefits identified, at a Greater Cambridge and UK level, although highest for the High interventional level are also significant for the Medium intervention level, when compared to the Low intervention level (on-highway measures). The High and Medium level intervention Options represent a longer term investment in the capacity Greater Cambridge to accommodate the growth anticipated up to 2031 and thereby directly support planned development. These indicative figures are considered

conservative since no growth attribution is made to the scheme post 2031 despite considerable development being planned along the corridor.

37. The assessment of wider economic benefits is, similarly to the assessment of all costs and benefits attributed to the Options, carried out at an early stage conceptual level. The figures would be refined during the next Step of further scheme development built upon the well-defined Recommended Option.

Western Orbital Strategic Integration

38. Beyond the Cambourne to Cambridge corridor the options assessment sits within the context of a series of developing City Deal interventions on related corridors/areas. These interventions are being developed through discrete projects towards meeting the overall programme City Deal objectives and clearly have interdependency with the Cambourne to Cambridge corridor particularly in relation to the Eastern section of Option 3/3a..
39. The Western Orbital study involved exploring possible schemes to increase orbital bus capacity along the M11 corridor and to intercept car journeys from the A10 and A603 radial routes into Cambridge. Projected housing and employment growth in this area is likely to result in increased highway congestion unless these additional trips can be accommodated using public transport.
40. Sections of an orbital or circular bus route and Busway are already in operation linking the north of the City (Science Park) to the south east (rail station and Cambridge Biomedical Campus). In addition there is infrastructure connecting with the existing Busway that currently links the Trumpington Park and Ride site to Cambridge Biomedical Campus. The construction of the Darwin Green and North West Cambridge developments has secured further orbital connection linking the north to Madingley Road in the west. The lack of public transport catering for orbital movements in the south west of the City therefore emerges as a missing link which may be limiting public transport around the City.
41. In December 2015, the Executive Board agreed that high level Options for a Western Orbital bus link should be consulted on as part of ongoing development work. Due to its proximity the Western Orbital bus link has close strategic links with the Cambourne to Cambridge Corridor. A report will be presented to City Deal Board for selection of their preferred option (s) in November 2016
42. To support considerations on the Cambourne to Cambridge scheme the following **Table 5** summarises the strategic fit between Cambourne to Cambridge Options and the three Western Orbital Options that were subject to public consultation in 2016.

	A428 High level Intervention – i.e. Option 3	A428 Medium level intervention i.e. Options 2/4/5	A428 Low Level intervention i.e. Option 1
Western Orbital using M11	Not as attractive due to requirement for buses to loop through West Cambridge to access the M11 at Junction 13; Reduced journey time and reliability benefits of online Options could discourage use.	Opportunity to connect at Madingley Road P&R to access the M11 at Junction 13; Reduced journey time and reliability benefits of online Options could discourage use	Opportunity to connect at Madingley Road P&R ; Reduced journey time benefits and reliability benefits of online Options could discourage use.
Western Orbital Offline (East of M11)	Opportunity to connect at Madingley P&R or in West Cambridge ; Potential to create an offline junction to the east of the M11 to allow the A428 to continue to the City Centre and the Western Orbital to run alongside the M11; Could reduce the requirement to run an alternative service from the City Centre to Addenbrooke's.	Opportunity to connect at Madingley P&R or in West Cambridge ; Reduced journey time and reliability benefits of online Options could discourage use; Could reduce the requirement to run an alternative service from the City Centre to Addenbrooke's.	Opportunity to connect at Madingley P&R ; Reduced journey time and reliability benefits of online Options could discourage use; Could reduce the requirement to run an alternative service from the City Centre to Addenbrooke's.
Western Orbital Offline (West of M11)	Potential to create an offline junction to the west of the M11 to allow the A428 to continue to West Cambridge and the Western Orbital to run alongside the M11; Could reduce the requirement to run an alternative service from the City Centre to Addenbrooke's.	Reduced journey time and reliability benefits of online Options could discourage use; Could reduce the requirement to run an alternative service from the City Centre to Addenbrooke's.	Reduced journey time and reliability benefits of online Options could discourage use; Could reduce the need to run an alternative service from the City Centre to Addenbrooke's.

Table 5: Strategic Assessment of Western Orbital and A428 Options

43. The Western Orbital assessment in Table 5 indicates that selection of the A428 offline Option will make it more difficult to ensure the effective integration of the A428 / A1303 scheme with a Western Orbital Option that uses the M11. Conversely, an offline Western Orbital Option to either the east or west of the M11 would have a very good 'strategic fit' with Cambourne to Cambridge.
44. There is a high level of synergy between these two City Deal schemes and the potential positive impact on the BCR by considering both schemes strategically as scheme development for both to move forward.

Cambridge Access and Capacity Study

45. In June 2016, the City Deal Executive Board considered recommendations on the Cambridge Access and Capacity Study. They agreed a policy approach for a congestion reduction package, incorporating:
- better bus services and expanded usage of Park and Rides;
 - better pedestrian and cycling infrastructure;
 - better streetscape and public realm;
 - peak congestion control points in the weekday morning and evening peak periods;
 - a workplace parking levy;
 - on-street parking controls (including residents' parking)
 - smart technology;
 - travel planning.
46. The Peak-time Congestion Control Points (PCCPs) involve the closure of key routes in the City Centre to general traffic in the morning and evening peak hours, while allowing pedestrians, cyclists and public transport services continued priority access. PCCPs are under consideration on Grange Road and Queens Road to the west of the City Centre.
47. Early traffic modelling for the City Centre Access Study has suggested that PCCP's could result in more congestion at peak times along Madingley Road which would impact public transport reliability and support a separate segregated resilient route for public transport into the City Centre.
48. In terms of maximising benefits for users of new infrastructure along the Cambourne to Cambridge corridor there is a high level of synergy between the infrastructure proposals and the Cambridge Access proposals, which could result in further improvements to bus patronage over and above those that will be seen from the infrastructure proposals on their own. This is because the measures will jointly increase the attractiveness of the bus and reduce the attractiveness of the car for journeys at peak times.

Summary: The Strategic Case sets out the case for implementing the scheme and assesses options at the highest strategic level. The

Strategic Case demonstrates that the higher quality intervention as represented by Option 3 will deliver the highest strategic fit against the core City Deal objectives. The inclusion of wider economic benefits within the Strategic Case strengthens this conclusion. The consideration of the interaction between the City Deal schemes also supports Option 3 as the Option with the greatest coherence to the wider programme. Early engineering assessment considers that Option 3a may potentially be a viable alternative to Option 3 with similar strategic benefits.

B Economic Case

49. The Economic Case documents the assessments of public transport economic efficiency, cost, environmental impact, wider economic benefits and social & distributional impacts. The Economic Case also contains a multi-criteria analysis of the performance of each Option against a range of qualitative and quantitative economic and strategic criteria.
50. A significant tool to derive the Economic Case is strategic transport modelling. Transport modelling is a way of predicting the direct transport impacts (benefits and disbenefits) of proposed schemes/interventions. Therefore to represent the levels of intervention, the five Options were assessed using the Cambridge Sub-Regional Strategic Model (CSRM).
51. The focus of the “initial” BCR is to reflect core transport specific impacts compared to costs. These impacts include:
- Transport User Impacts:
- I. Journey time impacts to all modes
 - II. Operating cost changes
 - III. Fares, tariffs, tolls incurred by users
- Transport Provider impacts, public and private sector
- I. Infrastructure costs - construction, land/property, maintenance, operation and renewal
 - II. Service delivery costs – fleet, operating and maintenance costs
 - III. Revenues – fares/ticket receipts, advertising, retail
 - IV. Taxes – impact on tax receipts to Government
52. The BCR and associated Net Present Value (NPV) calculation, is often used by central Government to assist in national investment decisions. As such its calculation method is closely constrained at this stage of scheme development. For example at this stage the assessment does not assume any form of mitigation for environmental impacts within the BCR calculation, as that would form part of the next Step of the project.
53. It should be noted that the wider economic impacts defined in the Economic Case do not include GVA impacts. However as described earlier in this report

GVA impacts are captured within the Strategic Case to reflect City Deal objectives.

54. **Table 6** below summarises the monetised impacts of the scheme as defined by the Economic Case

Costs and Benefits	Option 1	Option 2	Option 3	Option 4	Option 5
Net Public Transport Benefits (£000s)	56,886	69,144	57,536	22,052	24,565
Environmental Impacts (£000s)	-6,440	-8,758	-9,968	-11,861	-11,859
Wider public finance (Indirect Tax Revenues)	-6,796	-7,825	-6,252	-3,683	-4,284
Total Present Value Benefit (all monetised benefits, including wider public finance impacts and excluding wider economic impacts) (£000s)	43,694	52,561	41,317	6,509	8,421
Total Present Value Cost (£000s)	42,515	109,185	207,846	149,269	167,423
Initial BCR	1.03	0.48	0.20	0.04	0.05
Wider Economic Impacts (£000s)	8,221	1,481	1,361	-2,613	-2468
Total Present Value Benefits (all monetised benefits plus Wider Economic Impacts) (£000s)	51,870	54,042	42,678	3,896	5,953
Adjusted BCR	1.22	0.49	0.21	0.03	0.04

Table 6 Economic appraisal summary (all values NPV, 2010, £000s)

55. The Benefit to Cost ratios for all Options are poor or low, with initial BCRs ranging from 0.04 for Option 4 to 1.03 for Option 1 (the lowest cost Option). Poor BCR performance is attributed both to low modelled generic transport benefits and to the high estimated costs associated with building new offline infrastructure

56. Low transport benefits reflect the low modelled levels of demand for public transport along the A428 corridor which are due to the relatively faster journey times of private car for local commuting and business trips and to the high levels of car dependency in Cambridgeshire. The mode share for public transport in the A428 corridor is approximately 21% across all user types, patronage is dominated by education and leisure users which have low values of time according to the approach taken in TAG to attributing values of time to different user groups.

57. The modelling suggests that while the options offer journey time improvements for public transport trips, these improvements still do not

enable public transport journey times to compete with car journey times, and the low levels of demand for public transport means these journey time improvements translate into a relatively small level of transport benefits. This emphasis for the need for improvements in high quality public transport infrastructure to combine with congestion reduction proposals with the Cambridge Access Report.

Environmental Assessment

58. Within the BCR calculation is a first stage assessment of the potential environmental effects of each Option. This environmental assessment includes consideration of the following issues:
- Noise Impacts
 - Air Quality Impacts
 - Greenhouse Gases
 - Impacts on Landscape
 - Impacts on Townscape
 - Impacts on the Historic Environment
 - Impacts on Biodiversity
 - Impacts on the Water Environment
59. The assessment at this Step looks at the range of known environmental constraints on the corridor and takes a high-level desktop view on the extent to which such constraints could avoid, mitigate compensate or enhance within the detailed design of any recommended option (although such mitigation is not included within the BCR). In effect, this assessment identifies any insurmountable constraints which would make an option unfeasible. The details on any specific effects will emerge in detail at the further development of the schemes progresses.
60. All of the options are likely have some effects in different ways on the environment. The aim of ongoing environmental assessment is to ensure that the environmental implications of decisions at each step of the scheme selection process are fully understood and appropriately managed and mitigated. The requirement of environmental appraisal at the early stage of feasibility and option analysis is effectively a desk top study to determine the scope of potential effects associated with each of the options. Consequently the Step 2 appraisal has considered
- Identification of key constraints along the corridor
 - Mapping of constraints
 - Review of relevant local and national policy
 - Specialist desktop review of site specific environmental information
61. On the basis of the assessment done to date, it is not considered that any of the options has overriding constraints which would cause them to be ruled out at this stage.

62. The environmental assessment at Step 2 has recognised the issue of impact on the Green Belt. This is a planning constraint and as such will be a consideration of the further detailed scheme development. As part of the next Step of scheme development a more detailed assessment of Green Belt issues would be carried out.
63. In general online options involving widening works are unlikely to be considered inappropriate development because the road is already established within the Green Belt and widening works are unlikely to impact on the openness of the Green Belt or conflict with the purposes of including land in the Green Belt.
64. All offline segregated routes would pass through the Green Belt. Whilst inappropriate development in Green Belt is generally restricted, development of local transport infrastructure can be considered as appropriate development under specific circumstances. This would be the case where a requirement for Green Belt location can be demonstrated, it preserves the openness of the Green Belt and it does not conflict with the purpose of including land in Green Belt.
65. Segregated infrastructure proposals would have to undergo these tests to determine whether it constitutes appropriate development, and if not whether there are very special circumstances justifying the development. In either case, impact on the Green Belt would need to be minimised through sensitive engineering design to minimise as far as practicable the degree to which the scheme impacts on the Green Belt's openness and the purposes of including land in the Green Belt, which may for example include: ensuring that any associated buildings and structures are of a suitable size relative to the operational requirements; visual screening and landscaping measures; limiting of lighting etc.

Other considerations to BCR

66. The BCR is, when fully assessed for a recommended option an overall assessment of value for money – in other words the overall benefit the public will receive for an intervention versus the cost of that intervention.
67. The value of a transport scheme is judged by weighing the benefits against the costs to indicate whether it is Value for Money. The Value for Money assessment is, however, not just about money and saving people time; a wide spectrum of impacts is considered in a detailed appraisal, including various impacts on the economy, the environment and social welfare

68. BCR's are categorised by the DfT as follows:

- poor VfM if the BCR is less than 1.0
- low VfM if the BCR is between 1.0 and 1.5
- medium VfM if the BCR is between 1.5 and 2.0
- high VfM if the BCR is between 2.0 and 4.0
- very high VfM if the BCR is greater than 4.0

69. The BCRs generated by the Strategic Outline Business Case assessment for each option are based on early stage design development and proportional analysis of costs and benefits. These costs and benefits are subject to change through more detailed analysis in the following areas that may allow for design and benefits optimisation and thereby increase the ratio of benefits to costs. The following issues will be more fully considered as part of the next Step of further scheme development to test for BCR sensitivities to local and circumstances route catchment area of the selected option:

Land Use Planning assumptions

In terms of land use the modelling is restricted to the minimum growth figures to 2031. For example at Bourn Airfield 1360 houses are predicted to be built by 2031 rather than the full 3500 that have been identified in the Submitted Local Plan. This reflects the land use assumptions in the District Council's Housing Trajectory to 2031¹². The incorporation of growth after 2031 will provide increased benefits for all options and increase BCRs.

Third Party funding contributions

The BCR does not take into account financial contributions from the significant developments (S106 funding) along the corridor which will change the effective BCR by reducing the public sector net contribution. These developments contributions are still under negotiation and as such within the BCR constraints it is not possible to account for them until more certainty has been obtained on the level of contribution. Nor does the take account of the source of public sector contributions.

Modelling Methodology

Use of the CSRM modelling supports option selection. However traffic interaction may affect some options more than others and the full impact of this would not be fully understood until detailed modelling is carried out in Step 3. The on line options (e.g. Option 1) are likely to have higher traffic interactions than off line Options (e.g. Option 3). Where such traffic interactions had higher adverse traffic impacts, this could affect or alter the standard BCR calculation.

¹² South Cambridgeshire Annual Monitoring Report 2014-2015 (January 2016)

Madingley Road P&R

The initial modelling assumption was that Madingley Road P&R would remain open for the duration of the modelling period but found it would reach capacity in 2022. In any event the lease expires in 2031. In the context of City Deal planning horizon, there is a likely scenario that the existing P&R site may close and that the benefits of the 5 Options should also take account of a scenario in which the P&R at Madingley Road is closed. Although not a specific scheme objective, significant direct transport benefits for Options 1 and 2 (in so far as they incorporate proposals previously identified as Options 1 North and 1 Central) are attributed to serving the existing Madingley Road P&R site. If the P&R closes benefits attributed to Options 1 North and 1 Central would likely be reduced. Transport benefits which are derived from demand emanating from the M11 rather than Madingley Rise west-bound.

Benefit Optimisation

At the current stage of development only limited assumptions have been made around key factors that may impact demand. For example no account has been taken around specific bus service routes, timetabling, fares, ticketing and passenger information. Similarly the impacts of demand management within the City Centre that may occur as part of the City Centre Access study and other City Deal schemes have not been reflected in the BCR at this stage. These will be a factor in the next Step of further scheme development.

Estimated Scheme Costs

At this stage the overall estimated scheme costs are based on high level assumptions based upon previous schemes and include significant risk and optimism bias allowances. Further detail scheme development will provide greater detail on costs and optimisation as opportunities for efficiencies are realised.

Estimated Environmental Costs

As stated, at this stage environmental assessments are desktop and costs are considered “worst case” and do not accounting for potential mitigation measures, which will result in an overall reduction of these as monetised costs within the Full Outline Business Case.

Summary: The Economic Case at this stage has estimated poor or low BCR's for all Options. It is expected that refinement of a single Option will result in further changes to the BCR. Environmental considerations form part of the BCR, again at this Step of scheme development focusing on constraints. Again this assessment will be further refined in line with the other aspects of the BCR. Green

Belt impacts do not form part of the environmental assessment.
At the policy level it is expected that the overall process of refining the environmental effects will consider the specific issues in the Green Belt.

C Multi Criteria Analysis Framework

70. The Strategic and Economic cases, together allow for an overall performance assessment to be made for each Option at this stage.

The Multi Criteria Assessment Framework (MCAF) is an appraisal tool used to assess the Strategic Fit of the Options has been assessed by the extent to which they align with The scheme aims to deliver new High Quality Public Transport infrastructure and the City Deal objectives to achieve improved connectivity and reduced congestion between residential and employment

71. The MCAF assessed Options based on the following strategic criteria (alongside other standard environmental and economic metrics that have been considered in the business case):
- The extent to which the Option's infrastructure and services are likely provide High Quality Public Transport (HQPT) in terms of ride quality, HQPT buses and related facilities (for example the ability of an Option to include Wi-Fi, smart ticketing and branding).
 - The level of segregated service (where segregation allows for greater reliability, route control and potentially minimises disruptive utility road works permissions issues);
 - The extent to which the Options provide potential improvement in walking infrastructure (where segregation is likely to enable and encourage more and safer walking);
 - The extent to which the Options provide potential improvement in cycling infrastructure (where segregation is likely to enable and encourage more and safer cycling); and
 - Reliability (where segregation supports greater reliability as it is dedicated infrastructure and there is minimised interaction with other traffic).
72. The Strategic objectives are derived from the City Deal Agreement with Government. To achieve the strategic objectives specific requirements are identified which are considered most relevant considering the TSCSC. In other words although there may be other potential interventions to achieve the strategic objectives these would not be policy compliant.
73. Table 7 represents the MCAF assessment for each option:

MCAF Analysis Cambourne to Cambridge Better Bus Journeys Scheme Options	Key									
	Qualitative scoring					Quantitative scoring				
	Best performing option	5				Best performing option	5			
	Worst performing option	1				All other options	Proportion based on the best performing option			

Strategic Goals (City Deal Assurance Framework) by the needs of businesses and other key stakeholders such as the universities. Value for Money, increased transport capacity, improved transport connectivity, improved journey times, High Quality Public Transport	Outcomes	Metric for scoring outcomes	Ranking										Rationale
			Option 1		Option 2		Option 3		Option 4		Option 5		
			Assessment	Score	Assessment	Score	Assessment	Score	Assessment	Score	Assessment	Score	
		High Quality Public Transport Attributes (vehicle fleet/ride quality/RTPI/branding/ticketing)	Lowest	1	Medium	3	Highest	5	Medium	3	Medium	3	Option 1 has no dedicated infrastructure and therefore the high quality ride expected to be achieved with a HQPT scheme could deteriorate over-time. Options 2, 4 and 5 have some dedicated infrastructure, but lower control overall when compared to option 3 which is offline and can maintain both ride quality and start/stop frequency. Branding is also expected to be lower on an online scheme.
		Level of service that segregation provides	No segregation	1	Partially segregated	2	Fully segregated	5	Partially segregated	3	Partially segregated	3	More segregation will be indicative of greater route control and fewer permissions issues e.g. utilities / general highway maintenance works that could be undertaken during operation.
		Improvements in walking infrastructure	No segregation	1	Partially segregated	2	Fully segregated	5	Partially segregated	3	Partially segregated	3	Where busway sections are provided, direct walking infrastructure will be included within the scheme.
		Improvements in cycling infrastructure	No segregation	1	Partially segregated	2	Fully segregated	5	Partially segregated	3	Partially segregated	3	Where busway sections are provided, direct cycling infrastructure will be included within the scheme.
		Disruption to existing traffic during construction	Highest	1	High	2	Lowest	5	Medium	3	Medium	3	No full assessment of construction disruption has been undertaken, however construction impacts will be greatest where infrastructure is proposed on Madingley Road / Madingley Rise. Option 1 has an eastbound bus lane proposed, east of Madingley Mulch roundabout. Option 2 has works on Madingley Road, east of the M11 bridge. Diversion options for traffic using Madingley Road are very limited.
		Deliverability risk (planning/consents)	Lowest	5	Medium-high	2	Highest	1	Medium-high	2	Medium-high	2	Deliverability risk (in terms of planning requirements and permissions) is expected to be lowest where schemes are based on upgrades to existing infrastructure. New infrastructure on greenfield sites is expected to have the highest risk. Any relevant environmental / statutory consents would be required.
		PVC (Bus Only)	£42,515,000	5.0	£109,185,000	3.4	£207,846,000	1.0	£149,269,000	2.4	£167,423,000	2.0	Results from modelling undertaken.
		PT Benefits	£43,648,905	4.2	£52,334,527	5.0	£40,074,353	3.9	£6,195,801	1.0	£8,120,677	1.2	Results from modelling undertaken. Does not include environmental disbenefits (see below)

Potential of the international high-tech businesses of the future.	the international high-tech businesses of the future.	markets so that the right conditions are in place to drive further growth.	the international high-tech businesses of the future.											
			More Housing			Environmental Impacts								
			£45,400,000	-	Not assessed	-	£198,100,000	-	£153,400,000		Not assessed	-	Mott MacDonald assessment of Wider Economic Benefits. Work assessed Options 1,3 and 4 only and therefore option-specific performance is not scored as part of this MCAF assessment. Source: Mott MacDonald (2016) Strategic Economic Appraisal of A428-A1303 Bus Scheme: Wider Economic Benefits.	
			GVA benefits - UK Level - (PVB over 30 years, 2010 prices, Source: Mott MacDonald)											
			Journey times (2031, Cambourne - Drummer Street, Inbound, AM Peak)	46	1.0	23	4.5	20	5.0	22	4.7	22	4.8	Results from modelling undertaken.
			Bus frequency (AM Peak, Buses Per Hour, Inbound)	6	1.0	12	5.0	9	3.0	9	3.0	9	3.0	Reported as number of buses per hour. For Option 1 divide by two as it is 12 buses per hour, but not on the full route
			Bus and Park and Ride mode share	21%	1.0	23%	3.0	25%	5.0	22%	2.0	21%	1.0	Results from modelling undertaken.
			Wider Impacts (PVB over 60 years, 2010 prices)	£8,220,538	5.0	£1,480,843	2.5	£1,361,425	2.5	-£2,613,091	1.0	-£2,467,951	1.1	Results from modelling undertaken.
			Constructability risk (complexity of delivery)	Medium	2	Medium	2	Highest	1	Medium	3	Highest	1	Delivery will be most complex where the route options include a new bridge over the M11. In addition, Madingley Road has traffic management restrictions in peak periods, so construction windows are likely to be restricted, increasing the complexity of construction.
			Operability risk	Highest	1	Medium-high	2	Lowest	5	Medium	3	Medium	3	Bus operations are easier where 2-way priority is given to buses. This gives operators more consistent and reliable journey times to enable easier planning for turn-around.
			Reliability	No segregation	1	Partially segregated	2	Fully segregated	5	Partially segregated	4	Partially segregated	4	Expected that offline options will offer a more reliable service than those that run online.
			Sub-total	31		42		57		41		38		
			Accessibility	Lowest	1	Medium	3	Medium	3	Medium	3	Medium	3	Based on qualitative assessment of accessibility plots, which rely on journey times.
			Sub-total	1		3		3		3		3		
			Total change in air quality over the 60 year appraisal period	-£98,413	5.0	-£390,560	1.9	-£400,349	1.8	-£476,740	1.0	-£365,105	2.2	These figures are partly based on highway modelling that is not being presented fully due to the model being overly sensitive to changes in network conditions, which don't totally represent changes due to the scheme.
			Change in CO2 emissions (£,NPV)	-£6,393,751	5.0	-£7,022,713	3.9	-£8,699,656	1.0	-£8,581,612	1.2	-£8,332,582	1.6	
			Change in noise impacts on households (£,NPV)	£52,070	5.0	-£1,571,200	3.2	-£2,110,641	2.5	-£3,115,847	1.4	-£3,461,636	1.0	
			Impact on the water environment	Neutral	5.0	Slight adverse	4.0	Slight adverse	1.0	Slight adverse	2.0	Slight adverse	3.0	Based on environmental assessment undertaken
			Landscape and visual impact	Slight adverse	5	Slight/Moderate adverse	2	Moderate adverse	1	Slight/Moderate adverse	2	Slight/Moderate adverse	2	Based on environmental assessment undertaken
			Heritage impact	Neutral	5	Slight adverse	4	Moderate adverse	3	Slight adverse	4	Moderate adverse	3	Based on environmental assessment undertaken
			Biodiversity impact	Large adverse	1	Large adverse	1	Large adverse	1	Large adverse	1	Large adverse	1	Based on environmental assessment undertaken, based on the principal of 'most adverse category'. Mitigation options to be explored during design development.
			Reduction in road traffic	Neutral	0	Neutral	0	Neutral	0	Neutral	0	Neutral	0	Minimal change across all options, compared to do-minimum

Stakeholder support	accidents										
	Sub-total	31		20		11		13		14	
	From public consultation	Most support	5	Some support	4	Most opposition	1	Some support	3	Some opposition	2
	Sub-total	5		4		1		3		2	
	TOTAL SCORE	68		69		73		60		57	

Table 7: Atkins (2016) with UK-level GVA impacts supplied by Mott MacDonald (2016). Strategic Economic Appraisal of A428-A1303 Bus Scheme: Wider Economic Benefits.

Commentary on MCAF Table Outcomes

Option 1 (on line Option from Cambourne to Cambridge using AA428 and A1303)

74. As outline in the Economic Case, Option 1 is the lowest estimated cost option. The combination of low costs and high levels of strict transport benefits results in a BCR of 1.03 (the highest of the 5 options) but will not offer a step change in connectivity and journey efficiency (i.e. combination of speed and reliability) and unlikely to deliver a HQPT service along the corridor. In increasing public transport capacity this option meets some, but not all, of the strategic criteria. Critically, the TSCSC aspires to deliver a High Quality Passenger Transport (HQPT) service along the corridor, with increasing levels of segregation. As a fully online option with bus priority measures on the existing highway, the option has a limited ability to achieve the key strategic objective to deliver HQPT services. The restrictions of the online alignment on the A1303 also mean that bus priority provision can only be accommodated in an inbound (eastbound) direction, meaning that there is no priority for services travelling away from Cambridge at the same time even with tidal flow arrangements.
75. Option 1 does not provide infrastructure or service improvements west of the Madingley Mulch roundabout. This means that this option is not likely to achieve the requirements (set out in the TSCSC) for providing 'busway / HQPT infrastructure' that connects Cambourne West and Bourn Airfield. In addition, this option does not improve cycling or pedestrian provision as there is little scope along the A1303 to widen the alignment to provide high Quality improvements. Therefore it does not support the requirements of the TSCSC policy, which aims to provide more improved cycling and walking routes.
76. The public transport benefits generated by Option 1 are driven mostly by the specific transport benefits provided to the users of the existing Madingley Park & Ride site, east of the M11 J13 Bridge. This is based upon the modelling assumption that patronage from the south i.e. M11 corridor is an important factor in the scheme.
77. The existing Park & Ride at Madingley Road allows traffic to be intercepted from both the A1303/Madingley Road and from the M11. Whilst journey time improvements related to the existing Park & Ride as a result of this option are relatively low, the volume of trips that have been generated for bus travel combined with the benefits provided to users of the Madingley Road Park & Ride site, result in the large transport benefits.
78. Option 1 is predicted to have the lowest impacts in terms of noise, air quality and emissions as well as wider environmental impacts (such as impacts on the historic environment and biodiversity) and this is primarily because the scheme will run on existing roads. At this stage it does not assume increased

car usage that takes up the freed up capacity due to the modal shift provided for by offline segregated route. It does not consider the implementation of demand management measures which would reduce this capacity.

79. The MCAF does not consider the impacts of property acquisition and land take which in the case of Option 1 unlike the other options would likely require the acquisition of some residential garden space.
80. In summary, from the MCAF and economic analysis undertaken it is evident that while Option 1 generates high transport benefits due to high volumes of use from P&R passengers at Madingley Road and low costs (and, therefore, demonstrates the best value for money) it also demonstrates a significantly lower strategic fit than options that deliver a highly segregated HQPT route. This is primarily due to the option providing no segregation and as a result not providing the same level of HQPT as routes with offline options

Option 2: Using Old St Neots Road with no significant infrastructure intervention and then routing north of the American Cemetery on Madingley Road before returning to Madingley Road east of M11)

81. Option 2 generates the highest level of public transport benefits of all options, driven in part by servicing both the existing Madingley Road Park & Ride (located east of the M11 J13) as well as the new Madingley Mulch Park & Ride. The BCR is 0.48 which is lower than Option 1 despite the higher benefits, due to much higher costs. The MCAF assessment identifies that this option addresses some of the strategic goals of the scheme, however it does not align fully with the longer term aspiration and visions of the sub-region to provide corridor-wide segregation for buses, pedestrians and cyclists.
82. The option is offline between Cambourne and Bourn Airfield which directly addresses the objective in the TSCSC to create a HQPT corridor that provides a busway/HQPT infrastructure to serve Bourn Airfield / Cambourne. This segregation does not extend throughout the scheme. This offline busway section increases the cost when compared to Option 1, however due to the option making use of existing infrastructure along St. Neots Road, it provides a compromise between fully offline and fully online options. The restrictions of the online alignment on the A1303 mean that bus priority provision can only be accommodated in an inbound direction, meaning that there is no priority for services travelling away from Cambridge on what is expected to continue to be a congested section of the corridor.
83. The Option is considered to be a compromise between costs, connectivity, accessibility and HQPT to the west of the Madingley Mulch roundabout. The option broadly addresses strategic objectives for the western section of the scheme. In addition this option provides direct walking and cycling

infrastructure along the offline section of the route, addressing walking and cycling objectives for this section of the route, however not along the entire corridor.

84. Based on the modelling and analysis, a significant proportion of the patronage is generated by the existing Madingley Road Park & Ride and not the new housing schemes at Cambourne West and Bourn Airfield. This is upon the modelling that takes account of patronage from the south i.e. M11 corridor.
85. Because this scheme includes new, offline sections, there may be noise impacts to additional households that were previously less exposed to noise, air quality impacts through increased vehicle kilometres and a related increase in GHG emissions. In addition there will be increased landscape, historic environment and biodiversity impacts due to the fact that the option includes a section of offline route through greenbelt land. This option passes closest to Site of Special Scientific Interest (SSSI) at Madingley Wood and the listed American Cemetery and additionally through the newly planted 800 Wood. Further design development could mitigate some of these effects in future stages of the scheme development.
86. This option provides the highest level of public transport benefits and is partially aligned to the strategic objectives and vision for the corridor and Greater Cambridge. Importantly by not providing segregation along the entire corridor, the option does not provide the level of segregation that is envisaged in the policy nor are pedestrians and cyclists catered for on a corridor-wide basis.

Option 3: Fully segregated route from Cambourne to Cambridge

87. Option 3 performs best in terms of strategic fit, mainly because the fully offline route provides the highest level of connectivity, capacity and journey efficiency and therefore is best aligned to the provision of a HQPT service and direct, segregated walking and cycling infrastructure. However, as a result the option is the most costly due to significant conception, design and construction costs (plus other costs, revenue and indirect tax impacts). It has a poor BCR of 0.20.
88. This option does not directly connect with the existing Madingley Road Park & Ride (as services would need to significantly divert from their route to do so), which results in lower transport benefits than Options 1 and 2, which do serve the Madingley Road P&R.
89. Importantly, this option avoids Madingley Road and is segregated, therefore the eastern section of the route does not add to congestion on Madingley road (nor is it impacted by congestion) as it is not online. This indicates a

good strategic fit in this area in that it addresses strategic HQPT objectives whilst also addressing existing congestion issues in this part of the corridor.

90. This option requires further environmental assessment. Noise, Air Quality and Green House Gas emissions are modelled to increase as a result of the new route and additional buses. The assessment to date does not take account of the potential overall reduction of car use due to the provision of segregated HQPT as a sustainable alternative to the care desktop assessment at this stage suggests that the relative effect on the landscape, historic environment and biodiversity may be significant as this scheme includes the most new off line infrastructure. Further scheme development would be required to assesses these impacts and proposed mitigation where required.

Option 4 – Using old St Neots Road with minimal infrastructure intervention, proceeding north of American Cemetery before entering West Cambridge.

91. Option 4 is offline between Cambourne and Bourn Airfield, which partially addresses the strategic objective to create a HQPT service to link Cambourne and Bourn Airfield with central Cambridge, Addenbrooks and the Science Park. However, this option's potential alignment, in the approach to central Cambridge, does not include a bridge over the M11 and instead re-joins the main carriageway where the buses will integrate with general traffic which severely undermines the HQPT offering on this portion of the route. Having utilised the existing bridge, the services would continue on dedicated bus infrastructure.
92. As for all the segregated or partially segregated options (Options 2 through to 5) there may be negative noise and air quality impacts to additional households that were not previously as close to bus routes. These negative impacts may be mitigated. A more detailed environmental assessment as part of further scheme development would identify what the effects are and any mitigation measures required as a consequence. While the exclusion of a new bridge does reduce cost, the cost still remain high compared to the associated benefits currently forecast for the route and as such the initial BCR of this scheme is 0.04.

Option 5 (Using old St Neots Road with minimal infrastructure intervention before proceeding south of the Madingley Hill across a new bridge to the east of the M11)

93. As this option includes new, offline sections, there may be effects to households that were previously not exposed to the levels of noise, air quality impacts and Green House Gas emissions associated with bus services running close-by. Further scheme development would be required to assesses these effects and propose mitigation measures where required.

94. This option does not serve the existing Madingley Road Park & Ride as buses would need to significantly divert from this route to do so, as such this Option has lower transport benefits than Options 1 and 2. Options 4 and 5 have slightly longer journey times than Option 3, and do not stop at Caldecote and Coton which suggest why Option 3 significantly outperforms Options 4 and 5.
95. The estimated costs associated with this scheme, compared with the associated benefits leads to an initial BCR of 0.05.

Summary: The Multi-Criteria Assessment Framework has been undertaken to provide a broad assessment of each Option against strategic fit, transport economic, environmental, and delivery criteria to indicate the extent to which each demonstrates a compelling case for investment. Option 3 (and 3a) have the highest combined score of all the Options as it aligns most closely with the strategic objectives for the scheme, namely the provision of a segregated and thus reliable high quality public transport that connects the housing developments in Cambourne and Bourn Airfield with employment sites in Cambridge, Addenbrooke's and the Science Park.

D Financial Case.

96. The Financial Case represents both Capital and Operational total outturn costs estimate and expenditure profiles of each of the Options are presented, along with an assessment of the impact of construction of each Option on the City Deal budgets and accounts.
97. The Financial Case has considered the estimated costs of the scheme, with reference to capital expenditure including estimated construction infrastructure and land costs.
98. As with all Cases at this stage of scheme development further refinement will be provided in the next Step of work.

Capital construction costs

99. Construction cost estimates for each of the options are derived from high level preliminary proof of concept design consideration. For further details on the infrastructure proposed for each option, refer to the option descriptions presented in the Strategic Case. Each option includes an estimated cost for the new Park & Ride site. The base costs exclude allowances for VAT, inflation, risk and optimism bias.
100. The capital cost estimates include the following key assumptions:
- Ground conditions are generally good with no soft spots;
 - No piling is required along the length of any guideway (i.e. shallow foundations);
 - Stabilising of soils not required over and above risk allowance;
 - Services are not generally diverted but protected;

- No major environmental impacts.
- A 12% allowance for construction preparatory costs, including professional fees.

101. The options that include an off-line segregated infrastructure allow for the cost of implementing a guided busway for the off-line sections.

102. Fleet investment has been estimated with reference to the Peak Vehicle Requirement forecasts, derived using the CSRM. For further details on the proposed number of public transport services for each Option refer to the Economic Case.

103. Table 8 provides a summarised breakdown of the out-turn cost estimate (i.e. the costs which will actually be incurred at the time of expenditure, taking into account the full impacts of construction inflation, with no discounting, market price adjustment or removal of background inflation as has been applied in the Economic Case) for each of the options, excluding VAT. The risk allowance is also included within the out-turn cost totals.

Estimated Cost item	Option 1 cost (000's)	Option 2 cost (000's)	Option 3 cost (000's)	Option 4 cost (000's)	Option 5 cost (000's)
Preparatory costs	£2,238	£5,106	£10,140	£5,945	£7,286
Construction + Land costs	£25,234	£55,517	£112,545	£64,124	£77,749
Risk	£5,164	£11,703	£19,147	£13,603	£16,679
Total	£32,636	£72,326	£141,833	£83,673	£101,713

Table 8 – preparatory, estimated capital construction costs for each option

104. The Financial Case represents a high level assessment of the five options

105. The Financial Case presents an estimated range of between £32 million and £141 million in out-turn costs (including risk) between the options. This variation can be attributed to the proportion of each Option which requires off-line infrastructure, including a new bridge over the M11 and the differences in route alignment (i.e. the resultant land acquisition requirements).

106. Option 1 is shown to be the lowest cost Option, with an out-turn cost of approximately £32 million. The estimated highest-cost option is indicated as Option 3, with an out-turn cost of approximately £142 million.

107. In addition to the estimated scheme costs presented, the whole life costs (maintenance and capital renewal) are considered within the Economic Case. Operational cost estimates are set out in Table 9.

Option	Initial Fleet Investment (000s)	Operating Cost (000s)	Operating Revenue (000s)	Revenue-Cost (000s, excluding fleet investment)
Option 1	£3,600	£38,500	£45,900	£7,400
Option 2	£5,700	£60,500	£52,200	-£8,300
Option 3	£5,300	£55,300	£42,000	-£13,300
Option 4	£5,800	£58,100	£24,300	-£33,900
Option 5	£5,800	£57,700	£28,200	-£29,400

Table 9 – Nominal modelled operational costs

108. In practice it would not be expected to set up a bus scheme that ab initio requires subsidy for the lifetime of the scheme, and would instead seek to optimise the bus service specification as far as possible, however, at this stage of analysis, the TAG assumptions are utilised in the modelling which results in an operational deficit.

109. Further work to reduce operating deficit will explore:

- The optimal number of additional buses per hour assumed on the recommended option and existing routes
- The optimal route of the recommended option to maximise patronage along the alignment or diversion of buses onto more commercial routes
- The optimal fare
- various sources of subsidy, such as developer contribution .
- Part of the subsidy includes paying for concessionary passengers for instance, which may be central government funded

110. The cost estimates will be subject to significant refinement to establish affordability as part of the further business case development

E Management/Delivery Case

111. The purpose of the Delivery Case is to assess if the proposals are deliverable. As such the Delivery Case presents the current view on the management and governance arrangements to be adopted to enable delivery of the scheme. It clearly sets out what needs to be done, why, when and how, with measures in place to identify and manage any risks.

112. The Delivery Case does not relate to any single option but addresses the overall programme and project management structure and seeks assurance that it has sufficient capacity to govern the project.

113. Use is made of evidence from other similar schemes delivered by the County Council such as the Cambridgeshire Guided Busway to demonstrate effective delivery structures.
114. The Delivery Case reviewed the City Deal programme management arrangements, the project management arrangements in place including the Terms of Reference for the Project Board controlling the project, the Project Inception Document and Project Plan.
115. The Delivery Plan concluded that arrangements that will ensure successful delivery of the scheme have been initiated by the promoters, with a number of plans and strategies emerging. The promoters can draw upon the lessons learned and experience of delivery of other major transport infrastructure projects including the Cambridgeshire Guided Busway. While there were difficulties encountered during construction, the system has delivered the required service levels and quality, with large numbers of passengers transferring to bus.
116. Governance arrangements are in place that will enable efficient decision making and change control to take place throughout the phases of the project from feasibility and Optioneering to approval, construction and operation.
117. There are a number of key milestones in the Project Plan where internal and/or external approvals will be required in order for the scheme to progress. The project will pass through a number of gateways to ensure that progress is approved. The role of the Assembly will be to scrutinise Executive Board decisions. Independent local audits will be carried out and these will be reported to the Executive Board, Assembly and the constituent member organisations as appropriate.
118. Effective communication is critical to the success of the project. Key stakeholders have been identified and will be involved in the delivery of the proposed scheme project. All internal and external stakeholders will need to be informed of relevant project information in a timely manner. Stakeholder engagement including public consultation and a LLF is an important means of realising opportunities and informing key decisions. The cooperation of the bus operator(s) will be essential so that high quality, reliable and frequent services can be realised.
119. Risk management processes are employed and recorded throughout the project lifecycle. A risk register is monitored and, as necessary, updated at regular workshops and meetings. Risks to delivery will be identified, assessed avoided mitigated or accepted. A key strategic risk will be the appointment of a contractor. Managing risk will be a key issue within any contractual arrangements.

120. Monitoring and evaluation of potential benefits is required to establish the extent to which the defined scheme meets the objectives. To be fully effective, plans for monitoring and evaluation form part of the early development of - and be a continuous process within – the scheme business case. Measuring performance, understanding scheme impacts and disseminating this to Government and to wider stakeholders to ensure that any potential issues post implementation are identified and addressed is a key activity.
121. The Management or Delivery Case provides a high-level assessment, of whether the proposed scheme is deliverable. The Delivery Case presents the current view on the management and governance arrangements to be adopted to enable delivery of the scheme and concludes that the promoters of the scheme have initiated arrangements to ensure successful delivery of the scheme, whichever Option is taken forward for implementation. The promoters can draw upon the lessons learned and experience of delivery of other major transport infrastructure projects for example The Cambridgeshire Guided Busway (CGB).
122. While there were difficulties encountered during construction, the Busway has delivered high quality public transport and exceed predicted service levels, with large numbers of passengers transferring from car to bus.

F Commercial Case

123. The Commercial Case explores the procurement strategy Options available to engage the market, setting out the financial implications of each potential procurement strategy and the commercial model which drives best value for money. It provides evidence on how the scheme is seeking to implement an innovative approach to deliver the objectives outlined in the Strategic Case.
124. At this stage of Business Case development, the Commercial Case has been prepared at a high level, to provide a strategic overview. Details on construction contract length and management will be finalised and updated subject to approval to proceed with the development of the Full Business Case at Step 4.
125. Five Options have been considered in the preparation of the Commercial Case. In identifying an appropriate procurement strategy for the infrastructure (Capital) outputs for these options procurement strategies have been developed. These will be subject to further specialist review and development during the next Step of scheme development.

126. In terms of infrastructure, all of the options include a new P&R site, bus priority traffic signals and varying amounts of utility diversionary works.

127. Where options require carriageway widening or completely new infrastructure (notably the P&R site and any new segregated busways) the delivery of which can only be secured by the use of additional land ('land assembly'), such land assembly will need to be secured through the possession of powers of compulsory acquisition; and compliance with legislative and regulatory requirements .

128. A high level qualitative risk assessment of the key specific risks to time, cost and delivery arising from the outputs from the 5options is shown in **Table 10** below. The assessment identifies in each case the derived risk of 'occurrence' in terms of High ('H'), Medium ('M') or Low ('L').

Risk	Assessed Risk Factor ('H', 'M', 'L')		
	TIME	COST	DELIVERY
Land Acquisition	H	L	L
Utilities works	H	M	L
New Bridge design	M	M	L
New Bridge construction	H	L	L
Contaminated land treatment	M	M	L
Traffic Management ('TM')	H	H	L
Signalised Junctions design	M	L	H
Signalised Junctions construction	M	L	H
Segregated design	M	L	H
Segregated construction	M	L	H
Park & Ride site design	M	L	H
Park & Ride site construction	M	L	H
Maintenance	L	M	M

Table 10: Qualitative Risk Assessment of Output Risks

129. The Commercial Case discusses risk management strategies which are common to all options. These strategies include:

- Establishing a clear capital works procurement strategy based on the specific design/build/operate requirements of the option, This will cover such matters as construction contractual arrangements to balance cost and risk, the appropriate pricing and payments mechanism and the contractor performance management regime.
- Establish a clear approach to contract management. A form of contract that is well understood throughout the supply chain and relies on a pre-defined risk register to allocate and manage anticipated risk is preferred.
- Considering an approach for securing levels of bus service including using market mechanism, CGB style Agreements third party contributions and using various partnership arrangements including potential Enhanced Partnership

arrangements as set out in the Draft Bus Services Bill (2016) currently under parliamentary consideration.

130. The Commercial Case at this stage of assessment considers all Options procurable. As identified in Section 1.11 of the Commercial Case ('Rationale for Preferred Sourcing Option') it is considered at this early stage that the 'Develop and Construct' model of procurement may be appropriate for all the options.

131. The risk mitigation facilities available within the New Engineering Contract (NEC) standard form contracts could be adjusted to suit the specific risk profiles that emerge for the scheme and the outline design developed further before tendering. Specialist support has been appointed to develop procurement and contract strategy to ensure that the City Deal obtains the best balance of efficiency and risk management in constructing a scheme.

Summary: The Financial, Commercial and Delivery Cases do not provide high level strategic differentials between the options. These Cases are dealing with more detailed implementation considerations which will be more fully considered at the next Step of scheme development. However these Cases do demonstrate that, commensurate with the stage of scheme development the overall approach taken thus far by the scheme and wider project management is compliant with TAG and feasible.

Overall Option Recommendation

Policy Compliance

132. As detailed earlier, the LTP, incorporating the Long Term Transport Strategy is the core transport policy document for the area and sets clear objectives for the extension of HQPT networks on the corridor and the extension of busway. These interventions are seeking to achieve modal shift. The approach is reflected in the TSCSC and South Cambridgeshire and the submitted Local Plans, providing what amounts to a single overarching development, infrastructure and delivery strategy for Cambridge.

133. A review of the extent to which options comply with policy goals has been undertaken to support option selection. The policy compliance review assumes that the stated policy goals are to achieve the highest quality outcomes in each area of public transport provision. The key factors which are considered policy compliant and the extent to which each option achieves them is summarised in **Table 11**.

134. In Table 10 the following rating approach has been taken:

- High rating – the Option is considered to contribute fully to the achievement of the policy goals
- Medium rating – the Option will partially contribute toward the achievement of policy goals with omissions
- Low rating – the Option will not achieve the policy goal or have significant omissions

TSCSC corridor goals (policy compliance)	Rating				
	Option 1	Option 2	Option 3	Option 4	Option 5
• Focus on bus and addressing issues that prevent a good service being delivered.	Low	Medium	High	Medium	Medium
• Segregated links or offline alignments on the A428 and M11.	Low	Medium	High	Medium	Medium
• Bus priority measures	Medium	Medium	High	Medium	Medium
• Outer ring of Park & Ride	High	High	High	High	High
• Busway / HQPT infrastructure to serve Bourn Airfield / Cambourne	Low	Medium	High	Medium	Medium
• Walking and cycling improvements, including direct links	Low	Medium	High	Medium	Medium
• Highway capacity improvements	Low	Low	Low	Low	Low

Table 11: Policy Compliance Rating of Options

135. Table 11 indicates that Option 3 with the provision of segregated infrastructure has the highest degree of policy compliance on key considerations.

The Option Selection

136. As set out in TAG guidance there is a key distinction between the transport appraisal process and the decision-making process. The transport appraisal process is about options generation, development and evaluation of intervention impacts. In contrast, the decision-making process involves a separate governance process concerned with identifying and implementing interventions that deliver the needs of the sponsoring organisation and fits best with its investment funding objectives

Overall Weighting

137. At this stage of scheme development the key requirement is to establish the strategic case for investment, to demonstrate how this investment will further City Deal’s aims and objectives and to secure approval

to proceed with development a Full Outline Business Case for a specific route alignment with an recommended option catchment area.¹³ The following **Table 12** summarises the overall performance of each option against the weighted 5 cases:

¹³ Ref: DfT (2013). The Transport Business Cases

	Strategic	Economic	Financial	Delivery	Commercial
Key Factors	<ul style="list-style-type: none"> • Segregation improves reliability • provides better connectivity, journey time speed direct connection between houses and employment – • future proofing for increased long term capacity , • policy compliance • Maximising wider economic benefits • HIGHEST WEIGHTING 	<ul style="list-style-type: none"> • Direct Transport benefits for users of scheme • Direct and scheme specific economic benefits • Environmental impact • HIGH WEIGHTING 	<ul style="list-style-type: none"> • Overall cost and affordability • LESS HIGH WEIGHTING 	<ul style="list-style-type: none"> • Capacity of City Deal to deliver schemes • LESS HIGH WEIGHTING 	<ul style="list-style-type: none"> • Management of risk factors related to build and operation of scheme • LESS HIGH WEIGHTING
Reason for weighting	<i>The level of assessment is focused on the strategic considerations and as such they best inform the decision. The strategic decision is key to get right before the more detailed analysis is undertaken in the next stage</i>	<i>Direct benefits of any scheme are significant in any strategic decision. However at the Option selection stage the degree of understanding of these benefits is lower, The direct benefits are more fully explored during the next stage</i>	<i>The costings are high level and subject to further refinement and as such should be used a 'scale of investment required' consideration rather than a detailed assessment of affordability at this stage</i>	<i>At this stage the key objective is to understand overall organisational capacity to deliver a scheme. Unless any clear deficiencies are identified in terms of delivering one specific Option this Case is not likely to be a key strategic decision making criteria</i>	<i>At this stage the objective is to ensure that overall risk management processes are understood and either are in place or can be put in place (in relation to capacity highlighted in Delivery Case) Again unless one Option highlights unmanageable risks which the organisation cannot manage, this is not likely to be a key strategic decision making criteria</i>
Option 1	<p>LOW PERFORMING OPTION</p> <p>This option has low strategic fit. It does not provide the level of segregation, capacity and resilience which would support the ambitious local and national policy objectives. Lowest impact on Gross Value Added which is a key City Deal objective.</p>	<p>LOW PERFORMING OPTION</p> <p>The overall BCR for this Option is low in terms of overall DfT investment criteria so taken in isolation there is no strong case to invest on the basis of this BCR. Moreover this BCR has low potential to improve during the next stage of work due to constraints of using the existing highway network – for example the impact on other road users</p>	<p>HIGH PERFORMING OPTION</p> <p>This is the lowest cost Option</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this Option and other Options in terms of the Delivery Case</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this Option and other Options in terms of the Commercial Case</p>
Option 2	<p>MEDIUM PERFORMING OPTION</p> <p>This option has medium strategic fit. It does provide segregation in parts of the corridor where there is currently significant congestion by providing an off line alignment to the north of Madingley Hill. However this capacity is then reduced by returning buses to Madingley Road which may impact reliability and journey</p>	<p>LOW PERFORMING OPTION</p> <p>The overall BCR for this Option is poor. There is lower potential to optimise the BCR as the Option is constrained by the Madingley Road corridor. Some of the benefits captured relate to Madingley Road P&R which</p>	<p>MEDIUM PERFORMING OPTION</p> <p>This is medium cost Option</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this Option and other Options in terms of the Delivery Case</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this Option and other Options in terms of the Commercial Case</p>

	times as well as reducing utility for other road users.	could be attributed to Option 3 with further analysis.			
Option 3	<p>HIGH PERFORMING OPTION</p> <p>This option has high strategic fit as it offers significant whole route segregation addressing both current congestion issues and future growth impacts. It creates significant new capacity from the west into Cambridge supporting the long term economic growth on this corridor. It offers a resilient solution under control of the City Deal authorities.</p>	<p>LOW PERFORMING OPTION</p> <p>The overall BCR is poor at this stage although there is significant potential to improve this BCR. High potential environmental effects and estimated construction costs impact the BCR. Mitigation and cost control and benefit optimisation would be used in the next Step of scheme development to improve the BCR.</p>	<p>LOW PERFORMING OPTION</p> <p>This is the highest estimated cost Option</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this option and other options in terms of the Delivery Case</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this option and other options in terms of the Commercial Case</p>
Option 4	<p>MEDIUM PERFORMING OPTION</p> <p>This option has medium strategic fit. It does provide segregation in parts of the corridor where there is currently significant congestion by providing an off line alignment to the north of Madingley Hill. However this capacity is then reduced by returning buses to Madingley Road at J13 which may impact reliability and journey times as well as reducing utility for other road users.</p>	<p>LOW PERFORMING OPTION</p> <p>The overall BCR for this Option is poor. There is lower potential to optimise the BCR as the Option is the crossing over the M11 and the bottlenecks around North West Cambridge and Madingley Road P&R. Some of the benefits captured relate to Madingley Road P&R which could be attributed to Option 3 with further analysis.</p>	<p>MEDIUM PERFORMING OPTION</p> <p>This is medium cost Option</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this option and other options in terms of the Delivery Case</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this option and other options in terms of the Commercial Case</p>
Option 5	<p>MEDIUM PERFORMING OPTION</p> <p>This Option has medium strategic fit. It does provide segregation in parts of the corridor where there is currently significant congestion by providing an off line alignment to the south of the A1303 and a new bridge over the M11. However it does provide for future capacity and resilience at the Bourn end of the corridor as it assumes only limited bus priority along St Neots Road. .</p>	<p>LOW PERFORMING OPTION</p> <p>The overall BCR for this option is poor. It does have high cost elements associated with Option 3 including off line busway and a new M11 crossing. .</p>	<p>MEDIUM PERFORMING OPTION</p> <p>This is medium cost Option</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this option and other options in terms of the Delivery Case</p>	<p>MEDIUM PERFORMING OPTION</p> <p>There is no significant differential between this option and other options in terms of the Commercial Case</p>

Table 12 – Option Assessment Summary Outcome Table

138. The assessment in Table 11 concludes that the Recommended Option 3 as the best performing option against the highest weighted strategic objectives. The performance of the other options against the other lower weighted cases does not provide significant differentials which would override the strategic benefit of the Recommended Option.

Park & Ride Option Selection

139. Based on the P&R location transport planning and engineering assessment it is recommended that location 3 as set out in Figure 4 is the best placed to accommodate the facility for the Recommended Option. It would allow the most direct access for public transport services, and remove the conflict of buses with other road traffic. Further assessment of the traffic arrangements and of the P&R location, will be undertaken alongside the development of the Recommend Option alongside the environmental and other assessments as set out in the Next Steps.

Discussion of Recommended Option

140. The main basis for recommending Option 3a as set out in Table 12 is the high strategic fit of this option which is the key criteria for decision making at the conclusion of the pioneering and feasibility Step 2 of scheme development.

141. Selection of a Recommended Option will allow the scheme to progress to a specific route alignment within the catchment area with further detailed assessment leading to the presentation of a Full Outline Business Case including a revised BCR for approval by the Executive Board in November 2017.

142. The key strategic benefits of Recommended Option 3 are as follows

- *Frequency*: High frequency services are particularly attractive to commuters. Segregated infrastructure provides for a high capacity 2 way public transport corridor into Cambridge into the city. Since frequencies on segregated routes can be higher than on routes where the bus conflicts with traffic, the capacity of the system is greater. Segregated infrastructure is therefore more future-proof to allow for increases in service frequency if required. For example the Transportation Research Board has published details on the maximum capacity (passengers per hour per direction) achievable for different bus infrastructure systems which are as follows.
 - 1,200 – 1600 for kerbside bus lanes (30-40 buses per hour)
 - 1,600 – 2400 for Busway and Guided Bus (40-60 buses per hour)

This offers long term resilience for current and future growth potential in an area with regional and national economic importance

- *Reliability*: Segregation improves the reliability of bus services against on line options. For example Real Time Passenger Information (RTPI) systems in Cambridge, for all school term days in November 2015 across a range of different infrastructures, suggest fully segregated busways provide greater reliability than bus lanes. For example, analysis of RTPI data demonstrates that in the AM peak, services in bus lanes exhibit 14% less variation in travel time compared to those not in a bus lane. Urban Busway services have 29% less variability in the AM peak than those running with general traffic. Greater reliability of public transport has potential to support business productivity and investment as set out in the GVA analysis.
- *Journey Times*: Segregation improves journey times by providing dedicated bus infrastructure. Estimated journey times for the options

assessed are as follows in **Table 13**. The current highest operational speed of buses on the Cambridgeshire Guided Busway is 57mph

Option	Cambourne-Queens Rd-Cambourne JTs (Minutes)
DM	75
Option 1	64
Option 2	38
Option 3	28
Option 4	32
Option 5	30

Table 13: Journey Times of options compared

- *Flexibility* : Off line infrastructure would be integrated into online bus priority measures to allow for services to join and leave the infrastructure at different point as required. Service patterns can be changed to complement changes to demand in the area.
 - *Coherence with City Deal vision and local policy objectives*: The City Deal vision is dependent on a coherent and high quality public transport network across the Greater Cambridge area. The Recommended Option is a highly segregated scheme and is anticipated to deliver the highest level of economic benefits since it also contributes to the longer term strategic aims of Greater Cambridge in terms of promoting a positive image and perceptions and investment in capacity for post 2031 growth.
 - The Recommended Option in line with local policy offers an extension of the quality interventions delivered by the Guided Busway and offers strong synergy with emerging options for the Western Orbital to provide a regional transit across the west of Cambridge. Additionally the provision of reliable high quality public transport will support the strategy for managing car use within the core centre of Cambridge in line with potential demand management measures.
 - *Potential for further optimisation*: The segregated bus infrastructure offers further potential for optimisation. Specific opportunities include:
 - Potential for specific service level agreements with operators
 - Higher quality environmental mitigation as compared to non-segregated route
143. The Cambourne to Bourn Airfield section of the Recommended Option is subject to a number of specific considerations:

- The progress related to the live planning application for the Cambourne West development. This planning application proposes development on a larger site with higher housing numbers than specified in the Submission South Cambridgeshire Local Plan (2350 dwellings on land excluding the existing business park)
- The extent to which effective bus priority measures can be achieved through Greater and Upper Cambourne to allow for high quality public transport
- The appropriate location to allow for priority bus access from Upper Cambourne to Bourn Airfield via the Broadway.
- Consideration at an appropriate stage through a Master planning process for Bourn Airfield and the extent to which a segregated bus corridor can be achieved and connection onward to either St Neots Road (option 3a) or to the south (Option 3)

144. Engagement has taken place with the promoters of schemes on these sites but further detailed work will need to be considered as part of the next Step of work.

145. The Cambridge West site is also a key location along the corridor. This site may also significantly intensify use subject to planning permission. A planning application is currently being considered by Cambridge City Council. Early engagement with the land owner has taken place to understand potential opportunities and constraints within this site and would need to continue as part of the ongoing option development.

146. The Cambridge West site will be served by the scheme.

147. The section of route on highway within the City Centre will be subject to further detailed development at the next Step of work. The issues around passenger demand, route optimisation and on street measures will be considered. Coherence with City Centre Access Study proposals for tackling peak time congestion (e.g. locations of Peak Congestion Control Points) will be a key consideration and proposals are being advanced to facilitate more effective bus operation in the city centre. It is envisaged that as part of scheme delivery measure a number of on street measures will be promoted to benefit all public transport and active modes.

148. The Recommended Option development would include strategic integration with the Western Orbital proposals as they emerge. In particular the issues around access to the M11 motorway at J13 or future integration with a segregated alignment alongside the M11 will be part of the detailed consideration in Step 3.

Summary: The Outline Business Case study which comprises the 5 cases for investment support the decision on the selection of the Recommended Option. The key consideration at this stage is strategic fit with the City Deal objectives as demonstrated in the Strategic Case. The more detailed considerations around the economic, commercial, financial and delivery cases have a greater degree of significance once a Recommended Option has been identified. Option 3 or 3a are recommended for detailed development. This detailed development will also include further testing of Option 3a to determine if it can be taken forward as the Recommend Option. Detailed proposals within the City Centre and through development areas as well as coherence with the Western Orbital are subject to further assessment.

Next steps

149. The OAR summarises the output STEP 2 of and recommends an Option for further scheme development.
150. The decision sought from the City Deal Executive Board at the end of STEP 2 on October 13th 2016 informed by the OAR is for the following recommendations:

The Executive Board is asked to:

- I. Note the accompanying Option Assessment Report, the further background papers containing the Outline Strategic Business Case, and the Appendices to this Report;
- II. Agree – in principle – that a segregated route between Cambourne and Cambridge, with a Park & Ride near the Madingley Mulch roundabout, best meets the strategic objectives of the City Deal and the City Deal Agreement, given the wider economic benefits;
- III. Instruct Officers to undertake further appraisal on:
 - (a) Possible specific route alignments within Catchment Area 3a ,with Catchment Area 3 as an alternative if (but only if) Option 3a proves unviable , noting that both would connect with and potentially through Cambridge West ; and
 - (b) a new Park & Ride (P&R) at location 3 (see Figure 5 below)all in accordance with the scheme design criteria set out in Paragraph 12 below, and within established environmental and planning policies;
- IV. Delegate to the Executive Director of Economy, Transport and Environment,

acting:

- a) with input from the A428/A1303 Local Liaison Forum (LLF); from the Parish Councils and Residents' Associations along Catchment Areas 3a and 3; from interested members of the Assembly; and from interested Councillors from the County, City and District Councils; and:
- b) in consultation with the Chair and Vice Chair of the City Deal Executive Board

the responsibility to:

- a. identify a specific route alignment(s) within Catchment Area 3a (or, if necessary, Catchment Area 3);
- b. identify a footprint for a P&R location at location 3;
- c. undertake a public consultation on that specific route alignment and P&R location, targeted for May-July 2017; and
- d. subsequent to that public consultation, provide a report to the Assembly and Executive Board, targeted for November 2017, containing a recommendation and Full Outline Business Case for a specific route alignment and one Park & Ride location; that would then subsequently be worked-up in detail, and an application made for Statutory Approval in 2018.

151. This further scheme development will consist of the following elements:

- Production of a more detailed potential alignment within the catchment of the corridor from which to recommend a final alignment
- Further environmental assessment including field surveys
- Additional transport/traffic modelling at both the strategic and local level
- Undertaken further public consultation and ongoing stakeholder engagement
- Refinement of business case to deliver a Final Outline Business Case for a single Option

152. The following section sets out in summary form the main aspects of this work under each element

Production of a detailed proposed alignment within the catchment

153. The next stage of work will require the identification of an optimum alignment for the scheme within the catchment area of the Recommended Option set out in the OAR. This will involve a multi-disciplinary approach including engineering, transport planning, a range of field technical surveys and buildability assessments. Property and planning considerations will also

form part of this analysis. The technical specification for the development of the optimum alignment will be based upon regulation guidance and policy.

Further environmental assessment

154. Identification of the optimum alignment will also require further environmental assessment
155. Environmental impact Assessment (EIA) is the process by which the anticipated or potential effects on the environment of the selected Option are assessed and measured...
156. The appraisal within the Strategic Outline Business Case has been high level desk top assessment using 'worst case scenario' considerations.
157. Having identified a Recommended Option further detailed assessment including site surveys will be undertaken to identify the potential scope of impacts in order to understand the likely environmental effects and to inform the design development and mitigation measures.
158. The Local Planning Authority and relevant bodies such as Natural England play an important role in attaining formal consent for a major transport scheme. This is likely to require an Environmental Impact Assessment to be undertaken and Environmental Statement submitted.
159. The following provides a list of some of the potential assessment areas of that EIA on an environmental topic basis.
 - **Planning**
 - **Property**
 - **Heritage & Archaeology:**
 - **Ecology & Biodiversity**
 - **Landscape and Visual**
 - **Air Quality**
 - **Lighting**
 - **Sound, Noise and Vibration**
 - **Water Quality, Flood Risk and Drainage**
 - **Ground Conditions**
 - **Waste**
 - **Social and Community**
 - **Transport**
160. Design measures or other relevant mitigation measures can be taken to reduce or avoid effects. In some instances environmental enhancements may result e.g. the creation of new or better quality ecological habitats. The overall approach to the design measures will be defined by local and national policy and guidance. The effects of the scheme will be addressed in detail and where necessary undertakings for appropriate and mitigation and or compensation measures specified.

161. The City Deal will produce environmental design criteria to guide design through the scheme development and minimise negative environmental impacts. The criteria will be based on the City Deal objectives. The criteria will include design approaches that ensure that new infrastructure integrates into the existing landscape and urban realm and protects the continuity and character of open space and green belt. The Design Criteria will consider the following issues:

- I. Location of infrastructure – respecting the urban and rural context for example through assessing proximity to and the relationship with the existing built up areas
- II. A specific route alignment assessment to test accessibility from the start to the end of journeys through the centres of employment (e.g. Cambridge West) and housing (e.g. Bourn) and the environmental effects with a view to integrating with existing infrastructure and minimising impacts
- III. Siting – positioning of infrastructure to minimise visual intrusion on the existing landscape through considering issues such as ground levels, slopes and other natural features and also minimising impact on important features such as ecological and heritage assets
- IV. Design – the materials, features and introduced landscaping that will form the new infrastructure and achieve high quality design, minimising environmental impacts consistent with delivering the scheme’s objectives, and integration with existing infrastructure and the ends of the route and along it.

162. These design criteria will reflect and supplement the existing statutory assessments, local and national policy and guidance and will update the Urban and Environmental Design Guidance adopted in June 2016.

Additional transport/traffic modelling at both the strategic and local level

163. Further scheme development will require refinement of the modelling. This will include both strategic and local traffic modelling. Strategic modelling will use updated data to fully consider future travel patterns across the corridor and focus on the optimisation of the performance of the Recommended Option. Local traffic modelling will be used to understand specific issues and highway constraints as they interact with the recommend Option. Examples may be junctions and P&R access/entrance.

Carry out further public consultation and ongoing stakeholder engagement

164. The public consultation approach taken to date is consistent with the TAG major scheme development methodology. Public consultation is undertaken as part of wider stakeholder engagement in advance of any decisions on final options to consider and facilitate necessary input in the development of the scheme. There are two main categories of stakeholders, although some may appear in more than one category, are:
165. Community stakeholders: This includes individuals or organisations that are interested because they live in the community the scheme may affect, for example interested parties, local businesses, bus operators, developers, landowners and local action groups. Local Liaison Forums provide for regular dialogue between the project team and members of the local community during the course of any major transport project, ensuring interested parties are kept informed and can continue to have their say outside of formal consultation processes. The Local Liaison will continue to be the key body engagement with local residents and their representatives and will form an integral part of ongoing scheme development.
166. Statutory consultees: These include bodies which the Greater Cambridge City Deal partnership should consult in order to comply with requirements set out in planning legislation. This includes bodies such as government agencies and local authorities. For example district and parish councils, Environment Agency, Highways England, Historic England and Natural England.
167. The next public consultation before recommendation of a final specific route alignment to the City Deal Board will be held on the proposed alignment(s) within the Recommended Option catchment area. Within the public consultation the range of alignments considered with the benefits and disbenefits of each will be set out alongside the proposed specific route alignment(s).

Refinement of business case to deliver a Final Outline Business Case for a single Option

168. The next key decision Report to the City Deal Board is proposed at the Completion of STEP 3 in November 2017
169. The culmination of STEP 3 is the Full Outline Business Case. The City Deal Board will consider the Full Outline Business Case to decide whether a recommended specific route alignment should proceed to detailed design of a scheme and application for statutory approvals.
170. The Full Outline Business Case will broadly mirror the structure of the Strategic Outline Business Case presented at the end of STEP 2 but will be for one option and will have significant additional detail including. :

- set out the result of the consultation programmed for Early STEP 3 and how this has influenced the scheme proposal
- provides details of the project's overall balance of benefits and costs against objectives and set out plans for monitoring and evaluating these benefits when required;
- confirm the strategic fit and the case for change;
- provide the business and financial rationale for the project;
- detail the proposed contract management resourcing, processes and benefit realisation plans;
- show how the return would justify the overall investment of time and money; and
- continue to be used to align the progress of the project towards achieving City Deal objectives.

171. In line with TAG guidance it will be necessary to continue to develop a lower cost option for comparative purposes to inform further decision that the City Deal Executive Board will be required to consider. As such Option 1 (on line option) will also continue to be assessed.

Programme

172. The Recommended Option may require a Transport and Works Act (TWA) Order or possibly (depending on the nature and scale of the scheme) a suite of consents including Highways Act powers and planning powers to achieve the range of consents necessary to deliver the scheme. Any consents 'package' would be likely to need to include the following:

- Compulsory purchase of land
- Planning permission
- Traffic regulation orders
- Public rights of way orders

The advantage of a TWA Order is that it could (for the right type of scheme) incorporate all of the above elements.

173. Should a TWA be sought and granted it will be for a scheme for guided transport only.

174. The Cambridgeshire Guided Busway Order 2005 took approximately 3 years to achieve and given the extent of powers which may be required for Option 3 an updated timescale from the generic programme reported to the City Deal Board in March 2016 is now set out in the following **Table 14**:

Stage	Target Completion Date
Report to GCCF Executive Board on outline business case in order to select a Recommended Option Completion of STEP 2	October 2016 (this report)
Refinement of Recommended Option (s) detail to ensure sufficient public information available during next consultation	End 2016
Consult on Recommended Option (s)	Summer 2017
Completion of Full Outline Business Case for Recommended Option	October 2017
Report to GCCD Executive Board on a Full Outline Business Case for the Recommended Option and to seek authority to commence statutory processes and procurement Completion of STEP 3	November 2017
Substantially complete statutory Approvals	June 2019
Report to GCCD Board on final scheme for authority to construct Completion STEP 4	September 2019
Start construction of scheme	February 2020
Substantially complete construction of entire scheme Cambridge to Cambourne	Summer 2023

Table 14 Programme

175. The above timetable does not preclude potential for sectional completion of elements of the scheme with potential joint working with developers along the corridor.
176. A detailed implementation strategy including procurement, contract management and construction timetable would form part of the Step 3 report to be presented to the Board in November 2017.