Supplementary Option Assessment Report for Cambourne to Cambridge Better Bus Journeys

Prepared by A428 Local Liaison Forum

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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)	A quality of Public Transport service that is generally perceived, by local politicians and in the media, to be reliable, frequent, good-value, reasonably comfortable (throughout the journey), reasonably fast, operate at convenient times, and to be suitable for most core journeys between key traffic generators (including residential areas) and the town / city centre. [Source: PROCEED – Guidelines for European High Quality Public Transport in small and medium sized cities]
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)
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, e.g., bus lane, busway
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

EXECUTIVE SUMMARY

1. This Option Assessment Report (OAR) supplements the previous OAR for the Cambourne to Cambridge Better Bus Journeys Scheme, published in September 2016 for the City Deal Executive Board meeting of 13 October 2016, adding information on an important option (henceforth referred to as "Option 6") that was omitted from the original OAR.

2. It also draws on an earlier "Options Appraisal Report", dated 20 June 2014, which evaluated 11 route options incorporating 21 possible route elements, including offline busways, online bus priority enhancements, Park & Ride, and traditional bus services. For reasons as yet unknown, that report was not made public until December 2016. Also for reasons unknown, some of the options recommended in that report were not taken through to the next stage of assessment and included in the September 2016 OAR. Option 6 is similar to one of those recommended options, which was not progressed (Scheme B).

3. This report is subdivided into 2 parts.

4. **Part 1** provides a review of context and the decision-making process to date, and provides a detailed description of the new Option 6, and compares it to the recommended option from the September 2016 OAR, Option 3/3a.

5. **Part 2** considers the five Transport Assessment Guidance 'cases' (which together form the Strategic Outline Business Case) for appraising the investment implications for the Options:
    - Strategic Case (including a wider economic assessment)
    - Economic Case (including an environmental assessment)
    - Financial Case
    - Commercial Case
    - Delivery Case

6. This assessment report takes account of the results of the public consultation on route options, carried out in October 2015. The consultation 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, there was strong opposition to the environmental impact and the cost of off-line infrastructure.

7. As well as the 2014 appraisal of route elements and options, this report also takes account of the information provided in the September 2016 Strategic Outline Business Case report on 5 Options for different levels of infrastructure interventions between Cambourne and Cambridge and proposed Park & Ride locations close to Madingley Mulch roundabout.

8. That Strategic Outline Business Case concluded: "the option with the highest

strategic policy fit is that which best meets the scheme objectives is Option 3 as modified by Option 3a" [sic]. However, the basis for that conclusion was not robust, as Option 3/3a was not compared to optimal alternatives.

9. Of the 4 other options considered, only one made significant use of existing infrastructure, but did so in a highly inefficient way and was described as unfeasible in the technical documentation. For as yet unknown reasons, more suitable options, recommended in an earlier "Options Appraisal Report", dated 20 June 2014, were not considered.

10. Furthermore, other reasons underpinning the conclusion were either speculative or inaccurate, including a suggestion that Option 3/3a had, by virtue of its offline segregation, a particularly high degree of "compliance with local policy objectives including both transport and planning policies", which is untrue; and that it generated "high economic benefits as expressed through Gross Value Added to the national economy", which is highly speculative and not supported by robust methodology.

11. The Economic, Management, Commercial and Finance cases did not significantly differentiate between options 2, 3/3a, 4 and 5, but did find that Option 1 was substantially less expensive and had a benefit-cost ratio (BCR) around five times higher than other options. There was no convincing evidence in the Economic Case (which captured direct transport/economic and environmental costs and benefits) to lead to a conclusion that option 3/3a was superior to any other option.

12. Public consultation and stakeholder engagement was intended to inform the ongoing development of the scheme but has so far been largely disregarded. There has been strong support for public transport and cycling improvements on the corridor but overwhelming opposition to the cost, social impact and potential environmental effects of new infrastructure on the green belt.

13. A Local Liaison Forum (LLF) was established with a view that it would play a key role in further detailed scheme development but its major recommendations have thus far been resisted by the City Deal Executive Board. After extensive consultation and review, the LLF has proposed a preferred route option.

14. This report provides a detailed assessment of the LLF's preferred route option and Park & Ride location.

15. Additional Technical Notes are also in preparation, addressing topics such as:

- Practical aspects of centrally-located on-line bus segregation (central bus lanes);
- Design options for Madingley Mulch intersection;
- Increasing modal share of public transport without costly infrastructure.

PART 1: BACKGROUND – SETTING THE SCENE

Introduction

1. This Option Assessment Report (OAR) summarises and assesses the same range of technical information for the Cambourne to Cambridge Better Bus Journeys Scheme as the original report and follows the same essential format.

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

Objectives of the Scheme

3. The Cambridge to Cambourne Better Bus Journeys scheme objective was originally stated as "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". The flaw in this objective is that it focuses exclusively on new infrastructure, without consideration of other aspects of service provision, such as journey cost, accessibility, user experience, etc.

4. 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. While there is a stated preference for segregated bus infrastructure, there is no indication in any of the plans that this has to be off-line. Indeed, the strategic plans specifically identify on-line segregation as a strategic target for the A428 corridor.

5. The PROCEED project (Principles of successful high quality public transport operation and development) is a 3-year project co-financed by the European Commission aimed at helping to plan, develop and implement effective and efficient public (bus) transport systems in small and medium sized European cities. Detailed analysis of data and experiences of 67 small and medium sized European cities in 24 European countries led to a better understanding of success factors and pitfalls for efficient and effective public bus transport and delivered 16 high-level recommendations for optimal system provision.

6. Among the most pertinent recommendations are:

   - Build solid political support for HQPT projects: It is important to obtain broad political consensus for HQPT to ensure that planning and service can continue even in the event of a change in local government.

   - Deliver high quality throughout the "package": HQPT aims to provide a service that competes with private cars (high availability, good comfort, etc.). Therefore, public transport services must be "as good as possible" in

all respects. Frequent service will not attract customers if, for instance, buses are of poor quality, dirty or badly maintained. However, providing top-level quality and standards in all aspects of operation is expensive and, consequently, the goal is to balance the quality of each element so that it contributes to a consistent quality level for the overall system (vehicles, stops, level of service, customer information, tariff system). **Extremes should be avoided**: single strategies that are too ambitious may cause financial problems and poor quality in any one element may destroy the image of the whole system.

- Continuous marketing is critical for success: The public transport industry tends to underestimate the value of marketing. However, research shows that in some cases 'soft' techniques, such as marketing, can be more effective in attracting new customers than 'hard' techniques, such as providing more buses or lines. An urban bus service needs continuous marketing and strong, well-designed 'branding' to enter and remain in the minds of potential customers and citizens. A good and positive image of the urban bus system among all citizens is a major factor in delivering success.

7. The scheme should therefore seek to deliver a high quality public transport solution which, as identified in the original OAR:

    - 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 Cambourne and other western settlements with 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).
    - 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;
    - 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; and
    - Improves quality of life and environmental sustainability in Greater Cambridge.

    But also:

    - Provides genuinely high quality public transport, not just as defined

simplistically in the original OAR ("frequent, fast and reliable journeys") but as much better defined in the PROCEED project: "a service that is generally perceived, by local politicians and in the media, to be reliable, frequent, **good-value**, reasonably comfortable (throughout the journey), reasonably fast, operate at convenient times, and to be suitable for most core journeys between key traffic generators (including residential areas) and the town/city centre".

8. Quality should not be defined solely as the extent to which infrastructure can deliver 'fast, frequent and reliable' public transport journeys as that is not the only determinant of whether the service provides a genuine alternative to the private car. Because of the time needed to access public transport (the time between home and bus stop and between bus stop and workplace, plus waiting time), before the infrastructure can deliver any benefits, the raw bus journey time may not be sufficient to persuade many travellers to shift mode away from their car, especially if the user cost is unattractive. Large investments in infrastructure to shave modest amounts off the bus journey time are unlikely to be worthwhile, especially where the bus journey time is a smaller proportion of the overall end-to-end journey time. For example, if a commuter has a 10 minute walk to the bus stop, an average waiting time of 5 minutes and a further 5 minute walk from the bus stop to their place of work, then a bus journey time of 14 minutes represents only 41% of the 34-minute journey, and may not be competitive with the private car even at peak periods.

9. Optimal modal shift to buses is likely to require a balanced approach including infrastructural improvements to provide bus priority and/or segregation, enhanced service provision (frequency, comfort, ease of ticketing, etc), attractive fares for users and effective promotion.

10. By way of summary, the September 2016 OAR proposed that 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". However, by its nature, a "qualitative step change" cannot be measured and is not helpful either as an objective or as a performance indicator. A more helpful objective may be a quantitatively defined modal shift, with modelling used to determine an appropriate degree of shift.

Local Context – "Local Plan" and Transport Strategies

11. The Transport Strategy for Cambridge and South Cambridgeshire (TSCSC) and the Long Term Transport Strategy detail a range of improvements on the A428 corridor:

    - "A segregated bus link from Cambourne to Bourn Airfield, and on through the development to the junction of St Neots Road with Highfields Road; and any measures necessary to ensure that a bus journey between Highfields and the junction of the A428 and the A1303

is direct and unaffected by any congestion suffered by general traffic" (to be completed by 2020/21 at a cost of £20m).

- "On-line or off-line bus priority measures between the A428 and M11" (by 2016/17 at a cost of £9m);
- "On-line bus priority measures between the M11 and Queens Road" (by 2018/19 at a cost of £24m).

12. 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 developments. 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. It is noteworthy that the Inspector was critical of the assessment work and justifications provided by the Councils, in particular the failure to evaluate all reasonable options to the same standard as the Council's preferred option.

13. There are current congestion issues on Madingley Road inbound in the morning peak hours. The key current conditions on the corridor can be summarised as:
    - long delays on the eastbound (inbound) A1303 up to the Madingley Road Park & Ride (P&R) site;
    - inbound bus delays on Madingley Road in the AM peak;
    - significant journey time variability along the single carriageway sections of the corridor, eastbound in the morning peak;
    - low traffic speeds in both peaks, particularly approaching / at key junctions;
    - during the AM peak, 80% of the inbound route length from A428/A1303 junction to M11 J13 is subject to queues;
    - negligible westbound (outbound) delay – 17 seconds – in the afternoon peak hours from J13 to A428/A1303 junction;
    - the average delay in AM peak is 18 min between A428 / A1303 junction and Queen's Road / Northampton Street; and
    - significant knock on impact of interaction between P&R, M11 and other traffic that exacerbates congestion.

Summary: The A1303 area of the corridor is close to or at transport capacity in the inbound direction. An intervention to segregate buses from other traffic for inbound travel is needed. However, a segregated intervention westbound is of much more limited value.

Early Project Development Work

14. The Options Appraisal Report dated 20 June 2014 looked at 21 route elements, including offline busways, online bus priority enhancements, Park &

Ride, and traditional bus services, and combined them to generate 11 viable route options. Of these, four schemes were recommended for further assessment:

- Scheme A: Park & Ride at Madingley Mulch, signalisation of Madingley Mulch roundabout, a nearside eastbound bus lane on Madingley Rise and Madingley Road);
- Scheme B: a segregated bus route through Cambourne and Bourn Airfield, with services then running via St Neots Road to Madingley Mulch roundabout, signalisation of Madingley Mulch roundabout, a nearside eastbound bus lane on Madingley Rise and Madingley Road, potential intermediate Park & Ride at Bourn Airfield;
- Scheme C: a segregated bus route via Cambourne and Bourn Airfield re-joining Madingley Rise just west of the M11 having run to the north of Madingley Rise from a Park & Ride Site at Madingley Mulch , nearside eastbound bus lane on Madingley Road; and
- Scheme D: Park & Ride at Madingley Mulch, segregated offline bus route south of Madingley Rise and Madingley Road – this would not include a potential intermediate P&R located at Bourn Airfield due to the proximity with the new P&R located at Madingley Mulch.

15. The report noted that all four schemes "meet the strategic rationale for the intervention" and "could deliver significant benefits / impacts in terms of capturing demand, mode share / shift, and journey times".

16. For reasons that are as yet unclear, although Scheme A, C and D were effectively taken forward for further, detailed assessment, Scheme B was not, despite having many positive features, including low cost and time to deliver, adequacy of modelled journey time savings and low requirement for land take. In view of subsequent consultation findings (see below), it is also likely to attract the least public opposition.

Public Consultation

17. The results of a public consultation were presented to the Executive Board in March 2016. Important findings included:
    - 77.2% of respondents indicated their usual mode of travel was by car as a driver
    - 25.5% indicated they used the bus between Cambourne and Cambridge;
    - 'Factors making bus travel a better alternative to the car:
        - 'Reliable journey times' cited by 50.7% of respondents.
        - 'Faster journey times' cited by 44.3% respondents, and
        - 'More buses per hour' cited by 43.1% of respondents.
        - Although (surprisingly) cost of travel was not specifically asked, 142 respondents volunteered that reducing fares would make bus travel a better alternative.
    - 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;

Summary: Most support received during the consultation was for on-line Options and most objections were to off-line Options. 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, Hardwick Wood and the West Fields;**
- **High cost was also mentioned as a consideration.**

Description of Options

18. The indicative catchment area for each option is shown in Table 1 below.

19. Option 3/3a provides new off-line infrastructure for most of its route up to the West Cambridge site, including a new M11 overbridge to the south of the existing bridge at junction 13. Access to this new bridge would be via the north side of Coton and through the Coton Orchard. There are four possible routes from the new bridge to Grange Road, two of which potentially cross sensitive green belt. No information is yet available regarding the route, or potential journey times, from Grange Road to the centre of Cambridge. The scheme includes a new P&R in the vicinity of the Madingley Mulch Roundabout, the preferred location being next to Crome Lea business park on the side and crest of Madingley Hill. At the highest point west of the city, well inside the green belt and dominating the village of Coton, this location is highly controversial.

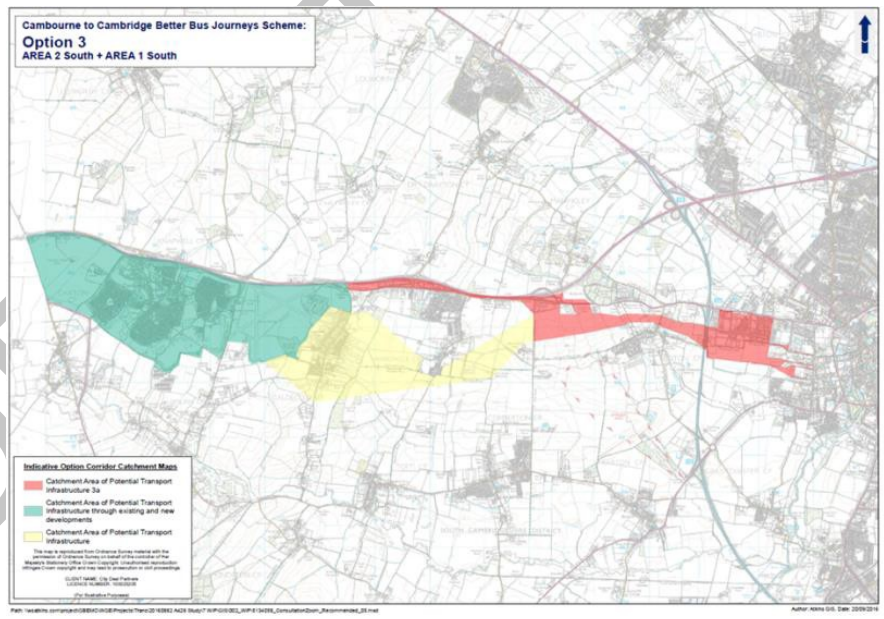
20. Option 6 provides a congestion-free, high-speed bus route between Cambourne/Cambourne West and a development at Bourn Airfield, if it is approved, and the Madingley Mulch Roundabout. Express services use the existing, uncongested A428, with the future option to designate one lane for “high-occupancy vehicles”, or even add dedicated bus lanes, should there be a traffic increase that warranted it. Stopping services, serving Caldecote and Hardwick villages, use the existing, uncongested St Neots Road, with bus priority measures where appropriate. Preferential signalling and/or segregated access is provided for buses across or round the Madingley Mulch Roundabout. A Park and Cycle/Ride is located in the vicinity of the A428 junction at Scotland Farm. This serves all local communities between

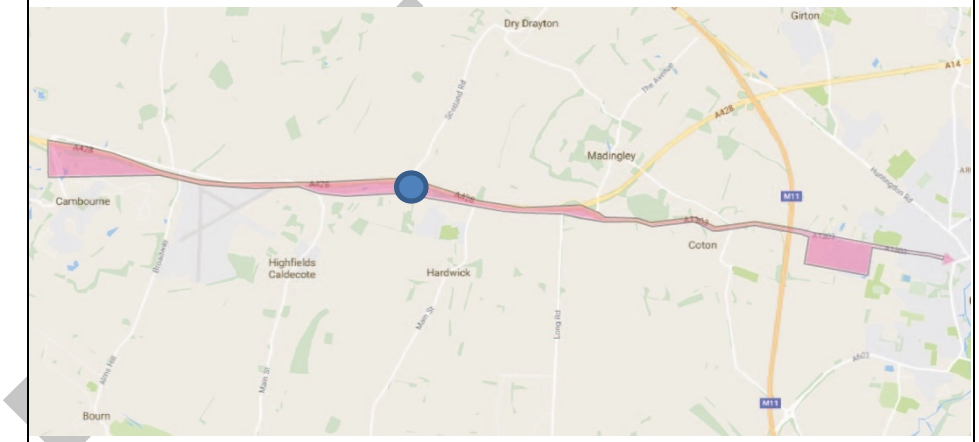
Cambourne and Cambridge, intercepting traffic prior to the build-up of congestion. Along Madingley Rise to the West Cambridge site, on-line segregation takes the form of one or two bus lanes, in the centre of the carriageway. A single central bus lane, either specified for inbound use only, but also capable of configuration for tidal use, is already known to be feasible (Tidal Bus Lane Review, 24 May 2016, Atkins). As congestion is limited to morning peak hours, a tidal solution would be more than adequate to provide attractive all-day journey times. A segregated, off-road pedestrian/cycleway runs south of Madingley Rise, through Coton village and over the existing footbridge to the West Cambridge site.

21. Some buses may continue along Madingley Road to provide an express end-to-end commuter bus service. The majority enter the West Cambridge site at Ada Lovelace Road or High Cross and continue along Charles Babbage Road. A bus/cycle transport hub would be located within the West Cambridge site, possibly on Charles Babbage Road. The City Deal has the opportunity currently to influence the Master Plan submitted by Cambridge University to ensure the provision of such a high quality transport hub on the site. Some buses connect with the Western Orbital route to Addenbrooke's, some traverse the North-West campus to the Science Park and some exit the West Cambridge Site to the north, travel along the existing infrastructure of Madingley Road and continue via Northampton Street, or could turn into Grange Road. At the West Cambridge transport hub, rental bikes will also be available, or passengers can choose to walk 10-15 minutes to the city centre. A dedicated cycle route from the West Cambridge site to the city centre will be established. In addition, high quality cycle and pedestrian provision will be provided from the transport hub (via an underpass beneath Madingley Road) to the North-West Cambridge site.

22. Of the two available route options between the West Cambridge site and the city centre, using Madingley Road is much less damaging than using Adams Road and makes more sense as it is the arterial main road. Furthermore, the route to, say, the bus stops at Grand Arcade/Drummer Street is much more efficient via the north of the city (Madingley Road, Northampton Street, Bridge Street, Jesus Lane and Emmanuel Road) than via the south (Adams Road, Grange Road, Queens Road, Silver Street, Trumpington Street and Downing Street, or Lensfield Road in the outbound direction). The northern approach is less than 2.5 miles in or outbound, of which about one-third is on roads already restricted to general traffic, with an approximate peak hours journey time of 7 minutes each way. The southern route in the outbound direction is almost 4 miles long, with a journey time of more than 10 minutes.

Table 1: Description of Options

Scheme	Option Description	Option Catchment Area Map
Option 3/3a	• A new off-line segregated dedicated bus route connection between Cambourne and Bourn Airfield. • The segregated route then runs south of Hardwick to Madingley Mulch roundabout. • *In Option 3a, the segregated route instead runs alongside the old A428 (St Neots Rd) to Madingley Mulch roundabout.* • From here direct access to a new segregated, dedicated busway running south of Madingley Road and Madingley Rise through Coton 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)	

Option 6	• A high-speed, congestion-free connection between Cambourne and the A1303/A428 junction using the A428 and/or St Neots Road, with bus priority measures where appropriate, including around/across Madingley Mulch roundabout. • Park & Ride in vicinity of A428 junction at Scotland Farm. • On-line single/tidal or double bus lane from the A1303 / A428 junction along Madingley Rise and Madingley Road, over existing M11 bridge and into West Cambridge site. • Segregated off-road cycleway south of Madingley Rise and through Coton. • Some buses may provide direct express service to city. Those serving West Cambridge site exit to the north and access city centre via Madingley Road and Northampton Street or Grange Road. • Bus/cycle hub on West Cambridge site, with dedicated cycle route into the city. Interconnection with Western Orbital route to Addenbrooke's, and through North-West Cambridge site to Cambridge Science Park. • Rental bikes available at the Hub for onward travel.	 Scotland Farm P&R

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. Despite that, the September 2016 OAR recommended a route option (3/3a) which offered extremely poor value for money. Furthermore, other route options which could have performed equally well overall and delivered far superior value for money were omitted from assessment. This report redresses that oversight. This will help ensure that City Deal complies with its assurance framework.

Details of the Assessment

2. This report follows the same TAG methodology used in the September 2016 OAR. The proposed Option 6 is compared against Option 3/3a, the recommended option in the previous OAR.

Outcomes of Assessment

A Strategic Case

3. The Strategic Case was laid out in the September 2016 OAR. It is noteworthy that while HQPT routes should ideally be "free from other traffic, where possible, in order for them to deliver on reliability and speed of journey", there was no strategic imperative for segregation to be off-line rather than on-line. Clearly, there must be a balance between costs (financial, environmental, social, etc) and benefits (primarily the journey time and its predictability in peak hours) when determining whether an off-line approach is superior to on-line.

4. The output which seems to have been considered most important is Wider Economic Benefits (WEBs). These were very crude measures based on combining:

- a qualitative appraisal of the intervention level of the option – designated High ("a significant degree of offline segregation for all or the majority of the route"), Medium ("a hybrid of both on and off highway measures such as a stretch of busway combined with an on road bus lane") or Low ("conventional highway improvements such as bus lanes") – 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).

5. This “finger in the air” assessment led to a conclusion that options with High and Medium levels of intervention were likely to deliver the most benefits in terms of supporting business investment and growth and labour market mobility. It was further concluded, without any clearly supported justification, that off-line segregation “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”. No evidence of any kind was provided to support the suggestion of a positive image and perceptions.

6. It is noteworthy that the analysis only considered the potential incoming population and failed to take into account the impact of interventions on the existing population, which contributes enormously to both current and future economic prosperity. If an intervention caused a negative image and perceptions among a significant proportion of the existing population, then that could be expected to reduce its economic benefits.

7. A revised WEBs assessment estimates that the total attributable proportion of remaining B-use (Business/Industrial/ Storage/Distribution) jobs in Greater Cambridge is not significantly different between Option 3/3a and Option 6, amounting to around 800 jobs and housing in the region of 900 dwellings between 2016- 2031 for each option.

8. The calculated wider economic benefits are shown in Table 2:

Table 2: Wider Economic Benefits (£Ms rounded to 2010 discounted values and prices) over 30 year period

	Option 3/3a	Option 6
GVA benefits – Greater Cambridge level (£s in discounted 2010 factor prices)		
Direct jobs	786	786
Direct GVA per annum	22.6	22.6
TOTAL GVA	**679.3**	**679.3**
GVA benefits – UK level (£s in discounted 2010 factor prices)		
Land utilisation – net additional jobs to the UK	167.5	167.5
Move to more productive jobs within the UK	30.6	30.6
TOTAL GVA	**198.1**	**198.1**
Welfare benefits – UK level (£s in discounted 2010 market prices)		
Reduction in spatial inequalities	1.21	1.21
Alleviation of unemployment	0.28	0.28
Option and non-use values	29.76	29.76
TOTAL WELFARE	**31.25**	**31.25**

9. It should be remembered, as noted in the previous OAR, that the assessment of wider economic benefits is “carried out at an early stage conceptual level” and great caution should be exercised in using the quantitative outputs. In

particular, it should be recognised that the margin of error is extremely large on the calculated values.

Western Orbital Strategic Integration

10. Current thinking on the Western Orbital indicates a preference for it to run on the M11. Table 3 summarises the strategic fit between Options 3/3a and 6 and the on-line Western Orbital options.

Table 3: Strategic Assessment of Western Orbital and A428 Options

	Option 3/3a	Option 6
Western Orbital using M11	**Not as attractive due to requirement for buses to loop through West Cambridge** to access the M11 at Junction 13; **Increased journey time** could discourage use.	Opportunity to **connect at Madingley Road P&R** to access the M11 at Junction 13; **Improved connectivity** could encourage use

11. The Western Orbital assessment in Table 3 indicates that selection of Option 3/3a will make it more difficult to ensure the effective integration of the A428 / A1303 scheme with a Western Orbital Option that uses the M11.

Cambridge Access and Capacity Study

12. A scheme involving Peak-time Congestion Control Points (PCCPs), where key routes in the City Centre would be closed to general traffic in the morning and evening peak hours, was considered by City Deal. Early traffic modelling suggested that PCCPs could result in more congestion at peak times along Madingley Road and this was used as an argument to support the off-line segregation of Option 3/3a. However, that scheme has now been shelved and that argument no longer holds. In any case, Option 6, with on-line segregation, would have been equally beneficial.

Summary: The Strategic Case sets out the case for implementing the scheme and assesses options at the highest strategic level. The Strategic Case indicates that segregation (on-line or off-line) will deliver the highest strategic fit against the core City Deal objectives, because those objectives already pre-determine segregation to be a strategic objective. A crude estimate of wider economic benefits within the Strategic Case suggests that segregation (on-line or off-line), where that is needed to by-pass peak-hours congestion and therefore deliver a journey time benefit, may deliver useful benefits, though the numbers should be treated with caution. On that basis, the Strategic Case supports both Option 3/3a and Option 6 equally.

However, a consideration of the interaction between the City Deal schemes (A428 & Western Orbital) supports Option 6 as the Option with the greatest coherence to the wider programme.

B Economic Case

13. 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 speculative and unweighted multi-criteria analysis of the performance of each Option against a range of qualitative and quantitative economic and strategic criteria.

14. Table 4 below summarises the monetised impacts of the scheme as defined by the Economic Case.

Table 4: Economic appraisal summary (all values NPV, 2010, £000s)

Costs and Benefits	Option 3	Option 6
Net Public Transport Benefits (£000s)	57,536	56,886
Environmental Impacts (£000s)	-9,968	-6,440
Wider public finance (Indirect Tax Revenues)	-6,252	-6,796
Total Present Value Benefit (all monetised benefits, including wider public finance impacts and excluding wider economic impacts) (£000s)	41,317	43,694
Total Present Value Cost (£000s)	207,846	42,515
Initial BCR	0.20	1.03
Wider Economic Impacts (£000s)	1,361	8,221
Total Present Value Benefits (all monetised benefits plus Wider Economic Impacts) (£000s)	42,678	51,870
Adjusted BCR	0.21	1.22

15. The Benefit to Cost ratio for Option 3/3a is extremely poor even after adjustment. There is no prospect whatsoever that this option could ever offer anything above poor or low value for money. The BCR for Option 6 is low but has the possibility to rise to medium (1.5-2) or even high (2-4), after further refinement.

16. Low transport benefits reflect the low modelled levels of demand for public transport along the A428 corridor which are due to the relatively low added value offered by public transport (high-quality or otherwise) on the corridor and the relatively small population which will be served, even taking account of future growth in the new developments. Unlike the situation between Huntingdon/St Ives and Cambridge, where an attractive direct route for cars did not exist, the A428/A1303 route from Cambourne to Cambridge is short (10 miles), free of congestion apart from 1-2 hours on weekday mornings ona specific stretch (Madingley Rise) and generally attractive to car users, especially those whose journeys continue up or down the M11, to workplaces north or south of the city or to the Midlands or London. As noted in the original OAR: “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”.

17. Therefore, the opportunity for achieving modal shift, even with the highest level of segregation, will be somewhat limited and it is difficult to justify a large expenditure to pursue it. A more realistic and credible approach would be to invest an appropriate amount in improving the public transport offering to capture the bulk of the modal shift available, leaving funds for other initiatives which could deliver further value.

Environmental Assessment

18. Option 3/3a has an enormously higher environmental impact than Option 6, both in terms of the new off-line busway infrastructure and the proposed Park & Ride. Indeed it has the worst environmental impact of any option considered.

19. Option 3/3a would pass through Option 3/3a would pass through a large swathe of Green Belt, potentially including The West Fields, The Coton Orchard, Hardwick Wood, and along the south face of Madingley Rise.. Whilst inappropriate development in Green Belt is generally restricted, development of local transport infrastructure can be considered as appropriate development under specific circumstances. However, it must be recognised that the presence of a busway through the Green Belt would greatly add weight to the arguments of landowners seeking to develop their Green Belt holdings. Unsurprisingly, the strongest support for Option 3/3a has come from landowners wishing to develop in the Green Belt and others sympathetic to such aims.

Summary: The Economic Case estimated a very poor BCR for Option 3/3a and a much better BCR for Option 6. It should be recognised that the BCR assessment is based on many assumptions and subject to many caveats. The calculated values might therefore increase somewhat (perhaps as much as double) as further refinements are incorporated. However, there is no prospect that Option 3/3a will ever represent acceptable value for money.

The Environmental Assessment shows that Option 3/3a has significantly higher environmental impact that Option 6, but then it is the worst of any option considered.

C Multi Criteria Analysis Framework

20. 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 a very crude appraisal tool used to assess the Strategic Fit of the Options.

21. As with some other outputs, caution should be exercised when considering the numerical outputs of the MCAF, which have a very high margin of error. While it sometimes appears helpful to have numbers to compare, it must be recognised that the scores generated by the MCAF are based on highly subjective, unvalidated and unweighted input values. This was particularly the case in the MCAF presented in the original OAR, which fell foul of several of the DfT's guidelines on multi-criteria analysis. The MCAF presented below has corrected some of these errors, but the resulting outputs should still be treated with appropriate caution.

22. The MCAF assesses Options based on the following strategic criteria:
    - 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 and consequent reliability (where both off-line and on-line segregation allow for similarly improved reliability);
    - The extent to which the Options provide potential improvement in cycling and walking infrastructure (which can be achieved equally by an off-line segregated busway with adjacent cycle/pedestrian path, or much less expensively by means of a separate, segregated cycle/pedestrian path).

23. The original MCAF used repeated, overlapping measures of the above criteria, resulting in double-counting and redundancy. For example, separate criteria for walking and cycling benefits were included, whereas those benefits are achieved by the same choice (a cycle/pedestrian path) and are therefore not independent. Similarly, "level of service that segregation provides", "operability" and "reliability" all measure the same fundamental attribute, which is journey time reliability/predictability.

24. Table 5 presents the MCAF assessment for each option, still without any weighting but removing sources of redundancy or double-counting. For each attribute, the better performing option of the two scores 5, the other scores 1.

Table 5: Revised MCAF

Outcomes	Metric for scoring outcomes	Ranking				
		Option 3/3a		Option 6		
		Assessment	**Score**	**Assessment**	**Score**	**Rationale**
Value for Money, increased transport capacity, improved transport connectivity, improved journey times, High Quality Public Transport	**High Quality Public Transport Attributes (vehicle fleet/ride quality/RTPI/branding/ticketing)**	Highest	5	Highest	5	Option 3/3a and 6 are indistinguishable in terms of expected ride quality, ticketing options, bus technology, branding, etc.
	Benefit delivered by segregation (journey time reliability or predictability)	Fully segregated	5	Partially segregated	1	Full segregation, including west of Madingley Mulch, might give a marginally improved journey time and marginal reliability benefits.
	Improvements in walking and cycling infrastructure	Fully segregated	5	Fully segregated	5	For Option 3/3a, direct walking/cycling infrastructure will be included within the scheme. For Option 6, separate segregated direct walking/cycling infrastructure will be provided.
	Disruption to existing traffic during construction	Medium	3	Medium	3	No full assessment of construction disruption has been undertaken, however the construction impact on Madingley Hill (Option 6) is likely to be similar to that caused on the M11 due to construction of a new bridge.
	Deliverability risk (planning/consents)	Highest	1	Lowest	5	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.
	PVC (Bus Only)	£207,846,000	1.0	£42,515,000	5.0	Results from modelling undertaken.
	PT Benefits	£40,100,000	1.0	£43,600,000	5.0	Results from modelling undertaken. Does not include environmental disbenefits.
	GVA benefits - UK Level - (PVB over 30 years, 2010 prices)	£198,100,000	5.0	£198,100,000	5.0	Based on Mott MacDonald assessment of Wider Economic Benefits.
	Journey times (2031, Cambourne - Drummer Street, Inbound, AM Peak)	20	5.0	22	1.0	Results from modelling undertaken.
	Bus frequency (AM Peak, Buses Per Hour, Inbound)	9	5.0	9	5.0	Reported as number of buses per hour.
	Bus and Park and Ride mode share	25%	5.0	25%	5.0	Results from modelling undertaken.

Outcomes	Metric for scoring outcomes	Ranking				
		Option 3/3a		Option 6		
		Assessment	Score	Assessment	Score	Rationale
	Wider Impacts (PVB over 60 years, 2010 prices)	£1,361,425	1.0	£8,200,000	5.0	Results from modelling undertaken.
	Constructability risk (complexity of delivery)	Highest	1	Lowest	5	Delivery will be most complex where the route option includes a new bridge over the M11.
	Sub-total		38		50	
More Housing	Accessibility	Equal	3	Equal	3	
	Sub-total		3		3	
Environmental Impacts	Total change in air quality over the 60 year appraisal period	-£400,349	1.0	-£98,000	5.0	These figures are partly based on highway modelling.
	Change in CO2 emissions (£,NPV)	-£8,699,656	1.0	-£6,400,000	5.0	
	Change in noise impacts on households (£,NPV)	-£2,110,641	1.0	£52,070	5.0	
	Impact on the water environment	Slight adverse	1.0	Neutral	5.0	Based on environmental assessment undertaken.
	Landscape and visual impact	Moderate adverse	1	Slight adverse	5	
	Heritage impact	Moderate adverse	1	Neutral	5	
	Biodiversity impact	Large adverse	1	Minimal	5	
	Reduction in road traffic accidents	Neutral	0	Neutral	0	
	Sub-total		7		35	
Stakeholder support	From public consultation	Most opposition	1	Most support	5	Based on assessment of consultation responses.
	Sub-total		1		5	
	TOTAL SCORE		**49**		**93**	

Commentary on MCAF Table Outcomes

25. Option 3/3a performs worse than Option 6 in terms of strategic fit, mainly because the fully offline route is much more costly and more difficult to construct and deliver, which outweigh any marginal advantage in terms of journey time and predictability. Both routes have the potential for a HQPT service and direct, segregated walking and cycling infrastructure.

26. Option 3/3a 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 Option 6, which could serve the Madingley Road P&R.

27. Option 3/3a is a segregated off-road solution, whereas Option 6 provides a tailored mix of on-road segregation and appropriate bus priority measures. The difference between the two approaches amounts to not more than 2 minutes in journey time each way.

28. For Option 3/3a, Noise, Air Quality and Green House Gas emissions are modelled to increase as a result of the new route. Desktop assessment 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.

Summary: **The Multi-Criteria Assessment Framework provides a crude assessment of the Options against strategic fit, transport economic, environmental, and delivery criteria to indicate the extent to which each demonstrates a compelling case for investment. Option 6 greatly outscores Option 3/3a. It aligns most closely with the strategic objectives for the scheme, namely the provision of a high-speed, appropriately segregated, reliable, high quality public transport option that connects the housing developments in and around Cambourne with employment sites in Cambridge, Addenbrooke's and the Science Park, and does so at a reasonable cost with minimal adverse environmental impact and with maximum stakeholder support.**

D Financial Case

29. The Financial Case was clearly explained in the original OAR. Estimates presented here are derived from the original figures.

30. Table 6 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.

Table 6: Preparatory, estimated capital construction costs for each option

Estimated Cost item	Option 3/3a cost (000's)	Option 6 cost (000's)
Preparatory costs	**£10,140**	**£2,238**
Construction + Land costs	**£112 545**	**£25,234**
Risk	**£19,147**	**£5,164**
Total	**£141,833**	**£32,636**

31. 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 7.

Table 7: Nominal modelled operational costs

Option	Initial Fleet Investment (000s)	Operating Cost (000s)	Operating Revenue (000s)	Revenue-Cost (000s, excluding fleet investment)
Option 3/3a	£5,300	£55,300	£42,000	-£13,300
Option 6	£3,600	£38,500	£45,900	£7,400

E Management/Delivery Case

32. The purpose of the Delivery Case is to assess if the proposals are deliverable.

33. While Option 6 is clearly straightforward to deliver, there are significant concerns with respect to Option 3/3a, based on evidence from the one other similar scheme delivered by the County Council, the Cambridgeshire Guided Busway.

34. The delivery of the Cambridgeshire Guided Busway was fraught with difficulties encountered during construction, including huge overruns in cost and timescale, quality issues, legal disputes with the contractor and so on. Now the busway is running into further issues due to deterioration of the track, which may necessitate extensive relaying of sections.

35. Delivery of Option 3/3a is further compromised by the very strong opposition of almost all key stakeholders, including local residents, MPs and councillors, environmental and conservation groups, transport campaign groups and some landowners. This means that a collaborative

approach to delivery will not be possible and delivery will therefore be dogged by legal, technical, administrative and other challenges. While it may eventually be possible to force the project through despite this opposition, this can only add to the costs and risks associated with the project. Furthermore, the constant negative publicity puts at risk, by contamination, the wider portfolio of City Deal projects.

F Commercial Case

36. The Commercial Case in the original OAR considered all Options procurable and did not distinguish materially between them. Therefore no further work has been done on that case.

Summary: The Financial and Delivery Cases clearly indicate that Option 6 is superior to Option 3/3a.

Overall Option Recommendation

Policy Compliance

37. 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 the Local Plans, providing what amounts to a single overarching development, infrastructure and delivery strategy for Cambridge.

38. A review of the extent to which the two options comply with policy goals is summarised in Table 8, using the following rating approach:

- 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

Table 8: Policy Compliance Rating of Options

TSCSC corridor goals (policy compliance)	Rating	
	Option 3/3a	Option 6

• Focus on bus and addressing issues that prevent a good service being delivered.	High	High
• Segregated on-line or off-line alignments where appropriate on the A428 and M11.	High	High
• Bus priority measures	High	High
• Outer ring of Park & Ride	High	High
• HQPT infrastructure (new busway or existing uncongested, high-speed infracstructure) to serve Cambourne, etc.	High	High
• Walking and cycling improvements, including direct links	High	High
• Highway capacity improvements	Low	Low

39. Table 8 indicates that the two options have the same degree of policy compliance on key considerations.

The Option Selection

40. 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

41. 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. Error! Reference source not found. summarises the overall performance of Options 3/3a and 6 against the weighted 5 cases:

Table 9: Option Assessment Summary Outcome Table

	Strategic	Economic	Financial	Delivery	Commercial
Key Factors	• **Segregation (on- or off-line) improves journey time reliability** • **Future proofing for increased long term capacity** • **Policy compliance** • **Maximising wider economic benefits** • **HIGHEST WEIGHTING**	• **Direct Transport benefits for users of scheme** • **Direct and scheme specific economic benefits** • **Environmental impact** • **HIGH WEIGHTING**	• **Overall cost and affordability** • **LESS HIGH WEIGHTING**	• **Capacity of City Deal to deliver schemes** • **LESS HIGH WEIGHTING**	• **Management of risk factors related to build and operation of scheme** • **LESS HIGH WEIGHTING**
Reason for weighting	*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.*	*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.*	*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.*	*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 criterion.*	*At this stage, objective is to ensure that overall risk management processes are understood and either are or can be put in place (in relation to capacity highlighted in Delivery Case). Unless one Option highlights unmanageable risks which the organisation cannot manage, this is not likely to be a key strategic decision making criterion.*
Option 3/3a	HIGH PERFORMING OPTION 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.	LOW PERFORMING OPTION The overall BCR is poor at this stage. There is potential to improve this BCR, but since it would have to increase fivefold even to get to "low", there is no prospect it will ever be anything other than unacceptable. High potential environmental effects and estimated construction costs impact the BCR.	LOW PERFORMING OPTION This is by far the highest cost Option.	LOW PERFORMING OPTION There are significant delivery risks associated with project complexity, stakeholder opposition, land take requirement, etc.	MEDIUM PERFORMING OPTION There is no significant differential between the options in terms of the Commercial Case.
Option 6	HIGH PEFORMING OPTION This option has high strategic fit as it offers segregation where required on the route, 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.	MEDIUM PERFORMING OPTION The overall BCR for this Option is low. There is potential to improve this BCR, such that it may become medium or even high.	HIGH PERFORMING OPTION This is the lowest cost Option, saving more than £150 million over Option 3/3a.	HIGH PERFORMING OPTION Delivery is very straightforward.	MEDIUM PERFORMING OPTION There is no significant differential between the options in terms of the Commercial Case.

42. The assessment in **Error! Reference source not found.** concludes that the Option 6 is the best performing option overall, both against the highest weighted strategic objectives and against the lower weighted cases.

Park & Ride Option Selection

43. A Park and Cycle/Ride should be located west of the Madingley Mulch Roundabout, in the vicinity of the A428 junction at Scotland Farm. This would serve all local communities between Cambourne and Cambridge, intercepting traffic prior to the build-up of congestion. It would be easily accessible for public transport services on the A428 corridor and would have low environmental impact, particularly if placed west of Scotland Farm outside the Green Belt.

44. In contrast, a Park & Ride next to Crome Lea Business Park is not considered a good location. It would exacerbate, and be significantly hampered by, peak hours in-bound congestion on Madingley Rise, and would not be accessible to car traffic travelling on the A428 westbound, significantly reducing its utility. Most importantly though, it would have major adverse environmental and social impact.

45. Traffic modelling undertaken as part of the current A14 upgrade shows that volumes are predicted to increase through Madingley and Dry Drayton as a result. A Park & Ride at/near Scotland Farm could increase this further. It is important that traffic reduction measures through these villages are considered as part of any Park & Ride considerations.

Discussion of Recommended Option

46. It is clear from this assessment that Option 6 is far superior to Option 3/3a in all respects. Option 6 has better strategic fit, as scored by the MCAF (50 vs 38) which appears to be the key criterion for decision making. It is also much better value for money, much more straightforward to deliver, less environmentally damaging and, importantly, has substantial community support, which would enhance the deliverability of this project and the public perception of the City Deal as a whole.

47. The key benefits of Option 6 are as follows:

- *Overall Fitness for Purpose*: Option 6 provides a meaningful, cost-effective and deliverable improvement in bus journeys from Cambourne to Cambridge that is appropriate to the projected level of demand. It is sufficient to meet the needs of the Local Plan and matches the stated transport strategy for Cambridge. In terms of strategic fit, Option 6 heavily outscores Option 3/3a. It also has widespread community support and could be implemented in a matter of months.

- *Value for Money*: Option 6 is more than five times better value for money than Option 3/3a, while offering virtually the same transport benefits.

- *Environmental Sensitivity*: Option 6 causes minimal adverse environmental impact and makes best use of existing infrastructure.

- *Frequency*: High frequency services are particularly attractive to commuters. Segregated on-line or off-line infrastructure which by-passes congestion provides for a high capacity public transport corridor from Cambourne to Cambridge. This is not of particular value on uncongested roads, such as the St Neots Road or outbound on the A1303, where delays are negligible, but it is valuable on the inbound A1303, which suffers significant congestion in the morning peak hours. It has been argued that Option 3/3a might have an advantage because off-line segregation could enable somewhat a higher maximum frequency than on-line segregation, but since the maximum in either case (one bus every minute for off-line versus one bus every 1.5 minutes for on-line) far exceeds any plausible future demand on the A428 corridor, the distinction is irrelevant.

- *Reliability*: Segregation improves the reliability of bus services. There is some evidence that off-line segregation may give slightly better performance than on-line segregation, but over the short distance between Cambourne and West Cambridge site (less than 8 miles), the impact is marginal.

- *Journey Times:* Segregation improves journey times by minimising conflict with other traffic. Off-line segregation may enable slightly faster journey

times than on-line segregation, since buses could in theory travel faster. However, over the short distance between Cambourne and West Cambridge site, the opportunity for buses to get up to speeds much in excess of 30-40 mph would be very limited and the overall impact would be marginal, amounting to little more than 2 minutes on the journey time. Estimated journey times for Options 3/3a and 6 to the West Cambridge site and to Queens' Road are shown in Table 10. It should be borne in mind that journey times to destinations which might potentially be more useful for commuters, such as the city centre, Science Park or Addenbrooke's, are as yet unknown. Furthermore, total home-to-work journey times, including home-to-bus-stop, waiting time and bus-stop-to-work, are likely to be considerably longer, minimising the value of a reduction in the bus journey time.

Table 10: Journey Time estimates

Option	Cambourne-West Cambridge site (Minutes)	Cambourne-Queens Rd-Cambourne round-trip (Minutes)
Option 3/3a	12	28
Option 6	14	32

- *Flexibility:* Option 6, through its use of existing infrastructure and convenient Park & Ride location, offers maximal flexibility in terms of access for potential users (including residents in existing communities), connectivity, service pattern and pricing.

- *Coherence with Western Orbital scheme*: Option 6 has the most efficient connectivity with an on-line Western orbital.

- *Coherence with City Deal vision and local policy objectives*: Option 6 delivers virtually all the benefits of an off-line segregated scheme, including the highest level of economic benefits, but at a fraction of the cost of new infrastructure. Through its environmental sensitivity and community acceptance, it promotes a positive image and perceptions, encouraging investment and growth.

Summary: The Outline Business Case study which comprises the five cases for investment strongly supports Option 6 as the most suitable option for providing better bus journeys between Cambourne and Cambridge. If the key consideration is strategic fit with the City Deal objectives, then Option 6 provides an excellent fit with acceptable value for money. The more detailed considerations around the economic, commercial, financial and delivery cases make Option 6 an even more compelling solution. Option 6 should be taken forward for detailed development.