M11 J11 Park and Ride: Strategic Outline Business Case Addendum

Alternative Options

04 September 2018

Greater Cambridge Partnership
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1 Introduction

This document is an addendum to the Strategic Outline Business Case (SOBC) for a major enhancement to Park and Ride facilities near M11 Junction 11. Following Greater Cambridge Partnership Executive Board recommendations, this Addendum considers a wider range of alternative options to compare and contrast with the option short list presented in the SOBC. It will be used to decide whether the short list should be amended. All short list options will then need to be assessed to a consistent level of detail as part of the Outline Business Case.

1.1 Context

A Strategic Outline Business Case (SOBC) has been developed in support of major enhancements to Park and Ride facilities in close proximity to M11 Junction 11. The SOBC has a relatively tight geographical scope, focusing on the transport issues in the Southern Fringe area between the Cambridge Biomedical Campus and M11 Junction 11. It also focuses on a road-based public transport Park and Ride solution to serve the A10 and M11 corridors from major sites (of at least 1000 spaces) close to the M11, based on the measures set out in the Transport Strategy for Cambridge and South Cambridgeshire 2014.

The SOBC option long list considers options for new sites adjacent to the M11, as well as a major expansion of the existing Trumpington site. The option short list similarly includes a smaller number of new site options and an option to expand the existing site. Other schemes that serve trips into Cambridge from the A10 and M11 corridors are recognised as interdependent and complementary within the SOBC. However, these complementary schemes have not previously been considered as alternative options to satisfy the forecast Park and Ride demand arising from the A10 and M11 corridors.

At a meeting on 21 March 2018, the Greater Cambridge Partnership (GCP) Executive Board agreed to analyse a wider range of alternative transport options, in advance of progressing to the next business case stage (Outline Business Case).

1.2 Purpose of the Strategic Outline Business Case (SOBC) Addendum

This SOBC Addendum has been prepared in response to the GCP Executive Board decision made on 21 March 2018 to analyse a wider range of alternative transport options for a Park and Ride site. This SOBC Addendum identifies whether, by considering a wider range of options, a case exists to amend the option short list and take additional/alternative options through to the Outline Business Case stage. The decision on whether to progress any of the alternative options will be made by the GCP. The document uses the HM Treasury / Department for Transport’s five case model structure, focusing on the expected performance of the alternative transport options in contrast to the expected performance of the options in the SOBC short list.

1.3 Alternative Options

To widen the geographical scope and range of solutions under consideration, four alternative options (shown in Figure 1) have been compared on an equal basis with the options set out within the SOBC document. These are referred to as locations/sites/options F, G, H and I.
The four alternative options involve providing for the levels of demand that are forecast to be required for a Park and Ride close to M11 Junction 11, but by providing all the additional parking at alternative locations – on the A10 at Foxton rail station, at Whittlesford Parkway station close to M11 Junction 10, at both Foxton and Whittlesford Parkway, or additional parking directly at the Cambridge Biomedical Campus. These alternative options would be instead of either a major expansion to the existing Trumpington Park and Ride site or a new site adjacent to M11 Junction 11.

A new station at Cambridge South is being progressed by the Department for Transport, to serve the Cambridge Biomedical Campus. Cambridge South will not include a car park and will therefore not provide for any opportunity to act as a Park and Ride. As it is likely to function predominantly as a destination station within Cambridge, rather than a station from which people commence the public transport part of their journey into Cambridge, it will remain complementary to the Park and Ride options.

1.4 Document Structure

The remainder of this Addendum is structured around the five-case model for transport business cases:

- Section 2 presents the **Strategic Case**. Since the SOBC already considers the ‘case for change’, including expected wider economic benefits and the policy context, this Addendum focuses on assessing the relative merits of the alternative options.

- Section 3 summarises the **Economic Case** of the SOBC and identifies whether the alternative options offer any significant economic, environmental, social, and public accounts impacts that are different to those in the SOBC option short list.

- Section 4 covers the **Financial, Commercial and Management Cases** and assesses the likelihood of there being any significant cost, procurement, programme, governance, communications strategy or risk management differences for the alternative options when compared to the SOBC option short list.
2 Strategic Case

The purpose of the Strategic Case is to demonstrate the need for the scheme. The SOBC already considers the ‘case for change’, including expected wider economic benefits, the policy context, scheme objectives and strategic influences. Therefore, this Addendum provides a summary of the SOBC and assesses the alternative options against the scheme objectives and multi-criteria assessment indicators originally identified in the SOBC.

2.1 Summary of SOBC Strategic Case

Greater Cambridge is a world-leading centre for research, innovation and technology and is home to the internationally significant Cambridge Biomedical Campus which is expected to employ 30,000 people by 2031. Greater Cambridge’s success brings jobs and opportunities for the whole region and beyond. Alongside its success, Cambridge faces transport supply threats to its economic growth.

Transport problems in the Southern Fringe have been identified (Figure 2). In conjunction with a review of existing policy and strategy documentation, the problems have been translated into six objectives to guide option selection.

Figure 2: Scheme rationale – case for change and objectives

Investments in transport infrastructure will be critical, ensuring transport network capacity, high congestion levels and poor reliability issues are addressed to unlock the city’s growth potential. Major enhancements to Park and Ride facilities in close proximity to M11 Junction 11 can contribute to the economic growth of Cambridge, in particular the Cambridge Biomedical Campus, and will be ideally positioned to support the Cambridge Autonomous Metro proposals – providing a location where trips from outside the area can be aggregated and loaded onto the system.
The SOBC option sifting process concluded that a new site to the west of the M11 (referred to as Site D) would best meet the scheme objectives, as it would intercept trips along the A10 before they reach Junction 11, as well as intercepting trips approaching Cambridge on the M11 northbound. It would also be more deliverable (compared to new sites in other nearby locations) within the required timescales, due to land availability, and would have the least adverse environmental impacts.

Following a multi-criteria assessment, based on 26 indicators, the SOBC option short list comprises four new site options on land to the west of the M11. A fifth option for major expansion at Trumpington has been retained. All options include complementary public transport priority measures along the A1309/A1134 corridor to the city centre.

This Addendum assesses the alternative options following the same sifting process to determine whether or not a case exists to amend the short list and take additional/alternative options through to the Outline Business Case stage.

2.2 Scope of Alternative Options

The popularity of Park and Ride as a travel option in Cambridge and the need for new, expanded or relocated Park and Ride sites is set out in the Cambridgeshire Local Transport Plan (2011-2031). The focus of three of the alternative options is therefore enhanced Park and Ride provision.

Three of the four alternative options are major rail-based Park and Ride sites further afield than the SOBC short list options – on the A10 at Foxton station, at Whittlesford Parkway station close to M11 Junction 10, or in both locations. The fourth alternative option places additional parking directly at the Cambridge Biomedical Campus. The following summarises the journey capture implications of each option:

- A major rail-based Park and Ride adjacent to Foxton rail station has potential to intercept northbound journeys on the A10 during the morning peak. However, a Park and Ride at this site would realistically only benefit those commuting to Cambridge who travel along the A10 corridor.
- A major rail-based Park and Ride at Whittlesford Parkway close to M11 Junction 10 has potential to intercept northbound journeys on the M11 during the morning peak. However, a Park and Ride at this site would realistically only benefit those commuting to Cambridge who travel from the south along the M11 corridor.
- Delivering a major rail-based Park and Ride site at both Foxton and Whittlesford Parkway stations has the potential to intercept both northbound journeys on the A10 and the M11 during the morning peak.
- Additional on-site parking at the Cambridge Biomedical Campus would not intercept any journeys and would instead allow some drivers to travel directly to their destination. This facility would be of little benefit to anyone travelling to the city centre and would exacerbate an existing transport problem.

2.3 Option Assessment

2.3.1 Method Overview

To assess if the four alternative options align with the scheme objectives shown in Figure 2, and offer value for money in the widest sense, the steps shown in Figure 3 have been followed.
2.3.2 Step 1: Park and Ride Location Assessment

A major expansion of Park and Ride facilities to serve the Southern Fringe and reduce pressure on the existing Trumpington Park and Ride site can be achieved by delivering a new complementary site or through a major expansion of the existing site. Potential locations are shown in Figure 4, comprising the original SOBC locations - the existing Trumpington site (A) and the four quadrants adjacent to Junction 11 (B to E), as well as four alternative locations at Foxton rail station (F), Whittlesford Parkway station (G), a combination of both Foxton and Whittlesford Parkway stations (H) and additional on-site parking at the Cambridge Biomedical Campus (I).
In this Addendum, the four alternative options (F, G, H and I) have firstly been assessed based on the extent to which they would be able to meet the six scheme objectives and on environmental constraints. Scoring is based on the seven point scale recommended in WebTAG, from -3 (large adverse) to +3 (large beneficial) and where 0 indicates a neutral impact. A summary scoring matrix against the objectives is presented in Table 2 and a high-level environmental constraints assessment in Table 3.

To inform the location assessment, and given that three of the alternative options (F, G and H) are rail-based Park and Ride, a series of strategic questions have been investigated (Table 1).
Table 1: Rail-based Park and Ride questions for Sites F, G and H

<table>
<thead>
<tr>
<th>Strategic Question</th>
<th>Response</th>
</tr>
</thead>
</table>
| What level of capacity exists on trains to cater for additional passengers travelling into Cambridge? | ● Based on limited data from 2017 provided by G graffiti Thameslink Railway, one of the AM peak period trains from Foxton into Cambridge (arriving 08:30) and one of the PM peak period trains from Cambridge to Foxton (departing 16:24) has been operating with a load factor over 100%. All other Foxton to Cambridge services in the AM peak and Cambridge to Foxton services in the PM peak have been operating within capacity.  
   ● Since the data was obtained, the new timetable has more than doubled capacity between Foxton and Cambridge, with 8-car (rather than 4-car) train sets being used. Capacity exists for up to 1,100 passengers on each train, with even the busiest services having available space remaining for more than 650 passengers.  
   ● With the new timetable, available space exists for more than 3,000 additional passengers across the four services arriving into Cambridge between approximately 07:30 and 09:00, and for the four services departing Cambridge between approximately 16:30 and 18:00.  
   ● Based on train crowding information published by Greater Anglia there are known capacity pressures on the existing services between Whittlesford Parkway and Cambridge in the AM peak period, and between Cambridge and Whittlesford Parkway in the PM peak period. The train arriving into Cambridge at 08:08 is listed as usually crowded, as well as the trains departing Cambridge at 17:51 and 17:51.  
   ● Further data collection and/or surveys are required to confirm available passenger capacity at Whittlesford Parkway. This would need to be undertaken during Autumn 2018, when the impact of new rail timetables has stabilised. |
| What level of service frequency can be provided for rail-based Park and Ride from each site? | ● There are two trains per hour between Cambridge and both Foxton and Whittlesford Parkway stations. Outside peak periods, an additional one train per hour calls at Whittlesford Parkway.  
   ● The maximum wait time for a train when arriving at either Foxton or Whittlesford Parkway is therefore 30 minutes.                                                                                                                                          |
| Which destinations in Cambridge can be served by rail from each Park and Ride site? | ● A rail-based Park and Ride at Whittlesford Parkway or Foxton would serve journeys to Cambridge station, which is approximately 20–30 minutes’ walk from the city centre, or 10-15 minutes by bus. Cambridge station is also 10 minutes by bus (along the busway) from Cambridge Biomedical Campus.  
   ● Direct access to Cambridge Biomedical Campus is dependent on the opening of Cambridge South Station, which is currently under consideration and, if implemented, will be several years in the future.                                                                                                                                                                                                                                                                 |
| How attractive are the fares/charges for rail-based Park and Ride? | ● An anytime return rail ticket (which allows travel during peak hours) from Foxton rail station is £5.10 and a monthly pass is £94.10. An anytime return from Whittlesford Parkway to Cambridge Central is £6.20 and a monthly pass is £91.10.  
   ● The existing station car park at Whittlesford Parkway has a charge of £8.00 per day or £30.00 per week. This means that the combined parking and rail fare cost is £14.20 per day.  
   ● The existing Park and Ride bus service from Trumpington offers a roundtrip ticket for £3.00 a day, £14.00 a week, or £56.00 a month.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Source: Mott MacDonald
Whittlesford

Reduce traffic flow and delay at M11 J11, particularly in the AM peak, including reducing flows associated with non-motorway traffic (A10-A1309) that pass across the junction.

For Sites A, B, C, and E, trips approaching on the A10 would still need to travel across the motorway junction as at present. Site D would only reduce J11 M11 traffic and flow slightly by intercepting trips from the A10 northbound traffic coming from the southwest. There is a small chance that commuters from other directions, who have no other parking option, may be attracted through M11 J11 to access a Park and Ride at Foxton. Site G would realistically only reduce J11 M11 traffic and flow slightly by intercepting M11 northbound traffic coming from the south. Site H (which combines F and G) would have the potential to moderate reduce J11 M11 traffic flow by intercepting A10 northbound traffic from the southwest and M11 northbound traffic coming from the south. Site I would not intercept any traffic heading towards the Biomedical Campus and could even encourage more car trips through M11 J11 (and away from existing Park and Ride and public transport provision) due to parking availability.

Reduce delays on the A10 through Harston and Hauxton, on the approach to M11 J11.

For Sites A, B, and C, make no difference to delay on A10, as all existing traffic would continue to pass through the same sets of signals at J11 on the way to a Park and Ride site. Site D has the potential to reduce delays slightly by allowing for unhindered northbound access from the A10 into the Park and Ride, removing some traffic from the queues approaching the J11 signals. Site E would be likely to have a negative impact due to a need to introduce a new junction for traffic to turn right into the Park and Ride from the A10, through which all A10 traffic would need to pass. Site F would have the potential to reduce delays on the A10 through Harston and Hauxton, by intercepting traffic at Foxton and in advance of Harston and Hauxton. However, there may be some additional car trips made outbound from Cambridge in the AM peak to use Foxton as a Park and Ride for trains heading south towards London. Site G would have no impact on reducing delays on the A10 since it does not intercept trips from that direction. Site H (which combines F and G) would reduce delays slightly on the A10 through Harston and Hauxton, by intercepting traffic at Foxton and in advance of Harston and Hauxton. Site I would not intercept any traffic on the A10.

Increase sustainable transport mode share for trips into the city centre and Cambridge Biomedical Campus, focused on trips originating from the south and south west (M11 and A10).

Due to its location beyond the Addenbrookes’ road junction, major expansion at Site A would be less suitable for intercepting A10 or M11 trips heading for the Cambridge Biomedical Campus. Sites B, C, D, and E would all be able to intercept trips from the A10 and M11, heading for both the city centre and Cambridge Biomedical Campus. Site F would only intercept trips from the south west (A10) and only if the trip destination at the Cambridge end is close to a rail station. Site G would only intercept trips from the south (M11) and only if the trip destination at the Cambridge end is close to a rail station. Site H (which combines F and G) would reduce delays slightly on the A10 through Harston and Hauxton, by intercepting traffic at Foxton and in advance of Harston and Hauxton. Site I could decrease sustainable transport mode share by encouraging trips to the Biomedical Campus to be made entirely by car.

Increase Park and Ride capacity, in particular to serve forecast growth at the Cambridge Biomedical Campus key employment area, with deliveries aligned to overall Campus development timescales.

All sites would lead to an overall increase in capacity. The benefits of a major expansion at Site A would be limited as it is not in the optimum location for serving the Biomedical Campus. There would also be significant loss of capacity during construction.

Reduce public transport journey times between Trumpington and the city centre, enabling Park and Ride and other public transport journeys to compete more effectively with the private car.

N/A for location assessment - dependent on separate but complimentary public transport priority measures.
It is clear from the assessment against objectives (Table 2) that Site D remains the location for a major Park and Ride site that would be most likely to meet the scheme objectives. A Park and Ride at Site D would be able to intercept trips along the A10 before they reach Junction 11, but would also serve trips from various origins that are using the M11 corridor. Site D is expected to be more deliverable within the required timescales (due to land availability).

Major Park and Ride provision at both Foxton and Whittlesford Parkway stations (H) is a close second to meeting the six scheme objectives, but environmental constraints (shown in Table 3) lessen its potential.

Table 3: High-level environmental constraints assessment

<table>
<thead>
<tr>
<th>Constraint</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
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<tbody>
<tr>
<td>Noise</td>
<td>SA</td>
<td>SA</td>
<td>SA</td>
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<td>N /</td>
<td>N /</td>
<td>N /</td>
<td>N</td>
</tr>
</tbody>
</table>

N- Neutral, SA- Slightly Averse, MA- Moderately Averse
Source: Mott MacDonald

The environmental constraints of Sites A to E have already been assessed in the SOBC, in which it was concluded that Site D is the most suitable location due to a combination of strategic objective and environmental constraint reasons.

Table 3 assesses the environmental constraints at alternative locations (F-I) alongside the SOBC location options. Sites F, G and H are in close proximity to Foxton, Whittlesford or both villages, thereby the Park and Ride site as well as the associated traffic would have a negative impact on village noise, air quality and townscape conditions. In these options, even though the Park and Ride site would not be built within the Green Belt, it would almost certainly be located on a greenfield site in a rural area, adjacent to a small village settlement. A major Park and Ride site has the potential to negatively impact the local character of a small village.

Site I at the Cambridge Biomedical Campus would be likely to make the noise and air quality of an already constrained area significantly worse, and would encourage more car users to drive into the Southern Fringe.

Based on the high-level assessments undertaken, none of the new location options performs equally or better against the strategic objectives or environmental constraints. Therefore, Site D is still considered the most suitable for a new major Park and Ride site.

While the environmental impacts at Sites F and G (and therefore the combined location H) might be acceptable for smaller scale Park and Rides, they are deemed to be less suitable locations for major Park and Ride provision (at least 1000 spaces) due to their rural locations within small village settlements. However, for completeness, Sites F, G and H have been included in the multi-criteria assessment alongside options for Site D and expansion of the existing Trumpington Park and Ride (A).
Site I has been removed from further consideration due to poor performance against scheme objectives and environmental constraints.

2.3.3 Step 2: Park and Ride Concepts

The new options for Park and Ride locations will comprise three key elements which need to be in place to achieve the scheme objectives:

- Suitable access / egress arrangements for light vehicles. For Sites F, G and H these arrangements are assumed to be:
  - Direct access from the A10 for a new major Park and Ride at Foxton (F and H)
  - Direct access from Station Road East for a larger Park and Ride at Whittlesford Parkway (G and H)
- Safe, direct and short pedestrian route between the car park and station platforms
- Possible platform lengthening at Foxton rail station (the southbound platform is currently shorter) to avoid the need to use selective door opening

2.3.4 Step 3: Options Long List

At this stage, Foxton Park and Ride (F) is considered as a single option because the impact on the multi-criteria assessment indicators is expected to be broadly similar regardless of the exact car park location. The same is true for the Park and Ride at Whittlesford Parkway (G) and therefore the combined location option (H). This is in contrast to Site D, where a range of options exist which have different impacts on the multi-criteria assessment indicators, particularly the indicators associated with traffic flows on the A10 approaches M11 Junction 11 and at Junction 11.

2.3.5 Step 4: Multi Criteria Assessment

The multi-criteria assessment step involved scoring the alternative options against a total of 26 indicators grouped within four selection themes, combining the scheme objectives with a wide range of scheme impact considerations as listed in WebTAG:

- Theme 1 – reducing traffic levels and congestion (linked to scheme objectives 1.i to 1.iii)
- Theme 2 – maximising potential for journeys to be undertaken by sustainable modes (linked to scheme objectives 2.i to 2.iii)
- Theme 3 – quality of life and environment (linked to the elements of the WebTAG Appraisal Summary Table not covered in Themes 1 and 2)
- Theme 4 – scheme deliverability

The full set of indicators is set out in Table 4. Using the same approach as for the Park and Ride location assessment, scores have been awarded using the WebTAG seven point scale, ranging from -3 (large adverse) to +3 (large beneficial) and where 0 indicates a neutral impact.
Table 4 Multi-Criteria Assessment indicators

<table>
<thead>
<tr>
<th>Selection Theme 1: Reducing traffic levels and congestion</th>
<th>Selection Theme 2: Maximising potential for journeys to be undertaken by sustainable modes</th>
<th>Selection Theme 3: Quality of life and environment</th>
<th>Selection Theme 4: Scheme deliverability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected impact in AM peak on…</td>
<td>Compare options based on…</td>
<td>Compare options based on impact on…</td>
<td>Compare options based on impact on…</td>
</tr>
<tr>
<td>● Traffic flow on J11 circulatory</td>
<td>● Time to access P&amp;R site from A10</td>
<td>● Potential for road accidents</td>
<td>● Construction risks</td>
</tr>
<tr>
<td>● Overall delay at J11</td>
<td>● Time to access P&amp;R site from M11 northbound</td>
<td>● Walking and cycling networks</td>
<td>● Disruption during construction</td>
</tr>
<tr>
<td>● Traffic flow on A1309 Hauxton Rd</td>
<td>● P&amp;R public transport journey time</td>
<td>● Noise</td>
<td>● Land acquisition requirements</td>
</tr>
<tr>
<td>● Traffic flow on A1309 High St</td>
<td>● Potential to link with existing public transport</td>
<td>● Local air quality</td>
<td>● Infrastructure maintenance / renewals complexity</td>
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<tr>
<td>● Traffic flow on A10, Harston</td>
<td>● Potential to link with future public transport proposals</td>
<td>● Landscape</td>
<td>● Ongoing cost implications – site</td>
</tr>
<tr>
<td>● Delay on A10 between Harston and M11</td>
<td></td>
<td>● Townscape</td>
<td>● Ongoing cost implications – public transport</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Historic environment</td>
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<td></td>
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<td>● Biodiversity</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>● Water environment</td>
<td></td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

Scores within each selection theme have been normalised to provide a score out of ten, which avoids results being skewed by the number of indicators within each theme. Weightings have then been applied to reflect the relative importance of each theme. Two sets of weightings have been tested, using weightings agreed previously at a meeting with the Greater Cambridge Partnership project team:

- **Weighting test 1**: Equal 25% weighting per selection theme
- **Weighting test 2**: Greater emphasis on indicators that relate to the strategic scheme objectives – 40% (Theme 1), 40% (Theme 2), 10% (Theme 3), 10% (Theme 4)

Normalised multi-criteria assessment scores, and option ranking for both weighting tests, are shown in Table 5.

In the SOBC, in both versions of the multi-criteria assessment the top three scoring options (for a new major Park and Ride site at Site D) were **Cyan**, **Purple**, and **White**. These options scored well against the scheme objectives and were included in the SOBC option short list. A lower cost option (**Yellow**) was also included in the short list – further explanation of this is provided in the SOBC. Although the major Trumpington expansion option (Magenta) at Site A performed poorly and was ranked ninth of nine in both versions of the weightings, it remains as a logical alternative to providing a completely new site.

For this Addendum, three of the four alternative options have been added to the same multi-criteria assessment alongside the SOBC short list options. Cyan, Purple and White (all options for Site D) remain as the top three options, with Option H (providing a major Park and Ride at both Foxton and Whittlesey Parkway stations) ranked fourth in both weighting test 1 and 2.

The option to provide a new major Park and Ride site at Foxton rail station (F) is ranked sixth, above Whittlesey Parkway station (G) at seventh (or eighth in weighting test 2), as it would be able to intercept trips along the A10 and remove traffic from Harston and Hauxton.

The generally lower rankings for alternative rail-based Park and Ride options is for a range of reasons including their reduced ability to intercept trips because of the smaller number of destinations served, the half-hourly service frequency, comparatively high fares and therefore a more limited ability to reduce traffic flow at M11 Junction 11 and along the A10 and A1309.
Another reason for the lower scoring is the detrimental environmental impact that a major park and ride site would be expected to have on the village settings of Foxton and Whittlesford, particularly in relation to noise, air quality, and townscape impacts.

Even though the alternative options did not generally score better than the SOBC short list options for Site D, there is merit in further considering Park and Ride provision at both Foxton and Whittlesford Parkway stations (Option H). However, given the expected environmental impacts of major Park and Ride sites at both Foxton and Whittlesford Parkway (Table 3), continuing the rural travel hub approach with these sites would appear to be the most sensible approach. The rural travel hubs would remain complementary to major Park and Ride facility enhancements in the vicinity of M11 Junction 11, rather than replacing these enhancements. The rural travel hubs would not provide a direct connection to the Cambridge Biomedical Campus (without Cambridge South station) or the city centre.

Table 5 compares the alternative options against the SOBC short listed options. Multi-criteria assessment scores are shown in Appendix A.
## Table 5: Multi-criteria assessment normalised scores and option ranking

<table>
<thead>
<tr>
<th></th>
<th>D</th>
<th>D</th>
<th>D</th>
<th>D</th>
<th>Major Trumpington expansion (MAGENTA) A</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PURPLE</td>
<td>WHITE</td>
<td>YELLOW</td>
<td>CYAN</td>
<td></td>
<td>Foxton P&amp;R</td>
<td>Whittlesford P&amp;R</td>
<td>Foxton &amp; Whittlesford P&amp;R</td>
</tr>
<tr>
<td><strong>Selection Theme 1:</strong> Reducing (or avoiding negative impact on) traffic levels and congestion</td>
<td>6.9</td>
<td>7.8</td>
<td>6.9</td>
<td>8.1</td>
<td>6.1</td>
<td>6.7</td>
<td>6.1</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Selection Theme 2:</strong> Maximising potential for journeys to be undertaken by sustainable modes</td>
<td>7.3</td>
<td>7.0</td>
<td>6.3</td>
<td>7.0</td>
<td>5.3</td>
<td>5.3</td>
<td>5.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Selection Theme 3:</strong> Quality of life &amp; environment</td>
<td>4.8</td>
<td>3.9</td>
<td>3.3</td>
<td>3.9</td>
<td>3.9</td>
<td>3.3</td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Selection Theme 4:</strong> Scheme deliverability</td>
<td>3.3</td>
<td>2.8</td>
<td>4.4</td>
<td>2.8</td>
<td>3.3</td>
<td>5.0</td>
<td>5.0</td>
<td>4.4</td>
</tr>
</tbody>
</table>

**Weighting test 1**

| Normalised score (max.10) | 5.61 | 5.36 | 5.26 | 5.43 | 4.67 | 5.08 | 4.86 | 5.32 |
| Rank                     | 1    | 3    | 5    | 2    | 8    | 6    | 7    | 4    |

**Weighting test 2**

| Normalised score (max.10) | 6.53 | 6.58 | 6.09 | 6.69 | 5.30 | 5.63 | 5.28 | 6.18 |
| Rank                     | 3    | 2    | 5    | 1    | 7    | 6    | 8    | 4    |

Source: Mott MacDonald
2.3.6 Step 5: Options Short List

After assessing the alternative options, the original SOBC options short list (Cyan, Purple, White and Yellow for Site D), should continue to be taken forward to the Outline Business Case stage. The Magenta option (major Trumpington expansion) is also taken forward to the Outline Business Case stage, as a logical alternative to providing a completely new site.

The alternative options multi-criteria assessment introduces the possibility of including Option H (Major Park and Ride provision at both Foxton and Whittlesford Parkway stations) in the Outline Business Case option short list. This is a larger version of the schemes being progressed as part of the rural travel hubs project. However, given the expected negative environmental impacts of a major Park and Ride site (at least 1000 spaces) at either of these locations, it would seem sensible to continue the rural travel hub approach for these stations. These smaller scale rural travel hub schemes would then continue to be complementary to any major enhancement of Park and Ride facilities in the vicinity of M11 Junction 11.

2.4 Strategic Influences

Any enhancement to Park and Ride facilities regardless of which options are progressed, will need to take account of the constraints, interdependencies and stakeholder needs set out in this section.

2.4.1 Constraints

This SOBC Addendum has introduced rail-based Park and Ride options which have a different set of constraints to the options identified in the SOBC. In designing new or enhanced Park and Ride facilities at Foxton or Whittlesford Parkway stations, scheme designs would need to consider how best to overcome, incorporate or mitigate impacts relating to the following constraints:

- Building or enlarging Park and Ride sites in a relatively small village, in a manner that is sensitive to the surroundings
- Lack of access to Cambridge Biomedical Campus (in the absence of a new station at Cambridge South) from a rail Park and Ride several miles away
- Capacity at the rail stations to serve Park and Ride commuters, including for example ticket purchasing facilities and waiting shelters

2.4.2 Interdependencies

Other schemes are currently being progressed to serve trips arriving into Cambridge along the A10 and M11 corridors. The influence of these schemes on Park and Ride demand and effectiveness, under alternative demand scenarios, will be considered as part of Outline Business Case appraisal. Five interdependencies were identified in the SOBC. The three interdependencies described in this section are of particular relevance to the rail-based Park and Ride options considered in this SOBC Addendum.

Cambridge South station

The proposed new rail station at Cambridge South will serve the Biomedical Campus and is therefore an important interdependency for Sites F, G and H. A new station is likely to help remove car trips from the M11 and A10 corridor. A large Park and Ride at either Foxton Rail station (F), Whittlesford Parkway (G) or both (H) will then allow for a direct rail Park and Ride link to Cambridge South Station. However, Cambridge South station is at an early stage of scheme development and it is expected to be several years until it is operational. Without
Cambridge South station the effectiveness of a major Park and Ride site at either Foxton or Whittlesford Parkway will be reduced.

**Foxton rural travel hub and bridge replacement for level crossing**

The Foxton rural travel hub scheme is expected to include a new car park at Foxton rail station, providing trips approaching Cambridge along the A10 with the option to transfer to rail. Cambridge-bound trips that might be attracted to transfer to rail at Foxton are expected to be those with a destination within a short walk of Cambridge or Cambridge North stations. The Foxton scheme might also attract trips in the opposite direction, from developments across the Cambridge Southern Fringe (such as Trumpington Meadows), to transfer to rail at Foxton for London.

The Cambridge-bound trips transferring to rail at Foxton would represent a small proportion of total trips and a smaller proportion of trips than would be attracted to use a Park and Ride site that can serve Cambridge city centre and the Biomedical Campus directly.

If Site F (major Park and Ride at Foxton station) or Site H were to be progressed then these would replace the smaller scale rural travel hub scheme. However, this SOBC Addendum has explained that a Park and Ride at Foxton would not be a feasible alternative to major Park and Ride enhancements in the vicinity of M11 Junction 11, but rather a complementary measure that reduces overall demand for Park and Ride at Junction 11. By reducing demand it may be possible to reduce the size and therefore the land take of any new site adjacent to Junction 11.

**Whittlesford rural travel hub**

The Whittlesford rural travel hub would include a larger car park at Whittlesford Parkway station, providing an improved ability for trips approaching Cambridge from the south along the M11 to leave at Junction 10 (A505), park at the station and transfer to rail. As with the Foxton rural travel hub, Cambridge-bound trips that might be attracted to transfer to rail at Whittlesford Parkway are expected to be those with a destination within a short walk of Cambridge or Cambridge North stations.

The Cambridge-bound trips transferring to rail would represent a small proportion of total trips and a smaller proportion of trips than would be attracted to use a Park and Ride site that can serve Cambridge city centre and the Biomedical Campus directly.

If Site G (major Park and Ride at Whittlesford Parkway station) or Site H were to be progressed then it would replace the smaller scale rural travel hub scheme. However, this SOBC Addendum has explained that a major Park and Ride at Whittlesford Parkway would not be a feasible alternative to major Park and Ride enhancements in the vicinity of M11 Junction 11, partly due to lack of available land close to the station, but rather a complementary measure that reduces overall demand for Park and Ride at Junction 11. By reducing demand, it may be possible to reduce the size and therefore the land take of any new site adjacent to Junction 11.

### 2.4.3 Stakeholders

The key stakeholders for the proposed major enhancements to Park and Ride provision are the same as identified in the SOBC, with additional stakeholders as follows:

- Network Rail and train operating companies – Greater Anglia and Govia Thameslink Railway currently provide services from Whittlesford Parkway and Foxton stations respectively. By placing a large Park and Ride site adjacent to the stations, there will be an increase in demand for rail services into Cambridge station. Platform lengths at Foxton as well as capacity will have to be discussed. There might also be a decrease in demand for other
stations further away from Cambridge, if the Park and Ride encourages people to drive and park at a station nearer to their destination.

- Foxton and Whittlesford Parish Councils
- Residents in Foxton and Whittlesford who will be affected by the changes to the local village and transport network that result from the scheme

The methods through which stakeholders will be engaged in the Outline Business Case (including SOBC) have been set out in the Outline Business Case Consultation Plan.

### 2.5 Strategic Case Addendum Summary

- As covered in the SOBC, a range of existing and future transport problems which have the potential to constrain economic growth within the Southern Fringe have been identified in relation to congestion, high private car mode share and lack of Park and Ride capacity to cater for future employment growth. These problems have been translated into a set of six specific objectives to guide solution and option selection for enhanced Park and Ride facilities to serve the Southern Fringe.
- In the SOBC, a multi-criteria assessment was applied to create an option shortlist for major enhancements to Park and Ride provision in the vicinity of M11 Junction 11. The Greater Cambridge Partnership subsequently agreed to analyse a wider range of alternative transport options before progressing to the next business case stage, Outline Business Case.
- Four alternative options, a major Park and Ride site at Foxton Rail Station (Site F), a major Park and Ride site at Whittlesford Parkway Station (Site G), two separate major Park and Ride sites at Foxton and Whittlesford Parkway stations (Site H), and additional on-site parking facilities at Cambridge Biomedical Campus (Site I) have been assessed alongside the original short-listed options using the same assessment process.
- Additional parking at Cambridge Biomedical Campus (Site I) has been removed from further consideration as part of this project, due to the expected poor performance against scheme objectives and environmental constraints.
- Out of the remaining three alternative options (F, G and H), Option H (major Park and Ride provision at both Foxton and Whittlesford Parkway stations) is the strongest contender for including in the short list, due to the ability of the scheme to intercept trips from both the A10 and M11 corridors.
- However, given the expected negative local impacts of major Park and Ride sites at either Foxton or Whittlesford, it would seem sensible to continue the smaller scale rural travel hub approach for these sites.
- The smaller scale schemes at Foxton and Whittlesford Parkway stations would continue to be complementary to any major Park and Ride facilities in the vicinity of M11 Junction 11 rather than being replacements.
3 Economic Case

The Economic Case in this SOBC Addendum only identifies economic, environmental, social, and public accounts impacts that would be significantly different (whether positive or negative) with any of the alternative options.

3.1 Overview

3.2 Review of SOBC Economic Case

The SOBC Economic Case was prepared using methods that are appropriate for an early stage of scheme development. A high-level assessment of the five short list options was undertaken, based on the Department for Transport’s standard WebTAG economic, environmental, and social impact headings.

At this stage, a value for money category has not been identified, although there are clear benefits associated with each of the SOBC short list options. The expected impacts are set out in Figure 5.

Figure 5: Expected scheme impacts for SOBC short list options

<table>
<thead>
<tr>
<th>Economic</th>
<th>Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Net economic benefit for road users (especially commuters during peak periods) – mode shift decisions will reduce traffic flows</td>
<td>- Unlikely to lead to any significant adverse impacts</td>
</tr>
<tr>
<td>- Reduced time searching for a space</td>
<td>- Noise, local air quality and townscape impacts expected to be less detrimental for new site compared to expanding Trumpington</td>
</tr>
<tr>
<td>- Reduced car journey time into site (new site only)</td>
<td>- Landscape, historic environment, biodiversity and water environment impacts expected to be less detrimental for expanding Trumpington</td>
</tr>
<tr>
<td>- Reliable onward public transport journey time</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wider Economic Benefits</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Park and Ride capacity on the edge of the city will:</td>
<td></td>
</tr>
<tr>
<td>- Widen the travel to work area</td>
<td>- Increase in walking as part of an end-to-end journey that involves Park and Ride</td>
</tr>
<tr>
<td>- Increase labour supply for major employment growth areas</td>
<td>- Improvements to cycling routes across Junction 11</td>
</tr>
<tr>
<td>To unlock economic growth potential</td>
<td>- Reduced traveller frustration from oversubscribed parking</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald
3.2.1 Options Appraised

This SOBC Addendum identifies economic, environmental, social, and public accounts impacts that would be significantly different (whether positive or negative) with the alternative options – major Park and Ride site at Foxton station (Site F), major Park and Ride site at Whittlesford Parkway station (Site G), and major Park and Ride sites at both Foxton and Whittlesford Parkway (H).

3.3 Appraisal Summary

3.3.1 Appraisal Summary Table

The economic, environmental, social, and public accounts impacts that will be significantly different with the alternative options are summarised under the relevant standard WebTAG Appraisal Summary Table (AST) headings in this section.

3.3.2 Economic Impacts

Business users

Business user benefits relate to journey time reductions and vehicle operating costs savings for those undertaking business journeys. The assessment in Table 6 is informed by the scores from the six indicators within multi-criteria assessment Selection Theme 1 (reducing traffic levels and congestion).

Table 6: Business user impacts

<table>
<thead>
<tr>
<th>Option</th>
<th>Expected business user impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>F (major Foxton Park and Ride site)</td>
<td>Slight Beneficial: By intercepting a proportion of trips on the A10 northbound, this option is expected to reduce traffic flow on the circulatory at Junction 11, potentially reducing delays to all journeys passing through the junction including business journeys. However, trip interception may be limited.</td>
</tr>
<tr>
<td>G (Whittlesford Park and Ride)</td>
<td>Slight Beneficial: By intercepting a proportion of trips on the M11 northbound, this option is expected to reduce traffic flow on the circulatory at Junction 11, potentially reducing delays to all journeys passing through the junction including business journeys. However, trip interception may be limited.</td>
</tr>
<tr>
<td>H (Foxton and Whittlesford Park and Ride)</td>
<td>Moderate Beneficial: By intercepting trips on both the A10 northbound and M11 northbound this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction including business journeys.</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

Overall there is expected to be a net benefit for business users, as mode shift decisions made by other road users (including those making commuting and other journeys) will reduce traffic flows and delay in an area where significant congestion is experienced. However, the mode shift potential of the alternative options is not expected to be as great as the potential for the Site D options shortlisted in the SOBC, due to the limited destinations in Cambridge served by rail, the half hourly service frequency and comparatively high fares.

Journey time reliability impact on business users

Journey time reliability refers to daily variations in end to end journey time that transport users are not reasonably able to predict. For Park and Ride business journeys using the existing over-subscribed Trumpington site, the three key areas of journey time (un)reliability are access / egress times at the Park and Ride site, time taken to find a parking space and the public transport journey between the site and ultimate destination. The assessment in Table 7 is informed by the scores from the access and public transport journey time indicators within multi-
criteria assessment Selection Theme 2 (maximising potential for journeys to be undertaken by sustainable modes).

Table 7: Business user journey time reliability impacts

<table>
<thead>
<tr>
<th>Option(s)</th>
<th>Expected business user journey time reliability impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>F (Foxton Park and Ride site)</td>
<td>Neutral: For the three alternative options (F-H), although journey times to a major Park and Ride site would be reduced for business users driving along the A10 or M11 and an increase in parking spaces will reduce the time taken to look for a space, the sites are several miles from the Southern Fringe and Biomedical Campus and are served by a rail service only operating every 30 minutes. This introduces the risk of missing a service, having to wait for a lengthy period and then increasing the end to end journey time by up to 30 minutes.</td>
</tr>
<tr>
<td>G (Whittlesford Park and Ride)</td>
<td></td>
</tr>
<tr>
<td>H (Foxton and Whittlesford Park and Ride)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

3.3.3 Environmental Impacts

The environmental assessments set out in this sub-section are based on desktop assessment only. Where relevant, the assessments are informed by multi-criteria assessment scores from the seven environmental impact indicators in Selection Theme 3 (Quality of life and environment). From an environmental perspective the impacts of implementing two separate major Park and Ride facilities (Option H) would be worse than choosing either Option F or G which would result in impacts at one site only, even if the impacts were slightly higher than would arise at that site under Option H.

Noise, Local Air Quality, Greenhouse gases

Options F, G and H are in close proximity to Foxton and/or Whittlesford villages, thereby the Park and Ride site will introduce a source of noise and vehicle emissions (from slow moving and idling vehicles) directly into the villages. The expected noise and local air quality impacts of the alternative options are considered to be worse than the impacts of the SOBC short list options at Site D.

Landscape

A key advantage of Options F, G and H is that they do not involve construction within the Green Belt, either within the Cambridge City Council or South Cambridgeshire District Council area. However, the sites will require building large parking areas on a greenfield site within a rural area and several miles from the Cambridge urban area. From a purely landscape impact position all the options have similar scale impacts to the options at Site D.

Townscape

Options F, G and H are in close proximity to Foxton and/or Whittlesford villages. A large Park and Ride site has the potential to have a detrimental impact on the townscape and local character of a small village in a rural area which is several miles from the edge of the Cambridge urban area. The impact on townscape from the options at Site D would be significantly lower than Options F, G and H.

Heritage

Option F (Foxton) is close to 26 Grade II listed buildings in the village and one Grade I listed building (Church of St Laurence). There are two Scheduled Ancient Monuments close to the village (a Settlement due south of West Hill and Chalk Hill) and there are Roman Buildings north west of the railway alignment. There is also another Settlement north of the railway line on either side of the A10 near Hoffer Bridge. Given this range of Scheduled Monuments made up
of settlements it is likely there will be archaeology within the area of Foxton that has not been identified yet. Assuming a Park and Ride site was in one of the arable fields around the village and properly landscaped to mitigate impacts on listed building settings the impacts would be manageable for built heritage. In archaeology terms there is a reasonably high potential to find archaeological remains around Foxton.

Option G (Whittlesford Parkway) is close to a single Grade II listed building (the Red Lion Hotel) and one Scheduled Monument in the village (Chapel of the Hospital of St John at Whittlesford Bridge) adjacent to the Red Lion Hotel. The village therefore has fewer listed buildings or Scheduled Monuments in and around it than Foxton and therefore is likely to be a slightly less sensitive setting in terms of heritage.

Biodiversity

The MAGIC dataset\(^1\) shows that Option F (Foxton) has no protected sites located near to the village but that there are a number of broadleaved woodlands identified as priority sites. However, it is assumed that any Park and Ride site would be located on open land and not require any woodland/scrub habitat to be removed.

There are no surface water courses near to Foxton that could have associated habitat affected by any runoff from a park and ride site. Overall Option F (Foxton) is likely to have similar biodiversity value as the options at Site D.

Option G (Whittlesford Parkway) has no protected sites located near to the village – Sawston Meadows SSSI is the closest and is over 1.5 km to the north east. There are a number of priority habitats around the village, ranging from wetland/flood plains associated with the River Cam/Granta, deciduous broadleaved woodland and some areas of young woodland planting. The number of arable fields around the village is similar to that around Foxton, but there are higher numbers of hedgerows around the fields. It is likely that Option G will have a slightly higher biodiversity sensitivity than Option F and the options at Site D.

3.3.4 Social Impacts

Commuting and other users

Commuting and other user benefits relate to journey time reductions and vehicle operating costs savings for those undertaking these types of journeys. Commuting journeys are expected to form the greatest proportion of trips that will benefit from major enhancements to Park and Ride facilities, particularly focused on trips to the growing Cambridge Biomedical Campus. However, compared to the SOBC option short list for Site D, trip interception for the alternative options (F, G and H) may be more limited, due to the limited destinations in Cambridge served by rail, the half hourly service frequency and comparatively high fares.

Overall the impacts for commuting and other users will be similar to the impacts experienced by business users (as outlined in Table 6).

Journey time reliability impact on commuting and other users

Journey time reliability benefits for commuting and other users are expected to be identical to those experienced by business users, as summarised in Table 7.

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\(^1\) Natural England (2018). MAGIC. Available online at: http://www.magic.gov.uk/
Physical activity

Due to the location of Cambridge station, at more than one mile from the city centre, rail-based Park and Ride options (F, G and H) would be likely to increase the amount of walking undertaken by those shifting from an end to end car journey to Park and Ride. However, the smaller proportion of journeys that are expected to shift to Park and Ride will limit the overall physical activity impact when compared to the road-based public transport Park and Ride options in the SOBC.

Journey quality

For Options F, G and H journey quality benefits are expected to be similar to the benefits for the SOBC option short list:

- New Park and Ride users, who have switched from private car for the full journey to Park and Ride, should benefit from reduced traveller stress and frustration associated with congested roads and oversubscribed parking in the city centre and at the Cambridge Biomedical Campus.
- Existing Park and Ride users will benefit from improved ability to find a parking space.

The main journey quality issue associated with Options F, G and H is that rail service frequencies (every 30 minutes) are much lower than road-based public transport alternatives, leading to longer waiting times and the potential frustration of missing a service.

Accidents

Increased use of Park and Ride is expected to reduce vehicle-miles and therefore road accidents within Cambridge. Options F, G and H would remove vehicles several miles from the Cambridge urban area, possibly reducing the likelihood of road accidents for those vehicles. However, the smaller proportion of journeys that are expected to be intercepted by a rail-based Park and Ride will limit the benefits.

Affordability

Options F, G and H are expected to change the personal affordability of travel. An anytime return ticket from Whittlesford Parkway to Cambridge is £6.20 and from Foxton rail station is £5.10. A roundtrip ticket for the existing park and ride is £3.00 a day, £14.00 a week, and £56.00 a month. Unless new deals can be arranged with the train operating companies then personal affordability will be worse for rail-based Park and Ride options.

3.3.5 Impact on Public Accounts

Cost to broad transport budget

High level cost estimates have not yet been prepared for the major rail-based Park and Ride options (F, G and H) although they are expected to sit within the risk-adjusted costs estimate range for the SOBC options. Option H would be more costly as it involves construction at two separate locations.
3.4 Economic Case Addendum Summary

- The Economic Case Addendum has been prepared using methods that are considered to be appropriate for an early stage of scheme development. At this stage a value for money category has not been identified for any option.

- A high-level assessment of the alternative options is provided, under the standard WebTAG economic, environmental, and social impact headings, using information from the multi-criteria assessment and focusing on impacts that would be significantly different from the SOBC short list options.

- For any of the SOBC short list and alternative options there is expected to be a net economic benefit for road users, as mode shift decisions will reduce traffic flows and delay in an area where significant congestion is experienced. However, the mode shift potential of the alternative options is not expected to be as great due to the limited destinations in Cambridge served by rail, the half hourly service frequency and comparatively high fares.

- Users of a new Park and Ride site adjacent to Foxton and/or Whittlesford Parkway stations would benefit from reduced access times to a major Park and Ride facility, as well as improved ability to find a parking space. However, journey time reliability will be affected by the half-hourly rail service frequency, as missing a service would lead to a lengthy wait time.

- A high-level desktop environmental assessment has noted varied impacts by option. A concern is that options F, G and H, will negatively affect the townscape and local character of the villages of Foxton and/or Whittlesford as well as introducing a source of noise and vehicle emissions directly into the village(s). A key environmental advantage is that none of the alternative options are located in Green Belt.

- Negative personal affordability impacts would be much greater for the rail-based Park and Ride options (F, G and H) due to the comparatively high fares.
4 Financial, Commercial and Management Cases

The SOBC set out anticipated expenditure and potential funding sources (Financial Case), procurement considerations and options (Commercial Case), and an indicative programme and commentary on governance, communications and risk management (Management Case). This SOBC Addendum assesses the likelihood of there being any significant differences for the alternative options when compared to the SOBC option short list.

4.1 Potential Changes to Scheme Costs (Financial Case)

4.1.1 Investment Cost Considerations

SOBC option short list costs are estimated to range from £56 million to £71 million (all-in risk-adjusted costs, 2018 prices), excluding land costs and costs for complementary public transport priority measures along the A1309. More detailed cost estimates, including annual maintenance, site operating and public transport operating costs are to be prepared as part of the Outline Business Case.

At this stage, high-level cost estimates have not been prepared for the alternative rail-based Park and Ride options (F, G and H). Given the extent of work required to deliver a major Park and Ride site at either Foxton or Whittlesford Parkway, the costs for alternative options F and G are likely to be broadly similar to the SOBC options. Option H would be more costly as it involves construction in two separate locations.

The SOBC short list and alternative options all require new parking areas and new road junctions to be constructed. However, reasons why the alternative options might have different costs are set out in Table 8.

Table 8: Potential cost differences for alternatives compared to SOBC options

<table>
<thead>
<tr>
<th>Potential cost reductions</th>
<th>Potential cost increases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work to M11 Junction 11 would not be required as part of the scheme</td>
<td>Providing safe walking routes between the car park and station platforms, potentially including road crossings</td>
</tr>
<tr>
<td>Park and Ride access junction arrangements are likely to be more straightforward as, unlike the SOBC short list options, they would not interact with the motorway junction</td>
<td>Potential need to split parking provision across more than one site, due to lack of suitable land availability adjacent to the station</td>
</tr>
<tr>
<td>Public transport vehicle access/egress measures would not be required as the alternatives are rail-based options</td>
<td>Platform lengthening to remove the need to use selective door opening on the southbound platform at Foxton</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

4.1.2 Ongoing Operation and Maintenance Costs

Operating and maintenance cost estimates for SOBC short list options, and for any alternative options that are progressed, will be prepared at the Outline Business Case stage.

The alternative options are expected to have lower operating costs than the SOBC short list options as they would make use of existing rail services to provide the public transport leg of the journey, rather than requiring new or additional public transport services.
4.2 Procurement Considerations (Commercial Case)

The SOBC Commercial Case outlined the ways in which the scheme and associated road-based public transport services could be procured. Park and Ride site works for the SOBC options could be procured in three parts - scheme design, main site works, and works outside the site boundary. The same could be applied to the works for the alternative rail-based options.

For the alternative options there would be no need to procure additional public transport services, as sufficient capacity is expected to exist on existing rail services[2]. Overall this would be likely to make the alternative options slightly easier to deliver in procurement terms. However, ongoing management of the alternative rail-based options would be complicated by decisions on which organisation should operate and maintain the car park after opening.

4.3 Management Case Variations

The SOBC Management Case provided an indicative project programme and commentary on governance, quality assurance, communications and risk management. Key differences that would arise in the Management Case as a result of progressing the alternative options are set out in Table 9.

Table 9: Potential changes to Management Case for alternative options

<table>
<thead>
<tr>
<th>Management Case</th>
<th>Potential change</th>
</tr>
</thead>
</table>
| Project programme | ● Statutory procedures would almost certainly take longer than the SOBC short list options, as land would need to be acquired  
 ● Site opening would probably be delayed by at least 1-2 years. |
| Dependencies | ● Benefits of alternative rail-based Park and Ride options would be largely dependent on a new station at Cambridge South, which is currently at the early stages of development. Without Cambridge South the benefits would not be realised, as the Park and Ride would be of little use to anyone travelling to the Biomedical Campus.  
 ● Major rail-based Park and Rides at either Foxton or Whittlesford Parkway station would replace the rural travel hub schemes, which were previously listed as interdependencies. |
| Governance arrangements | ● Project board would need to include representatives from the rail industry – Network Rail and the train operating companies  
 ● Decisions would need to be made regarding which organisation would operate the car park. Potential options include Cambridgeshire County Council as the Local Highway Authority, or the train operating company (potentially using a third-party car park operator) as an extension to their asset management of the station.  
 ● Commercial public transport operators would not need to be involved, as the public transport element would be provided on existing rail services by the incumbent train operating company |
| Communications strategy | ● The key stakeholder list would need to be widened to include Foxton and/or Whittlesford Parish Councils, Network Rail, and the relevant train operating companies. |
| Risk management | ● The most significant additional risk associated with the alternative rail-based Park and Ride options is the dependency on a new station at Cambridge South. Without this the alternative options are of little use to the Cambridge Biomedical Campus, a key area of economic growth for the city. |

Source: Mott MacDonald

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[2] Further data collection and/or surveys are required to confirm available passenger capacity. This would need to be undertaken during Autumn 2018, when the impact of new rail timetables has stabilised.
4.4 Financial, Commercial and Management Cases Addendum Summary

- Costs for alternative rail-based Park and Ride options F and G are expected to be broadly similar to the costs for the SOBC short list options, although there are several reasons why costs may either increase or decrease. Option H would be more costly as it involves construction in two separate locations.
- Alternative rail-based Park and Ride options are expected to have lower annual operating costs, as they would make use of available capacity on existing rail services.
- Procurement for the alternative options may be simplified as there would be no need to procure additional public transport services, although ongoing management would be complicated by decisions on which organisation should operate and maintain the car park.
- Delivery timescales would be extended for the alternative options, due to land acquisition requirements.
- Governance arrangements and key stakeholder lists would need to be widened to include rail industry representatives.
- Benefits of the alternative rail-based options would be largely dependent on a station being delivered at Cambridge South – this presents a significant additional risk.
Appendices

A.  Multi-Criteria Assessment Scores 27
A. Multi-Criteria Assessment Scores
## Selection Theme 1: Maximising potential for journeys to be undertaken by public transport

**Selection Theme 2: Maximising potential for journeys to be undertaken by public transport**

**Selection Theme 3: Quality of life & environment**

**Selection Theme 4: Scheme deliverability**

### Appraisal Summary Table - Economic Case

<table>
<thead>
<tr>
<th>Option</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Car access time into P&amp;R from M11 northbound</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>-1</td>
</tr>
<tr>
<td>2. Traffic flow on A1123 to West of Cambridge Package</td>
<td>-1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. Delay due to lift from E122</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4. Traffic flow on A1123 to West of Cambridge Package</td>
<td>-2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5. Local air quality</td>
<td>-1</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>6. Landscape (Visual Impact)</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7. Wildlife</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8. Biodiversity</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Selection Theme 2: Maximising potential for journeys to be undertaken by public transport

**Transport options (continued)**

* 393699 - MIND-BCA-XX-RP-BC-0024 | 04 September 2018

**West of Cambridge Package**

**Selection Themes for the Strategic Outline Business Case Addendum**

**Alternative Options**

- **Red** scores -3 as land take limited to the P&R site only - no PT link or new slip roads.
- **Orange** scores -3 as new bridge over motorway (high flows) to be maintained, as well as new tunnel under A10.
- **Magenta** scores -2 as new offslip to cross.
- **Purple** scores -1 as new offslip to cross.
- **Yellow, White, Black, Cyan** score -2 as need for tunnel under A10, and a new structure across M11.
- **Blue** scores -2 as need to expand existing bridge structures at J11.
- **Wire** scores -1 as although some traffic managed by re-aligned A10, and although new site operates in the same location.
- **F & H score 0 since biodiversity is not perceived to be impacted.
- **Orange** cannot score 1 due to J11 enlargement into different areas of land.
- **No impacts expected for any option.
- **Magenta scores -1 as expanding the existing Trumpington site would increase the concentration of emissions.
- **F, G & H score 0, do not negatively impact or enhance walking and cycling facilities providing new cycling facilities with the PT veh lanes.
- **Blue score -1 as although two new junctions and offslip to cross, the impact could be offset to some extent by providing extra capacity to PT veh lanes.
- **Blue, Purple, Orange score 1 rather than 3 as they would introduce new capacity to the approach A10 slip roads.
- **Blue, Purple, Orange, Cyan score 2 as include free-flow off-slip for M11, reducing chance of queues on A10.
- **Red** scores -1 as one new junction on A10 to cross.
- **Purple, White, Orange, Cyan** score 3 as easy direct access from M11 northbound via dedicated slip road.
- **F & H score 2 since car access could be direct from the A10 vehicles from M11 direction may cause some delay.
- **Purple, White, Orange, Cyan score 2 rather than 3 as they would introduce new high frequency PT vehicle movements across A10.
- **F & H score 2 since it will intercept traffic from 2 directions (M11 and A10).
- ** purple** scores 2 as it will take out traffic flow from one side of the A1309.
- **H scores 2 as it will take out traffic flow from one side of the A1309.
- **H scores 1 as traffic will be intercepted via both the A10 and M11, but no new capacity will be provided.
- **H scores 2 as it will take out traffic flow from one side of the A1309, although new site operates in the same location.
- **Magenta** would have no impact on delays on A10.
- **Blue, Purple, Orange, Cyan score 2 as include free-flow off-slip for M11, reducing chance of queues on A10.
- **Purple, White, Orange, Cyan score 2 rather than 3 as they would introduce new high frequency PT vehicle movements across A10.
- **F & H score 2 since car access could be direct from the A10 vehicles from M11 direction may cause some delay.
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