MOTT MACDONALD

Cambridge South East Transport Phase 2

Outline Business Case
Appendix A: Options Appraisal Report

15 May 2020

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Outline Business Case
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Contents

Executive Summary

Phase 2 of the Cambridge South East Transport (CSET) scheme will deliver a new dedicated public transport route between a new Travel Hub near the A11/A1307/A505 junction and the Cambridge Biomedical Campus (CBC) via Sawston, Stapleford and Great Shelford. Connections will be provided from the Travel Hub to Babraham, Babraham Research Campus and Granta Park. At the Biomedical Campus, the new route is proposed to run on dedicated public transport lanes on Francis Crick Avenue, connecting to the existing Guided Busway, enabling services to continue to Cambridge Station and Cambridge City Centre via the Busway. Stops on the new route are proposed for the Biomedical Campus, Great Shelford, Stapleford, Sawston and the new Travel Hub site. The Biomedical Campus stop would be located near to the proposed Cambridge South Station to enable easy interchange with rail services in the future.

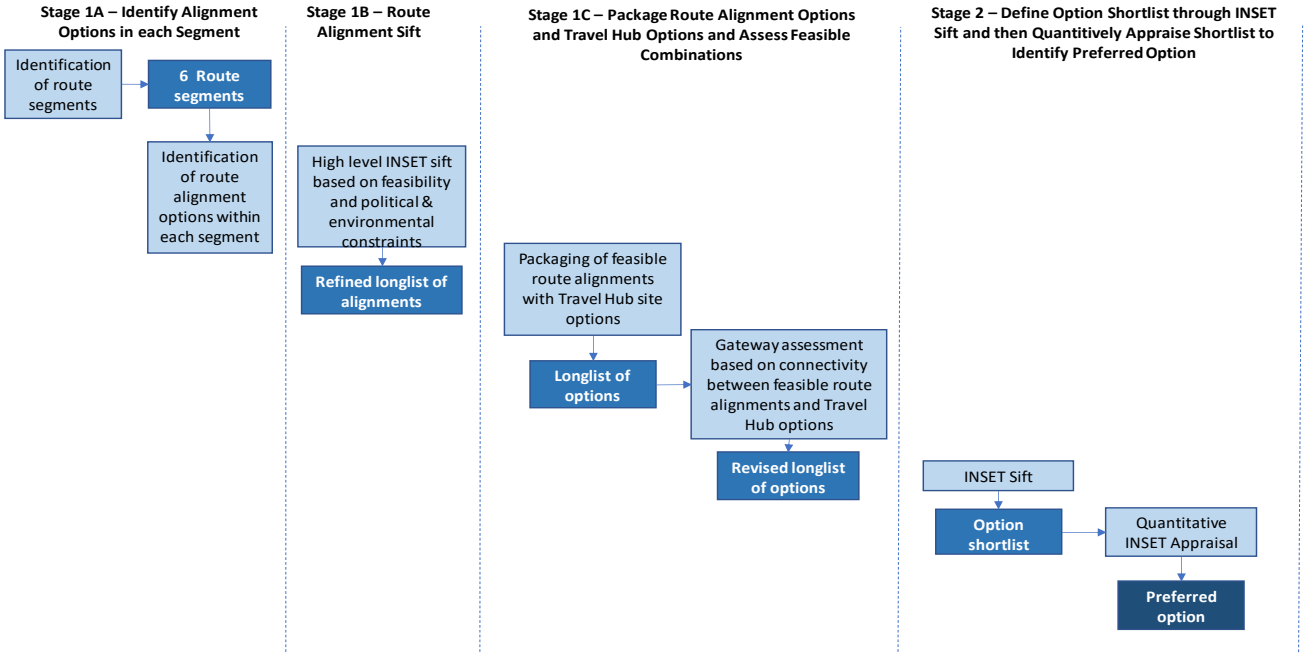
A robust and proportionate option generation and appraisal process has been undertaken to determine the indicative preferred option for CSET Phase 2. A four-stage process was adopted which enabled thorough appraisal at each stage. Details of the process undertaken at each stage are set out over the following sections of this Executive Summary.

Option Development and Assessment

Options generated were passed through four stages of appraisal and refinement, as illustrated in Figure 1. The four stages of the bespoke CSET Phase 2 option generation and appraisal process are aligned with the first two stages of the Department for Transport's (DfT) guidance 'The Transport Appraisal Process'[1]. The process enabled a thorough and appropriate assessment process which avoided assessing options in detail that did not meet basic requirements in the early stages of the development - Stages 1A and 1B. Each stage is described in further detail on the following pages.

[1] Transport Analysis Guidance, The Transport Appraisal Process, May 2018, Department for Transport (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/712965/webtag-transport-appraisal-process-may-2018.pdf)

Figure 1: Options Assessment Framework

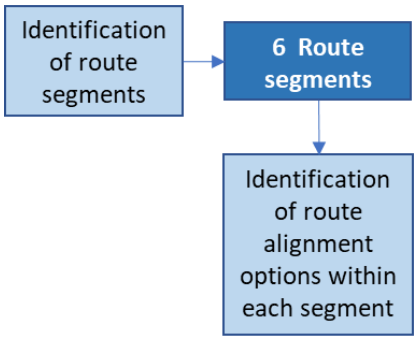


Source: Mott Macdonald

Stage 1A- Identification of Route Alignment Options

This Outline Business Case (OBC) stage builds upon work undertaken at the Strategic Outline Business Case (SOBC) stage in which broad strategies for potential alignments were developed. Stage 1A of the OBC process first established the need for intervention based on a review of current and future problems and opportunities, set in the context of both local and national policy. This enabled an option generation process which would address these problems and opportunities. The key steps within Stage 1A are illustrated in Figure 2.

Figure 2: Stage 1A Process – Identify Alignment in each Segment



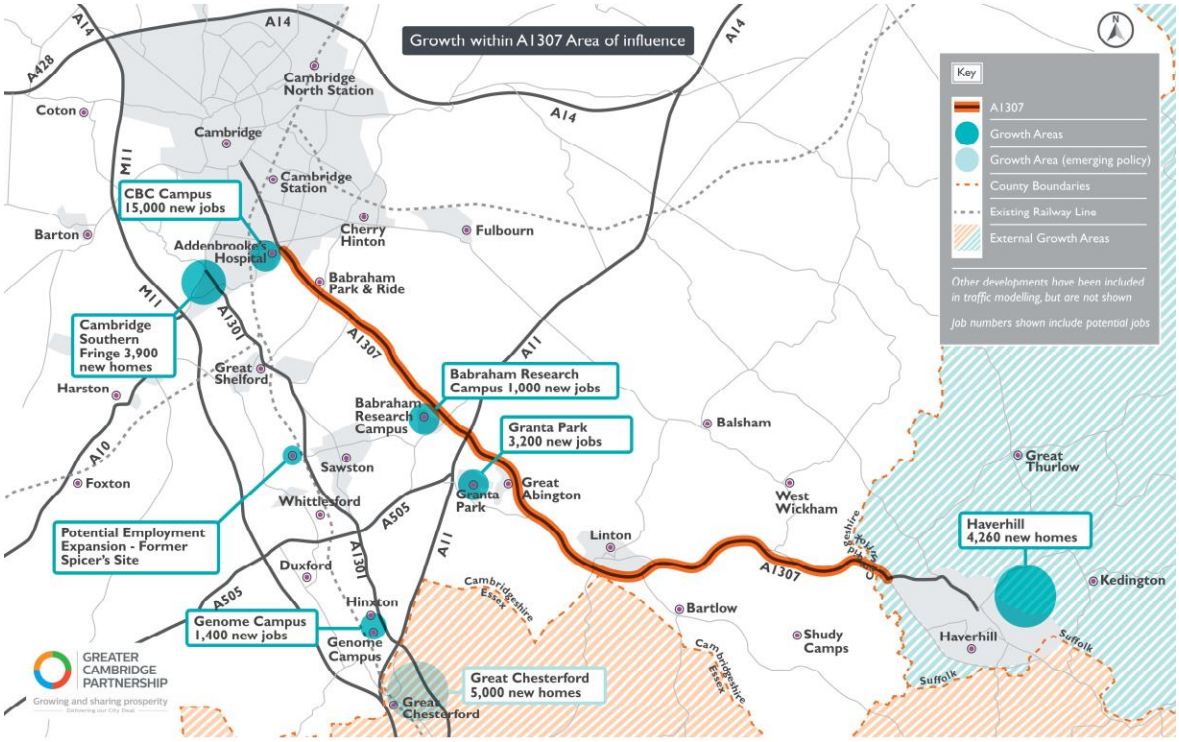
Source: Mott Macdonald

At SOBC stage in agreement with GCP it was established that the study area would cover the south east quadrant of Cambridge and South Cambridgeshire between A1307 and A1301 corridors, extending from the Cambridge Biomedical Campus at its north western edge to the

Suffolk town of Haverhill in the east, encompassing key settlements of Linton, the Abingtons, Babraham village, Pampisford, Sawston, Stapleford and Great Shelford.

This is a key area for substantial economic growth and investment with over 18,000 new jobs and 8000 new homes planned in the next 10 years. As such the scheme is intended to support sustainable economic growth in the south east of Cambridgeshire where significant international investment in Biomedical research is planned, as well as significant growth of the three research campuses Babraham Research Campus, Granta Park and the Cambridge Biomedical Campus (home to the world renowned Addenbrookes Hospital, Rosie Maternity Hospital and, soon to be relocated, Royal Papworth Hospital, plus Astra Zeneca Corporate global headquarters). It was on this basis that the study area was defined.

Figure 3: Study Area as Agreed at SOBC Stage



Source: WSP, Cambridge South East Transport Study, Outline Business Case (interim)

At SOBC stage three broad route alignments, called strategies, within the study corridor were proposed. Details of the three strategies initially identified are included below:

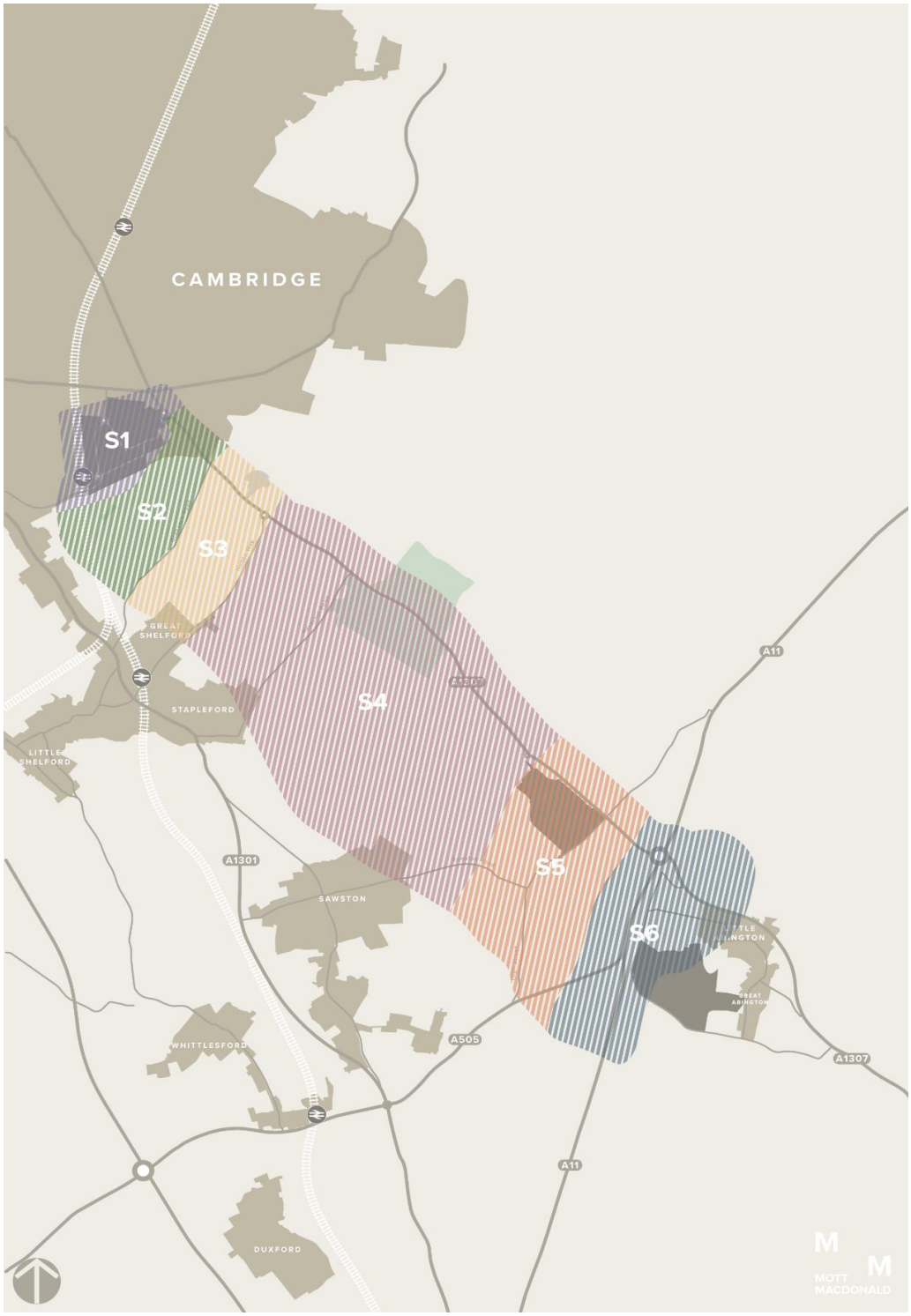
- **Strategy 1**: Identified as providing a strategic off-road public transport route between a new Travel Hub site located close to the A11 and CBC. This route would aim to provide connectivity to the settlements of Sawston, Stapleford and Great Shelford, following the alignment of the former Cambridge-Haverhill railway where possible.
- **Strategy 2**: Would provide a segregated public transport route following the alignment of the existing A1307, continuing along a new off-road route through current farmland connecting with the existing CBC road network at the southern boundary of the campus, before continuing through the site and on towards Cambridge City Centre via the existing guided busway.
- **Strategy 3**: From Babraham Road Park & Ride site, Strategy 3 would continue along the A1307, accessing the CBC using the existing road network. This route would then follow Robinson Way through the CBC site and onwards toward Cambridge City Centre via the

existing guided busway. Both strategies 2 and 3 would both broadly follow the same route between Little Abington and Babraham Road Park & Ride site.

Assessment of these strategies as SOBC stage found that Strategy 1 was the preferred strategy and an initial assumption was made that going forward all potential options would be based on alignment with Strategy 1. However, a review of the assessment process was undertaken at OBC stage to confirm these findings.

To ensure robustness, the approach to option development differed than what was undertaken at SOBC stage to serve as a cross-check on findings to date. Rather than re-assessing the three strategies against additional and more detailed criteria and then designing options constrained by a preferred strategy, Stage 1A looked holistically at the whole study area, irrespective of previously identified strategies. The corridor was split into six key segments, as illustrated in Figure 4, to enable multiple route alignment options within each of the six segments to be developed. This formed an initial longlist of route alignment options within each segment which progressed to Stage 1B. In total, 38 segmented route alignment options were progressed.

Figure 4: Stage 1A - Route Segmentation

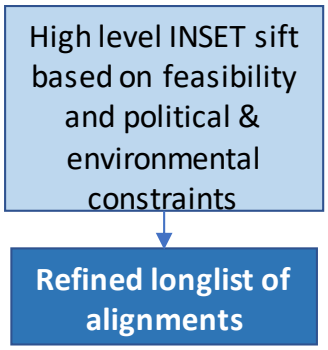


Source: Mott MacDonald

Stage 1B - Route Alignment Sift

At Stage 1B a high level sift was undertaken, designed to discount route alignment options which did not meet the initial deliverability or environmental criteria and offered no plausible transport benefits. An overview of the process undertaken at Stage 1B can be seen below in Figure 5.

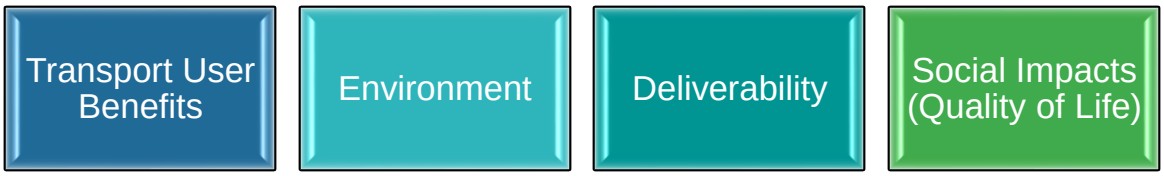
Figure 5: Stage 1B – Segmented Route Alignment Sift



Source: Mott MacDonald

Mott MacDonald's INvestment Sifting and Evaluation Tool (INSET) was used to refine the longlist of segmented route alignments. INSET is a decision support toolkit developed in-house by Mott MacDonald and was used to carry out the initial high level sift of route alignment options. Based on HM Treasury Green Book compliant Multi-Criteria Decision Analysis (MCDA) and accepted by the DfT as a valid assessment framework, INSET is flexible, replicable and transparent and can be used for both high level qualitative option sifting and detailed quantitative appraisal.

At this stage, INSET consisted of four assessment themes, as illustrated below:



Scores were assigned on a seven-point scale, ranging from -3 (large disbenefit) to +3 (large benefit) and 0 being neutral. Each of the four themes were weighted equally, and scores were assigned primarily on a qualitative basis. This is except for the Environment theme, where it was possible to assign scores to some of the criteria based on quantitative metrics generated from readily available information sources such as flood risk mapping.

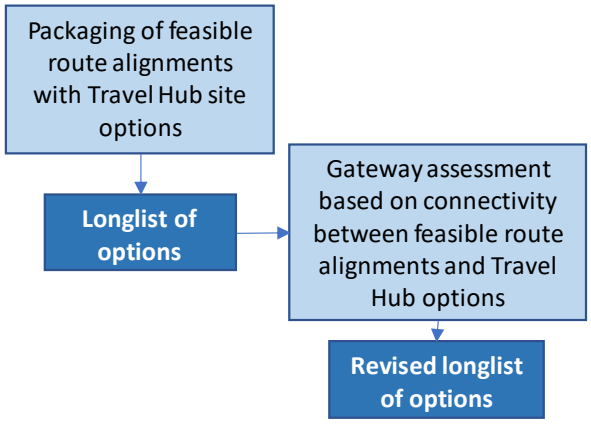
The three best performing alignment options within each segment (based on total score) progressed to the next stage. Additional alignments were progressed to the subsequent stage if additional alignment options had scored equally as well as the top three, or the third best performing option. Additional alignment options were also retained if they were required to construct a complete route.

This approach was taken to ensure complete routes could be created and to prevent segment alignment options which could score better when packaged with others from being discounted unfairly. In total 25 segmented route alignment options were progressed to Stage 1C, to be packaged as complete options.

Stage 1C - Option Packaging

Stage 1C packaged the 25 segmented route alignments into full corridor length route alignments and combined them with each of the proposed Travel Hub sites to create full option packages. A Gateway Assessment was then undertaken to sift out options that did not meet the gateway criteria. The key steps undertaken at Stage 1C are illustrated below in Figure 6.

Figure 6: Stage 1C Process – Packaging Route Alignments and Travel Hub Combinations; Assess Feasible Combinations



Source: Mott Macdonald

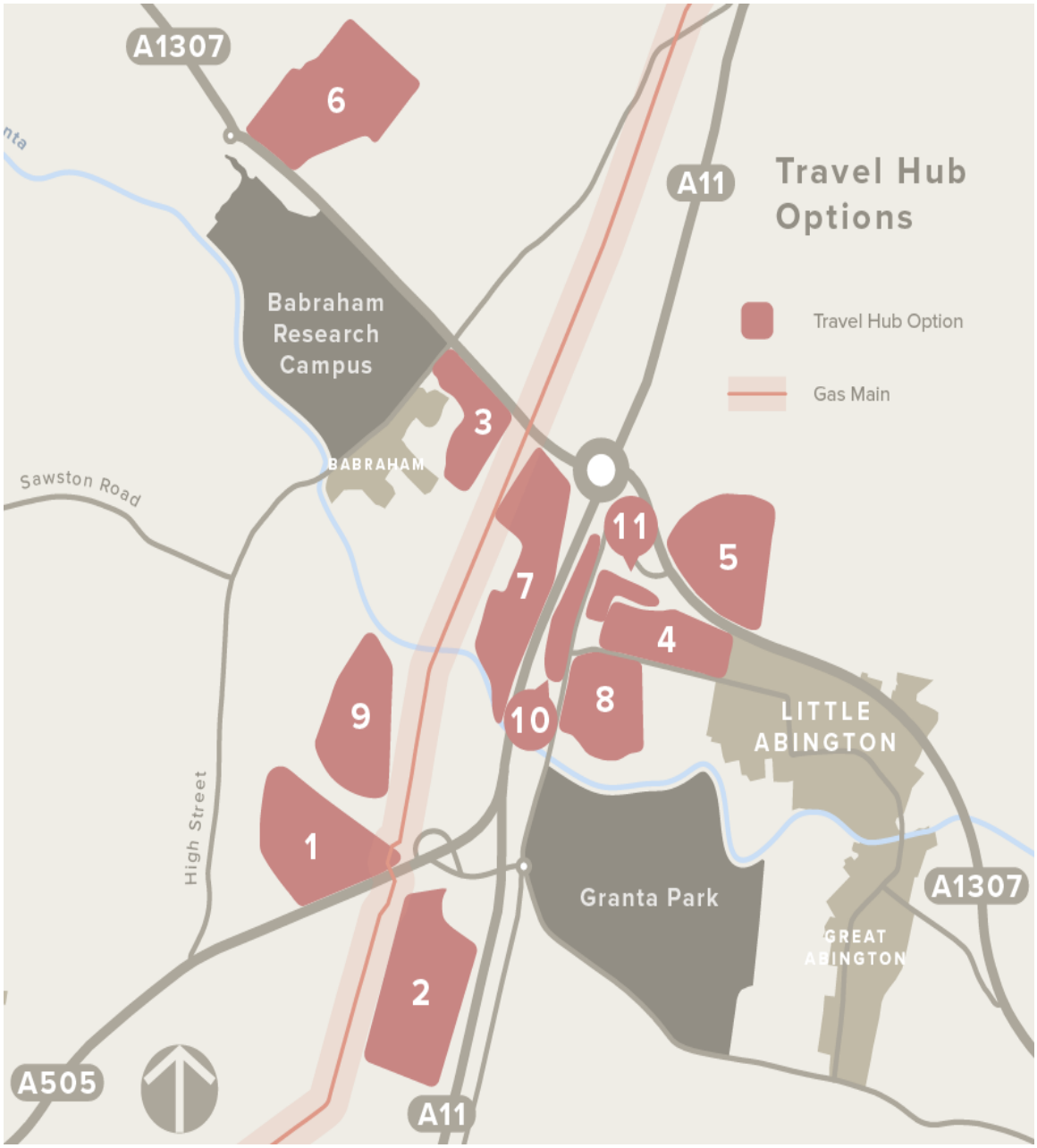
At Stage 1B Travel Hub sites were not considered, as route alignment was the driver as to which options would be developed. However, at Stage 1C the feasible route alignments were packaged with potential Travel Hub sites.

Previous work undertaken at SOBC stage on Travel Hub site development was revisited and reviewed to establish if any additional sites would be suitable for inclusion in the option packages. Eleven sites were identified, these are illustrated in Figure 7. Sites 1-8 were previously proposed at SOBC stage, with additional Sites 9-11 proposed for consideration at OBC stage. Sites were developed based upon the following key criteria:

- Location – the new strategic Travel Hub facility should be located in close proximity to the intersection of the A11, A1307 and A505
- Capacity – availability of sites of sufficient size to accommodate 2,000 to 3,000 spaces[2]
- Accessibility, proximity and synergy to corridor route alignments
- Compatibility with other emerging strategic transport infrastructure schemes
- Constraints to development.

[2] WSP's Technical Note ref 70012014-TN-006 P&R cites the Cambridge Parking Strategy Review (SDG, May 2017) in seeking a minimum parking space provision for new Travel Hub facilities of 2,000 spaces, with further consideration for future expansion to a total of 3,000 spaces

Figure 7: Proposed Travel Hub Sites

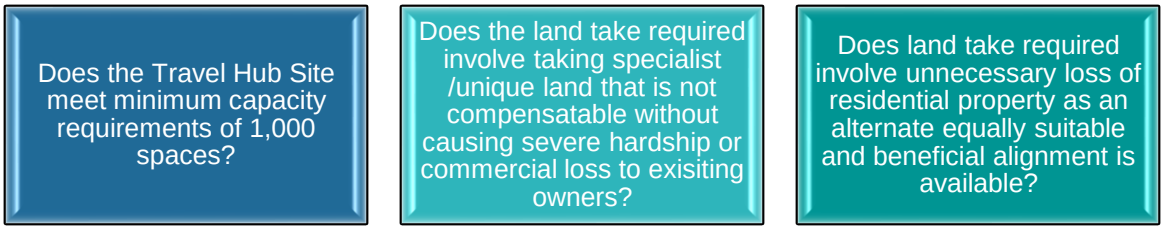


Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

After the sift of the route alignment options on a segment by segment basis, there were no route alignment options within Segment 6 that would connect to Travel Hub Site 2. It was therefore not possible to package this Travel Hub site with a route alignment as an overall option and so Site 2 was discarded on the basis it could not form part of any possible option package.

The remaining ten Travel Hub sites could however be packaged with multiple variations of route alignments. This led to the production of 231 option packages.

The 231 option packages were subject to three Gateway Assessment criteria which were effectively Yes/No responses. The three Gateway Assessment criteria can be seen below:



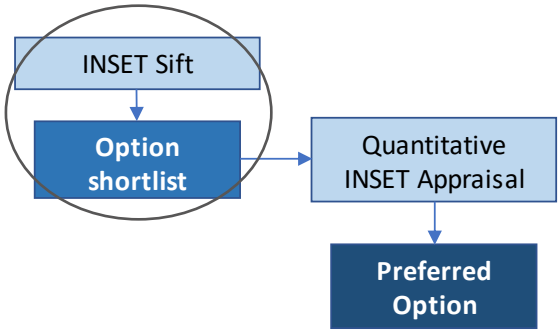
Through this Gateway Assessment, 141 of the 231 options were sifted out of the initial longlist and removed from further consideration. This left 90 options in the revised longlist to be progressed to Stage 2.

Stage 2 - Option Shortlisting and Quantitative Appraisal

Option Shortlisting

A second, more complex, INSET sift was then undertaken to appraise the revised longlist of options and produce an options shortlist. This involved revisiting themes and criteria to expand them to take account of packaged options that included both route alignment and Travel Hub elements. The first step within Stage 2 is circled below in Figure 8.

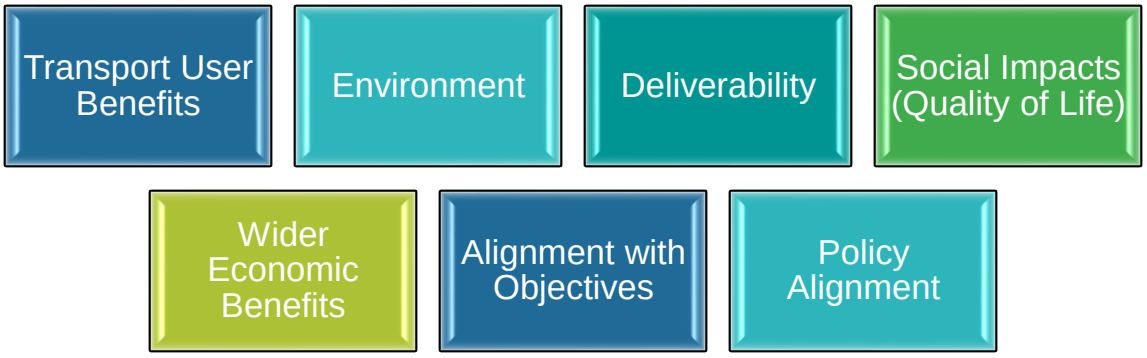
Figure 8: Stage 2 Process - Define Option Shortlist through INSET Sift and then Quantitively Appraise Shortlist to Identify Preferred Option



Source: Mott Macdonald

The longlist of 90 options were subjected to a further, more detailed INSET sift which included three additional criteria: Wider Economic Benefits; Alignment with Objectives; and Policy Alignment. At this stage, sub-criteria were also included under some criteria, the previous assessment at Stage 1B was undertaken at a theme and criteria level only.

At Stage 2, options were scored according to how well they addressed criteria under the themes of:



For consistency, a seven-point scoring system was adopted to assess how well options met the established criteria, using a scale of -3 to +3, where -3 represented a very poor ability to address criteria and +3 a very good ability. Scoring was qualitatively assigned based on Mott MacDonald's extensive experience and knowledge of the CSET scheme, the geographic area and INSET as an appraisal tool.

Initially, it was proposed that the shortlist would comprise of only the top three options from this sift, however, the top three options from this appraisal were highly similar in terms of route alignment and all three utilised the same Travel Hub site. With greater differentiation between routes thought to provide more robust results during the modelling and quantitative assessment stage, the shortlist was thus expanded to include the top seven options. These seven options were subjected to sensitivity testing where weightings were adjusted based on potential differences in the importance of each theme.

- Scenario 1: The weighting of the Environment theme was raised to 4 whilst the weightings of all other themes were held constant at 1.
- Scenario 2: The weighting of both the Transport Benefits and Social Impacts themes were raised to 2 and the weightings of all other themes were held constant at 1.
- Scenario 3: The Policy Alignment and Alignment with Objectives themes were weighted as zero, effectively removing them from consideration, whilst all other themes were held constant at 1.

Under all alternative scenarios, the top-ranking options remained the same.

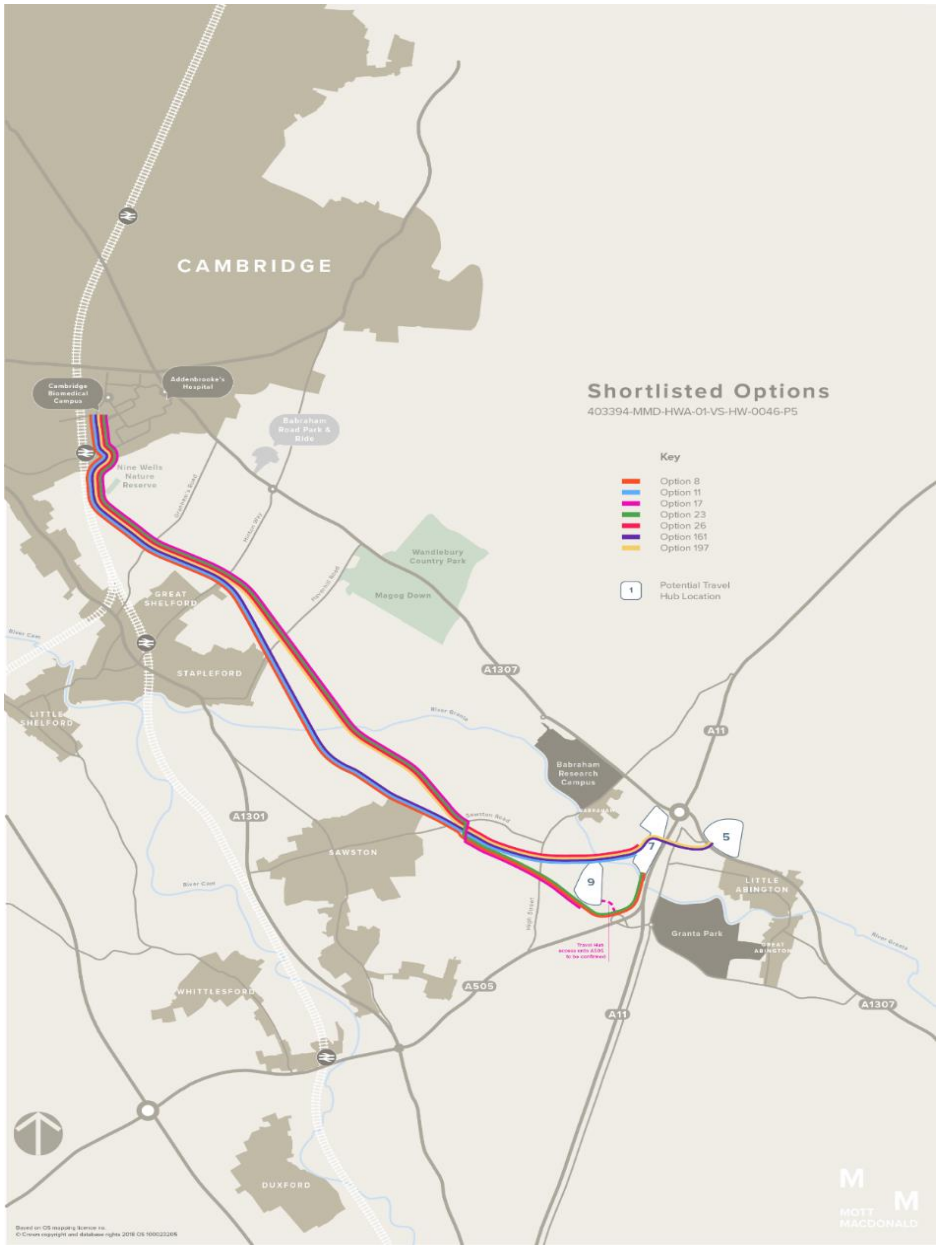
Option Shortlist

The original seven shortlisted options are listed below in the order in which they ranked. These alignments are illustrated in Figure 9, with colours corresponding to those set out below.

- **Option 26:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – East with no Travel Hub connection – Direct to A11/A1307, connecting with Travel Hub Site 7.
- **Option 11:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – West with no Travel Hub connection – Direct to A11/A1307, connecting with Travel Hub Site 7.
- **Option 23:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – East with no Travel Hub connection – North of railway – Parallel with A11 without crossing, connecting with Travel Hub Site 7.
- **Option 8:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – West with no Travel Hub connection – North of railway – Parallel with A11 without crossing, connecting with Travel Hub Site 7.

- **Option 17:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – East with no Travel Hub connection – North of railway – Direct from western alignment, connecting with Travel Hub Site 9.
- **Option 197:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – East with no Travel Hub connection – Direct to A11/A1307 – Crosses A11 with dedicated route to A1307 connecting with Travel Hub Site 5.
- **Option 161:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – West with no Travel Hub connection – Direct to A11/A1307 – Crosses A11 with dedicated route to A1307 connecting with Travel Hub Site 5.

Figure 9: Shortlisted Options Following Stage 2 INSET Sift

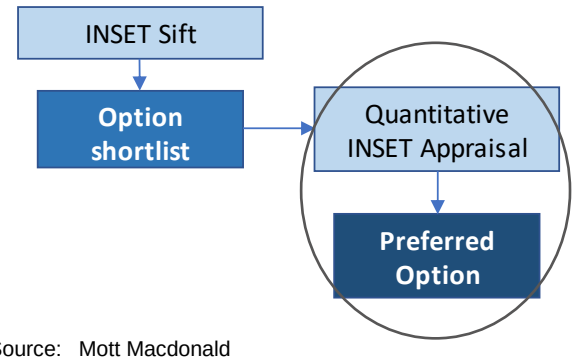


Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Quantitative Appraisal

Finally, in the last step of Stage 2 a more thorough appraisal process was undertaken. The same assessment themes and criteria were used as in the previous Stage 2 sift to arrive at the shortlist of seven options, however a quantitative analysis was undertaken (where possible) to assign metrics to options. Where quantitative analysis was not possible a more detailed and robust qualitative analysis was undertaken. The final step in Stage 2 is circled below in Figure 10.

Figure 10: Stage 2 Process - Define Option Shortlist through INSET Sift and then Quantitively Appraise Shortlist to Identify Preferred Option



Source: Mott Macdonald

Following stakeholder engagement, the seven shortlisted options were reduced to four. This was done on the basis that the central alignment between the CBC and Sawston Road was very similar for all options and that the variants of this were not deemed to be sufficiently different to present at public consultation. Instead, an optimum alignment between these two points, which seeks to maximise the proximity to urban areas and limit the impact on the environment, for example hedgerows and the greenbelt, was developed.

During this design development phase, the modification to the designs resulted in some options being effectively merged, specifically:

- Options 8 and 23
- Options 11 and 26
- Options 161 and 197

Along with Option 17 this reduced the shortlist to four options which were shared with GCP.

A fifth option was also identified that combined elements of options 8/23 and 161/197. This was in order to extend a route alongside the former railway and A11 to a dedicated public transport route towards Travel Hub Site 5 on the eastern side of the A11. Option packages combining a route alignment alongside the former railway with Site 5 were included in the longlist of options; however, these featured a more southerly crossing of the A11 to join Newmarket Road rather than a dedicated public transport alignment to connect with Site 5.

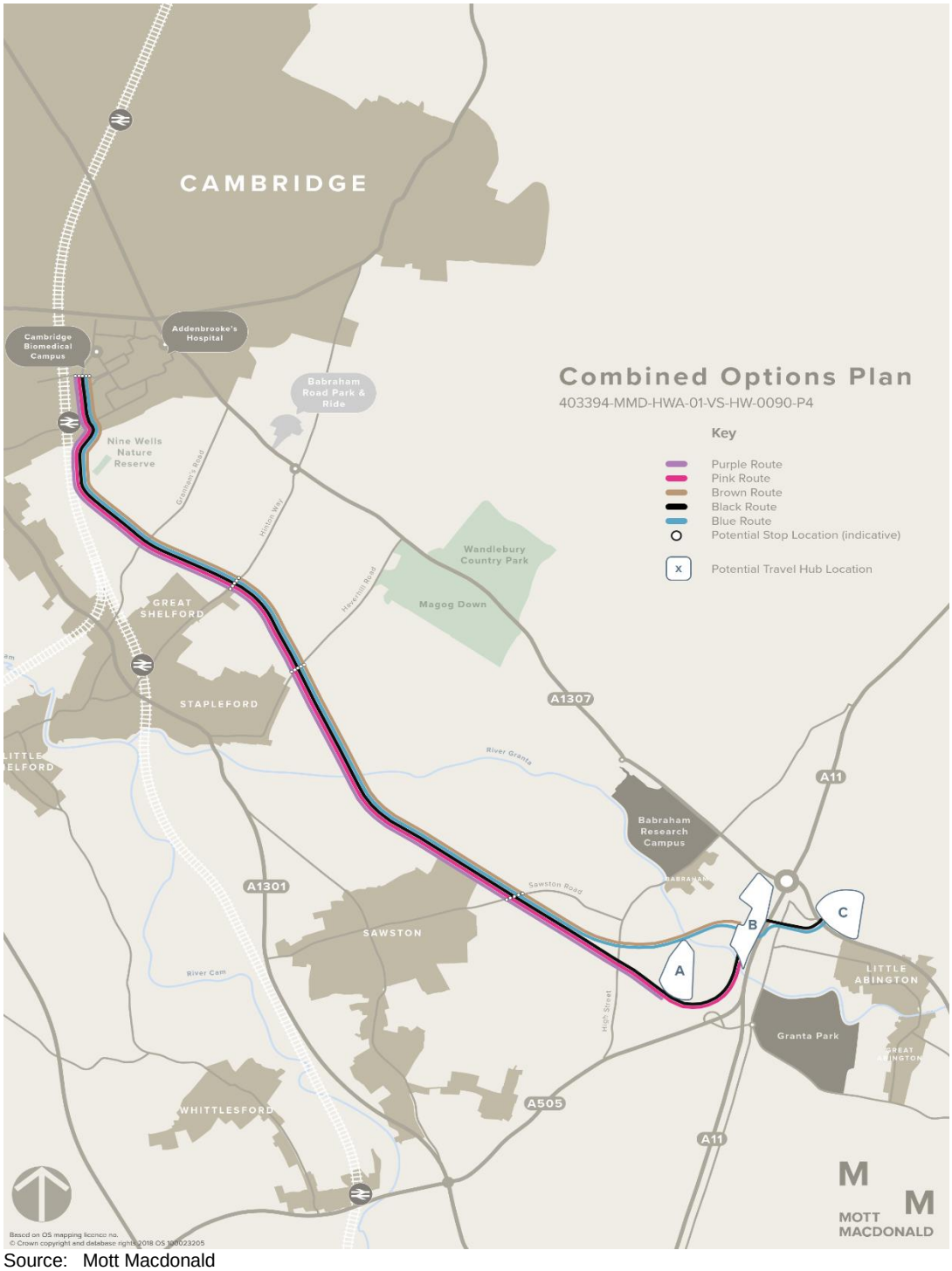
As key elements of the new options had previously been through the appraisal process and successfully progressed to the shortlist it was decided not to formally reappraise this amalgamated hybrid option; instead a desktop assessment was undertaken to ensure that the hybrid would still perform in a similar manner to its component parts. This resulted in a total of five options being progressed for appraisal.

Following this further refinement of the shortlist, it was agreed that, from this point onwards, the route alignments would be referred to by colour and the Travel Hubs would be referred to by letter, as set out in Table 1. All follow the same route between CBC and Sawston, from which point they diverge into five alternative alignments, leading to one of three Travel Hub sites. All options would have the same service frequencies and have similar levels of provision for pedestrians and cyclists. The revised option shortlist is shown in Figure 11.

Table 1: Revised Options Shortlist

Refined Shortlisted Option	Description	Original Shortlisted Option(s) Elements
Brown route from Travel Hub Site B	Direct to Travel Hub west of the A11 (Site 7)	11, 26
Blue route from Travel Hub Site C	Direct to Travel Hub east of the A11 (Site 5)	161, 197
Black route from Travel Hub Site C	Alongside former railway to Travel Hub east of the A11 (Site 5)	N/A (combines 8/23 and 161/197)
Pink route from Travel Hub Site B	Alongside former railway to Travel Hub west of the A11 (Site 7)	8, 23
Purple route from Travel Hub Site A	Alongside former railway to Travel Hub west of the A505 (Site 9)	17

Figure 11: Revised Option Shortlist



Source: Mott Macdonald

Having finalised the option shortlist, each of the five options was subjected to a quantitative or more robust qualitative appraisal of options against each of the established criteria. The final results of the INSET appraisal are set out in Table 2 and can be interpreted on a theme by theme basis before the final overall scores for each option, along with the final ranking of the five shortlisted options.

Table 2: Final Option Shortlist INSET Results

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
1	Brown Route from Travel Hub Site B	1.52	-1.25	-0.57	0.88	3.00	1.75	2.20	1.08
2	Pink Route from Travel Hub Site B	1.50	-1.25	-0.64	0.88	3.00	1.75	2.20	1.06
3	Blue Route from Travel Hub Site C	1.33	-1.25	-1.10	0.58	3.00	1.65	2.20	0.92
4	Purple Route from Travel Hub Site A	1.31	-1.38	-0.29	0.71	2.00	1.68	2.20	0.89
5	Black Route from Travel Hub Site C	1.33	-1.25	-1.38	0.58	3.00	1.65	2.20	0.88

Source: Mott MacDonald

As shown in Table 2, the INSET appraisal undertaken has identified the Brown Route from Travel Hub Site B as the indicative preferred option for CSET Phase 2.

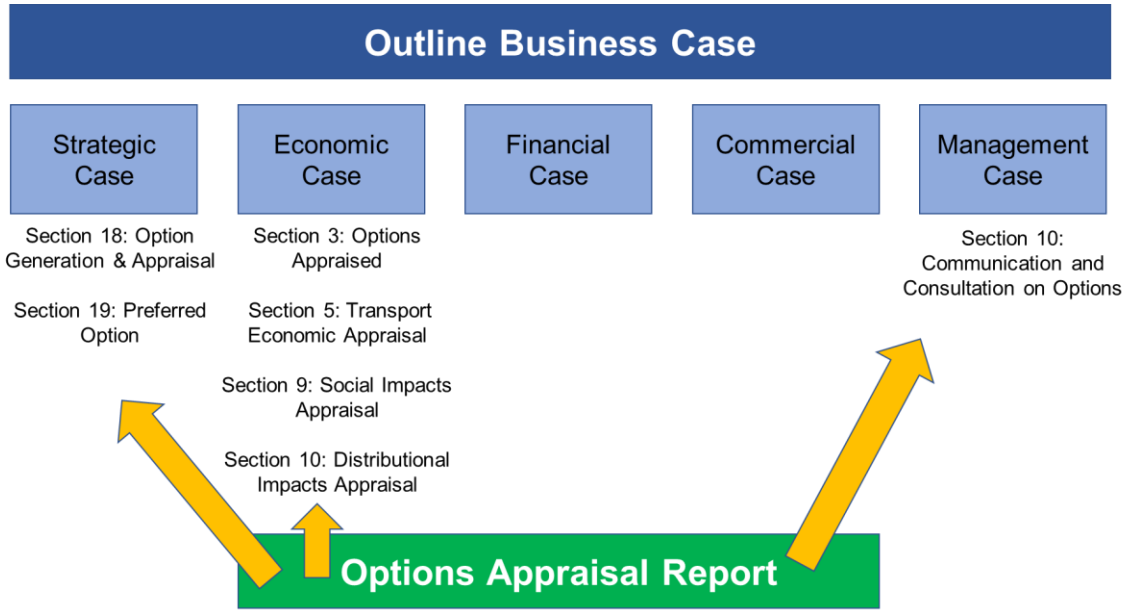
However, further work, including the calculation of Benefit Cost Ratios (BCRs) for the shortlisted options, will be undertaken to support and reconfirm the findings of the INSET assessment. This work will be documented in the Economic Case of the OBC. Stakeholder and public consultation feedback are also considered to be crucial to the confirmation of the preferred option. Therefore, although an indicative preferred option has been identified based on the results of the formal assessment process in this OAR, the final assessment of the shortlisted options will also take into account the value of the BCR calculations and the responses to public consultation in the Autumn of 2019 to either affirm or refine the results of the assessments documented in this OAR. The preferred option and the process to identify it, following this INSET assessment is documented in Section 19 of the Strategic Case, document reference 403394-MMD-BCA-00-RP-BC-0247.

1 Introduction

1.1 Purpose of this Report

Mott MacDonald have been commissioned by the Greater Cambridge Partnership (GCP) on behalf of Cambridgeshire County Council (CCC) to produce an Outline Business Case (OBC) for Phase 2 of the Cambridge South East Transport (CSET) scheme. This Options Appraisal Report (OAR) is an integral component of the OBC, addressing the transport appraisal process, and in this context, it sets out how GCP have systematically appraised and reviewed a set of options for the scheme and selected a preferred option. Figure 12 illustrates the relationship between the OAR and OBC and how the OAR feeds into three of the OBC cases; the OAR is the detailed technical analysis of the appraisal process used to identify the preferred option which is the focus of the OBC.

Figure 12: Relationship between the OAR and OBC



Source: Mott MacDonald

Phase 2 of the CSET scheme seeks to provide a High-Quality Public Transport (HQPT) route between central Cambridge and Haverhill along with a Travel Hub facility near to the A11 to further support the use of public transport for journeys in south east Cambridge. Travel Hubs are defined as transport interchanges of varying sizes allowing people from the surrounding areas to access sustainable transport networks such as public transport, walking and cycling routes.

In order to arrive at a preferred option for the scheme, it is crucial that a clear, transparent and robust process is followed, taking account of the benefits and dis-benefits of different solutions to the problems identified. Therefore, the purpose of this report is to set out, appraise and sift the options considered for Phase 2 of the CSET scheme and demonstrate an approach which fully complies with the relevant appraisal requirements (including WebTAG - the Department for Transport (DfT) governed framework for transport appraisal), thus giving confidence that the processes followed will lead to a robust OBC for the scheme.

1.2 Scheme Description

Sections 2 and onward of this OAR detail the process of option development and assessment, however a high-level overview of the indicative preferred option that has resulted from that process is provided here in this introductory section.

Phase 2 will deliver a new dedicated public transport route between a new Travel Hub near the A11/A1307/A505 junction and the Cambridge Biomedical Campus (CBC) via Sawston, Stapleford and Great Shelford. A Travel Hub is an interchange which allows people from the surrounding areas to access sustainable transport networks, such as public transport, walking and cycling routes.

Connections will be provided from the Travel Hub to Babraham, Babraham Research Campus and Granta Park. At the Biomedical Campus, the new route is proposed to run on dedicated public transport lanes, connecting to the existing Guided Busway, enabling services to continue to Cambridge Station and Cambridge City Centre via the Busway. Stops on the new route are proposed for the Biomedical Campus, Great Shelford, Stapleford, Sawston and the new Travel Hub site. The Biomedical Campus stop would be located near to the proposed Cambridge South Station to enable easy interchange with rail services in the future. All stops would have the following facilities:

- Platforms with shelter and real-time passenger information;
- Drop off facilities;
- Disabled parking; and
- Cycle parking and cycle lockers.

A new multi-user path, generally 3-4 metres wide, would also be provided along the length of the public transport route. The multi-user path will serve a range of non-motorised uses, such as cycling, walking, horse riding and for use by mobility scooters and electric bikes. The path will be hard-surfaced to enable use during all weathers for both commuting and leisure.

As part of its overarching investment strategy, GCP are proposing a range of local public transport, safety and walking improvements known as the Cambridge South East Transport scheme (CSET). These measures will be implemented in two phases.

Phase 1

Phase 1 comprises 17 discrete interventions to improve public transport into Cambridge and Haverhill along the A1307 corridor. These minor works intend to increase bus priority, road safety and walking and cycling by bringing to fruition early improvements in the A1307 corridor before the delivery of Phase 2.

It should be noted that *Scheme 17 - Road safety improvements between Linton and Haverhill* will now be delivered by the Cambridgeshire Road Safety Partnership. Scheme 17 is still considered to be a key scheme within the Phase 1 package and will be funded by City Deal Funding secured by GCP.

Phase 1 delivery is split into three delivery tranches as outlined below:

- Tranche 1 delivery – 2018/19
- Tranche 2 delivery – 2019/2020
- Tranche 3 delivery – 2020/21

Details of the 17 scheme elements which remain within the Phase 1 package at the time of writing are summarised in Table 3 below.

Table 3: Phase 1 Scheme Package

Scheme	Tranche 1 18/19	Tranche 2 19/20	Tranche 3 20/21
Scheme 1- Granham's Road junction- right turn lane		✓	
Scheme 2- Extra cycle storage at Babraham Road Park & Ride	✓		
Scheme 3- Linton Greenway (North of Babraham Park & Ride)		✓	
Scheme 3- Linton Greenway (South of Babraham Park & Ride)			✓
Scheme 4- Haverhill Road and the Gog Farm shop junction safety improvements			✓
Scheme 5- Wandlebury multi-user crossing			✓
Scheme 6- Signalised multi-user crossing- Babraham Research Campus roundabout		✓	
Scheme 7- Eastbound bus lane at A11		✓	
Scheme 8- Multi-user crossing of A11 via improved footbridge and underpass			✓
Scheme 9- Signalise Hildersham crossroads with Toucan/Pegasus crossing		✓	
Scheme 10 Advanced Works- Safety improvements at Dalehead Foods junction	✓		
Scheme 10 Main Works- Eastbound bus lanes on approach to Linton Village College		✓	
Scheme 11- Linton Village College junction signal upgrade	✓		
Scheme 12- Linton High Street junction signalisation		✓	
Scheme 13- Measures to ease bus movements in Linton			✓
Scheme 14- Westbound bus lanes on approach to B1052 junction			✓
Scheme 15- Bartlow Road roundabout and rural hub			✓
Scheme 16- Dead Road Crossroads- Partial closure			✓
Scheme 17- Road Safety improvements between Linton and Haverhill[3]			

Source: GCP/Mott MacDonald

Delivery of scheme elements within Tranche 1 was completed at the end of the 2018/19 financial year. Tranche 2 schemes were presented to GCP in October 2019, where approval to construct was received. Tranche 3 schemes will be presented to the Executive Board in 2020. The current programme anticipates that all Phase 1 schemes will be in the delivery stage by the end of 2020.

Phase 2

Phase 2 of the CSET scheme proposes a range of longer-term public transport improvements that build on Phase 1, noting that there may be some overlap of delivery of Phase 1 Tranche 3 schemes with Phase 2. However, in terms of this report it is assumed that all elements of Phase 1 are complete or committed and thus these are included as the baseline for appraising Phase 2 options.

[3] Scheme will now be delivered by the Cambridgeshire Road Safety Partnership

1.3 Structure of this Report

This OAR for Phase 2 of the CSET scheme has been structured to align with DfT's transport appraisal model, which is detailed in Section 2. Table 4 shows how this report has been aligned with the DfT's process. This OAR will also be appended to the OBC for the scheme.

Table 4: Approach to Options Appraisal Covered in the OAR

Section	Contents	Description	Alignment with WebTAG Option Appraisal Development Stages
2	Option Assessment Methodology	Reviews the steps in the DfT's transport appraisal process and outlines the proportionate two-stage process developed for appraising the options for the Cambridge South East Transport Phase 2 scheme.	2
3	Current and Future Issues and Opportunities	Reviews the socio-economic trends and future transport trends along the A1307 corridor and Cambridge to understand the current problems and opportunities in the study area. Sets out why intervention on the A1307 corridor is needed according to the strategic context and issues previously identified.	3
4	Scheme Objectives and Scope	Defines schemes objectives, each with a range of supporting enabling objectives, and sets the geographic scope of the scheme.	4
5	Stage 1 Options Generation and Assessment	Reports on the methodology used to generate a range of alternative route alignments and option packages and the approach used for an early qualitative sift for Phase 2 of the Cambridge South East Transport scheme.	5 & 6 & 7
6	Options Assessment Stage 2: Further Appraisal	Reports on the detailed qualitative appraisal process of the longlist of options to arrive at the shortlist of options and the sensitivity analysis undertaken to test the robustness of the shortlist	10
7	Stage 2 – Quantitative Appraisal to Define the Preferred Option	Details the quantitative appraisal of the shortlisted options, looking at traffic modelling and strategic level wider economic benefits to arrive at a preferred option.	10

Source: DfT/Mott MacDonald

2 Options Assessment Methodology

This section describes our approach to this option appraisal process and how the methodology adheres to WebTAG transport appraisal guidance.

2.1 WebTAG Guidance on the Transport Appraisal Process

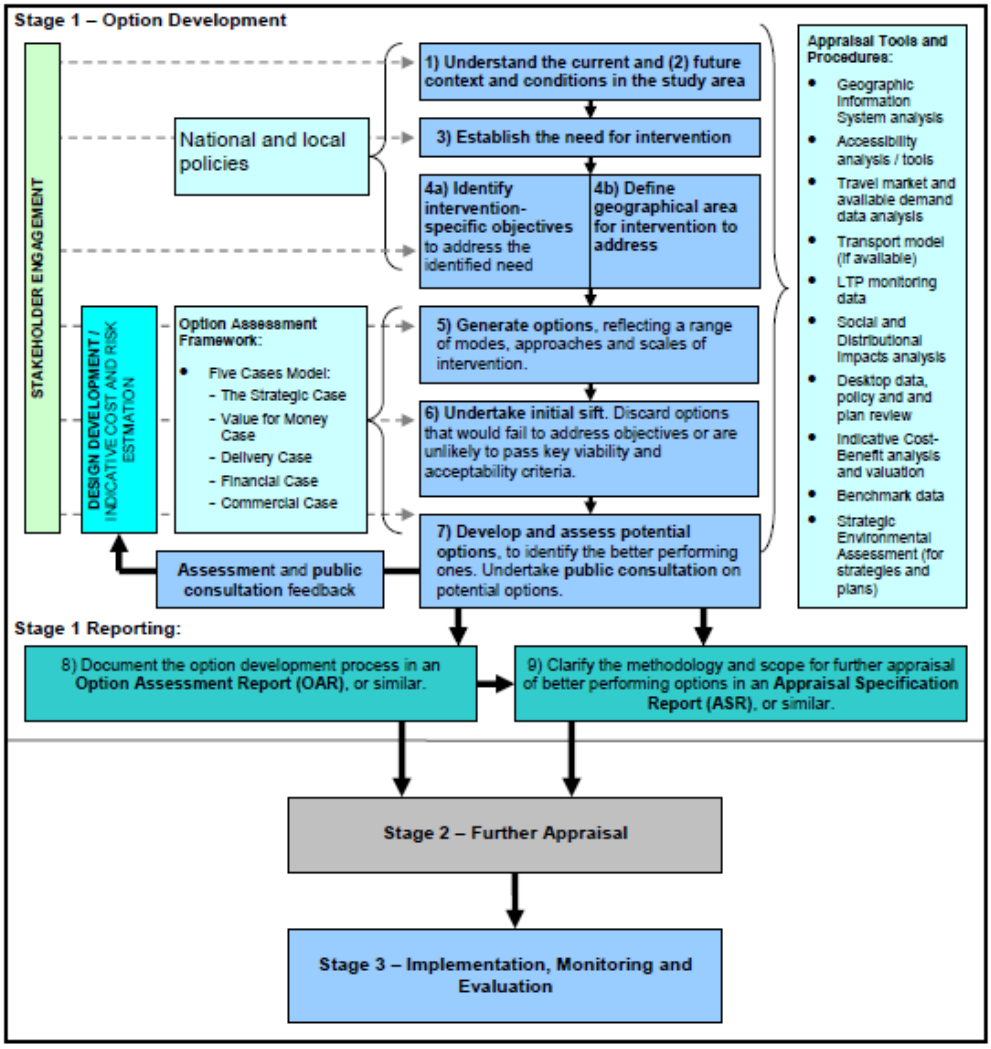
The OAR follows the Department for Transport's guidance 'The Transport Appraisal Process' which provides detailed guidance on appraisal and the requirements needed for transport intervention. A structured approach sets out the necessary steps from initial intervention through to the detailed appraisal that supports preparation of business or investment cases to subsequent approval stages and post implementation evaluation, Figure 13 and Figure 14 illustrate this DfT process.

The three stages in the DfT's transport appraisal process are given below:

- Stage 1 - Option Development. This involves identifying the need for intervention and developing options to address a clear set of locally developed objectives which express desired outcomes. These options are then sifted for the better performing options to be taken on to further detailed appraisal in Stage 2.
- Stage 2 - Further appraisal of a small number of better performing options in order to obtain sufficient information to enable decision makers to make rational and auditable decisions about whether or not to proceed with an intervention. The focus of analysis is on estimating the likely performance and impact of intervention(s) in sufficient detail.
- Stage 3 - Implementation, Monitoring and Evaluation.

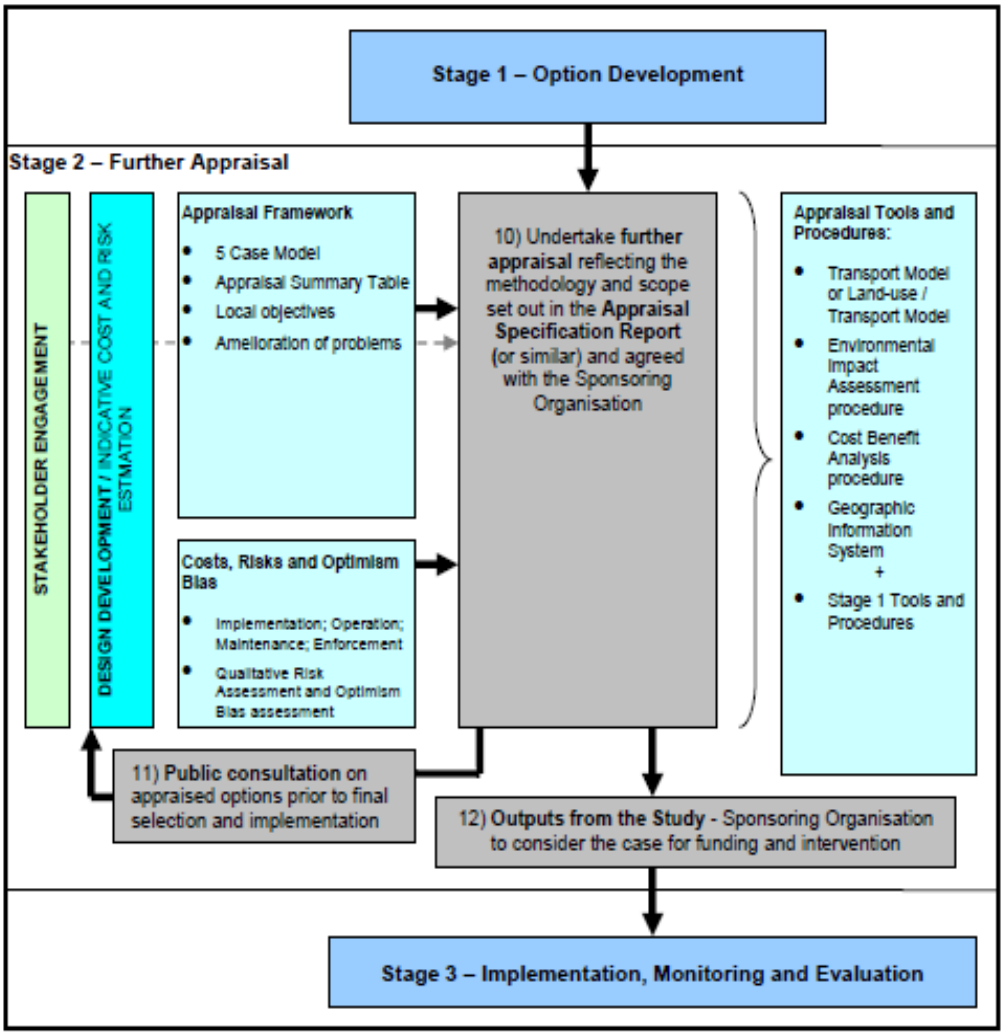
This OAR covers Stages 1 and 2 of the DfT process; Sections 3, 4 and 5 of this report broadly align with Stage 1 of the DfT process and Sections 6 and 7 with Stage 2.

Figure 13: Steps in Stage 1 of the Transport Appraisal Process (Option Development)



Source: Department for Transport (2014), Transport Analysis Guidance: The Transport Appraisal Process

Figure 14: Steps in Stage 2 of the Transport Appraisal Process ('Further Appraisal')

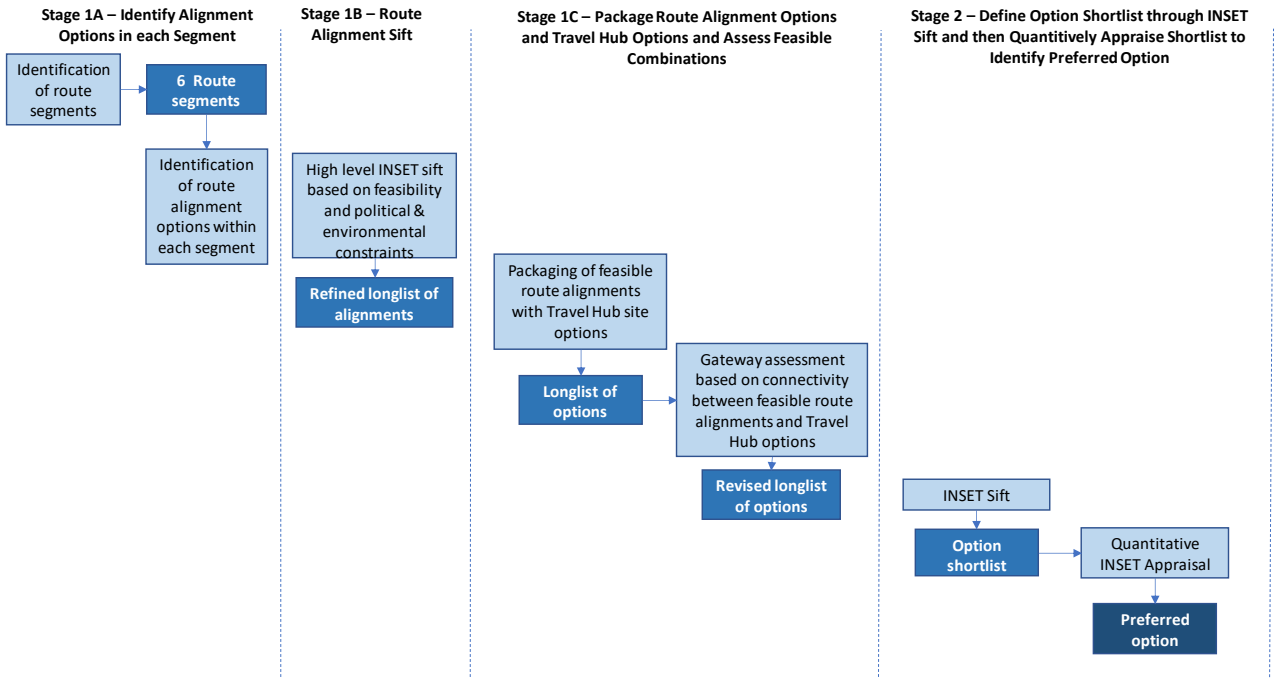


Source: Department for Transport (2014), Transport Analysis Guidance: The Transport Appraisal Process

2.2 Methodology Summary

As part of the options appraisal process undertaken for Phase 2, options generated in response to evidence-based need were passed through four stages of appraisal and refinement, as illustrated in Figure 15. The stages of appraisal are labelled as Stages 1A, 1B, 1C and 2, aligned with the first two stages of the DfT options appraisal process. The process enabled a thorough and appropriate assessment process which avoided assessing options in detail that did not meet basic requirements in the early stages of the development - Stages 1A and 1B.

Figure 15: Options Assessment Framework



Source: Mott MacDonald

2.2.1 Stage 1A – Identification of Route Alignment Options

Building upon work undertaken for the Strategic Outline Business Case (SOBC), Stage 1A of the OBC first established the need for intervention based on a review of current and future problems and opportunities, set in the context of both local and national policy. This formed the basis and rationale for option generation.

At SOBC stage 3 broad route alignments within the study corridor were identified; these were reviewed, and refined at OBC stage by splitting the corridor into six key segments to enable different route alignment options within each of the six segments to be developed. This formed an initial longlist of route alignment options within each segment which progressed to Stage 1B. Further detail on the process and resultant outcomes of Stage 1A can be found in Section 5.1.

2.2.2 Stage 1B – Route Alignment Sift

At Stage 1B all potential route alignments within each segment were subject to a high-level sift using Mott MacDonald's INvestment Sifting and Evaluation Tool (INSET).

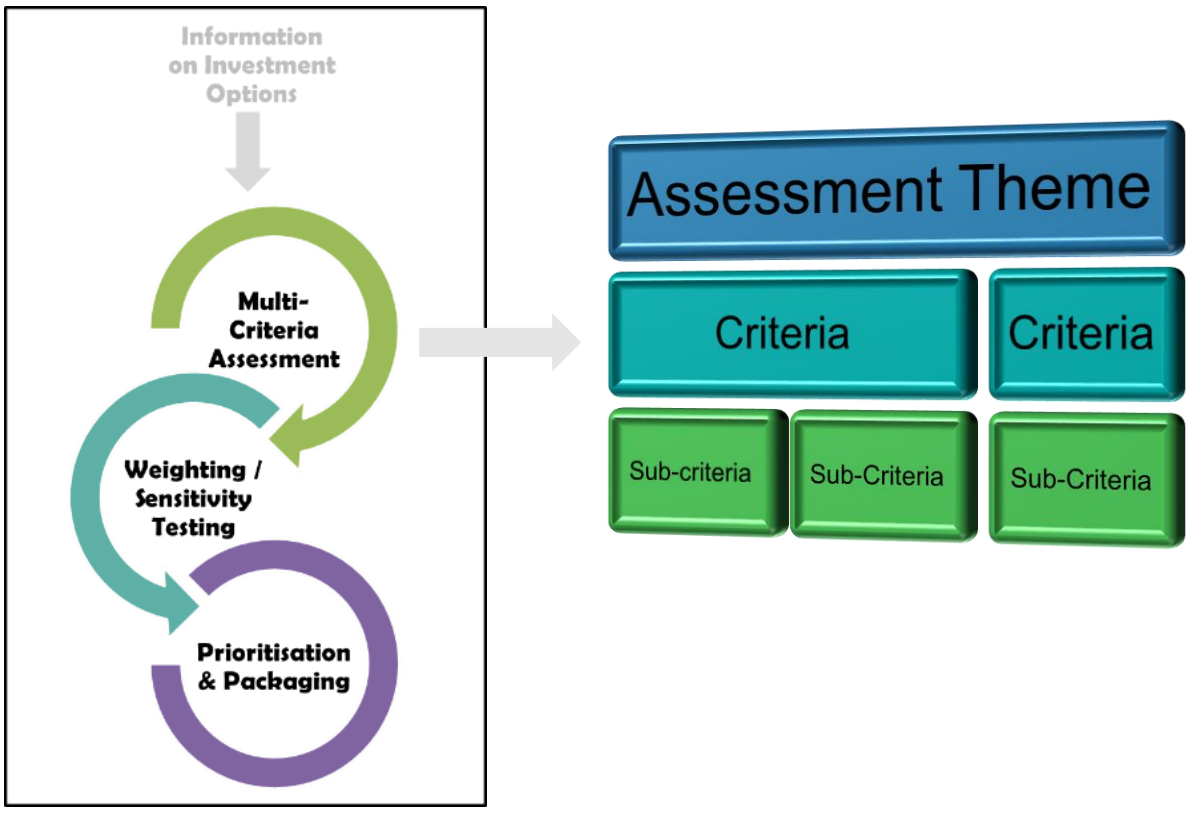
Overview of INSET

INSET is a decision support toolkit developed in-house by Mott MacDonald and is designed to be simple, flexible, replicable and transparent. An overview of the tool can be seen in Figure 16.

INSET is based on HM Treasury Green Book compliant Multi-Criteria Decision Analysis (MCDA). INSET draws on standard tools for comparing scheme options, primarily DfT's EAST (Early Assessment and Sifting Tool) and adds functionality to these existing tools.

Principally, INSET uses a set of assessment themes that group together homogenous criteria to appraise each of the design options. Themes and criteria can be tailored in accordance with the scope and objectives of the scheme and weightings assigned according to the relative importance of the themes and/or criteria.

Figure 16: Mott MacDonald's Investment Sifting and Evaluation Tool (INSET)



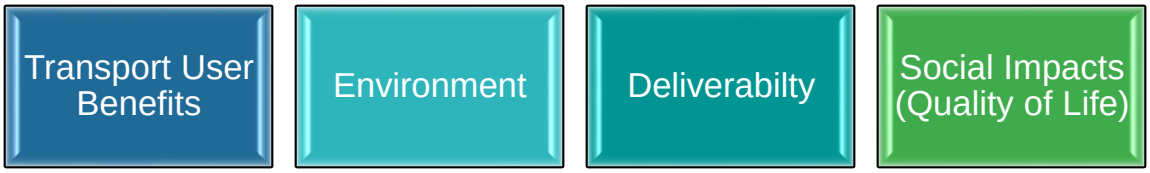
Source: Mott MacDonald

Mott MacDonald has developed INSET as an enhancement of EAST to support the evaluation of different options for large scale investments and investment programmes. Crucially it enables:

- 'Active' sifting of options in real time, supporting meetings, workshops and face to face engagement with a tool that can be used to facilitate discussions;
- The consideration of multiple economic scenarios as sifting and evaluation progresses through manipulation of criteria weighting, to enable project teams to discuss 'what if?' issues as options are developed; and
- The assessment of potential option packaging. INSET can assess one option against another and can also explore the merits of options being developed in isolation or as part of a package.

2.2.2.1 Stage 1B INSET Sift

Stage 1B was a high level sift designed to discount route alignment options which did not meet the initial deliverability or environmental criteria and offered no plausible transport benefits. To this extent four assessment themes were developed at this stage.



These themes were selected on the basis of scheme objectives, noting that that this stage only route alignments were being assessed, rather than complete packages. To this extent key factors were:

- How well the alignments would connect with each other and how the overall route would improve connectivity and journey times into Cambridge relative to the exiting transport offer (Transport User Benefits theme);
- Potential environmental (natural habitats) impact of building different alignments (Environment theme);
- Actual ability to construct the option, considering cost/time and existing natural or manmade infrastructure (Deliverability theme); and
- How the route may be able to accommodate active travel and provide increased and better options for people to access employment and educational opportunities (Social Impacts theme).

This produced a refined longlist of route alignments to progress to Stage 1C. The actual appraisal process at Stage 1B and the resultant outcomes are discussed in detail in Section 5.2.

2.2.3 Stage 1C – Option Packaging

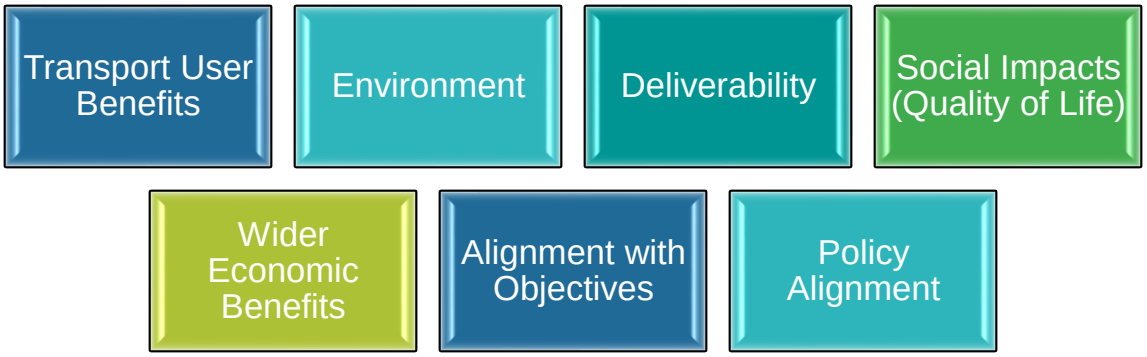
Route alignment options which were progressed to Stage 1C were then packaged with Travel Hub options, beginning the development of holistic scheme options for Phase 2. This longlist of options was then passed through a Gateway Assessment based on connectivity between feasible route alignments and Travel Hub options. Options which were not considered feasible when packaged together as a whole scheme were then discounted at this stage, producing a revised longlist of options. Further detail on the Gateway Assessment criteria can be found in Section 5.3.2.1.

2.2.4 Stage 2 – Option Shortlisting and Quantitative Appraisal

2.2.4.1 Option Shortlisting

A second, more complex, INSET sift was then undertaken to appraise the revised longlist of options and produce an options shortlist. This involved revisiting themes and criteria to expand them to take account of packaged options that included both route alignment and Travel Hub elements.

In Stage 2, options were scored according to how well they addressed criteria under the themes of:



The packaging of complete options (as opposed to just route alignments in Stage 1) meant that assessments could be made against alignment with policy and overall scheme objectives, which was not possible with just one component of a potential option. Complete scheme options also facilitated assessment against wider economic impacts, again, something that was not possible when simply assessing the viability of a section of route.

The actual assessment criteria and the rationale for their inclusion under each of their themes are documented in Section 6 which covers the actual outcomes of the process at this stage of assessment.

A seven-point scoring system was adopted to assess how well options met the established criteria, using a scale of -3 to +3, where -3 represented a very poor ability to address criteria and +3 a very good ability. Rationales for assigning scores for each of the themed criteria are itemised in Appendix B.

Scoring was qualitatively assigned based on Mott MacDonald's extensive experience and knowledge of the CSET scheme, the geographic area and INSET as an appraisal tool.

The top seven performing options were progressed to the Option Shortlist and taken forward for quantitative appraisal.

2.2.4.2 Quantitative Appraisal of the Shortlisted Options

Finally, in the last step of Stage 2 a more thorough appraisal process was undertaken. The same assessment themes and criteria were used as in the previous Stage 2 sift to arrive at the shortlist of seven options, however a quantitative analysis was undertaken (where possible) to assign metrics to options. Where quantitative analysis was not possible a more detailed and robust qualitative analysis was undertaken.

An overview of the quantitative assessment approach is noted by theme below:

Transport User Benefits

The Cambridge Sub Regional Model (CSRM) D-series highway base SATURN model with a 2015 base year was used to quantitatively appraise the shortlisted options against criteria under this theme. This model shows the effect of transport interventions (such as a new transit route and connecting Travel Hub site), on general traffic conditions and of housing or employment developments that also have an impact on the levels of traffic trying to use the available network. It uses the relationship between traffic demand and capacity to send traffic via the best available route in a representative average peak hour. A Medium Growth Scenario as identified in the Local Plan was used.

Highway improvements from CSET Phase 1 were added to the D-series foundation case for 2026 and 2036 to create Do-Minimum (DM) highway models and options were then modelled for these two forecast years and compared to the Do-Minimum. Models have been built representing the AM peak (08:00-09:00) and PM peak hour (17:00-18:00), also an average Interpeak hour between 10:00-16:00.

Sensitivity testing will be carried out for a high growth scenario, assuming a level of development consistent with the Cambridgeshire and Peterborough Independent Economic Review report (CPIERS growth).

A detailed explanation of the criteria is noted in Section 6, and the process used to appraise the shortlisted options against those criteria under the Transport User Benefits theme is noted in Section 7.

Environment

The environmental assessment for quantitative assessment of the shortlisted options required both desktop studies and environmental surveys.

An assessment methodology was developed that generally followed WebTAG worksheets and produced the outputs required for INSET, in line with the assessment criteria that fall under the Environment theme.

A description was provided in respect of environmental constraints for the study area based on desk studies and site works. This was covered by map(s) and descriptions to illustrate the key areas of concern. A detailed explanation of the criteria is noted in Section 6, and the process used to appraise the shortlisted options against those criteria under the Environment theme is noted in Section 7.

Deliverability

The criteria under deliverability were based on a combined qualitative and quantitative assessment against identified criteria which focused on the ability to deliver the option physically, financially and with the support of key stakeholders and the public. A detailed explanation of the criteria is noted in Section 6, and the process used to appraise the shortlisted options against those criteria under the Deliverability theme is noted in Section 7.

Social Impacts (Quality of Life)

The appraisal of criteria under the Social Impact theme was, where possible, quantified by undertaking a COBALT (COst and Benefit to Accidents – Light Touch) assessment. This is a computer program developed by the DfT to undertake analysis of the impact on accidents as part of economic appraisal. Other identified criteria under this theme that could not be assessed quantitatively were assessed on a qualitative basis. A detailed explanation of the criteria is noted in Section 6, and the process used to appraise the shortlisted options against those criteria under the Social Impacts theme is noted in Section 7.

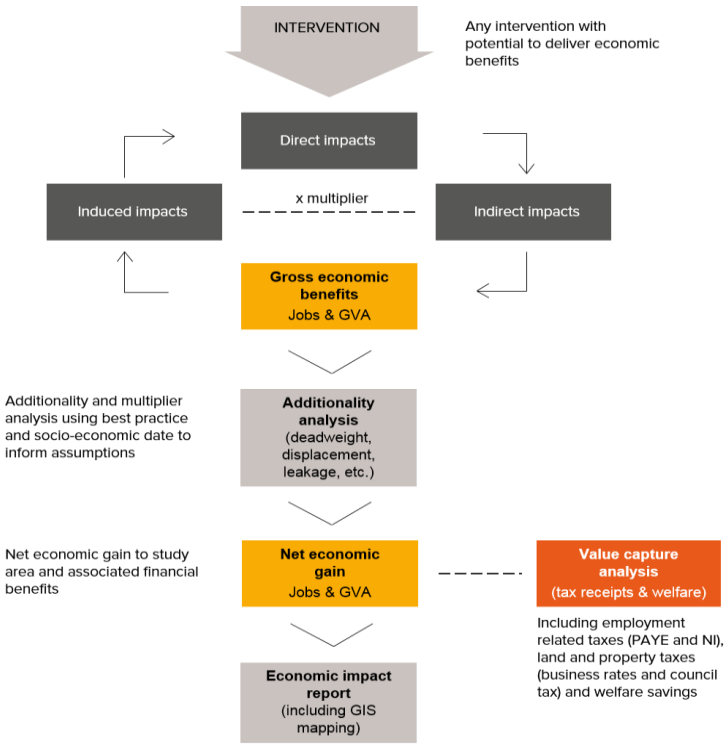
Wider Economic Benefits

Quantified Wider Economic Benefits were assessed using the Mott MacDonald developed Transparent Economic Assessment Model (TEAM) which examines land use changes due to infrastructure improvements and the resulting impact on the economy (in terms of jobs and Gross Value Added (GVA).

TEAM was produced and is operated by experts in economic development and regeneration. It was developed in line with HM Treasury Green Book principles and follows guidance from Homes England and the Department for Housing, Communities and Local Government (DHCLG). TEAM

assessments clearly set out the inputs, assumptions and outputs to enable clear understanding of the assessment. The TEAM process is shown in Figure 17.

Figure 17: TEAM Process



Source: Mott MacDonald

A detailed explanation of the criteria is noted in Section 6, and the process used to appraise the shortlisted options against those criteria under the Wider Economic Benefits theme is noted in Section 7.

Alignment with Objectives

A semi-quantitative assessment of how well each of the options aligned with the schemes five overarching objectives and 15 sub objectives was undertaken. As modelling outputs were available, some quantitative data was on hand to support objectives relating to transport user benefits. A detailed explanation of the criteria is noted in Section 6, and the process used to appraise the shortlisted options against those criteria under the Alignment with Objectives theme is noted in Section 7.

Policy Alignment

Only a qualitative assessment of how well each of the options aligned with key policy and strategy documents was possible. Although this approach does not differ from that taken at previous stages, more detailed designs and additional information about the shortlisted options permitted a more in-depth review and analysis. A detailed explanation of the criteria is noted in Section 6, and the process used to appraise the shortlisted options against those criteria under the Policy Alignment theme is noted in Section 7.

2.2.4.3 Calibration and Inputting of Metrics and Qualitative Analysis into INSET

As some assessments against the themed criteria of the shortlisted options were quantitative, resulting in metrics, such as specific journey time savings, and some were qualitative it was necessary to convert both quantitative and qualitative outputs into INSET based scoring ranging from -3 to +3 in order to compare the performance of options on an equal basis. Calibration of assessment outcomes was therefore undertaken and the methodology for how this was undertaken for each criterion under each of the themes is noted in Section 7.3.

2.2.4.4 Additional Assessment of Shortlisted Options

In addition to assessment against the themed criteria, transport Benefit Cost Ratio (BCR) values were calculated for each of the shortlisted options and Social and Distributional Impacts assessed in accordance with WebTAG based on modelling outputs. BCR values and the outcomes of SIDI assessments will be documented in the Economic Case of the OBC rather than in this OAR.

Transport Benefit Cost Ratio and Value for Money Calculation

The BCR is a ratio, expressed in monetary terms, of the total discounted benefits of a scheme option relative to its total discounted cost and is an indicator that summarises the transport economic Value for Money (VfM) of a scheme option. A BCR and the resultant Value for Money were used to assess the viability, benefits and value that each of the option would yield.

Social Impact Appraisal

An analysis of social impacts was then undertaken for the preferred option package in accordance with WebTAG Unit A4.1. A Social Impact Appraisal (SIA) considers the human experience of the option and its impact on eight social factors:

- Accidents;
- Physical activity;
- Security;
- Severance;
- Journey quality;
- Option and non-use values;
- Accessibility; and
- Personal affordability.

A screening stage was carried out to identify the impacts that were relevant to the overall option package and which could be assessed at this stage. Those that were relevant were appraised in comparison to the Do Minimum scenario.

Distributional Impact Assessment

A Distributional Impact Appraisal (DIA) was also undertaken for the shortlisted options. A DIA considers the variance of a options impact across different social groups and assesses whether these impacts disproportionately affect certain social groups.

Both beneficial and adverse distributional impacts of proposed interventions were considered, along with the identification of social groups likely to be affected. The impacts which have been considered are:

- User benefits;
- Noise;
- Air quality;
- Accidents;

- Security;
- Severance;
- Accessibility; and
- Personal affordability.

The social groups that require assessment for each impact, in accordance with WebTAG Unit A4.2, are set out in Table 5.

Table 5: DIA Social Groups

Social group (bullet indicates impact analysis required)	User benefits	Noise	Air quality	Accidents	Security	Severance	Accessibility	Affordability
Income distribution	•	•	•				•	•
Children under 16		•	•	•	•	•	•	
Young Adults aged 16-25				•			•	
Older People Aged 70+		•		•	•	•	•	
Proportion of population with a disability					•	•	•	
Proportion of population of BME origin					•		•	
Proportion of households without access to a car						•	•	
Carers: proportion of households with dependent children							•	

Source: Department for Transport (Dec 2015), WebTAG Unit A4.2 Distributional Impact Appraisal

As with the SIA, a screening stage was carried out to identify the impacts that were relevant to the scheme and which could be assessed at this stage. Those that were relevant were appraised in comparison to the Do Minimum scenario. The results of both the Social Impacts Appraisal and the Distributional Impacts Appraisal can be found in the appendices.

2.3 Preferred Option

An indicative preferred option was identified based on an INSET assessment against themed criteria only.

However, further work has been undertaken to support and reconfirm the findings of the INSET assessment which will be documented in the Economic Case of the OBC. Stakeholder and public consultation feedback are also considered to be crucial to the confirmation of the preferred option. Therefore, although an indicative preferred option has been identified based on the results of the formal assessment process in October 2019, the shortlisted options were taken to public consultation in the Autumn of 2019 to either affirm or refine the results of the assessment.

2.4 Summary

The methodology summarised in Section 2 facilitated the identification of an indicative preferred option for Phase 2 of the CSET scheme; the focus of the OBC to which this OAR is appended. The results of the appraisal process at each stage are noted in Sections 5,6 and 7 of this OAR.

3 Issues and Opportunities in the Study Area

This section provides a summary of the current issues and opportunities pertinent to the CSET Phase 2 scheme. These have guided the development of the scheme objectives outlined in Section 4 and in turn informed the assessment criteria that have enabled the appraisal process. Mott MacDonald have addressed the strategic context of the scheme by examining current and future issues in Cambridge and they are reported and evidenced in detail in the Strategic case of the OBC, but are summarised in the OAR in this section for context and to provide background for the rationale that underpins the scheme objectives, which are detailed in Section 4.

Evidence was gathered under the following topic themes:

- 3.1 Population;
- 3.2 Employment and Skills
- 3.3 Economy and Business;
- 3.4 Land Use and Development;
- 3.5 How People Travel;
- 3.6 Environment;
- 3.7 Highway Network and Traffic;
- 3.8 Road Safety;
- 3.9 Rail and Bus Provision;
- 3.10 Park & Ride Provision; and
- 3.11 Walking and Cycling

A full analysis of these issues and opportunities, together with the evidence base that gave rise to them is presented in Sections 5 to 12 of the Strategic Case, document reference 403394-MMD-BCA-00-RP-BC-0247.

3.1 Population

Population	Issues	Opportunities
	• The population of Cambridge and Cambridgeshire is growing rapidly. This is compounded by an increasing academic population. The current transport infrastructure is not evolving at a pace which matches population increase. • Transport infrastructure which is inadequately equipped to accommodate a rapidly growing population may force people to relocate away from the area, slowing the rate of economic growth which has recently been experienced. • Cambridge's dense population is overspilling into the periphery. A large proportion of the overspill is being accommodated in south east Cambridge, placing increased pressure on radial routes in and out of central Cambridge.	• A greater number of people living in the area will create demand to buy products and use local services, resulting in growth in the local economy. • A sustainable transport network will allow Cambridgeshire to continue its success in academia, technology and research. A transport system that supports growth of the area and economic growth will benefit the wider UK economy. • Futureproofing existing transport infrastructure will support the requirements of future generations and will ensure a successful and sustainable future for Cambridgeshire. • Cambridge has a large student population who are more likely to use public transport and cycle modes of transportation. Enhancing the sustainable transport options will benefit the future growth of the Universities in Cambridge and will relieve pressure on the transport network. • Providing a safe cycle and walking route will provide residents and students with travel options and will contribute to health and wellbeing.

3.2 Employment and Skills

Employment and Skills	Issues	Opportunities
	• Highly skilled professionals are required to fill a large proportion of the jobs on offer in Cambridgeshire. Employers in Cambridgeshire must recruit from outside of the immediate area in order to find individuals who meet the specific requirements of job roles on offer. • A large number of individuals work in Cambridgeshire but live outside of the area, leading to a high number of peak time commuters. • High numbers of commuters are causing congestion problems during peak times, particularly in south east Cambridgeshire as individuals travel to employment opportunities in central Cambridge and further sites along the A1307.	• Cambridgeshire has a large proportion of people working in professional, scientific and technical activities compared to the national average. Increased employment within these sectors presents the opportunity to further excel Cambridgeshire, and in particular south Cambridgeshire as a destination of excellence in science and industry. Thereby attracting more jobs, employment opportunities and investment and boosting the local economy. • CSET Phase 2 will provide attractive sustainable travel options that will help to accommodate existing and future commuter demand, providing a more efficient and sustainable transport network overall. Enhanced public transport and provision of an additional Travel Hub will alleviate pressure on the A1307.

3.3 Economy and Business

Economy and Business	Issues	Opportunities
	• Rapid business creation in Cambridgeshire has increased pressure on the existing transport network leading to increasing journey times and deteriorating journey reliability. • The existing transport network is inadequately equipped to accommodate current demand. If the network does not evolve at the same rate as economic growth, this problem will inevitably worsen. • Businesses may be deterred from investing if accessing the employment site is difficult for their workforce. • Existing businesses may struggle to attract labour from outside of the local area as journey times are long and unreliable. • The rate of business start-ups has slightly declined recently. Cambridgeshire must establish the reason for this and seek to address concerns.	• Cambridgeshire has a worldwide reputation and strong existing economic base, and one which continues to grow. As a result, the economy is likely to benefit from any uplift in infrastructure expenditure and will equip the area to deal with expansion. • The proposed Travel Hub will improve accessibility to key employment sites, including Babraham Research Campus, Granta Park and Cambridge Biomedical Campus, encouraging investment and supporting existing businesses. This will also alleviate pressure on the A1307. • Cambridgeshire must ensure that sustainable modes of travel are attractive to an ever-increasing number of commuters. The proposed scheme will provide a viable alternative to private car travel, reducing congestion along key routes and providing benefits for the environment and quality of life.

3.4 Land Use and Development

Land Use and Development	Issues	Opportunities
	• The level of planned development in Greater Cambridge will increase pressure on the existing transport network, resulting in deteriorating journey times and journey time reliability. • Increased demand on the road network across south east and central Cambridge will result in congestion and associated air quality issues. • Planned employment space may be left vacant if accessing the sites is deemed unattractive and inaccessible by the potential workforce. • Planned development may not come to fruition at the rate anticipated in the Local Plan if transport infrastructure is not in place to support development and expansion.	• Addressing issues associated with Cambridgeshire's transport network will encourage planned development to come to fruition. Development will bring forward an unprecedented number of opportunities for economic growth. • CSET Phase 2 will improve active travel infrastructure along a section of the A1307, improving connectivity for pedestrians and cyclists. Improved active travel links will encourage commuters to adopt more sustainable modes of travel. • Preparing the transport network for future growth will secure a prosperous future for Cambridgeshire and encourage growth, post Local Plan period, and provide economic benefits to the rest of the UK.

3.5 How People Travel

How People Travel	Issues	Opportunities
	• Cambridge and South Cambridgeshire are net importers of people for work purposes. However, the transport network is not equipped to accommodate the number of inbound commuter's flow. • 63% of Cambridge and South Cambridgeshire's workforce commute by car or van resulting in congestion and associated air quality issues across many of central Cambridge's key radial routes. • Ongoing growth at key employment sites across south east Cambridge and central Cambridge will result in increased commuter demand on the A1307 corridor where there is a lack of alternate travel modes to car. • The CBC employs a large number of people and is a significant generator of travel demand. 40% of staff at the campus access the site from the south east, using the A1307, resulting in congestion and delays at peak times.	• An increased number of sustainable travel options across south east Cambridge may encourage a modal shift away from car travel resulting in a more sustainable travel environment. • Improved public transport and walking and cycling provision across south east Cambridge could attract potential employees to opportunities in the area which will be essential to securing future growth of businesses in the area. • The proposed Travel Hub facility Is strategically located to intercept a large number of journeys heading into central Cambridge and towards the CBC and Babraham Research Campus. The onward public transport route and NMU route would provide a more sustainable link to key destinations whilst also providing journey time savings and journey time reliability for users.

3.6 Environment

Environment	Issues	Opportunities
Air Quality	• Vehicle exhaust and other emissions can have an impact on air quality, increasing NO2 and PM10 and PM2.5 concentrations that can be harmful to human health if they exceed certain levels in the atmosphere.	• Public Transport (PT) schemes are considered to have lower environmental impacts because they are able to move a greater number of people per unit of pollutant emitted. This scheme would encourage fewer private vehicles entering Cambridge where there is an air quality management problem, by providing high quality public transport. • A medium term move to electric or other non-fossil fuel powered public transport vehicles will reduce NO2 emissions in particular.
Noise	• The scheme is located in a largely rural environment which will experience some increases in noise along the route and adjacent to the Travel Hub.	• Noise mitigation in the form of earth bunds or acoustic barriers will be included in the design to minimise noise intrusion on sensitive receptors close to the route or Travel Hub.
Greenhouse Gases	• The government policy requires all development to deliver net zero carbon at the national level, which requires changes at every level in society.	• The scheme will lead to greater use of public transport in vehicles that are likely to be electric or other zero carbon powered vehicles in the medium term. Thus, the scheme should support GCPs move to meet government policy. • Landscape planting will provide a small amount of offsetting potential by carbon sequestration where belts of trees are planted as part of the scheme
Biodiversity	• There are Habitats of Principle Importance (HPIs) along the proposed route corridor which have the potential to be fragmented or isolated. This could cause an adverse impact on a range of protected species.	• There are opportunities for Biodiversity Net Gain along the proposed route corridor by planting ecologically valuable habitats. • There are opportunities to develop wildlife corridors by prioritising linking current areas of habitat together. • The immediate fields around the Nine Wells Nature Reserve are likely to be acquired by the scheme and would be planted up to increase biodiversity value around the reserve.
Landscape	• The current landscape in the area is open fields in a slightly elevated position. The introduction of access roads and hard engineering into the landscape is likely to have an adverse impact.	• There are opportunities for landscape mitigation to be planted to screen the travel hubs, so they have less impact on the landscape. • The design of the route would be carried out in a manner that minimised visual intrusion and impacts on landscape character, this would be achieved by changing the vertical profile of the route and sensitive planting along the route.
Heritage and Archaeology	• There are known archaeological remains of regional and potentially national significance within the footprint of the proposed route corridor.	• The scheme will be assessed using aerial photographic interpretation, geophysical surveys and trial trenching to better understand the buried archaeology along the route. This will increase knowledge and understanding of the setting around Wandlebury and the Magog Scheduled Monuments. • There is potential to incorporate some of the scheme drainage discharge into Hobson Brook – which is a heritage feature running towards the city and which is frequently dry. Increasing flows in the drainage feature could have heritage benefits which need to be assessed.

Water Resources	• The scheme crosses the flood plain of the River Granta and is within the footprint of the Source Protection Zone 2 of groundwater fed public water supplies	• The scheme design that crosses the River Granta will ensure that there is no increase in flood risk arising from the construction of the bridge(s) over the river. • There is opportunity to create water related habitat to compensate for lost flood storage in the River Granta flood plain. • The scheme will have SuDS drainage installed along the route and in the Travel Hub – this will ensure runoff does not contribute to flood risk, and should also ensure the quality of runoff discharged to infiltrate into the ground does not affect groundwater quality that is used for public water supplies. • Opportunities to help with any wider flood management plans being developed by the Environment Agency will be explored during the EIA phase of the project.
Green Belt	• The proposed route corridor sits largely within the Cambridge Green Belt which has strong protection at both local and national level.	• Appropriate landscaping and sensitive routing of the scheme. Or siting of the Travel Hub will minimise impacts on Green Belt function.

3.7 Highways Network and Traffic

Highways Network and Traffic	Issues	Opportunities
	• Heavy traffic flows are regularly experienced along the section of the A1307 approaching the CBC from the South. This is evidenced in ATC data analysed. Increasingly unattractive conditions are likely to deter further investment, restricting growth potential of the wider area. • Increasing demand across the A1307 corridor has had an impact on capacity, journey time reliability and possibly road safety. • Demand on the corridor is likely to increase, worsening congestion and journey times for users of the A1307. • The CBC is key attractor of vehicle trips along the A1307. With growth at the campus projected, traffic flows are likely to increase which will have an adverse impact on journey times along the route.	• Proposed improvements to the transport infrastructure along the A1307 will facilitate more reliable and accessible multi-modal journeys. This will incentivise shifts away from private car usage and reduce congestion around the CBC, ensuring growth continues. • Proposed infrastructure for public transport, walking and cycling along the A1307 will encourage the uptake of sustainable travel options along the corridor and reduce the demand on the road network. • Alternative modal options will reduce the dominance of car travel along the A1307, reducing congestion along the corridor and providing more sustainable travel options for users. • Congestion could be considered a key constraint for business investment and growth. Reducing congestion and improving transport provision could help improve network resilience. In tandem this could help encourage investment.

3.8 Road Safety

Road Safety	Issues	Opportunities
	• A high number of collisions have been recorded along the A1307 between Addenbrookes Hospital and A1307/A11 may be associated with high volumes of traffic for some sections of the route and congestion and delay. • A number of recorded collisions may be associated with high vehicle speeds for some parts of the route. This may contribute to the perception that the route is not safe for pedestrians and cyclists and discourage uptake.	• Alternative sustainable travel options will reduce the dominance of car travel along the A1307, thereby reducing congestion and delay along the corridor and will subsequently have a benefit to road safety. • Further improvements to cycling and walking provision will build upon interventions delivered in CSET Phase 1 to improve road safety for a number of users.

3.9 Rail and Bus

Rail and Bus	Issues	Opportunities
	• South east Cambridge is detached from the rail network forcing rail users to undertake lengthy multi-modal journeys, enduring inefficient interchanges and inadequate coverage. • Congestion along the A1307, coupled with multiple stops make bus journey times excessively lengthy and uncompetitive when compared with car travel. Discouraging uptake of bus travel. • The A1307 is not directly served by the Cambridgeshire Guided Busway. As such for commutes that start in locations where the busway is a convenient travel option, passengers will need to change to regular bus services to continue to employment locations along the A1307 corridor, beyond the CBC. Although tickets are transferable, the perception of a break in journey and the possibility of missing connections due to delay may lead to potential users still opting to travel by car.	• Improvements to public transport provision across south east Cambridge could encourage uptake, reducing the proportion of journeys undertaken by private car. • A reduction in the proportion of private car journeys across south east Cambridge could benefit the environment, creating a sustainable travel environment across south east Cambridge. • Better public transport connectivity, with services for key employment hubs could encourage commuters to adopt public transport as their primary mode of transport. • Possibility to integrate staff bus services to key employment hubs into the public transport network • Improved active transport routes delivered in tandem with new public transport infrastructure could encourage a greater number of multi-modal journeys.

3.10 Park & Ride Provision

Park & Ride Provision	Issues	Opportunities
	• Despite Cambridgeshire's existing Park & Ride network, facilities are not well positioned to serve demand associated with growing economic hubs across south east Cambridge. • Ongoing development across south east Cambridge will place increased pressure on the Babraham Road Park & Ride site. Capacity here will not be able to accommodate demand.	• A strategically located Travel Hub facility could encourage a larger proportion of users to opt for more sustainable modes of travel- Parking at the Travel Hub and using public transport or cycling or walking for their onward journey. • A new Travel Hub facility in south east Cambridge will accommodate increasing demand for parking capacity across the area.

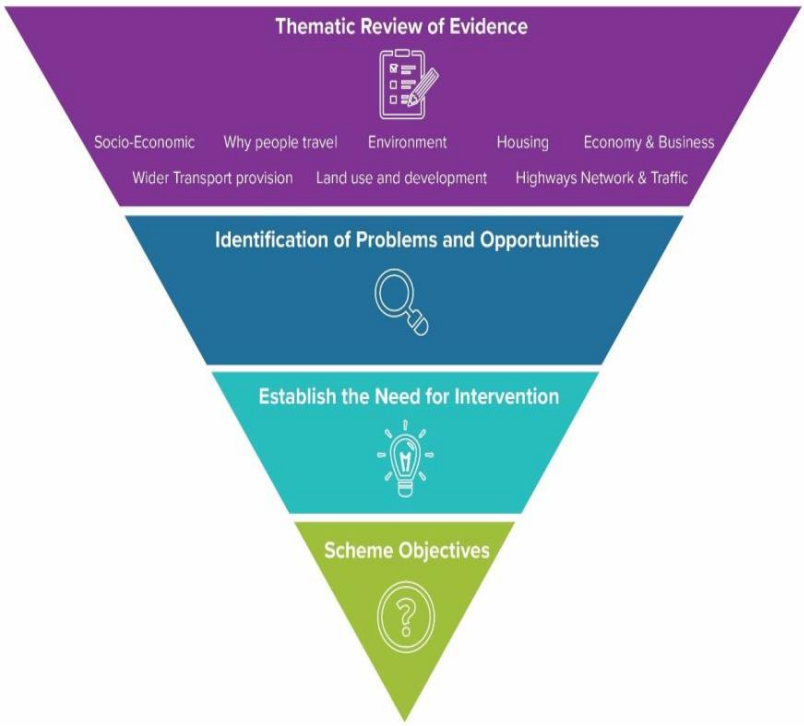
3.11 Walking and Cycling

Walking and Cycling	Issues	Opportunities
	• There is a lack of continuous active travel routes within the study area. The area particularly lacks connections to/from more rural settlements to the south east of Cambridge. • Alternate routes which are intended to serve the purpose of connecting south east Cambridge to central Cambridge do not adequately serve route demand. • Crossing points along the A1307 are few and far between and inadequately designed for NMU's, forcing users to cross high speed traffic unsafely. • It is likely that inadequate active travel provision along theA1307 for cyclists and pedestrians is a factor in low uptake of active travel modes along this route.	• Improved active travel infrastructure along the corridor could encourage increased uptake of cycling and walking, contributing to improved wellbeing and quality of life. • Higher uptake of active travel modes could reduce greenhouse gas emissions associated with car travel. • Adoption of active travel modes as a commuter transport mode could reduce congestion along the A1307 corridor as the modal share of active travel is maximised, improving journey reliability for public transport, further supporting modal shift away from car use. • The delivery of a Travel Hub could provide an efficient interchange between multiple transport modes, making sustainable travel easy and attractive for users, encouraging uptake of sustainable modes.

4 Scheme Objectives and Scope

This section sets out the aims and objectives of the CSET scheme which underpin the options development and appraisal process. In addition to scheme aims developed for the SOBC for Phase 2, scheme-specific objectives have since been established at OBC stage to reflect updates to the evidence base and ultimately to guide the final development and delivery of this scheme. The thematic evidence review, undertaken during the development of the Strategic Case for the OBC, enabled a range of problems and opportunities to be identified in the study area. These were summarised in Section 3 of this OAR. This helped to identify a set of emerging objectives and alongside the policy review, helped to facilitate an evidence based objective setting process. This process is illustrated below in Figure 18.

Figure 18: Objective Setting Process



Source: Mott MacDonald

Sections 4.1 and 4.2 outline GCP's Transport Aims, CSET Aims and CSET Objectives.

4.1 Study Aims

With regards to transport, the GCP have identified the following challenge:

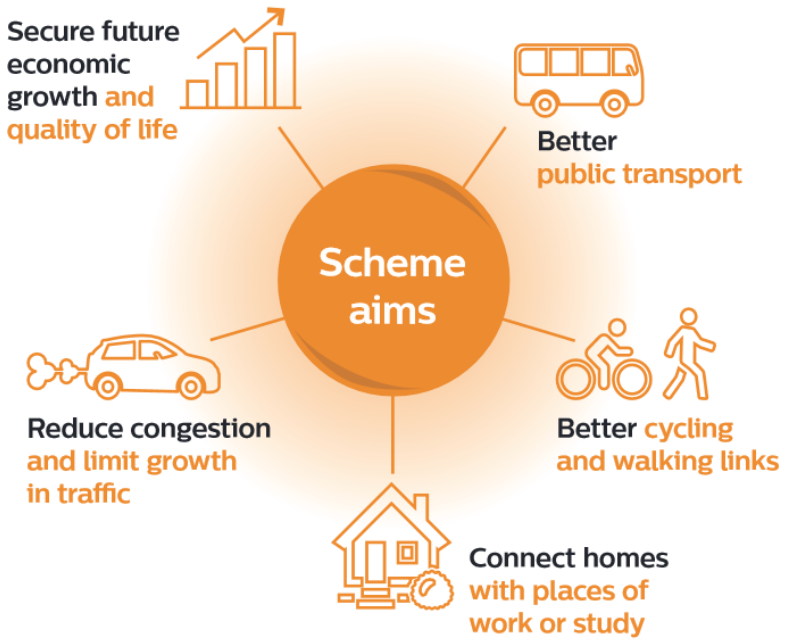
'The Greater Cambridge area of Cambridge and South Cambridgeshire is set to grow by up to 30% over the next 15 years - with the population rising by 65,000 to 338,000 by 2031. Population growth means trips on the transport network will increase by 25,000 by 2031. If we carry on as we are by 2031:

- *Traffic in Cambridge will increase by over 30% in the morning peak*
- *Traffic in South Cambridgeshire will increase by almost 40% in the morning peak*
- *The time spent in congestion will more than double.*

In developing an appropriate action plan to tackle the challenge set out above the GCP have developed six transport aims. The GCP will aim to:

- Ease congestion and prioritise greener and active travel, making it easier for people to travel by bus, rail, cycle or on foot to improve average journey times.
- Keep the Greater Cambridge area well connected to the regional and national transport network, opening up opportunities by working closely with strategic partners.
- Reallocate limited road space in the city centre and invest in public transport to make bus travel quicker and more reliable.
- Build an extensive network of new cycle ways, directly connecting people to homes, jobs, study and opportunity, across the city and neighbouring villages.
- Help make people's journeys and lives easier by making use of research and investing in cutting edge technology.
- Connect Cambridge with strategically important towns and cities by improving our rail stations, supporting the creation of new ones and financing new rail links.

In addition to the GCP Transport Aims set out above, five scheme-specific aims have been developed, these are illustrated in the infographic below.



The aims for the overarching CSET scheme, which are set out above, were established at SOBC stage. Both the GCP Transport Aims and CSET Aims have aided the development of the scheme-specific objectives developed at OBC stage. The scheme objectives set out in the following sub section detail how the aims outlined above will be achieved.

4.2 Scheme Objectives

Scheme objectives were developed and applied to CSET as a whole, i.e. both Phase 1 and Phase 2. The scheme objectives set out below have been designed to be Specific, Measurable, Achievable. Realistic, and Time-bound (SMART).

1
- **Support the continued growth of Cambridge and south Cambridge's economy.**
- Deliver journey time savings for commuters travelling by public transport to job opportunities in south east Cambridge and central Cambridge.
- Improve journey time reliability for users of the A1307 corridor.
- Provide the transport infrastructure necessary to sustain economic growth.

2
- **Relieve congestion and improve air quality in south east Cambridge.**
- Encourage use of sustainable transport modes for journeys through south east Cambridge and into central Cambridge.
- Enhance quality of life by relieving congestion and improving air quality in south east Cambridge.
- Relieve pressure at network pinch points.

3
- **Improve active travel infrastructure and public transport provision in south east Cambridge.**
- Deliver a High Quality Public Transport (HQPT) offer between Cambridge and Haverhill.
- Increase frequency of public transport services during peak periods.
- Reduce severance for cyclists, pedestrians and equestrians.
- Increase uptake of sustainable transport modes for commuter journeys.

4
- **Improve road safety for all users of the A1307 corridor.**
- Reduce the number of accidents at identified accident clusters along the corridor.
- Reduce the number of speed related incidents along the corridor.
- Improve the safety of crossing movements for cyclists, pedestrians and equestrians.

5
- **Improve connectivity to employment sites in south east Cambridge and central Cambridge.**
- Provide improved access to the Granta Park, Addensbrooke Hospital, Cambridge Biomedical Campus (CBC) and a number of other employment sites in south east Cambridge.
- Increase modal options for commuters travelling to and from employment sites in south east Cambridge and central Cambridge by delivering a HQPT network and improved active travel routes for users.

These objectives have formed the basis for the development of the appraisal themes and criteria used at each stage of the appraisal process and which are detailed in Section 5 and Section 6.

5 Stage 1: Options Generation and Assessment

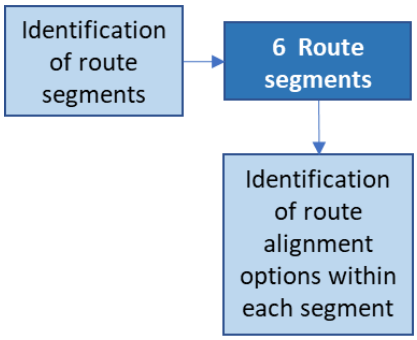
This section outlines the process undertaken that aligns with the DFT's Stage 1 Option Development Process; For the purposes of this scheme Stage 1 has been split into three distinct steps, 1A. 1B and 1C.

5.1 Stage 1A

Six route segments within the study corridor were defined; determined by logical break points including connecting roads. This allowed alternative alignments within each segment to be assessed discretely before being considered as complete routes at the next stage of the appraisal.

Route alignment options within these six segments previously identified at SOBC stage were reviewed and further work was undertaken to develop additional alignment options within each segment. This Stage 1A process is illustrated in Figure 19.

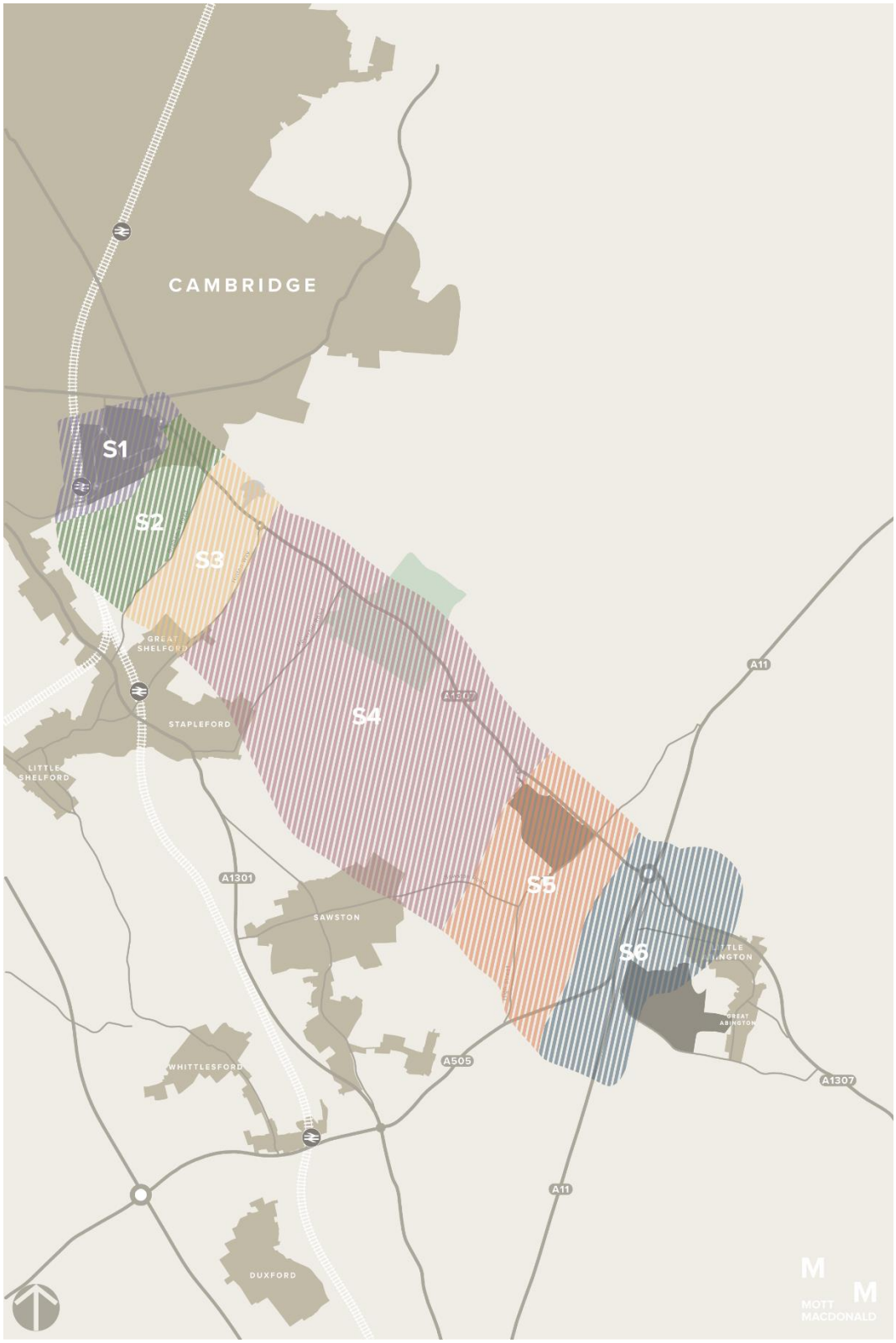
Figure 19: Stage 1A Process – Identify Alignment Options in each Segment



Source: Mott MacDonald

Alternative designs and route alignment options within each of the six route segments were identified and developed in CAD to an appropriate level of detail to allow a high level sift at Stage 1B to assess their feasibility. The six route segments can be seen in Figure 20.

Figure 20: Route Segments



Source: Contains OS data © Crown copyright and database rights 2018 OS 100023205

Previous exploratory work undertaken at SOBC stage had focused on potential strategies, in advance of developing individual options that would address those strategies; three alternates were proposed:

- Strategy 1 was identified as providing a strategic off-road public transport route between a new Travel Hub site located close to the A11 and CBC. This route would aim to provide connectivity to the settlements of Sawston, Stapleford and Great Shelford, following the alignment of the former Cambridge-Haverhill railway where possible.

Strategies 2 and 3 would provide a segregated public transport route following the alignment of the existing A1307. They would both broadly follow the same route between Little Abington and Babraham Road Park & Ride site.

- Strategy 2 was identified as a segregated public transport route following the alignment of the existing A1307, continuing on a new off-road route through current farmland connecting with the existing CBC road network at the southern boundary of the campus, before continuing through the site and on towards Cambridge City Centre via the existing guided busway.
- From Babraham Park & Ride site, Strategy 3 would continue along the A1307, accessing the CBC using the existing road network. This route would then follow Robinson Way through the CBC site and onwards toward Cambridge City Centre via the existing guided busway.

Assessment of these strategies by at this early conceptual stage found that Strategy 1 was the preferred strategy based on:

- Alignment with the Cambridge Autonomous Metro (CAM) and
- Public consultation feedback.

As such an initial assumption was made that going forward all potential options would be based on alignment with Strategy 1. In order to confirm the findings of initial work that established Strategy 1 as the preferred strategy in which to develop scheme options, the whole study area was revisited at OBC stage. Multiple route alignment options within each of the six segments were then developed. These 38 alignments are noted in Table 6.

For consistency and transition from the process undertaken for the SOBC to that being taken forward at OBC stage, Table 6 shows which options within each segment align with the previously identified strategies. This illustrates that there is the potential to explore route alignment combinations for the full length of the corridor that encompass multiple strategies.

Table 6: Route Alignment Options Longlist

Segment	Design Variant		Strategy		
			1	2	3
Segment 1: CBC	1A	Western alignment with entry via Francis Crick Ave	✓	×	×
	1B	Western alignment with entry via Robinson Way (East)	✓	×	×
	1C	Western alignment with entry via Robinson Way (West)	✓	×	×
	1D	A1307 alignment via Hills Road (segregated)	×	×	✓
	1E	A1307 alignment via Hills Road (shared traffic lanes)	×	×	✓
	1F	A1307 alignment with entry via Francis Crick Ave	×	✓	×
	1G	A1307 alignment with entry via Robinson Way (East)	×	✓	×
	1H	A1307 alignment with entry via Robinson Way (West)	×	✓	×
Segment 2: CBC to Granham's Road	2A	West of Nine Wells	✓	×	×
	2B	A1307 alignment (separate lanes)	×	×	✓
	2C	A1307 alignment (parallel alignment)	×	×	✓
	2D	A1307 alignment with link road to CBC via field boundary	×	✓	×
	2E	A1307 alignment with link road to CBC direct alignment	×	✓	×
Segment 3: Granham's Road to Hinton Way	3A	East (avoiding urban area)	✓	×	×
	3B	Western route	✓	×	×
	3C	A1307 (separate lanes)	×	✓	✓
	3D	A1307 (parallel alignment)	×	✓	✓
Segment 4: Hinton Way to Sawston Road	4A	West with no Travel Hub connection	✓	×	×
	4B	East with no Travel Hub connection	✓	×	×
	4C	East with northern connection to A1307 Travel Hub	✓	×	×
	4D	East with southern connection to A1307 Travel Hub	✓	×	×
	4E	West with northern connection to A1307 Travel Hub	✓	×	×
	4F	West with southern connection to A1307 Travel Hub	✓	×	×
	4G	A1307 (separate lanes)	×	✓	✓
	H	A1307 (parallel alignment)	×	✓	✓
Segment 5: Sawston Road to High Street	5A	Alongside former railway alignment	✓	×	×
	5B	South of former railway	✓	×	×
	5C	North of former railway	✓	×	×
	5D	Connection to A1307 Travel Hub	✓	×	×
	5E	A1307 (separate lanes)	×	✓	✓
	5F	A1307 (parallel alignment)	×	✓	✓
	5G	Direct Route to A11 and A1307 Travel Hub sites	×	✓	✓
Segment 6: Travel Hub Connection	6A	via A1307 (north)	×	✓	✓
	6B	via A1307 (south)	×	✓	✓
	6C	Direct from western alignment	✓	×	×
	6D	South of A505	✓	×	×
	6E	Parallel with A11 (without crossing)	✓	✓	✓
	6F	Parallel with A11 (with crossing)	✓	✓	✓

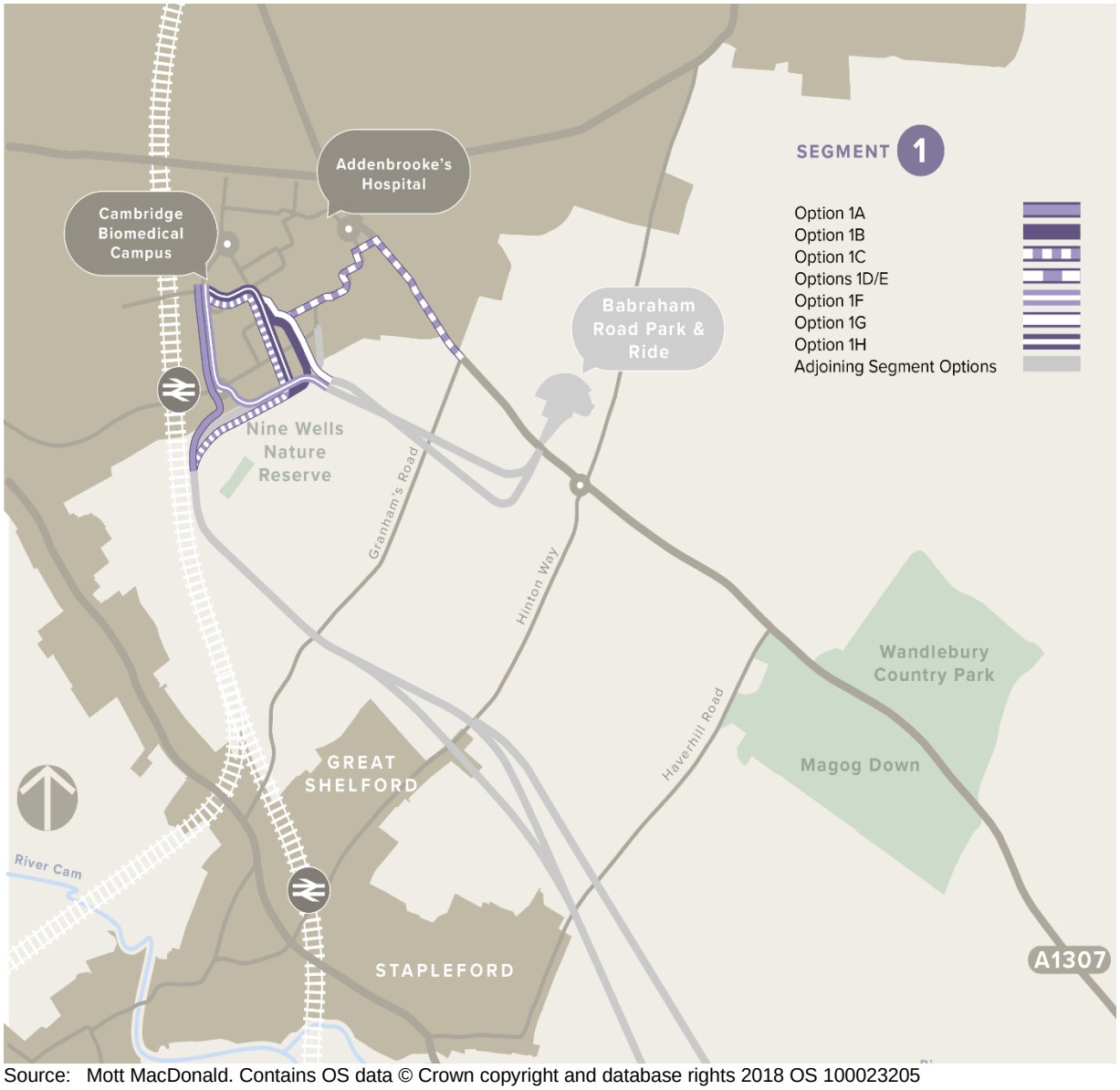
Source: Mott MacDonald

Schematics and a brief narrative about each of the 38 options are presented below on a segment by segment basis.

5.1.1 Segment 1: Connection to Cambridge Biomedical Campus (CBC)

Eight options were identified for the connection into the CBC, and these are illustrated in Figure 21.

Figure 21: Segment 1 Route Alignment Options



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Option 1A would run from a western alignment parallel with the railway and connect to the campus at the roundabout junction of Addenbrooke's Road, Dame Mary Archer Way and Francis Crick Avenue. It would then follow Francis Crick Avenue before joining the route of the existing guided busway. Option 1F is similar to Option 1A except it would connect to an alignment following the A1307 rather than a western alignment.

Options 1B, 1C, 1G and 1H would join the campus at Robinson Way and follow this to reach the route of the existing guided busway. The options differ in the route they take through land and the

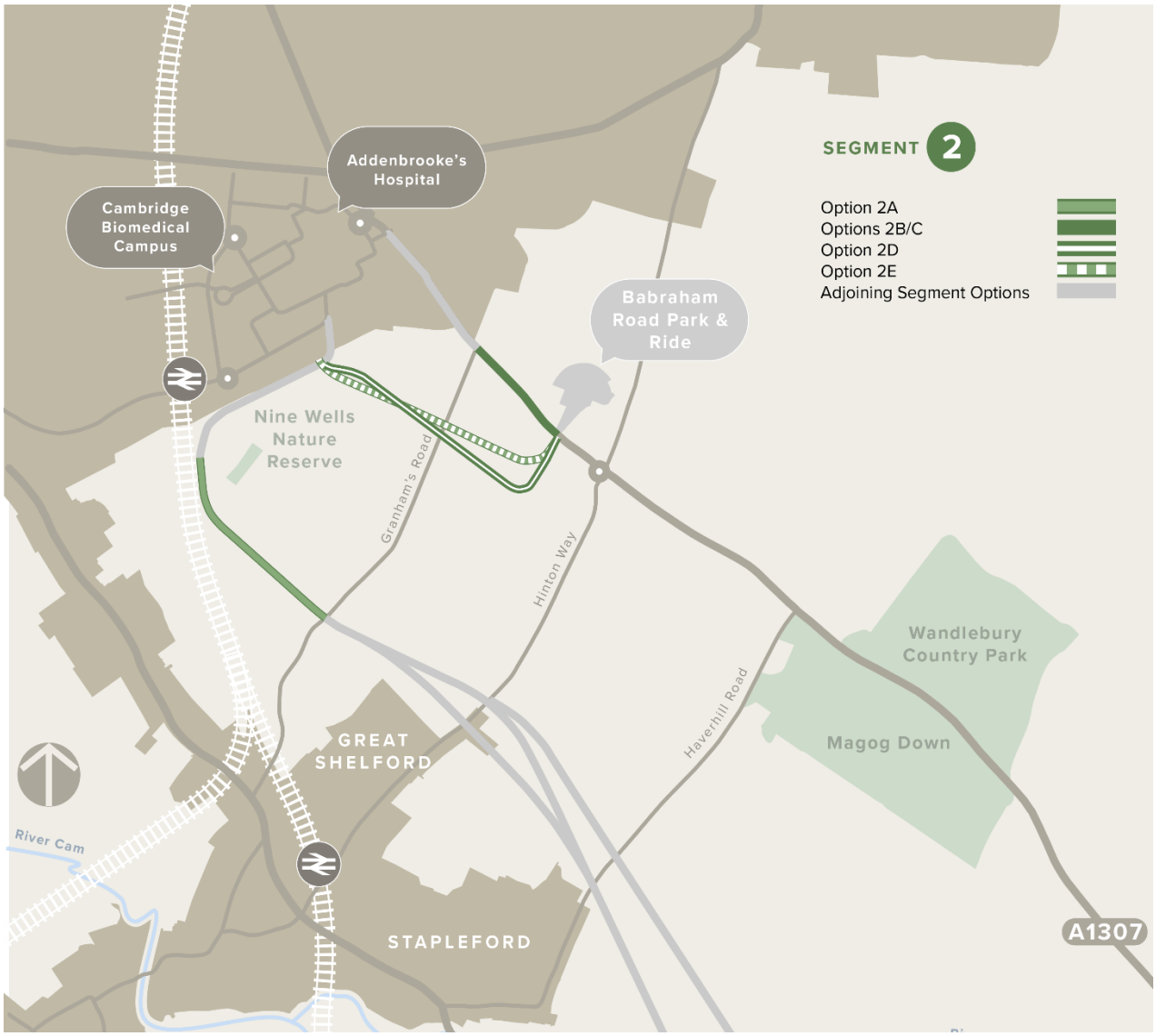
proposed development area to the south of the campus. Options 1B and 1C would connect to a western alignment, with Option 1C providing a more direct connection to Robinson Way. Options 1G and 1H would connect to an alignment alongside the A1307 with both being a similar distance.

Options 1D and 1E differ from the other options by entering the campus to the east, rather than the south, and connecting with a route running via Hills Road. Both options follow the same alignment however Option 1D would provide a segregated route into the campus whereas Option 1E would require public transport vehicles to share with general traffic.

5.1.2 Segment 2: CBC to Granham's Road

Five route alignment options were identified in Segment 2 and are shown in Figure 22.

Figure 22: Segment 2 Route Alignment Options



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Option 2A would provide a dedicated route for public transport vehicles and run to the west of Nine Wells Nature Reserve, parallel with the railway. This has been designed to avoid dissecting the nature reserve.

Options 2B and 2C would continue along the A1307 (Hills Road) to reach the CBC at the Addenbrooke's roundabout. Option 2B would provide separate lanes alongside the existing carriageway whereas Option 2C would provide a new alignment parallel to the existing carriageway. Options 2D and 2E would provide a new connecting road between the A1307 at Babraham Park & Ride to the south of the CBC. The difference between these options is that Option 2E provides a direct alignment and Option 2D follows the field boundary.

5.1.3 Segment 3: Granham's Road to Hinton Way

Four route alignment options were identified in Segment 3 and are shown in Figure 23.

Figure 23: Segment 3 Route Alignment Options

Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Both Options 3A and 3B would provide a new alignment. Option 3A would run between Granham's Road and Hinton Way to the east of Great Shelford whereas Option 3B would take a more direct route but consequently require the compulsory purchase of residential properties.

Options 3C and 3D would run alongside the A1307. Option 3C would comprise a widening of the existing carriageway whereas Option 3D would be the construction of a new road parallel with the A1307.

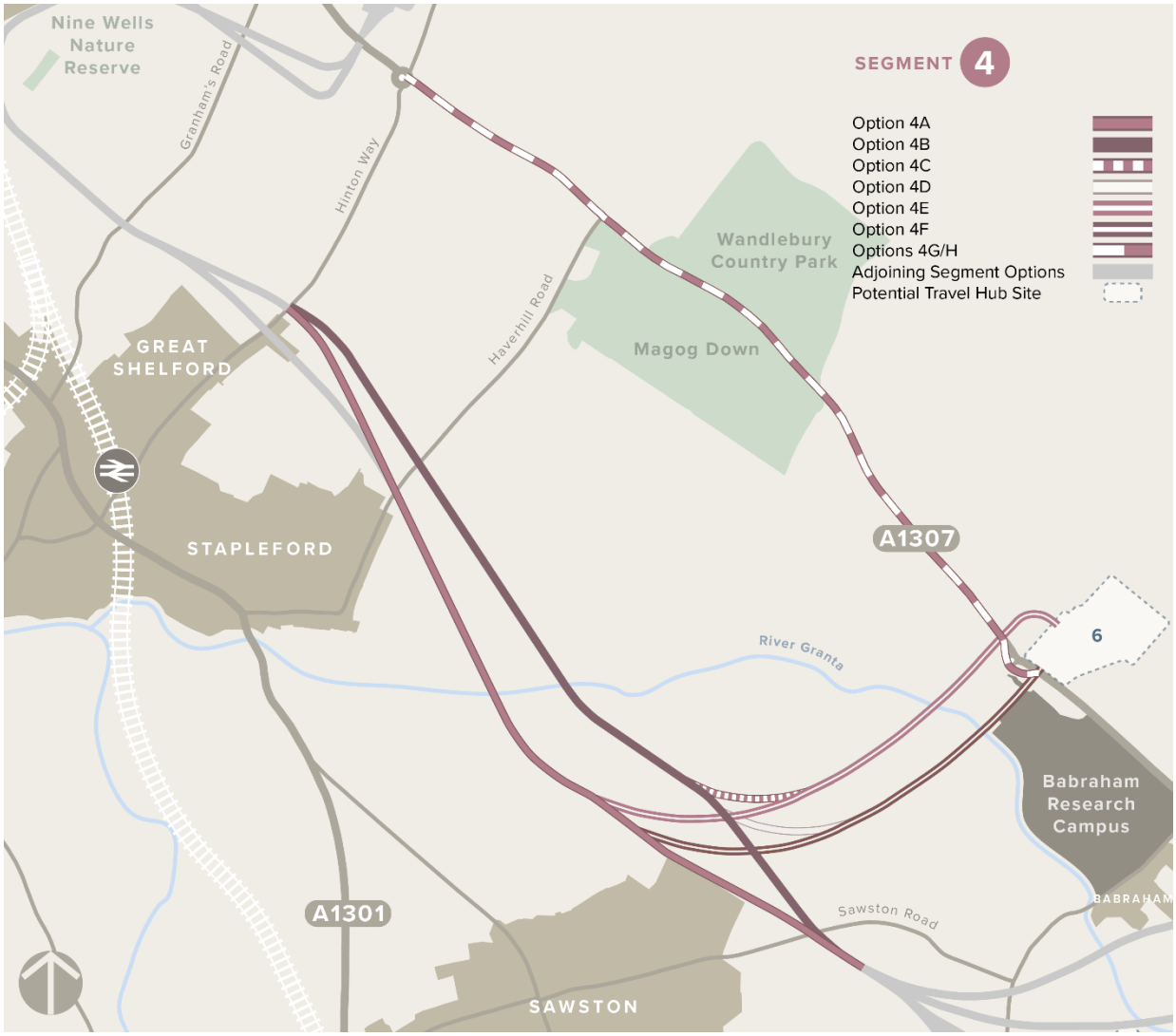
Initial work undertaken by for the SOBC 2018, considered following the former Cambridge-Haverhill railway to the south of Stapleford and the existing railway corridor through Great Shelford. On the basis of stakeholder feedback at OBC stage further feasibility studies were conducted and confirmed findings at the SOBC stage that "this is not viable for a road based public transport system given the lack of available space alongside the existing Cambridge-Liverpool St main line railway, particularly at Shelford Station that is located centrally within the village and surrounded by residential and commercial development that precludes taking a new route that by-passes the station and platforms that abut the railway"[4]. It is for these reasons that this option has not been proposed for further investigation within Segment 3.

[4] WSP (2018) REF: 70012014-TN-010 Strategy 1 Route Assessment Technical Note

5.1.4 Segment 4: Hinton Way to Sawston Road

Eight route alignment options were identified in Segment 4 and are shown in Figure 24.

Figure 24: Segment 4 Route Alignment Options



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Segment 4 provides options that would connect to Travel Hub site 6 in order to enable the site to be considered in next step of the process. For the section of the route east of Great Shelford and Stapleford, there is a route close to built-up areas and a more remote option.

Options 4A-4F are variations of a new alignment running between Hinton Way and Sawston Road, whereas Options 4G and 4H would follow the A1307 with Option 4G being a widening of the existing carriageway and Option 4H being a new road parallel with the A1307.

Option 4A is a westerly alignment which runs alongside the former railway alignment and close to the villages of Stapleford and Sawston. Option 4B follows a marginally more direct route to the east of Option 4A but is slightly further from the residential areas.

Options 4C and 4D provide connections from the easterly alignment (Option 4B) to a new Travel Hub site (Site 6) on the A1307, north of Babraham Research Campus. Option 4C would connect into the north of the site and Option 4D would connect into the south.

Similarly, Options 4E and 4F provide connections from the westerly alignment (Option 4A) to the same Travel Hub site on the A1307. Option 4E would connect into the north of the site and Option 4D would connect into the south.

5.1.5 Segment 5: Sawston Road to High Street

Seven route alignment options were identified in Segment 5 and are shown in Figure 25.

Figure 25: Segment 5 Route Alignment Options

Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Options 5A, 5B, 5C, 5D and 5G would provide a new alignment running south east of Sawston. Options 5E and 5F would instead follow the A1307 from Babraham Research Campus, with Option 5E being a widening of the existing carriageway and Option 5F a new road parallel with the A1307.

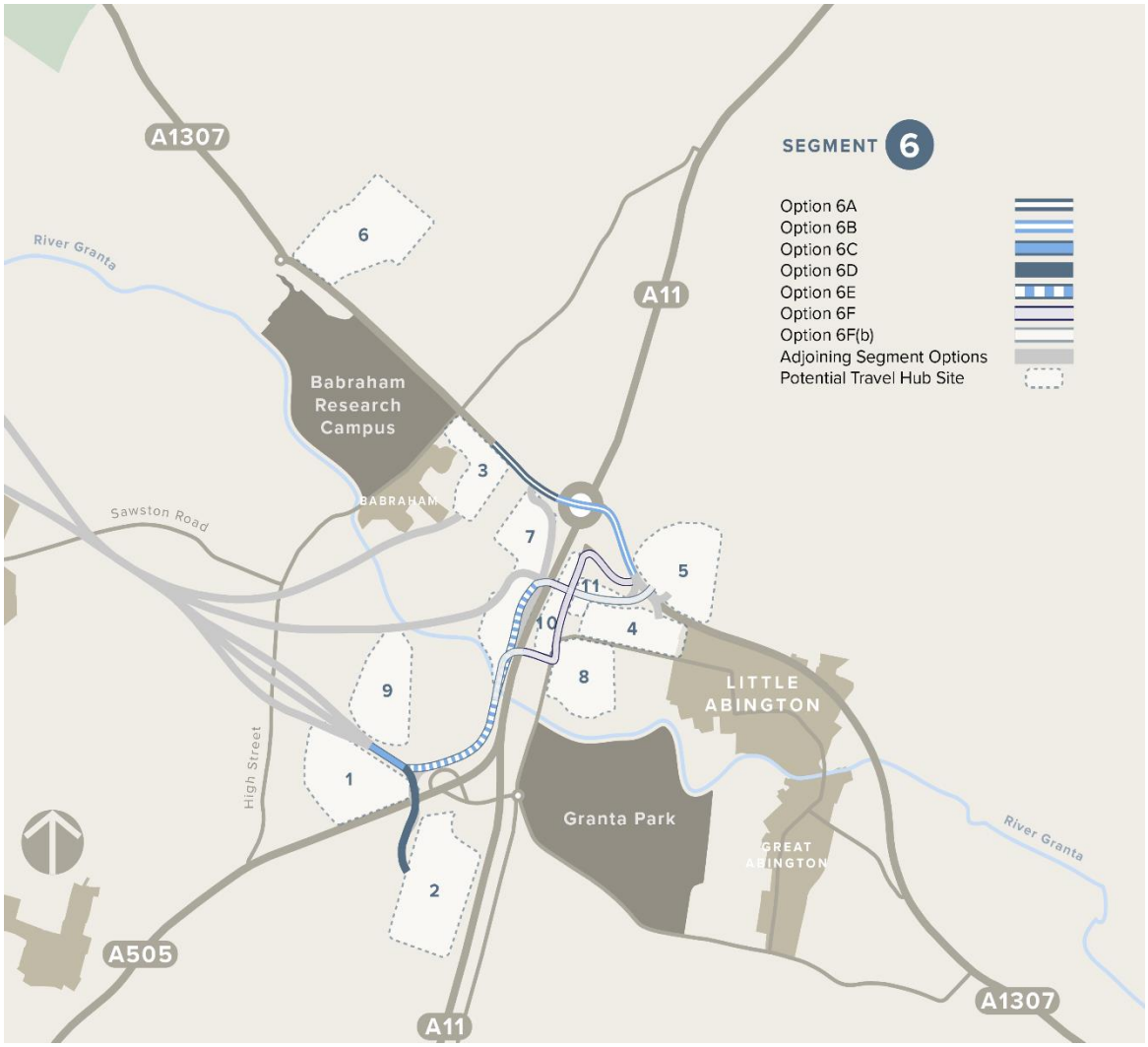
Option 5A would run adjacent to the former railway alignment from Sawston and therefore close to the County Wildlife Site. It would also require a bridge over High Street or significant regrading of land. This would be avoided by Options 5B and 5C which would bypass the former railway to the south and north respectively.

Option 5D would follow a different route from Sawston to connect directly with a Travel Hub site adjoining the A1307 to the south east of Babraham Research Campus. Option 5G would provide a direct link from Sawston to the A11/A1307 junction and a Travel Hub site located in this area.

5.1.6 Segment 6: Travel Hub Connection

Segment 6 considered how potential locations for Travel Hub sites would be accessed from the main alignment options extending as far as the A11. Further details of the identified Travel Hub site options are provided in Section 5.3.1. Six route alignment options were identified in this section and are shown in Figure 26.

Figure 26: Segment 6 Route Alignment Options



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Option 6A would run alongside the A1307 as far as the A11; therefore, serving a Travel Hub site west of the A11. Option 6B would also follow the A1307 but cross the A11 and serve a Travel Hub site to the east of this.

Option 6C would provide a connection from a new western alignment, serving Travel Hub sites located north of the A505. It would not require a significant extension to the public transport route in order to serve a Travel Hub site in this location.

Option 6D would extend from a new western alignment and cross the A505 to serve a Travel Hub site on the south of this.

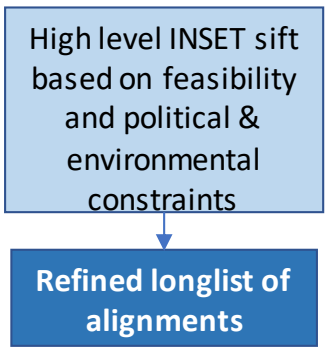
Option 6E would also require an extension to the public transport route, in this case running parallel with the A11.

Option 6F would extend Options 6E or 6G by creating a bridge across the A11. It would then join the existing highway network with public transport vehicles running on Newmarket Road/Bourn Bridge to connect with a Travel Hub site. Option 6F(b) would cross the A11 but extend to the A1307 via a dedicated new route instead of sharing with existing traffic on Newmarket Road.

5.2 Stage 1B

Once all potential route alignment options had been identified at Stage 1A, a high-level INSET sift was undertaken to reduce the number of potential alignment options to a more manageable number before route alignments were packaged with Travel Hub site options to develop holistic scheme options at Stage 1C. The Stage 1B process is shown in Figure 27.

Figure 27: Stage 1B Process – Route Alignment Sift



Source: Mott MacDonald

5.2.1 Application of INSET

High level appraisal criteria were developed for the purposes of Stage 1B appraisal under four assessment themes:

- Transport User Benefits;
- Environment;
- Deliverability; and
- Social Impacts.

Table 7 presents the assessment criteria developed under each of these assessment themes.

Table 7: Stage 1B Sift Themes and Criteria

Theme	Main Criteria						
Transport User Benefits	Journey Reliability	Route Flexibility - Links into CAM	Proximity to Settlements and Trip Attractors	Impact on Existing Traffic	Degree of Route Segregation	Journey Time	
Environment	Visual Impact	Noise	Air Quality	Water/Flood Risk	Biodiversity	Heritage	Impact on Greenbelt
Deliverability	Degree of Opposition Expected	Scheme Cost	Engineering Feasibility - Construction Method	Land Acquisition Required	Impact on Local Road Network during Construction	Futureproofing	
Social Impacts	Safety	Access to Cambridge Biomedical Campus	Access to Babraham Research Campus	Access to Granta Park	Loss of Buildings and Physical Infrastructure		

Source: Mott MacDonald

A seven-point scoring scale (+3 to -3 with 0 being neutral) was used to capture the disbenefits and benefits of each of the route alignment options. INSET allows themes and criteria to be weighted differently to reflect their relative importance. However, weighting was applied equally across all themes and criteria as only discrete elements of options were being assessed, rather than options in their entirety. The total score is the average of the sum of the themed scores.

The assessment was carried out by a group of Mott MacDonald staff who have extensive experience and knowledge of the CSET Phase 2 scheme, the geographical area and INSET as an appraisal tool. At this stage, scoring was primarily assigned on a qualitative basis, based on informed judgement and in-house expertise with similar schemes. This is except for the Environment theme, where it was possible to assign scores to some of the criteria based on quantitative metrics generated from readily available information sources such as flood risk mapping. Further details of the rationale used to assign scores under each criterion to all route alignment options can be found in Appendix B

5.2.2 Scoring Considerations

A brief description of the considerations that were taken into account when assessing each of the options against each of the themed criteria is provided in Table 8 and the Rationale for assigning scores is in Table 10

Table 8: Criteria Scoring Considerations

Assessment Theme/Assessment Criteria	Scoring Description
Transport User Benefits	
Journey Reliability	Route alignment options were assessed on the possible issues with delivering a reliable mode of transport, with higher scores being given to those with segregated routes and lower scores for routes which are shared with other modes or have complex junctions with other existing roads.
Route Flexibility - Links into CAM	Route alignments were assessed on how well they could be integrated with CAM in the future. Alignments offering fully segregated infrastructure which could be used by CAM vehicles and with very limited interaction with general traffic scored highly

Assessment Theme/Assessment Criteria	Scoring Description
	whereas shared routes with existing high traffic flows and congestion scored poorly.
Accessibility to Settlements and Trip Attractors	Route alignments were assessed on how close they ran to the centre of settlements or employment hubs. The closer the proximity the higher score based on providing improved accessibility. Negative scores were applied where alignments would deviate from trip attractors and employment hubs.
Impact on Existing Traffic	Route alignment options were assessed on how they will impact existing traffic during operation. Higher scores were given for improvements such as reduced congestion due to modal shift and lower scores have been given to delays caused by vehicle priority or areas of shared running. This will need to be confirmed with traffic modelling which will be completed at a later stage of appraisal.
Degree of Route Segregation	Route alignment options were assessed based on how much segregation there was from the existing network. Offline options with no integration with existing traffic scored best and those with no segregation the worst. This was on the basis that segregated routes would permit faster free flowing journeys and not be subject to congestion, reducing accident potential and ensuring journey time reliability.
Journey Time	Route alignment options were assessed based on a high-level review of journey times based on engineering judgement and assumptions. Higher scores were given to route alignment options that were perceived to offer faster journey times, although at this high level sift stage no modelling work had been undertaken.
Environment	
Visual Impact	Route alignment options were assessed on the visual intrusion of the route with higher scores given if the route enhances the existing landscape and lower scores where it introduces new highways infrastructure or structures.
Noise	Route alignment options were assessed on the proximity of the route to receptors with higher scores given if there are reductions in noise impact and lower scores if the route will create an increase in noise proximity to sensitive receptors.
Air Quality	Route alignment options were assessed on the impact the route will have on air quality with higher scores indicating improvement in the air quality and lower scores indicating a decrease in the air quality of the area.
Water/Flood Risk	Route alignment options were assessed based on their proximity to flood zones, the category of the flood zone, proximity to Source Protection Zones (SPZs) and proximity to any other water bodies. Alignment options which would be within a flood zone, SPZ or close to a water body were scored lower than those which would not be close to any potential water/flood risks.
Biodiversity	Route alignment options were assessed on the impact on biodiversity with higher scores given for improvements to biodiversity and lower scores for reduction in biodiversity including SSSI sites and destruction of habitats.
Heritage	Route alignment options were assessed based on the proximity and impact to areas of significant heritage and lower scores assigned to options with any impact on heritage sites.
Impact on Green belt	Route alignment options were assessed on the amount of land required and the impact this has on the greenbelt. Higher scores were given if land is reclaimed and lower scores if this land is required.
Deliverability	
Degree of Opposition Expected	Route alignment options were assessed against the likelihood of the need to take residential properties, the need to encroach on environmentally sensitive areas or parkland, or the impact on general traffic based on the perception these factors would cause opposition from the public. Higher scores were assigned if it was unlikely that the alignment would result in residential properties

Assessment Theme/Assessment Criteria	Scoring Description
	being acquired and/or minimal intrusion onto environmentally sensitive land. Lower or negative scores were given if the alignment was likely to require residential properties to be acquired or loss of environmentally sensitive areas.
Option Cost	Route alignment options were assessed against each other for capital cost of each option including any new infrastructure required as well as any alterations to existing infrastructure. Route alignment options which are expected to cost more in relative terms to each other were scored lower (more negatively) and those which were expected to cost less scored higher (more positively).
Engineering Feasibility- Construction method	Route alignment options were assessed on the complexity of construction which would be required to deliver the section of the route. Higher scores were assigned to alignment options which would be relatively simple to deliver. Lower scores were assigned to alignment options which would be more complex to deliver e.g. complex structures such as bridges would be required.
Land Acquisition Required	Route alignment options were assessed on the amount of land required to implement the section of the option, with higher scores given if land is reclaimed that had previously been developed and lower scores if more land is required, with variants based on the current use of the land and its potential for agriculture or development.
Impact on Local Road Network during Construction	Route alignment options were assessed on the impact on the local road network during construction. Higher scores were awarded to those which would result in minimal disruption, e.g. if the route is segregated from the road network. Lower scores were awarded if the alignment would be disruptive to existing traffic on the local road network, e.g. widening works.
Futureproofing	Route alignment options were assessed on how suitable they would be for future proposed schemes, including CAM and opportunities to extend the route. Higher scoring has been given if the location, geometry and infrastructure would support future schemes and lower scoring has been given if they do not.
Social Impacts	
Safety	Route alignment options were assessed on how many interactions the route has with other vehicles and the type of interaction. These will increase the opportunities for road traffic incidents. Higher scores are given if the route improves interactions with other road users and lower scores given if the route increases the risk of accidents.
Access to Cambridge Biomedical Campus	Route alignment options were assessed on how well they would facilitate access to the Cambridge Biomedical Campus. As a key employer improved access to this site provides employment and training opportunities for a greater number of people. Higher scores were assigned to alignments which provide direct access to the campus, lower scores were assigned to alignments which would provide poor access to the campus. Sections of the route which could neither improve nor worsen access due to their geographical proximity to the campus were regarded as neutral.
Access to Babraham Research Campus	Route alignment options were assessed on how well they would facilitate access to Babraham Research Campus. As a key employer improved access to this site provides employment and training opportunities for a greater number of people Higher scores were assigned to alignments which provide direct access to the campus. Lower scores were assigned to alignments which would provide poor access to the campus. Sections of the route which could neither improve nor worsen access due to their geographical proximity to the campus were regarded as neutral.
Access to Granta Park	Route alignment options were assessed on how well they would facilitate access to Granta Park. As a key employer improved access to this site provides employment and training opportunities for a greater number of people Higher scores were assigned to alignments which provide direct access to the site. Lower scores

Assessment Theme/Assessment Criteria	Scoring Description
	were assigned to alignments which would provide poor access to the site. Sections of the route which would neither improve nor worsen access due to their geographical proximity to the site were regarded as neutral.
Loss of Buildings and Physical Infrastructure	Route alignment options were assessed on the likelihood that implementation would require the acquisition of homes and property. Higher scores were assigned to alignments which would not require the acquisition of homes and property. Lower scores were awarded to alignments which would result in the need to acquire homes and property.

Source: Mott MacDonald

5.2.3 Stage 1B Sift Results

The scores for each of the options against each of the themes and total scores are presented in Table 9. They are shown by segment and in ranked order within each segment. The route alignment that performed best overall against the criteria, which is in Segment 1 is ranked as 1, the worst which is also in Segment 1 is ranked as 38.

However, in order to develop a complete route over the full corridor length, alignments from all six segments are required. It was therefore decided in most cases to take the three best performing alignments (based on total score) through to Stage 1C, irrespective of the overall rank. Where additional alignment options had scored equally as well as the top three, or the third best performing option, these too were progressed; this was the case for Segment 1, where four alignment options were progressed and Segment 4 where seven alignment options were progressed. Seven alignment options were progressed for Segment 4 because, in addition to the six best performing options, Option 4G within this segment was needed to progress the online route. This was also the case with Segments 5 and 6 where Options 5E and 6A needed to be retained in order also to form a complete route.

This approach was taken to ensure complete routes could be created and to prevent segment alignment options which could score better when packaged with others from being discounted unfairly. The route alignments taken forward are highlighted in the following colours in the results table, Table 9:

Segment 1 route alignment options progressed to Stage 1C for option packaging
Segment 2 route alignment options progressed to Stage 1C for option packaging
Segment 3 route alignment options progressed to Stage 1C for option packaging
Segment 4 route alignment options progressed to Stage 1C for option packaging
Segment 5 route alignment options progressed to Stage 1C for option packaging
Segment 6 route alignment options progressed to Stage 1C for option packaging

From the results table it can been seen that none of the best performing option alignments in Segment 4 score positively; the same holds true for the best performing option alignments in Segment 5, the second and third best performing option alignments in Segment 3 and the third and fourth best performing option alignments in Segment 4.

However, these alignments cannot be discounted because, whilst they have lower scores, they are either required to construct a full-length route through the study area corridor, or their performance could be improved when treated as part of a full-length route and so should be considered further.

Table 9: Stage 1B INSET Sift Theme and Total Score Results

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Total Score
1	Segment 1 - CBC: Option A - Western alignment with entry via Francis Crick Ave	1.00	-0.14	-0.33	0.60	0.28
4	Segment 1 - CBC: Option F - A1307 alignment with entry via Francis Crick Ave	0.83	-0.14	-0.50	0.40	0.15
30	Segment 1 - CBC: Option B - Western alignment with entry via Robinson Way (East)	-1.17	-0.14	-0.67	0.40	-0.39
30	Segment 1 - CBC: Option C - Western alignment with entry via Robinson Way (West)	-1.17	-0.14	-0.67	0.40	-0.39
34	Segment 1 - CBC: Option G - A1307 alignment with entry via Robinson Way (East)	-1.17	-0.14	-0.83	0.40	-0.44
34	Segment 1 - CBC: Option H - A1307 alignment with entry via Robinson Way (West)	-1.17	-0.14	-0.83	0.40	-0.44
37	Segment 1 - CBC: Option E - Hills Road (shared traffic lanes)	-1.83	-0.14	-0.67	0.20	-0.61
38	Segment 1 - CBC: Option D - Hills Road (segregated)	-0.17	-0.43	-2.00	-0.40	-0.75
3	Segment 2- CBC to Granham's Road- Option E- A1307 alignment with link road to CBC direct alignment	1.67	-0.43	-1.00	0.40	0.16
5	Segment 2- CBC to Granham's Road- Option D- A1307 alignment with link road to CBC via field boundary	1.50	-0.43	-1.00	0.40	0.12
7	Segment 2 - CBC to Granham's Road: Option A - West of Nine Wells	1.67	-0.71	-1.00	0.20	0.04
28	Segment 2 - CBC to Granham's Road: Option B - A1307 (separate lanes)	-0.33	-0.14	-1.00	0.00	-0.37
32	Segment 2 - CBC to Granham's Road: Option C - A1307 (parallel alignment)	0.00	-0.29	-1.33	0.00	-0.40
6	Segment 3 - Granham's Road to Hinton Way: Option A - East (avoiding urban area)	1.33	-0.43	-1.00	0.40	0.08
22	Segment 3 - Granham's Road to Hinton Way: Option B - Western Route	1.67	-0.71	-1.33	-0.40	-0.20
27	Segment 3 - Granham's Road to Hinton Way: Option C - A1307 (separate lanes)	-0.33	0.00	-0.83	0.20	-0.24

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Total Score
33	Segment 3 - Granham's Road to Hinton Way: Option D - A1307 (parallel alignment)	0.00	-0.71	-1.17	0.20	-0.42
14	Segment 4 - Hinton Way to Sawston Road: Option C - East with northern connection to Travel Hub	1.50	-1.00	-1.50	0.40	-0.15
14	Segment 4 - Hinton Way to Sawston Road: Option D - East with southern connection to Travel Hub	1.50	-1.00	-1.50	0.40	-0.15
14	Segment 4 - Hinton Way to Sawston Road: Option E - West with northern connection to Travel Hub	1.50	-1.00	-1.50	0.40	-0.15
14	Segment 4 - Hinton Way to Sawston Road: Option F - West with southern connection to Travel Hub	1.50	-1.00	-1.50	0.40	-0.15
18	Segment 4 - Hinton Way to Sawston Road: Option A - West with no Travel Hub connection	1.67	-0.86	-1.50	0.00	-0.17
18	Segment 4 - Hinton Way to Sawston Road: Option B - East with no Travel Hub connection	1.67	-0.86	-1.50	0.00	-0.17
22	Segment 4 - Hinton Way to Sawston Road: Option G - A1307 (separate lanes)	0.17	-0.14	-0.83	0.00	-0.20
36	Segment 4 - Hinton Way to Sawston Road: Option H - A1307 (parallel alignment)	0.50	-1.14	-1.17	0.00	-0.45
10	Segment 5 - Sawston Road to High Street: Option C - North of former railway	1.50	-0.43	-1.00	-0.20	-0.03
11	Section 5 – Sawston Road to High Street: Option G- Direct route to A11 and A1307 Travel Hub sites	1.50	-0.86	-1.33	0.40	-0.07
12	Segment 5 - Sawston Road to High Street: Option D - Connection to BRC Travel Hub (Site 3)	1.50	-1.00	-1.17	0.20	-0.12
13	Segment 5 - Sawston Road to High Street: Option B - South of former railway	1.50	-0.86	-1.00	-0.20	-0.14
18	Segment 5 - Sawston Road to High Street: Option E - A1307 (separate lanes)	0.17	0.00	-0.83	0.00	-0.17
26	Segment 5 - Sawston Road to High Street: Option A - Alongside former railway alignment	1.67	-0.71	-1.67	-0.20	-0.23
29	Segment 5 - Sawston Road to High Street: Option F - A1307 (parallel alignment)	0.50	-0.86	-1.17	0.00	-0.38
2	Segment 6 - Southern Travel Hub Connection: Option C - Direct from western alignment	1.50	-0.57	-0.17	0.00	0.19
8	Segment 6 - Southern Travel Hub Connection: Option F - Parallel with A11 (with crossing)	1.83	-0.57	-2.17	1.00	0.02

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Total Score
9	Segment 6 - Southern Travel Hub Connection: Option E - Parallel with A11 (without crossing)	1.50	-0.57	-1.33	0.40	0.00
21	Segment 6 - Southern Travel Hub Connection: Option A - via A1307 (north)	0.33	0.00	-0.83	-0.20	-0.18
24	Segment 6 - Southern Travel Hub Connection: Option B - via A1307 (south)	0.33	0.00	-1.00	-0.20	-0.22
24	Segment 6 - Southern Travel Hub Connection: Option D - South of A505	1.50	-0.71	-1.67	0.00	-0.22

Source: Mott MacDonald

5.2.4 Scoring Rationale

Following on from the considerations that were taken into account when assessing each option against the criteria as shown in Table 8, the parameters for assigning scores of -3 to +3 for each of the criteria are noted in Table 10.

Table 10: Scoring Rationale Against each of the Themed Criteria

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Theme: Transport Benefits							
Journey Reliability	Fully segregated. All junctions grade separated	Fully offline, no sharing with general traffic. Full priority at all junctions/ crossings (junctions at minor roads created by Strategy 1)	Typically in dedicated public transport lanes but some interaction with general traffic	No change in reliability	Some sharing at minor junctions	Sharing with general traffic on routes with lower traffic levels	Sharing with general traffic on already congested routes
Route flexibility - Links to CAM	Fully segregated infrastructure which could be used by CAM vehicles. Very limited interaction with general traffic	Fully segregated infrastructure which could be used by CAM vehicles. Some interaction with general traffic at junctions	Running alongside existing road but with separate lanes	Not applicable, any option will have either positive or negative scores relative to this criterion	Minor overlap with general traffic routes which may reduce CAM optimisation	Route shared with other traffic (existing low flows)	Route shared with other traffic (existing high flows and congestion)
Proximity to Settlements and Trip Attractors	Maximum accessibility to trip attractors with dedicated access to	Greater accessibility to trip attractors - runs close to the centre	Runs to the edge of settlements/ trip attractors	Section of route would not serve major trip attractors on any reasonable alignment but	Some deviation in route away from trip attractors/ settlements	Route would deviate from trip attractors/ settlements to an	Route would substantially deviate from trip attractors/ settlements to an

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
	employment hubs/ settlements	of settlements or employment hubs		provides link to trip attractors elsewhere		extent most are not served	extent hardly any are served
Impact on Existing Traffic	Not applicable as if option mixes with existing traffic then it is a negative impact	Not applicable as if option mixes with existing traffic then it is a negative impact	Not applicable as if option mixes with existing traffic then it is a negative impact	Completely segregated. Grade separated junction introduced where transit route crosses existing route This is considered neutral as opposed to positive as existing traffic is not necessarily benefiting	Runs alongside existing traffic using separate lanes. Existing routes have higher flows and more junctions affected. New at grade junction introduced	Shares with existing traffic. Large number of junctions and/or congested junctions are affected	Shares with existing traffic. Large number of congested junctions are seriously affected and congestion likely to worsen
Degree of Route Segregation	Offline route, no integration with existing traffic. Where transit route crosses existing road, the transit route has priority or junctions are grade separated	Parallel route with interaction with general traffic at junctions	Runs alongside existing carriageway but limited integration with existing traffic except at junctions	Not applicable – route is either segregated or not	Runs alongside existing traffic using separate lanes with some access points or junctions	Runs alongside existing traffic with interaction with existing traffic very likely	No route segregation
Journey Time	Very direct, segregated route, no limitations to achieving optimum speed	Direct, segregated route some sections where reduced speed restriction is likely. May be some junctions but transit route would have priority	Route less direct but largely segregated. Some junctions but transit route would have priority	No change	Route not segregated but shared sections have relatively light existing flows or route is segregated but will have higher integration with general traffic as a result of access points or junctions	Route not segregated with larger integration with existing traffic	Transit vehicles share with general traffic on existing congested roads
Theme: Environment							
Visual Impact	Route contributes to physical improvement of parkland or areas of historic interest	Improvement/ sustainability of landscape alongside parkland	Tree planting or tidying of road verge	No impact	Loss of trees or intrusions onto road verge	Construction of physical infrastructure alongside parkland	Construction of physical infrastructure encroaches parkland or areas

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
							of historic importance
Noise	Route diverts a substantial amount of traffic away from most housing	Route is a substantial distance away from housing	Route is partially away from residences and may cause reduction in noise pollution as traffic	No impact	Route is much closer to residences and will cause some local increases in noise pollution	Route is directly alongside housing causing major local increases in noise pollution in most areas	Route is directly alongside housing causing major local increases in noise pollution in all areas
Air Quality	Significant improvement in air quality	Moderate improvement in air quality	Slight improvement n in air quality	No impact	Slight deterioration in air quality due to option along route	Major deterioration in air quality due to option along route	Extreme deterioration in air quality due to option along route
Water/Flood Risk	Not applicable – no intervention will improve flood risk	Not applicable – no intervention will improve flood risk	Not applicable – no intervention will improve flood risk	No impact	Proposed route crosses flood zones of non-main rivers or Source Protection Zone (SPZ) 2	Proposed route crosses flood zones of main rivers or SPZ 1	Proposed route crosses flood zones of all waterways
Biodiversity	Significant increase in vegetation or trees	Moderate increase in vegetation or trees	Small increase in vegetation or trees	No impact	Small loss of some vegetation or trees, as well as loss of hedgerows at field boundaries	Major loss of vegetation / trees or loss of key habitats	Severe loss of vegetation / trees or loss of key habitats with no mitigation measures
Heritage	Not applicable – no intervention will improve heritage	Not applicable – no intervention will improve heritage	Not applicable – no intervention will improve heritage	No impact	Slight impact on setting of scheduled monuments / listed buildings / conservation areas	Major visual impact or partial demolition of scheduled monuments / listed buildings / conservation areas	Severe visual impact and demolition of multiple scheduled monuments / listed buildings / conservation areas
Impact on Greenbelt	Not applicable – no intervention will improve greenbelt	Not applicable – no intervention will improve greenbelt	Not applicable – no intervention will improve greenbelt	No impact	Route partially in green belt (majority outside)	Route encroaches significantly or totally onto greenbelt	Route encroaches totally onto green belt and/or there are significant structures impacting the open nature of the greenbelt

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Theme: Deliverability							
Degree of Opposition Expected	Expected to be very strongly supported with no impact on the environment, residential amenity and general traffic	Expected to be well supported with no impact on the environment, residential amenity and general traffic	Expected to generate moderate support	Not expected to generate significant public support or opposition	Expected opposition. Slight impact on environment/ existing traffic	Expected strong opposition. Large impact on existing traffic and/or impact on environmentally sensitive sites and/or impact on amenity of existing residents	Expected very strong opposition. Loss of environmentally sensitive sites and/or compulsory purchase of buildings and/or gardens required
Option Cost	Not applicable – cost not viewed as a positive	Not applicable – cost not viewed as a positive	Not applicable – cost not viewed as a positive	No or limited cost expected	Lower cost - localised widening and junction changes only	Higher cost - significant road widening	Highest cost - new road alignment
Engineering Feasibility – Construction Method	No work required with significant benefit over other options	No work required	Limited work required with few access constraints	Limited complexity or relative advantage	Offline route requiring new construction access routes	Significant work to widen existing roads and redesign junctions. Bridge construction over existing road required	Significant work required and large disbenefit compared to other options
Land Acquisition Required	Net sale of highway land for other uses	Significant reallocation of existing highway to other uses, partially offsetting acquisition requirements elsewhere	Minor reallocation of existing highway to other uses, partially offsetting acquisition requirements elsewhere	Limited or no land purchase	Some land purchase required. Limited current use	Significant purchase of farmland	Significant land purchase including buildings and gardens required
Impact on Local Road Network during Construction	Not applicable – no possibility of a positive impact on the road network during construction	Not applicable – no possibility of a positive impact on the road network during construction	Not applicable – no possibility of a positive impact on the road network during construction	Work generally away from the existing road network	Some works alongside existing roads. Expected limited disruption to traffic using these	Significant work alongside existing roads expected to result in disruption to existing traffic. Construction of bridge over existing minor road	Closure or significant disruption to major road network expected (including bridge construction over strategic roads)
Futureproofing	No constraints to future extension and use by different vehicle types	Suitable for use by CAM vehicles. Alignments allow connection to CAM	Route retains some flexibility for use by different vehicles in future and has	Route deviates from extension but would not prohibit this	Route may need modifying to allow future use by certain vehicle types or extension,	Route could be used by CAM vehicles but would not provide dedicated	Future use by CAM vehicles or extension to route not possible without significant redesign

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
		and potential extensions	options to be extended		but this would not be prohibited by the option design	infrastructure. Route alignment would make connections to Haverhill less direct	
Theme: Social Impacts							
Safety	Significant demonstrable benefit. As impact on safety has not been quantified at this stage, this score has not been assigned to any options	Large demonstrable benefit. As impact on safety has not been quantified at this stage, this score has not been assigned to any options	Likely benefit over alternative options- expected where route has a dedicated alignment with limited interaction with general traffic	Route does not offer dedicated infrastructure but not expected to offer disbenefit, for example because sharing on sections with lower traffic levels	Route alongside general traffic	Large disbenefit expected as a result of sharing between public transport route and general traffic. As impact on safety has not been quantified at this stage, this score has not been assigned to any options	Significant disbenefit expected as a result of sharing between public transport route and general traffic. As impact on safety has not been quantified at this stage, this score has not been assigned to any options
Access to Cambridge Biomedical Campus	Route provides excellent access to campus with dedicated infrastructure	Route provides excellent access to campus but not with dedicated infrastructure	Route provides good access to campus	Access to campus not applicable to route section	Route diverts from campus	Route diverts significantly from campus	Route would not serve campus
Access to Babraham Park & Ride	Route provides excellent access to campus with dedicated infrastructure	Route provides excellent access to campus but not with dedicated infrastructure	Route provides good access to campus	Access to campus not applicable to route section	Route diverts from campus	Route diverts significantly from campus	Route would not serve campus
Access to Granta Park	Route provides excellent access to campus with dedicated infrastructure	Route provides excellent access to campus but not with dedicated infrastructure	Route provides good access to campus	Access to campus not applicable to route section	Route diverts from campus	Route diverts significantly from campus	Route would not serve campus
Loss of Buildings and Physical Infrastructure	Not applicable – no possibility loss of buildings being viewed as largely positive	Not applicable – no possibility loss of buildings being viewed as largely positive	Alignment avoids loss of buildings other options for section would result in	All options for section avoid loss of buildings	Route may result in some loss of property but not homes of buildings	Likely to result in loss of property including residential properties	Likely to result in loss of property including impact on multiple residential properties

Source: Mott MacDonald

5.2.5 Stage 1B Refined Longlist for Progression to Stage 1C

Based on the sifting process and the INSET scores shown in Section 5.2.3, 25 route alignments were taken through to Stage 1C for packaging into full multiple corridor length routes and tie in with the proposed Travel Hub sites. These are shown by segment in Table 11.

Table 11: Refined Longlist of Route Alignment Options

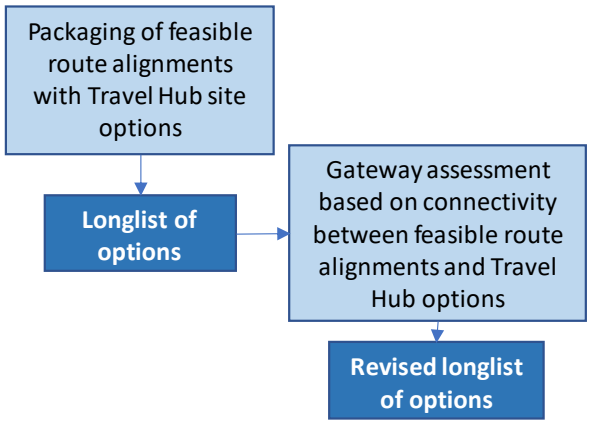
Rank	Route Alignment	Total Score
1	Segment 1 - CBC: Option A - Western alignment with entry via Francis Crick Ave	0.28
4	Segment 1 - CBC: Option F - A1307 alignment with entry via Francis Crick Ave	0.15
30	Segment 1 - CBC: Option B - Western alignment with entry via Robinson Way (East)	-0.39
30	Segment 1 – CBC: Option C – Western alignment via Robinson Way (East)	-0.39
3	Segment 2- CBC to Granham's Road- Option E- A1307 alignment with link road to CBC direct alignment	0.16
5	Segment 2- CBC to Granham's Road- Option D- A1307 alignment with link road to CBC via field boundary	0.12
7	Segment 2 - CBC to Granham's Road: Option A - West of Nine Wells	0.04
6	Segment 3 - Granham's Road to Hinton Way: Option A - East (avoiding urban area)	0.08
22	Segment 3 - Granham's Road to Hinton Way: Option B - Western Route	-0.20
27	Segment 3 - Granham's Road to Hinton Way: Option C - A1307 (separate lanes)	-0.24
14	Segment 4 - Hinton Way to Sawston Road: Option C - East with northern connection to Travel Hub	-0.15
14	Segment 4 - Hinton Way to Sawston Road: Option D - East with southern connection to Travel Hub	-0.15
14	Segment 4 - Hinton Way to Sawston Road: Option E - West with northern connection to Travel Hub	-0.15
14	Segment 4- Hinton Way to Sawston Road: Option F- West with southern BRC Travel Hub connection	-0.15
18	Segment 4- Hinton Way to Sawston Road: Option A – West with no Travel Hub connection	-0.17
18	Segment 4- Hinton Way to Sawston Road: Option B – East with no Travel Hub connection	-0.17
22	Segment 4 - Hinton Way to Sawston Road: Option G - A1307 (separate lanes)	-0.20
10	Segment 5 - Sawston Road to High Street: Option C - North of former railway	-0.03
11	Segment 5- Sawston Road to High Street: Option G - Direct route to A11 and A1307 Travel Hub sites	-0.07
12	Segment 5 - Sawston Road to High Street: Option D - Connection to BRC Travel Hub (Site 3)	-0.12
18	Segment 5 - Sawston Road to High Street: Option E - A1307 (separate lanes)	-0.17
2	Segment 6 - Southern Travel Hub Connection: Option C - Direct from western alignment	0.19
8	Segment 6 - Southern Travel Hub Connection: Option F - Parallel with A11 (with crossing)	0.02
9	Segment 6 - Southern Travel Hub Connection: Option E - Parallel with A11 (without crossing)	0.00
21	Segment 6 - Southern Travel Hub Connection: Option A - via A1307 (north)	-0.18

Source: Mott MacDonald

5.3 Stage 1C

Stage 1C packaged the 25 segmented route alignments into full corridor length route alignments and combined them with each of the proposed Travel Hub sites to create full option packages. A Gateway Assessment was then undertaken to sift out options that did not meet the gateway criteria. The Gateway Assessment and criteria are detailed in Section 5.3.2.1. The Stage 1C process is illustrated in Figure 28.

Figure 28: Stage 1C Process – Package Route Alignment Options and Travel Hub Options; Assess Feasible Combinations



Source: Mott MacDonald

Details of the route alignment segments were provided in Section 5.1, Stage 1A. At this stage, Travel Hub sites were not considered as route alignment was the driver as to which options would be developed. As part of the Stage 1C process, the feasible route alignments were packaged with potential Travel Hub sites. The following section provides an overview of the Travel Hub site options.

5.3.1 Travel Hub Sites

As a first step the previous work undertaken at SOBC stage on Travel Hub site development was revisited and reviewed to establish if any additional sites would be suitable for inclusion in the option packages.

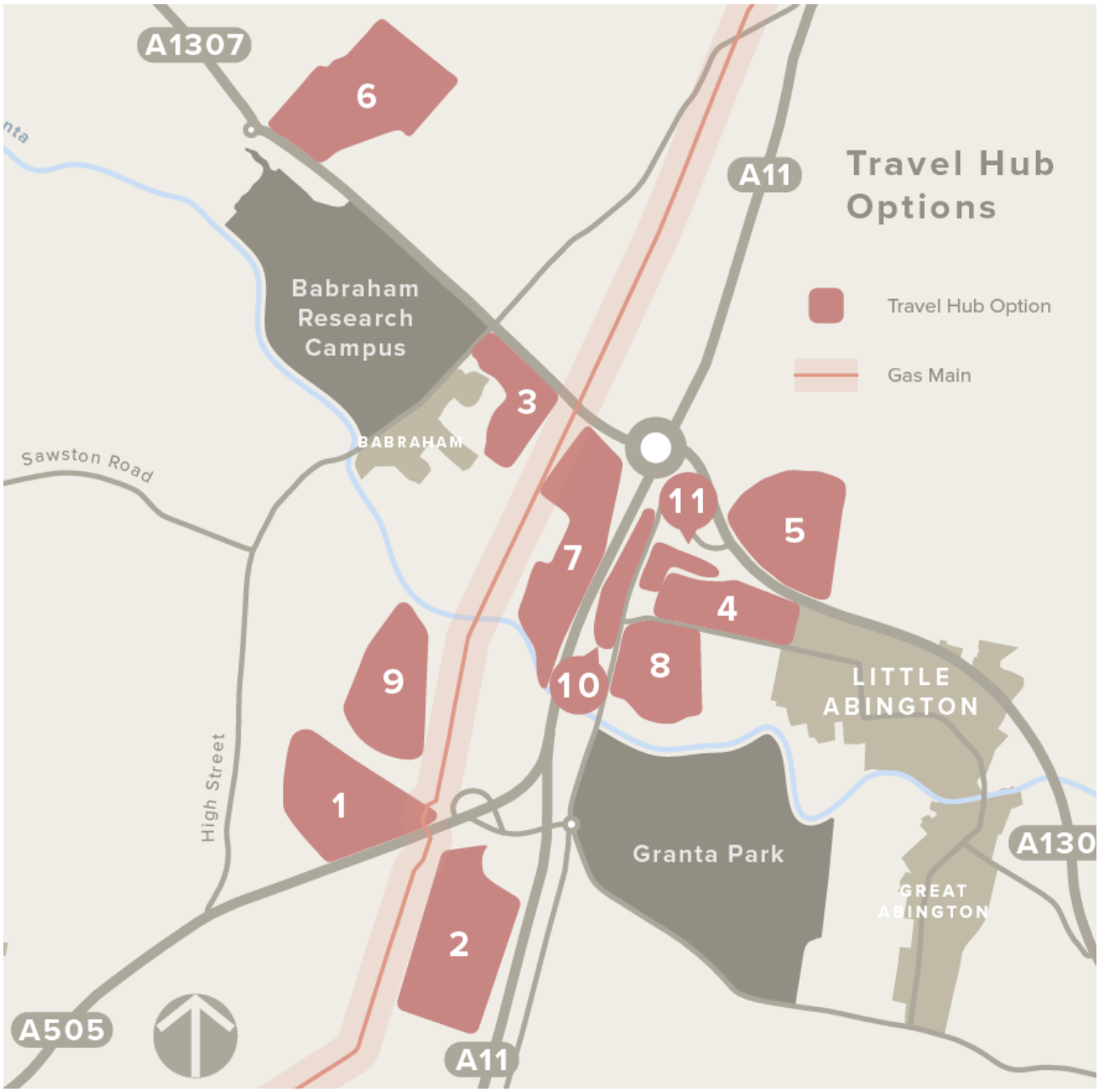
Eleven sites in total have been identified and these are shown in Figure 29. Sites 1-8 were previously proposed for the SOBC, with three additional Sites, 9-11 developed at OBC stage Sites were developed based upon the following key criteria:

- Location – the new strategic Travel Hub facility should be located in close proximity to the intersection of the A11, A1307 and A505
- Capacity – availability of sites of sufficient size to accommodate 2,000 to 3,000 spaces[5]
- Accessibility, proximity and synergy to corridor route alignments

[5] WSP's Technical Note ref 70012014-TN-006 P&R cites the Cambridge Parking Strategy Review (SDG, May 2017) in seeking a minimum parking space provision for new Travel Hub facilities of 2,000 spaces, with further consideration for future expansion to a total of 3,000 spaces

- Compatibility with other emerging strategic transport infrastructure schemes
- Constraints to development.

Figure 29: Proposed Phase 2 Travel Hub Sites



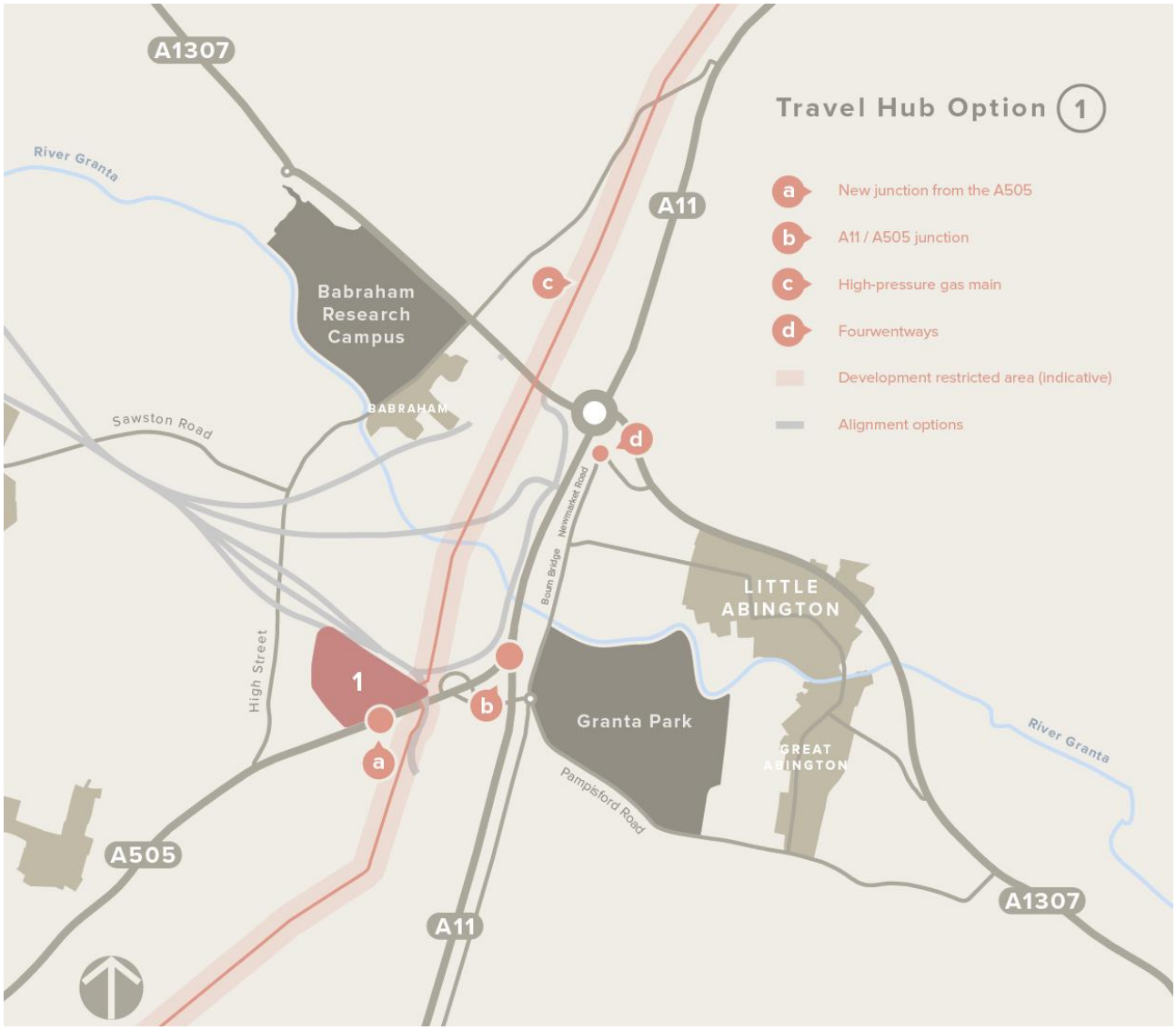
Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Location plans and a brief description of each site are outlined in the remainder of this section.

Travel Hub Site 1

Site 1 is located to the west of the A11/A505 junction, with direct access from the A505. Public access to the site would require a new junction from the A505 or significant improvements to the existing A11/A505 junction which is not currently an all-movements junction.

Figure 30: Location Plan: Travel Hub Site 1



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

The site would facilitate direct access to an offline route, with capacity of up to 3,000 spaces. The site is located on green belt land (current use arable farming) but could be seen as essential transport infrastructure and an exception could be permitted.

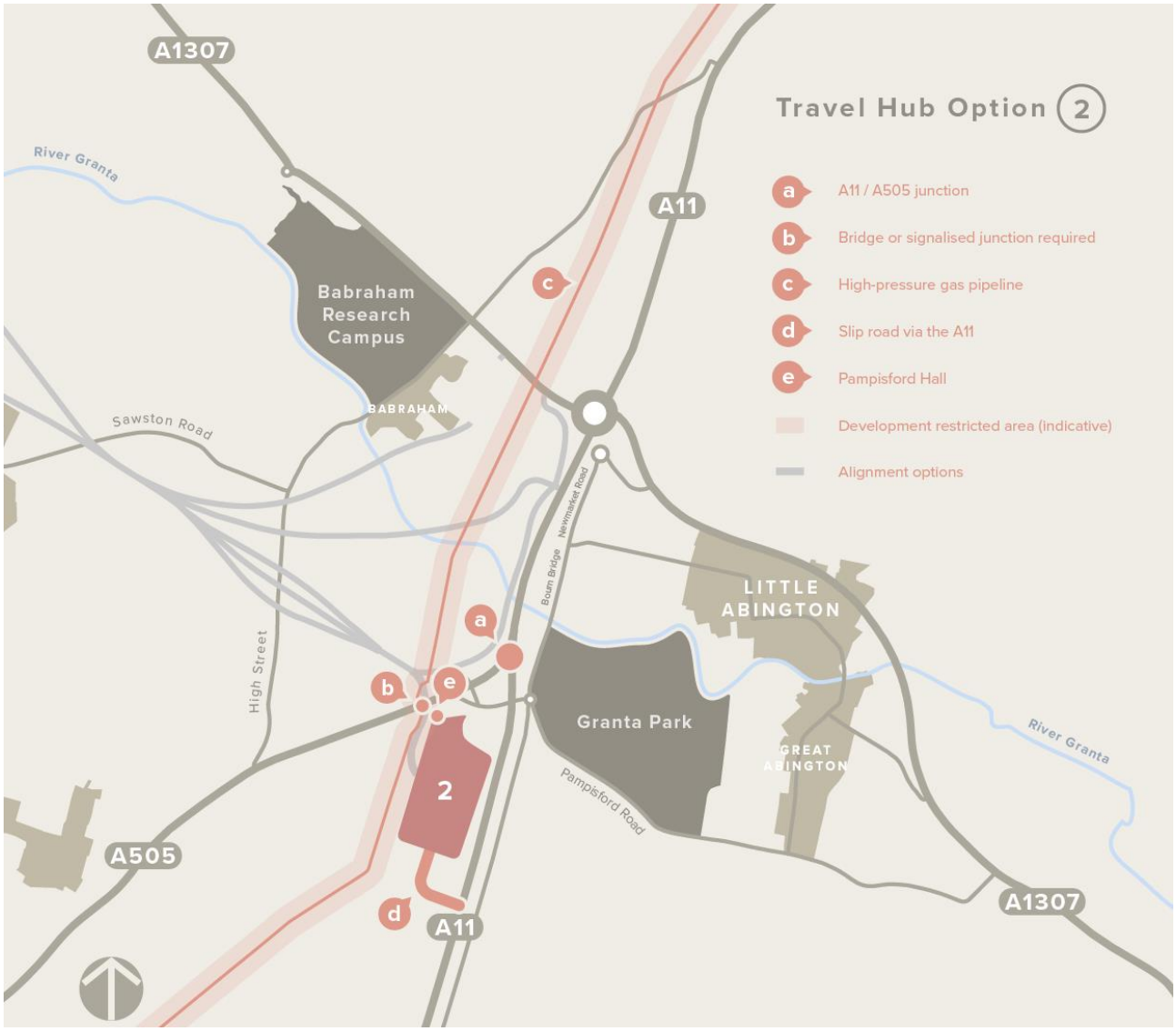
The location of the site would mean a diversion for many users away from their desire line into Cambridge. This could increase traffic using Pampisford Road and result in a change in traffic flow at the A11/A1307 junction (Fourwentways) and junctions between the A1307 and Newmarket Road and Pampisford Road.

Travel Hub Site 2

Site 2 is located to the west of the A11, with direct access from the A505 or A11 an option. A bridge across the A505 or signalised junction would be required to provide access for the public transport route. This location would require significant improvements to the existing A11/A505 junction to provide public vehicle access. For those willing to access the site from the A1307, there would be a significant diversion (approximately 2.4km).

The site is located beyond the dedicated green belt but has the potential to impact the setting of the Grade 2 listed Pampisford Hall. The site is also adjacent to a high-pressure gas pipeline over which development is restricted. However, there is enough space to accommodate 3,000 parking spaces within this boundary.

Figure 31: Location Plan: Travel Hub Site 2



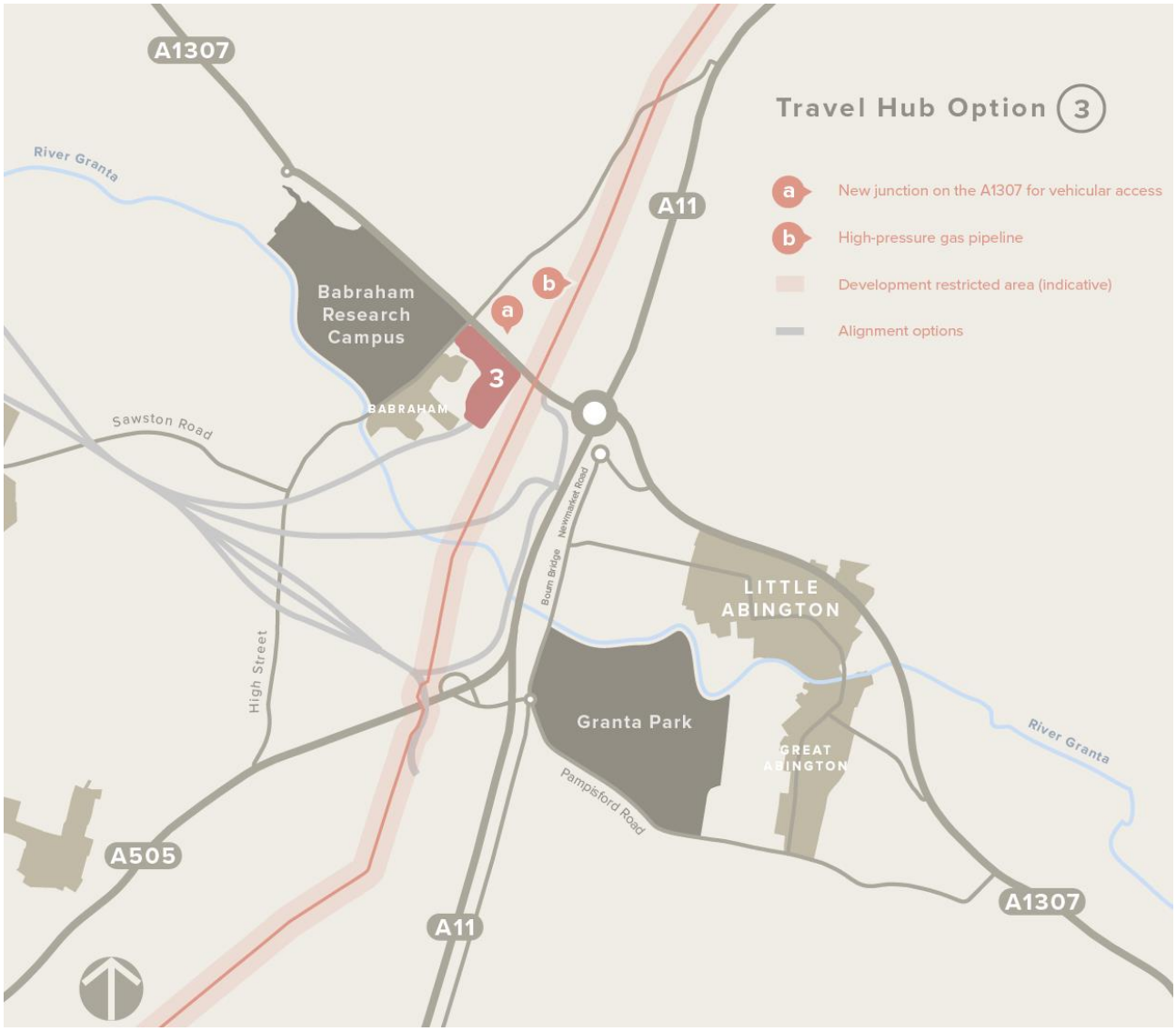
Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Travel Hub Site 3

Site 3 is located to the west of the A11, with direct access to the A1307 and would be well located for public access and to intercept potential users travelling into Cambridge via the A1307.

However, the site would require a dedicated public transport link from the western alignment options and consideration would need to be given to future proofing to allow for potential extensions and use by CAM vehicles.

Figure 32: Location Plan: Travel Hub Site 3



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

The site is dedicated as green belt land and would be located in close proximity to Babraham village. It is noted that GCP made an undertaking in November 2017 not to progress this site, owing to the potential impact on the setting of the village. However, it has been retained within the longlist of options here to allow a full and fair assessment against the other Travel Hub options that have subsequently been identified.

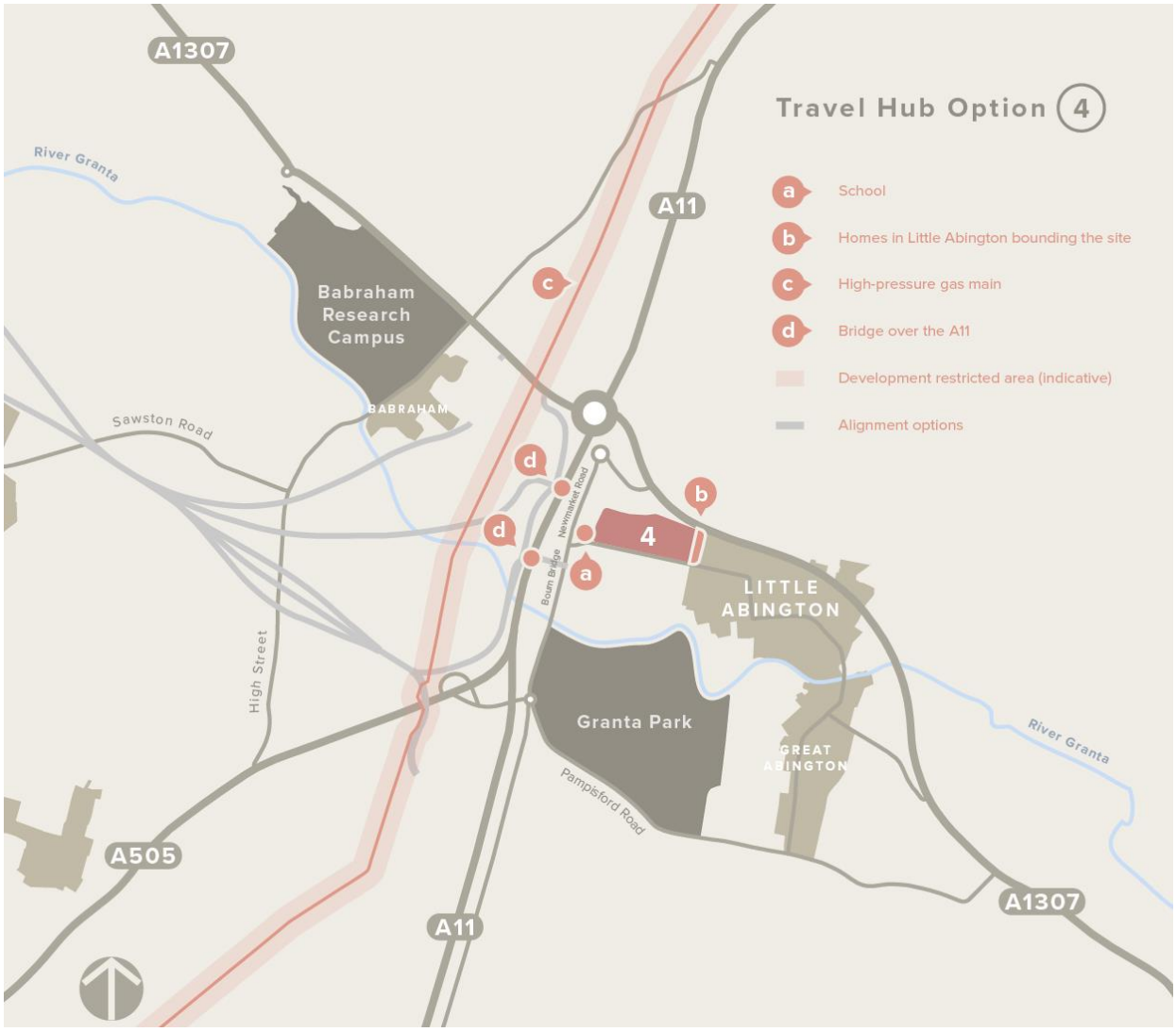
The site is also situated adjacent to the high-pressure gas pipeline and, although the required capacity could be provided, avoiding the gas pipeline would mean that the Travel Hub site would extend around the village, which was the reason for the previous GCP decision.

Travel Hub Site 4

Site 4 is located east of the A11. It is currently an organic farm, with a school neighbouring it to the west and residential dwellings in Little Abington to the east. The site has potential to accommodate up to 2,000 vehicles but there is less opportunity for expansion without impacting on the neighbouring school playing fields.

The site is not within the dedicated greenbelt, however, the current land use cannot be easily relocated or mitigated and developing this land would impact the operation of the farm and local employment. Developing a Travel Hub facility on this site could also have detrimental impacts on the school and Little Abington. To access the site, a bridge would be required over the A11, the position of which would be dependent on the alignment option.

Figure 33: Location Plan: Travel Hub Site 4



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Travel Hub Site 5

Site 5 is located on the A1307 east of the A11. It has a parking capacity of 2,100 and could accommodate an expansion of up to 3,000 vehicles. The site is currently used as arable farmland but is outside of the designated green belt.

As with the other sites located east of the A11, a bridge would be required to connect with the route alignment options west of the A11. A new junction would be required on the A1307 to provide access to the site. The design of this would be dependent on whether public transport vehicles join Newmarket Road or run via a dedicated alignment to Site 5. The latter would require a signalised junction on the A1307 to provide a crossing point for public transport vehicles to enter the site. General traffic could enter the site by replacing the existing priority junction between Newmarket Road and the A1307 with a four-arm roundabout.

The site is relatively well located for vehicles travelling towards Cambridge from Haverhill, Linton and other points east of the A11; however, those travelling on the A11 would need to deviate from their desire line into Cambridge and the site location would not be as visible to them.

Figure 34: Location Plan: Travel Hub Site 5

Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Travel Hub Site 6

Site 6 is located on the A1307, opposite the Babraham Research Campus roundabout with amendments to the existing junction providing access into the site. This site would be well located for potential users travelling into Cambridge and, as the site is located west of the A11/A1307 junction (Fourwentways), the current trip distribution would be maintained.

The site is on green belt land and has parking capacity of 2,000 with the opportunity to expand to 2,500.

Figure 35: Location Plan: Travel Hub Site 6

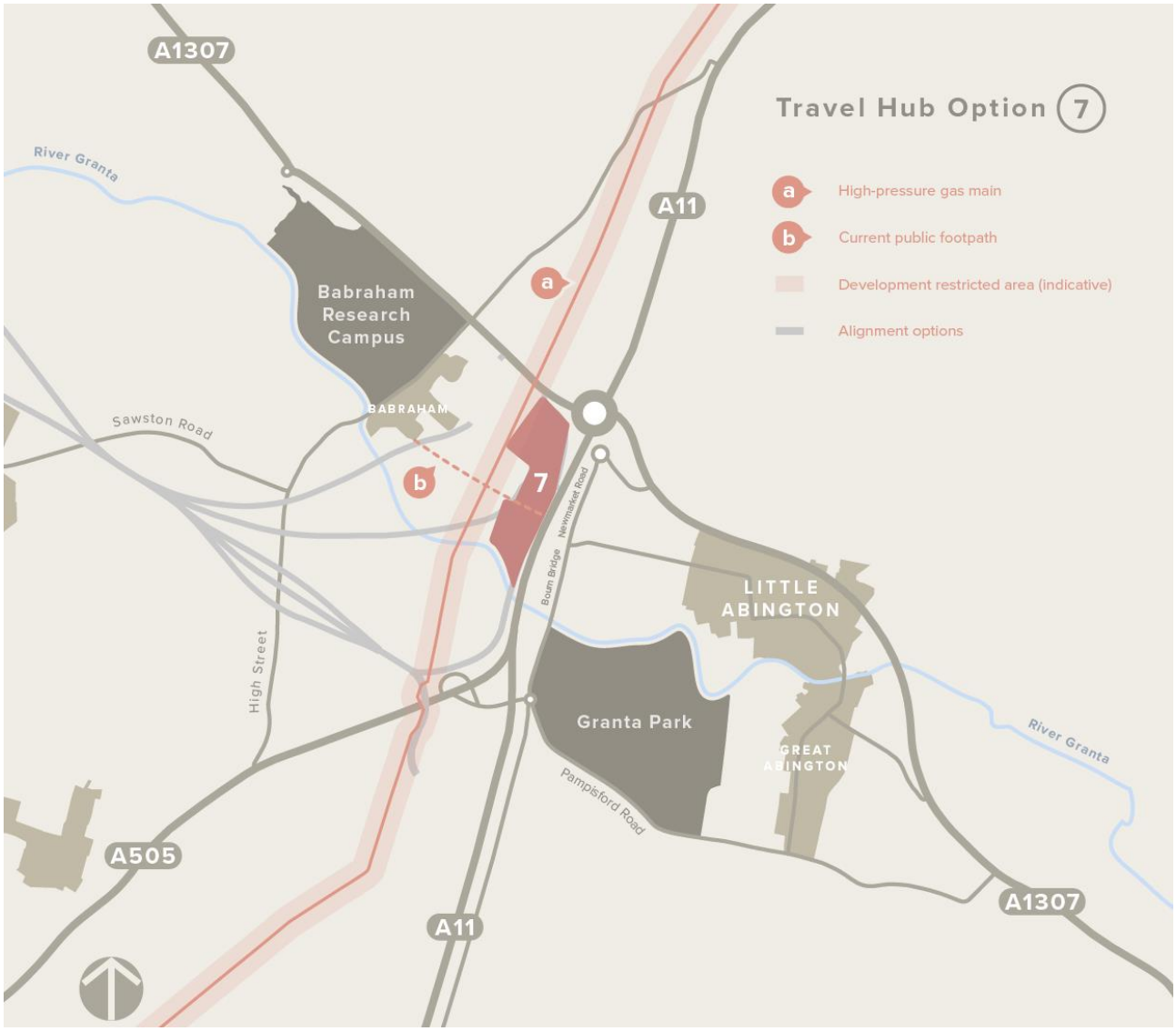
Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Travel Hub Site 7

Site 7 is located west of the A11 and in a location which would be passed by all traffic travelling west into Cambridge on the A1307, avoiding the need for many users to deviate from their existing route and being visible to drivers which would encourage future use. Access to this site would be from the A1307 via a new junction.

The site has a potential parking capacity of between 2,000 and 2,800 spaces but is subject to several constraints. It is located within the green belt, part of the site is situated in flood zones 2 and 3[6] and it is located adjacent to a high-pressure gas pipeline with the access from the A1307 crossing the pipeline. In addition, the site straddles an existing public footpath. All these would need careful consideration in planning the layout of the site and necessary mitigation measures.

Figure 36: Location Plan: Travel Hub Site 7



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

[6] Zone 2 is defined by the Environment Agency as land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%) and Zone 3 as land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%)

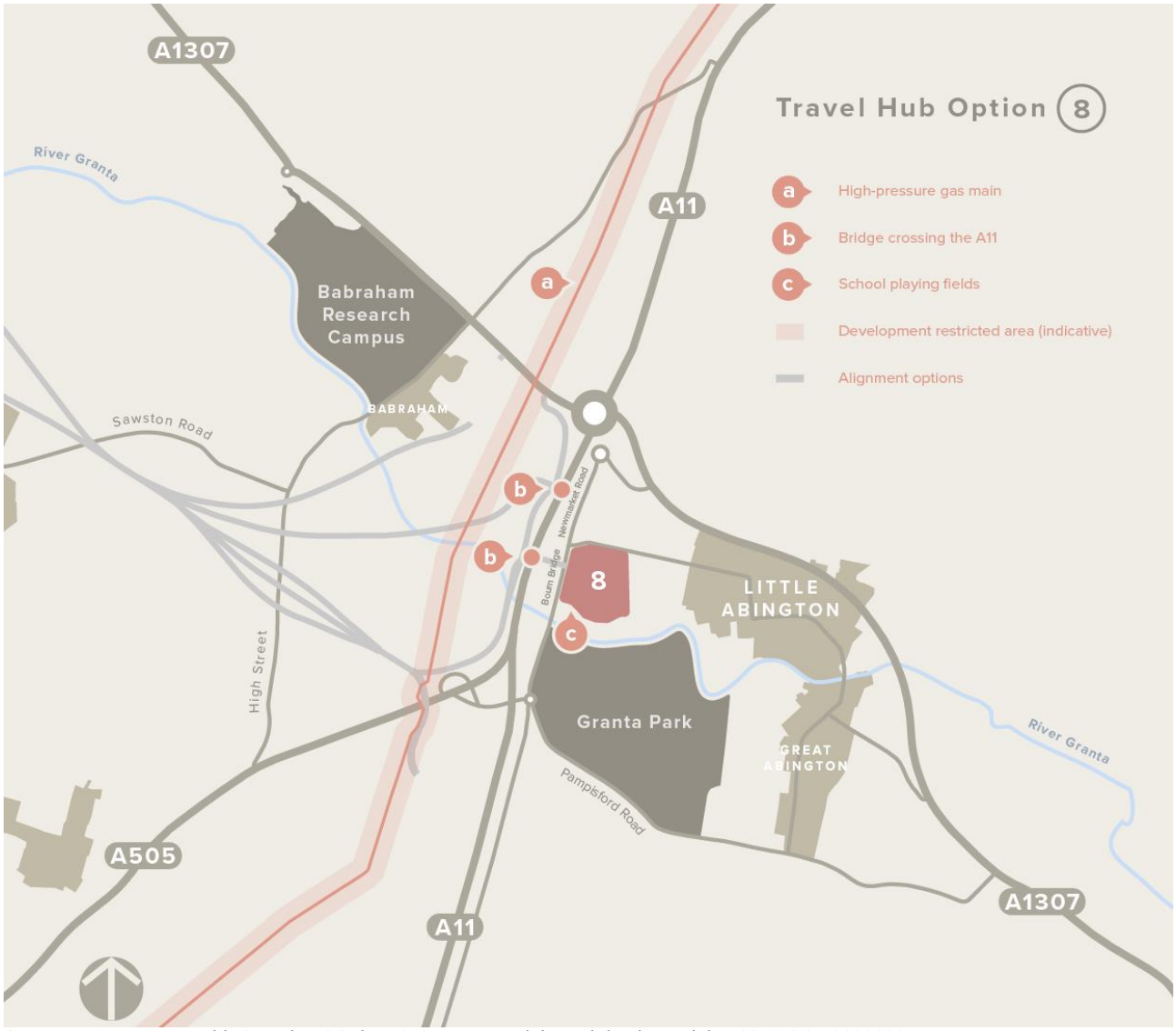
Travel Hub Site 8

Site 8 is located on Newmarket Road (east of the A11) and has a provisional parking capacity of 2,000 spaces, with potential to expand to 2,200. Access to the site would be indirect for vehicles which would need to travel from the A1307 via Newmarket Road and the site would have limited visibility.

For public transport access to the site, a bridge over the A11 would be required, the position of which would be dependent on the associated alignment option.

The site is adjacent to a listed building whilst the current land use is school playing fields. This has low ecological value but would need to be replaced and there are potentially greater air quality and noise impacts from a site in this location.

Figure 37: Location Plan: Travel Hub Site 8



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Travel Hub Site 9

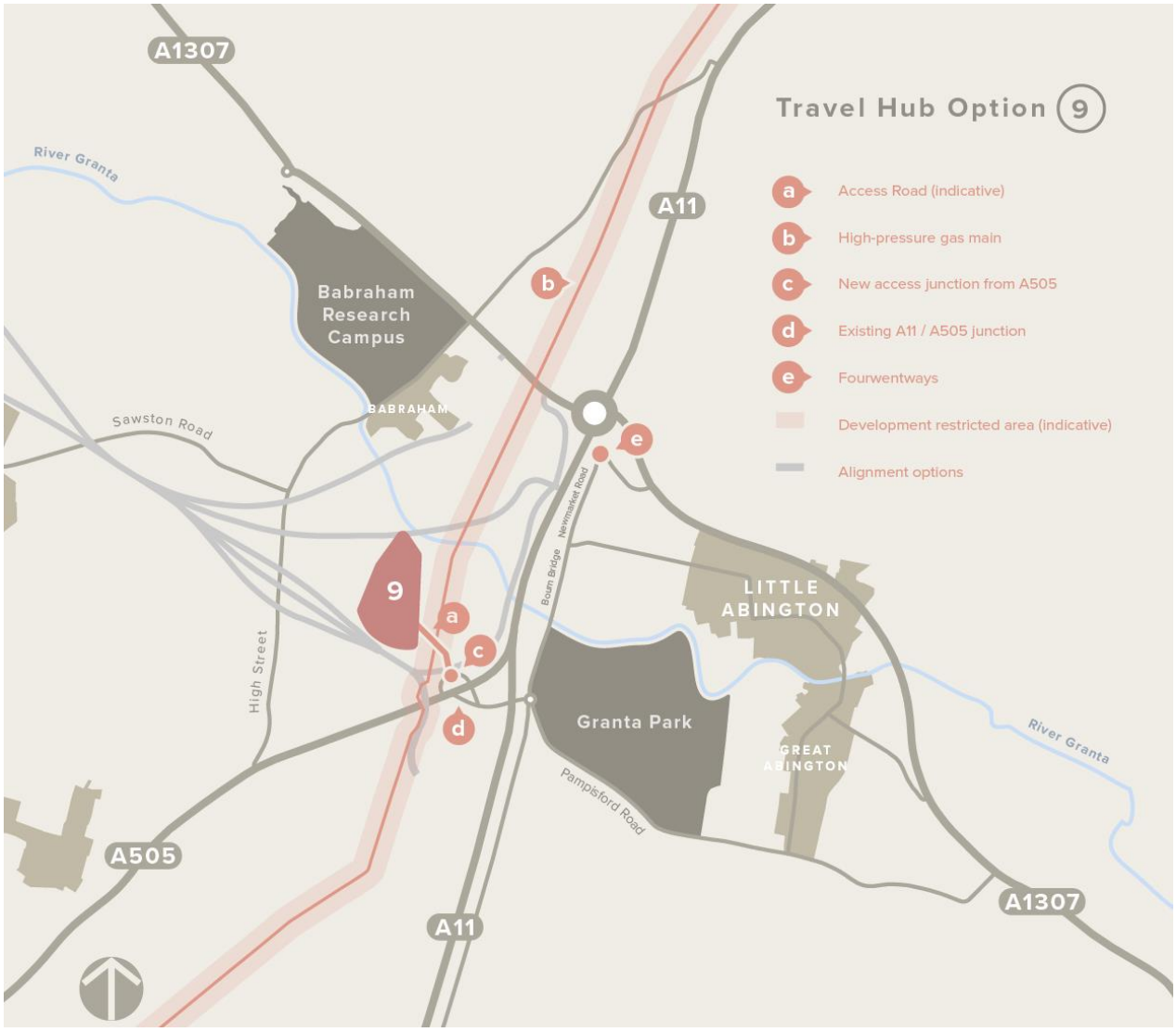
Site 9 is located opposite Site 1, to the west of the A11/A505 junction. The site is set back from the A505 so additional infrastructure would need to be implemented for access. The site has potential to provide between 2,000 and 3,000 spaces.

Public access to this site will require a new junction from the A505 or A11, the improvement of the existing A505/A11 junction or involve the construction of a new access road from the A1307.

The site is located on green belt land, which is currently being used for arable farming. In planning terms this type of transport infrastructure would be considered essential development, and therefore a case could be made for 'not inappropriate development'. The site is located close to the high-pressure gas pipeline and the impact on this would be dependent on the access location.

The location requires a significant diversion for those using the A1307 from the A11 (Fourwentways) junction and the site would be less visible to the majority of potential users.

Figure 38: Location Plan: Travel Hub Site 9



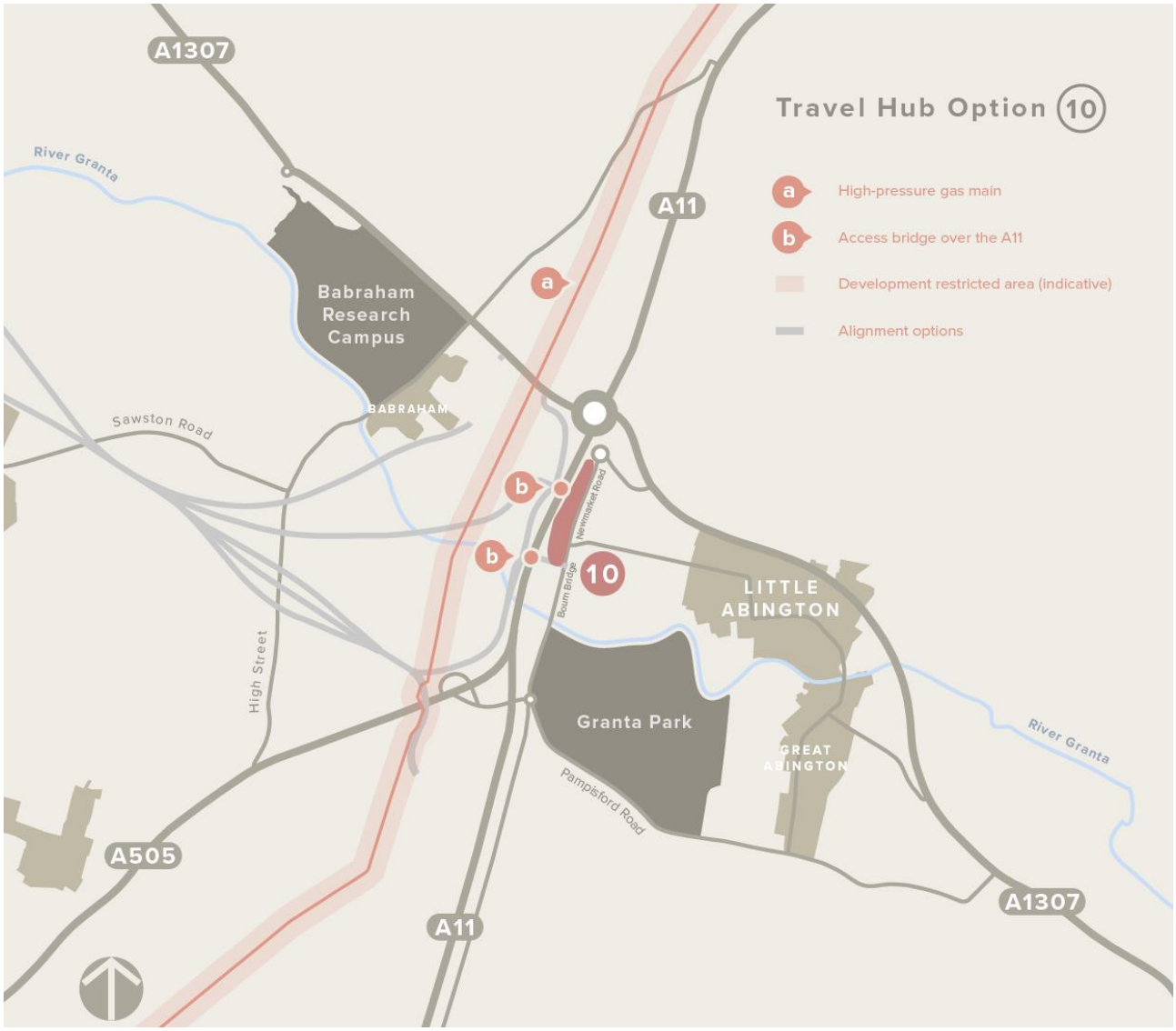
Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Travel Hub Site 10

Site 10 is located between the A11 and Newmarket Road. It is assumed access will be provided from Newmarket Road, rather than the A11, meaning access from the A1307, A505 and A11 would be indirect. As this site is located east of the A11, a bridge would be required for public transport access from the offline route alignment options.

The site would be insufficient in size to meet capacity requirements, with indicative layouts suggesting approximately 800-900 vehicles could be accommodated.

Figure 39: Location Plan: Travel Hub Site 10



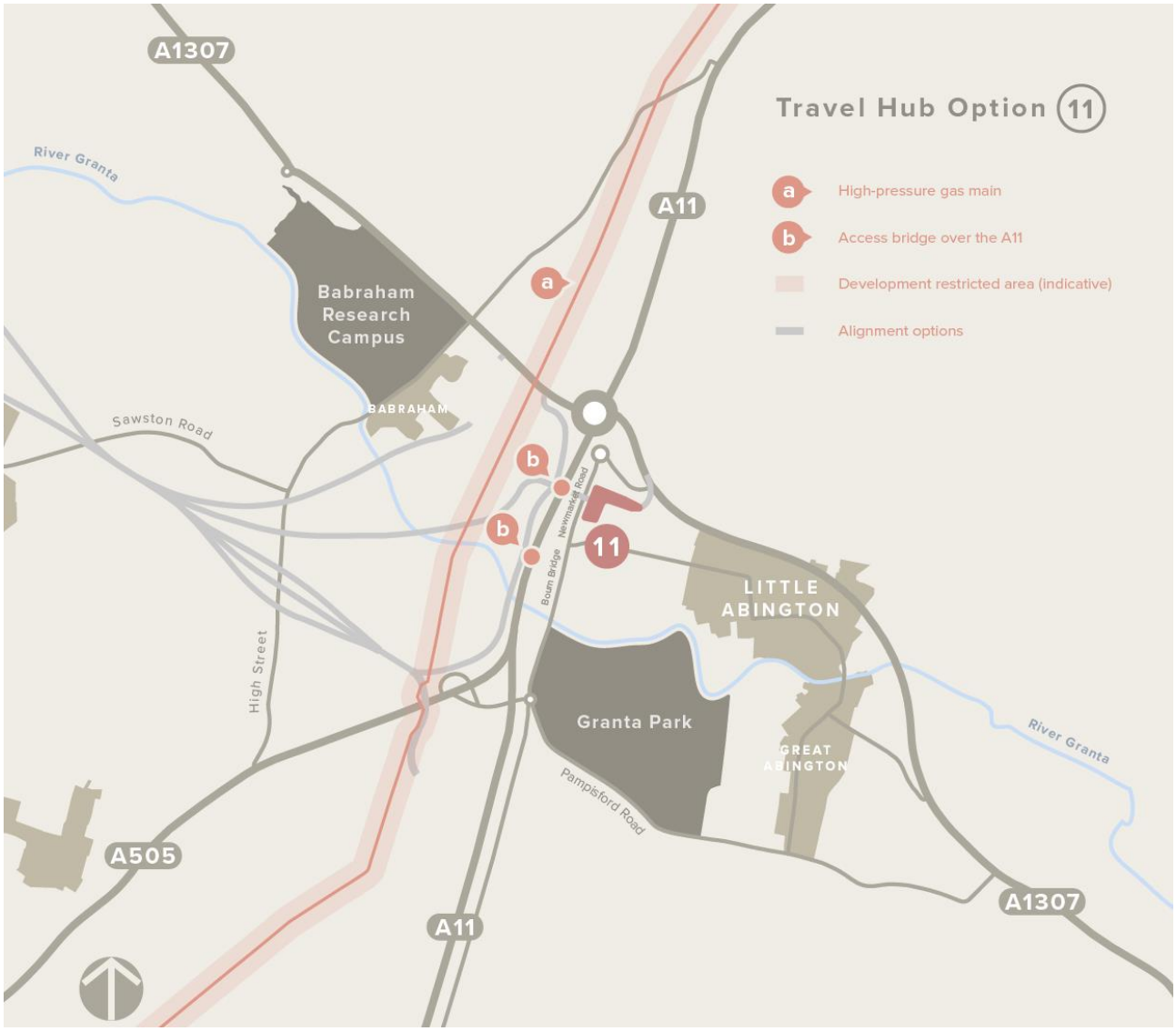
Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Travel Hub Site 11

Site 11 is a smaller site, located on Newmarket Road and was formerly use as a café and car park. It has a provisional parking capacity of approximately 500-600 vehicles.

The site could either be accessed from Newmarket Road or via a new or modified junction on the A1307.

Figure 40: Location Plan: Travel Hub Site 11



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

5.3.2 Option Packaging: Route Alignments and Travel Hub Sites

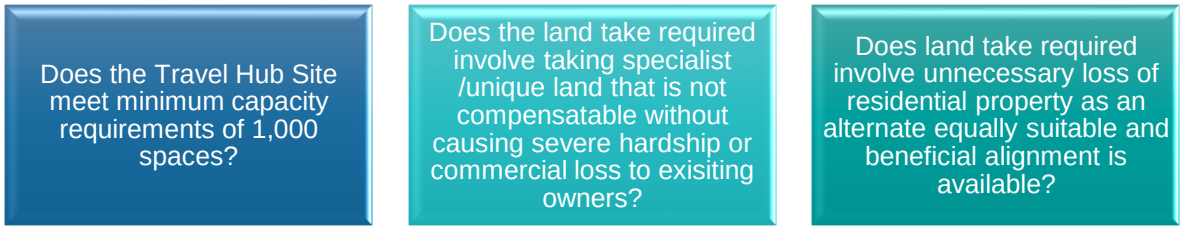
After the sift of the route alignment options on a segment by segment basis, there were no route alignment options within Segment 6 that would connect to Travel Hub Site 2. It was therefore not possible to package this Travel Hub site with a route alignment as an overall option and so Site 2 was discarded on the basis it could not form part of any possible option package.

The remaining ten Travel Hub sites could however be packaged with multiple variations of route alignments. This led to the production of 231 option packages. Appendix A contains a table which details the feasible combinations of the route alignments within each of the six segments and Travel Hub sites.

5.3.2.1 Gateway Assessment of the Option Packages

The 231 option packages in Appendix A were then subject to three Gateway Assessment criteria which were effectively Yes/No responses. These are shown in Figure 41.

Figure 41: Gateway Assessment Criteria for Option Packages



Source: Mott MacDonald

Through this Gateway Assessment, 141 of the 231 options were sifted out of the initial longlist. These are highlighted in grey in the table in Appendix A. This left 90 options in the revised longlist to be progressed to Stage 2. A rationale for the removal of the 141 options based on the three Gateway Assessment criteria is provided in Table 12.

5.3.2.2 Rationale for Exclusion of Option Packages (Options)

As a result of the Gateway Assessment, Option Packages, herein referred to as Options, were removed because of:

- A: Insufficient capacity; less than 1000 spaces could be provided;
- B: The option would require land take of specialist/unique land that could not be adequately compensated; or
- C: Unnecessary loss of residential property.

A: Proposed Travel Hub Sites 10 and 11 both had insufficient capacity and so any option that included these sites was removed.

B: Travel Hub Site 4 would involve building on the site of an organic farm, where the land has been cultivated over a long period to enable organic growth of vegetation and produce; it is also close to a school and the village of Little Abington. Due to the nature of the land at the organic farm and the time taken to cultivate the land into the required condition to enable the growth of organic produce, the farm cannot be easily relocated, and loss of the farm and the associated loss of employment cannot be justified or easily compensated.

C: Route Alignment Segment 3, Option B would result in the loss of residential property. It was not sifted out at Stage 1B as it was decided the top three route alignment options in each segment would be taken forward for further consideration in the context of construction of a complete corridor length route. This exercise highlighted that there would be limited overall benefit to taking the Segment 3B route and that alternative corridor packages perform similarly. As alternatives providing the required connectivity are available, the pursuit of an option that would result in the loss of residential property is unnecessary and would potentially create

adverse public reaction to the scheme as a whole. On this basis, any option that featured route alignment Segment 3B was excluded.

Table 12 below details the options removed from further consideration at Stage 2 in accordance with the Gateway Assessment criteria, noting that some options were removed because they failed multiple criteria.

Table 12: Breakdown of the 141 Excluded Options by Gateway Assessment Criteria

A: Capacity Issues (Travel Hub Sites 10 and 11)	B: Specialist / Unique Land Use (Travel Hub Site 4)	C: Unnecessary loss of Residential Property (Route Alignment Segment 3, Option B)	Both A and C	Both B and C
Options: 6, 7 ,13, 14, 21, 22, 28, 29, 57, 58, 64, 65, 72, 73, 79, 80, 108, 109, 115, 116, 123, 124, 130, 131,164, 165, 170, 171,176, 177, 200, 201, 206, 207, 212 & 213,	**Options**: 3, 9, 18, 24, 54, 60, 69, 75, 105, 111, 120, 126, 162, 168, 174, 198, 204 & 210	**Options**: 35, 36, 38, 39, 42, 44, 45, 46, 49, 50, 51, 86, 87, 89, 90, 93, 95, 96, 97, 100, 101 102, 137, 138, 140, 141, 144, 146, 147, 148, 151, 152, 153, 178,179,181, 184, 185, 187, 190, 191, 193, 214, 215, 217, 220, 221, 223, 226, 227 & 229	**Options**: 40, 41, 47, 48, 91, 92, 98, 99, 142, 143, 149, 150, 182, 183, 188, 189, 194, 195, 218, 219, 224, 225, 230 & 231	**Options**: 37, 43, 88, 94, 139, 145, 180, 186, 192, 216, 222 & 228
TOTAL: 36 Options	**TOTAL: 18 Options**	**TOTAL: 51 Options**	**TOTAL: 24 Options**	**TOTAL: 12 Options**

Source: Mott MacDonald

On this basis, a revised longlist of 90 options was taken forward to Stage 2 of the assessment process. This revised longlist is noted in Table 13 which breakdowns the 90 options by travel hub site, noting that only sites 1,3,5,6,7,8 and 9 are viable based on the Gateway Assessment. Details of which alignment within each segment that makes up these options can be found in Annex A in the table rows that are not shaded in grey.

Table 13: Revised Longlist of 90 Option Packages Broken Down by Travel Hub Site

Travel Hub 1	Travel Hub 3	Travel Hub 5	Travel Hub 6	Travel Hub 7	Travel Hub 8	Travel Hub 9
Options: 1, 16, 52, 67, 103, 118	**Options**: 15, 30, 66, 81, 117, 132, 156, 158	**Options**: 4, 10, 19, 25, 55, 61, 70, 76, 106, 112, 121, 127, 160, 161, 166, 167, 172, 173, 196, 197, 202, 203, 208, 209	**Options**: 31, 32, 33, 34, 82, 83, 84, 85, 133, 134, 135, 136, 154, 155	**Options**: 11, 23, 26, 59, 62, 74, 77, 110, 113, 125, 128, 157, 159	**Options**: 5, 7, 12, 20, 27, 56, 63, 71, 78, 107, 114, 122, 129, 163, 169, 175, 199, 205, 211	**Options**: 2, 17, 53, 68, 104, 119
TOTAL: 6 Options	**TOTAL: 8 Options**	**TOTAL: 24 Options**	**TOTAL: 14 Options**	**TOTAL: 13 Options**	**TOTAL: 19 Options**	**TOTAL: 6 Options**

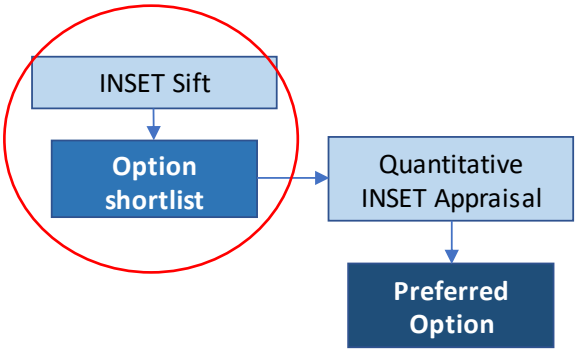
Source: Mott MacDonald

6 Options Assessment: Stage 2 Further Appraisal

6.1 Stage 2 Longlist Sift of Option Packages

Stage 2 utilised INSET to first sift the longlist of option packages that passed the Gateway Assessment in Stage 1C to arrive at a shortlist of seven options. This shortlist was then modelled and quantitively assessed against revised and more detailed criteria. This process is illustrated in Figure 42 and explained in more detail in Section 6 and Section 7. Section 6 focuses on the INSET sift of the longlist to arrive at a shortlist, whilst Section 7 focuses on the quantitative process undertaken to appraise the shortlist and arrive at a preferred option.

Figure 42: Stage 2 Process - Define Option Shortlist through INSET Sift and then Quantitively Appraise Shortlist to Identify Preferred Option



Source: Mott MacDonald

6.2 Option Packages

The Gateway Assessment established that there were 90 feasible options that could be taken forward for an INSET sift to establish a shortlist. A review of the themed assessment criteria was undertaken to include additional themes and criteria to enable a more robust assessment than at Stage 1 – the initial sift.

The following sections detail the application of INSET at Stage 2 including any revisions to themes and criteria, scoring rationale and weighting. This is followed by the results of the sift and sensitivity testing.

6.2.1 Stage 1B INSET Themes and Criteria

Table 14 details the revised themes, criteria and, where applicable, sub-criteria that were agreed with GCP for use to appraise the revised longlist of options. Items noted in green text are new or updated themes or criteria. All sub-criteria are new to this stage with the previous assessment (Stage 1B) undertaken at a theme and criteria level only.

All themes, criteria and sub-criteria were weighted equally for the Stage 2 assessment.

Table 14: Main Criteria and Sub-Criteria by Theme

Theme: Transport User Benefits							
Main Criteria	**Reliability of journey**	**Journey time (scheme users)**	**Route flexibility - Links into CAM and public transport routes[7]**	**Impact on existing traffic**	**Degree of route segregation**	**Walking and cycling connectivity**	**Suitability of Travel Hub facility**
Sub-Criteria	• Dedicated public transport routes for use by scheme vehicles only • Degree of priority at junctions	• Frequency of stops • Extent of dedicated and segregated infrastructure	• Can be used by CAM vehicles • Compatible with CAM alignments • Opportunities for benefits for users of existing public transport routes	• Loss of vehicular capacity along general alignment • Loss of capacity/priority at junctions • Impact of delay caused by additional junctions	• Junctions • General alignment	• Directness of new Non-Motorised User (NMU) route • Catchment of new NMU route • Severance of existing routes	• Capacity • Parking Durations/ restrictions • Access from A1307/A11 • Site amenities • Frequency of buses servicing the Travel Hub site • Travel Hub visibility from the Local Road Network /Strategic Road Network
Theme: Environment							
Main Criteria	**Visual Impact**	**Noise**	**Air Quality**	**Biodiversity**	**Heritage**	**Greenbelt**	**Water/Flood Risk**

[7] CAM vehicles are assumed to be articulated vehicles circa 18.7m in length.

Theme: Transport User Benefits							
Sub-Criteria	• N/A	• N/A	• N/A	• N/A	• N/A	• N/A	• N/A
Theme: Deliverability							
Main Criteria	**Degree of objection expected**	Option **cost**	**Engineering feasibility - construction method**	**Land acquisition required**	**Impact on other transport networks during construction**	**Futureproofing**	**Risks to delivery**
Sub-Criteria	• Loss of environmentally sensitive areas • Impact on existing residential dwellings • Impact on existing traffic	• Capital costs • Operating costs • Potential subsidy	• Accessibility to site during construction • Complexity of junctions • Structural complexity	• Quantity of land required • Division of field boundaries	• Impact on road network • Impact on rail network • Disruption to Non-Motorised Users	• Range of vehicle usability • Link to Haverhill	• Consents • Complexity
Theme: Social Impacts							
Main Criteria	**Safety**	**Links to Cambridge Biomedical Campus**	**Links to Babraham Research Campus**	**Links to Granta Park**	**Loss of homes or property**	**Improvements to physical wellbeing**	
Sub-Criteria	• Changes to vehicular accident rates • Changes to Non-Motorised User accident rates • Changes to personal safety	• Degree to which campus is served • Directness of route • Compatibility with masterplan proposals • Landowner support	• Degree to which campus is served • Directness of route • Compatibility with masterplan proposals • Landowner support	• Degree to which site is served • Directness of route • Compatibility with masterplan proposals • Landowner support	• Commercial Property • Residential Property	• Increase in cycling uptake • Increase in walking uptake	
Theme: Wider Economic Impacts							
Main Criteria	**Supporting development and employment sites**	**Number of new homes supported**	**Number of new jobs created**	**GVA Uplift**	**Land Value Uplift**	**Increase in job catchment areas**	

Theme: Transport User Benefits						
Sub-Criteria	• N/A	• N/A	• N/A	• N/A	• N/A	• N/A
Theme: Alignment with Objectives						
Main Criteria	**Support growth of local economy**	**Relieve congestion and improve air quality**	**Improve active travel infrastructure and public transport provision**	**Improve road safety**	**Improve connectivity to employment sites**	
Sub-Criteria	• Deliver journey time savings to jobs • Improve journey time reliability for PT users • Infrastructure necessary to sustain economic growth	• Encourage use of sustainable transport modes • Enhance quality of life • Relieve pressure at network pinch points	• Deliver HQPT • Increase frequency of PT during peaks • Reduce severance for pedestrians, cyclists and equestrians • Increase uptake of sustainable modes for commuter journeys	• Reduce number of accidents • Reduce number of speed related incidents • Improve safety of crossing movement for pedestrians, cyclists and equestrians	• Improved access to CBC and Granta Park • Increase modal options for commuters travelling to these sites	
Theme: Policy Alignment						
Main Criteria	Alignment with Mayoral Interim Transport Strategy	Alignment with Cambridgeshire LTP3	Alignment with Transport Strategy for Cambridge City and South Cambridgeshire	Alignment with Cambridgeshire Long Term Transport Strategy	Level to which the option would permit CAP	
Sub-Criteria	• N/A	• N/A	• N/A	• N/A	• N/A	

Source: Mott MacDonald

6.2.2 Scoring Rationale

Having established revised themes and criteria for the Stage 2 assessment process, a rationale was developed that formed the basis for assigning scores to the 90 option packages against each of the revised criteria. This was done to ensure consistency in scoring and rationales are specifically tailored to each criterion.

Scores were assigned to criteria or, where applicable, sub-criteria on a scale of -3 to +3. The basis for assigning scores under each criterion are set out in Appendix B.

6.3 Stage 2 INSET Longlist Sift Results

Based on the criteria shown in Table 14 and scoring rationales detailed in Appendix B, each of the 90 options in the revised longlist was assessed on a scale of -3 to +3 by a team of experts from Mott MacDonald, in collaboration with the GCP. The summarised results of this process are presented in Appendix C, however the best performing options – those with a total average score of over 0.5 are shown in Table 15, and they number 24 in total. Results are presented in ranked order showing the overall best performing option at the top of the list. A colour scale has been adopted for ease of reference to see at a broad glance how options performed against each theme; that scale is as follows:

2 to 3
1 to1.99
0 to 0.99
- 0.01 to -1
-1.01 to -2
-2.01 to -3

For each option a score was given for each of the individual assessment themes as well as an overall score, taking into account the average score of all themes. INSET uses averages to calculate scores to ensure there is no unintentional bias in favour of themes that have differing numbers of criteria.

Weighting can be assigned to favour themes or criteria that are perceived to be more important relative to scheme objectives, however, in this instance it was agreed that all themes and criteria would be weighted equally.

Table 15: Stage 2 INSET Scores of Revised Options Longlist

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
1	26-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR7	1.88	-1.00	-1.12	0.61	2.00	1.68	2.80	**0.98**
2	11-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR7	1.88	-1.29	-1.12	0.61	2.00	1.68	2.80	**0.94**
3	23-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 without crossing-PR7	1.76	-1.00	-0.95	0.32	2.00	1.40	2.80	**0.90**
4	8-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 without crossing-PR7	1.76	-1.29	-0.95	0.32	2.00	1.40	2.80	**0.86**
5	17-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-	1.48	-1.29	-0.74	0.28	2.00	1.37	2.80	**0.84**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	North of railway-Direct from western alignment-PR9								
6	197-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	1.81	-1.43	-1.33	0.58	2.00	1.37	2.80	**0.83**
7	161-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	1.81	-1.57	-1.33	0.58	2.00	1.37	2.80	**0.81**
8	2-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Direct from western alignment-PR9	1.48	-1.57	-0.74	0.28	2.00	1.37	2.80	**0.80**
9	30-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Connection to BRC Travel Hub-PR3	1.67	-1.43	-1.14	0.40	2.00	1.23	2.80	**0.79**
10	16-Western alignment via Francis Crick Ave-	1.52	-1.86	-0.74	0.28	2.00	1.37	2.80	**0.77**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Direct from western alignment-PR1								
10	20-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR8	1.52	-1.86	-1.00	0.57	2.00	1.33	2.80	**0.77**
10	25-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR5	1.33	-1.29	-1.21	0.61	2.00	1.15	2.80	**0.77**
13	1-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Direct from western alignment-PR1	1.52	-2.00	-0.74	0.28	2.00	1.37	2.80	**0.75**
13	10-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR5	1.38	-1.57	-1.21	0.61	2.00	1.22	2.80	**0.75**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
13	15-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Connection to BRC Travel Hub-PR3	1.67	-1.71	-1.14	0.40	2.00	1.23	2.80	**0.75**
16	5-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR8	1.52	-2.14	-1.10	0.57	2.00	1.60	2.60	**0.72**
17	4-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR5	0.62	-1.57	-1.00	0.40	2.00	1.20	2.80	**0.64**
17	19-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR5	0.57	-1.43	-1.10	0.40	2.00	1.20	2.80	**0.64**
19	196-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-	0.29	-1.43	-1.33	0.64	2.00	1.37	2.80	**0.62**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	Crosses A11 and joins Newmarket Road-PR5								
20	160-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR5	0.29	-1.57	-1.33	0.64	2.00	1.37	2.80	**0.60**
21	12-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR8	1.31	-2.14	-1.21	0.61	2.00	0.88	2.60	**0.58**
21	27-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR8	1.31	-2.14	-1.21	0.61	2.00	0.88	2.60	**0.58**
23	199-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR8	0.14	-1.86	-1.29	0.81	2.00	1.20	2.80	**0.54**
24	163-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-	0.14	-2.14	-1.29	0.81	2.00	1.33	2.80	**0.52**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR8								

Source: Mott MacDonald

Prior to the assessment of the longlist it was initially decided that only the top three options would be progressed to the shortlist for detailed quantitative analysis and modelling. However, the results of the appraisal revealed that the top three options all had very similar route alignments and the same Travel Hub site. On this basis it was felt that modelling and quantitative assessment of three barely differentiated options may not provide robust results and it was decided, in consultation with GCP, that the shortlist should include a minimum of three alternative Travel Hub site options. This was achieved by extending the shortlist to cover the top seven options in the ranking.

6.3.1 Sensitivity Testing

The INSET results shown above were based on all themes and criteria being given an equal weighting of 1; this is considered the original and default scenario. In order to test the robustness of the seven top ranked options, three sensitivity tests were applied, whereby the weighting of the themes was altered to reflect potential differences in the level of importance of each theme - scenarios which could be reflective of changes in policy, public opinion or scheme objectives. The weighting changes applied in each of the sensitivity test scenarios are as follows:

- Scenario 1: The weighting of the Environment theme was raised to 4 whilst the weightings of all other themes were held constant at 1.
- Scenario 2: The weighting of both the Transport Benefits and Social Impacts themes were raised to 2 and the weightings of all other themes were held constant at 1.
- Scenario 3: The Policy Alignment and Alignment with Objectives themes were weighted as zero, effectively removing them from consideration, whilst all other themes were held constant at 1.

Figure 43 and Figure 44 show the results of the sensitivity tests; the results are split into two tables solely for the purposes of legibility. The tables compare the scores of each of the top seven ranked options under the original scenario with the scores of each of the other 3 scenarios on a theme by theme basis. It also shows comparison of the overall scores and any change in rank as a result of the tests.

Figure 43: INSET Score Comparisons of the Original Top Ranked Options under Equal Weighting with Alternative Scenarios (part 1)

Option Number	Option Description / Scenario Score by Theme	Transport Benefits				Environment				Deliverability				Social Impacts /Quality of Life			
		Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3
26	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-Direct to A11/A1307-PR7	1.88	1.88	3.76	1.88	-1.00	-4.00	-1.00	-1.00	-1.12	-1.12	-1.12	-1.12	0.61	0.61	1.22	0.61
11	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no P&R connection-Direct to A11/A1307-PR7	1.88	1.88	3.76	1.88	-1.29	-5.14	-1.29	-1.29	-1.12	-1.12	-1.12	-1.12	0.61	0.61	1.22	0.61
23	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-North of railway-Parallel with A11 without crossing-PR7	1.76	1.76	3.52	1.76	-1.00	-4.00	-1.00	-1.00	-0.95	-0.95	-0.95	-0.95	0.32	0.32	0.64	0.32
8	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no P&R connection-North of railway-Parallel with A11 without crossing-PR7	1.76	1.76	3.52	1.76	-1.29	-5.14	-1.29	-1.29	-0.95	-0.95	-0.95	-0.95	0.32	0.32	0.64	0.32
17	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-North of railway-Direct from western alignment-PR9	1.48	1.48	2.95	1.48	-1.29	-5.14	-1.29	-1.29	-0.74	-0.74	-0.74	-0.74	0.28	0.28	0.56	0.28
197	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	1.81	1.81	3.62	1.81	-1.43	-5.71	-1.43	-1.43	-1.33	-1.33	-1.33	-1.33	0.58	0.58	1.17	0.58
161	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no P&R connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	1.81	1.81	3.62	1.81	-1.57	-6.29	-1.57	-1.57	-1.33	-1.33	-1.33	-1.33	0.58	0.58	1.17	0.58

Source: Mott MacDonald

Figure 44: INSET Score Comparisons of the Original Top Ranked Options under Equal Weighting with Alternative Scenarios (part 2)

Option Number	Option Description / Scenario Score by Theme	Wider Economic Benefits				Aligment with Objectives				Policy Alignmnet				Total Score				Rank			
		Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3
26	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-Direct to A11/A1307-PR7	2.00	2.00	2.00	2.00	1.68	1.68	1.68	0.00	2.80	2.80	2.80	0.00	0.98	0.55	1.34	0.34	1	1	1	1
11	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no P&R connection-Direct to A11/A1307-PR7	2.00	2.00	2.00	2.00	1.68	1.68	1.68	0.00	2.80	2.80	2.80	0.00	0.94	0.39	1.29	0.30	2	3	2	2
23	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-North of railway-Parallel with A11 without crossing-PR7	2.00	2.00	2.00	2.00	1.40	1.40	1.40	0.00	2.80	2.80	2.80	0.00	0.90	0.48	1.20	0.30	3	2	3	2
8	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no P&R connection-North of railway-Parallel with A11 without crossing-PR7	2.00	2.00	2.00	2.00	1.40	1.40	1.40	0.00	2.80	2.80	2.80	0.00	0.86	0.31	1.16	0.26	4	4	5	4
17	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-North of railway-Direct from western alignment-PR9	2.00	2.00	2.00	2.00	1.37	1.37	1.37	0.00	2.80	2.80	2.80	0.00	0.84	0.29	1.09	0.25	5	5	7	5
197	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	2.00	2.00	2.00	2.00	1.37	1.37	1.37	0.00	2.80	2.80	2.80	0.00	0.83	0.13	1.17	0.23	6	6	4	6
161	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no P&R connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	2.00	2.00	2.00	2.00	1.37	1.37	1.37	0.00	2.80	2.80	2.80	0.00	0.81	0.22	1.15	0.21	7	9	6	7

Source: Mott MacDonald

It can be seen that under all alternative scenarios the top ranked option under the original scenario remains in that position. Except for Option 161, which drops down to ninth in rank under Scenario 1 (highlighted in red), all top seven ranked options remain in the top seven, under all three alternative scenarios, albeit in a slightly different order. This result supports the fact that the top seven options are the best performing options and remain so under a variety of differing scenarios.

However, the sensitivity testing did result in three additional options featuring in the top seven ranked options under at least one scenario. This is as a result of Option 161 dropping to ninth place under Scenario 1 and several options scoring better than in the original scenario, such that they ranked equal seventh. These are shown in Figure 45 and Figure 46 and are highlighted in yellow.

Figure 45: INSET Score Comparisons of Additional Options Featuring in the Top 7 under any of the Alternative Scenarios (part 1)

Option Number	Option Description / Scenario Score by Theme	Transport Benefits				Environment				Deliverability				Social Impacts /Quality of Life			
		Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3
25	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-Direct to A11/A1307-PR5	1.33	1.33	2.67	1.33	-1.29	-5.14	-1.29	-1.29	-1.21	-1.21	-1.21	-1.21	0.61	0.61	1.22	0.61
30	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-Connection to BRC P&R-PR3	1.67	1.67	3.33	1.67	-1.43	-5.71	-1.43	-1.43	-1.14	-1.14	-1.14	-1.14	0.40	0.40	0.81	0.40
2	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no P&R connection-North of railway-Direct from western alignment-PR9	1.48	1.48	2.95	1.48	-1.57	-6.29	-1.57	-1.57	-0.74	-0.74	-0.74	-0.74	0.28	0.28	0.56	0.28

Source: Mott MacDonald

Figure 46: INSET Score Comparisons of Additional Options Featuring in the Top 7 under any of the Alternative Scenarios (part 2)

Option Number	Option Description / Scenario Score by Theme	Wider Economic Benefits				Aligment with Objectives				Policy Alignmnet				Total Score				Rank			
		Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3	Original Scenario	Scenario 1	Scenario 2	Scenario 3
25	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-Direct to A11/A1307-PR5	2.00	2.00	2.00	2.00	1.15	1.15	1.15	0	2.80	2.80	2.80	0.00	0.77	0.22	1.05	0.21	10	6	10	7
30	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no P&R connection-Connection to BRC P&R-PR3	2.00	2.00	2.00	2.00	1.23	1.23	1.23	0	2.80	2.80	2.80	0.00	0.79	0.18	1.09	0.21	9	8	7	7
2	Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no P&R connection-North of railway-Direct from western alignment-PR9	2.00	2.00	2.00	2.00	1.37	1.37	1.37	0	2.80	2.80	2.80	0.00	0.8	0.13	1.05	0.21	8	9	10	7

Source: Mott MacDonald

The reason these additional three options were not subsequently taken forward is because the purpose of the tests was to confirm the overall robustness of the original assessment, rather than add new options. The key finding here is that the top performing options are essentially the same while Options 25 and 2 are very similar to the shortlisted options actually taken forward. The biggest difference is Option 30 where Travel Hub Site 3 appears. GCP had previously excluded this site because of the likely impact on Babraham village and noted that it could only be reconsidered with strong justification. A seventh ranked position under a scenario where policy and scheme objectives are not considered and a scenario where transport benefits and social impacts are weighted above more strategic themes that cover economic growth and environmental issues was not considered strong justification. Furthermore, the decision to exclude the site was publicly documented through a GCP Executive Board report in November 2017.

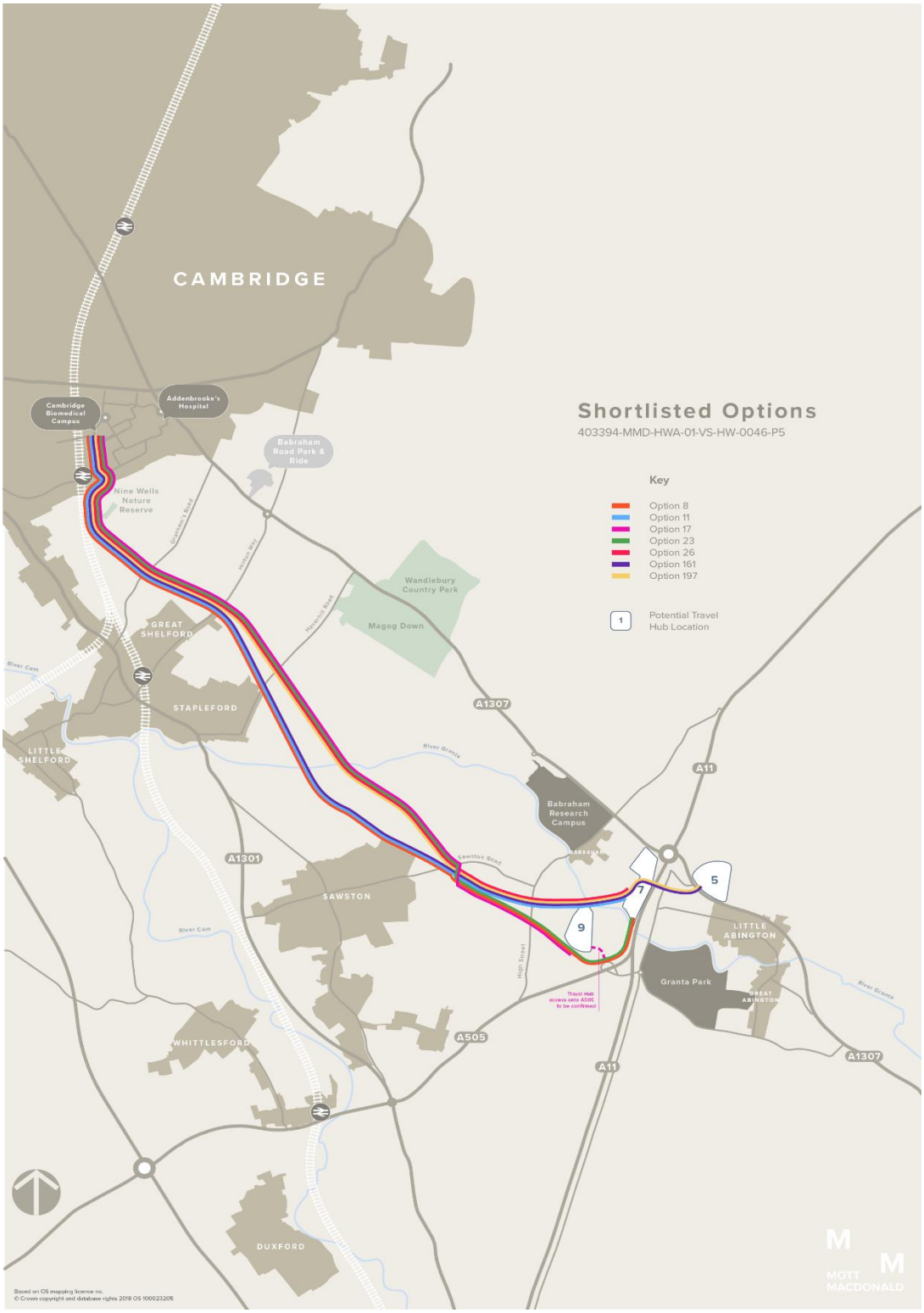
6.4 Options Shortlist

Based on the INSET sift under the original (default) scenario, where all themes were weighted equally, the seven shortlisted options taken forward, listed by rank (Option 26 being the highest scoring and Option 161 the lowest) were:

- **Option 26:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – East with no Travel Hub connection – Direct to A11/A1307, connecting with Travel Hub Site 7.
- **Option 11:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – West with no Travel Hub connection – Direct to A11/A1307, connecting with Travel Hub Site 7.
- **Option 23:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – East with no Travel Hub connection – North of railway – Parallel with A11 without crossing, connecting with Travel Hub Site 7.
- **Option 8:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – West with no Travel Hub connection – North of railway – Parallel with A11 without crossing, connecting with Travel Hub Site 7.
- **Option 17:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – East with no Travel Hub connection – North of railway – Direct from western alignment, connecting with Travel Hub Site 9.
- **Option 197:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – East with no Travel Hub connection – Direct to A11/A1307 – Crosses A11 with dedicated route to A1307 connecting with Travel Hub Site 5.
- **Option 161:** Western alignment via Francis Crick Ave – West of Nine Wells – West avoiding urban area – West with no Travel Hub connection – Direct to A11/A1307 – Crosses A11 with dedicated route to A1307 connecting with Travel Hub Site 5.

These alignments are shown in Figure 47, where the options are coloured as illustrated in the text above.

Figure 47: Shortlisted Options taken forward for Quantitative Assessment



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

6.4.1 Shortlisted Option Alignment Descriptions

All shortlisted options would form a new offline route between the A11 and Cambridge Biomedical Campus. Options featuring an alignment alongside the A1307 were included in the longlist but did not perform as strongly against the assessment criteria, including in relation to transport user benefits, wider economic benefits, alignment with objectives and policy compliance.

At the northern end, all shortlisted options would connect to the existing guided busway via a westerly route through the Biomedical Campus. This would require a widening of Francis Crick Avenue (Figure 48) in order to provide a dedicated alignment for public transport vehicles. Alternative options with more central alignments through the Biomedical Campus did not perform as well in the assessment with reasons including the constrained nature of existing roads (Figure 49) which would therefore limit the possibility of providing a dedicated public transport route and decrease journey reliability.

Figure 48: Francis Crick Avenue

Source: Mott MacDonald

Figure 49: Robinson Way

Source: Mott MacDonald

All shortlisted options then run to the west of Nine Wells Local Nature Reserve before diverging at Hinton Way (Great Shelford) with Options 8,11 and 161 taking a route slightly closer to the urban areas of Stapleford and Sawston and Options 17, 23, 26 and 197 taking a more easterly alignment.

All options would cross Granham's Road, Hinton Way, Haverhill Road and Sawston Road via at grade crossings. It is envisaged that these would be signalised junctions, giving priority to the public transport route.

The options then take alternative routes from Sawston Road with each then crossing High Street. Four of the options would serve Travel Hub Site 7, located to the west of the A11. Options 11 and 26 follow a direct alignment. Options 8 and 23 route to the north of the dismantled railway before running parallel with the A11.

Options 161 and 197 would serve Travel Hub Site 5, located to the east of the A1307. This would require a bridge to be constructed over the A11 as part of the current phase of the project. For the other options, this would only be constructed were a public transport route to be extended further east towards Haverhill in future. Between the A11 and A1307, the route would follow a dedicated alignment over land previously occupied by the Comfort Café (Figure 50). It is then expected that a signalised priority junction for public transport vehicles would need to be provided on the A1307 to the south of the junction with Newmarket Road (Figure 51).

Figure 50: Comfort Café Site

Source: Mott MacDonald

Figure 51: A1307 South of Newmarket Road Junction

Source: Mott MacDonald

6.4.2 Shortlisted Option Travel Hub Site Descriptions

Travel Hub Site 5 (Figure 52) is arable farmland located on the A1307 east of the A11 and would have parking capacity for 2,100 cars or up to 3,000 upon expansion. It is envisaged that the existing junction of the A1307 and Newmarket Road could be modified to create a four-arm roundabout in order to provide general traffic access into the site. As noted above, were the public transport route to be connected to the western side of the A11 via a dedicated alignment, a separate signalised crossing of the A1307 would be required.

The site is relatively well located for vehicles travelling towards Cambridge from Haverhill, Linton and other points east of the A11; however, those travelling on the A11 would need to deviate from their desire line into Cambridge and the site location would not be as visible to them.

The site is the only one of those included in the shortlisted options to be located outside of the designated green belt.

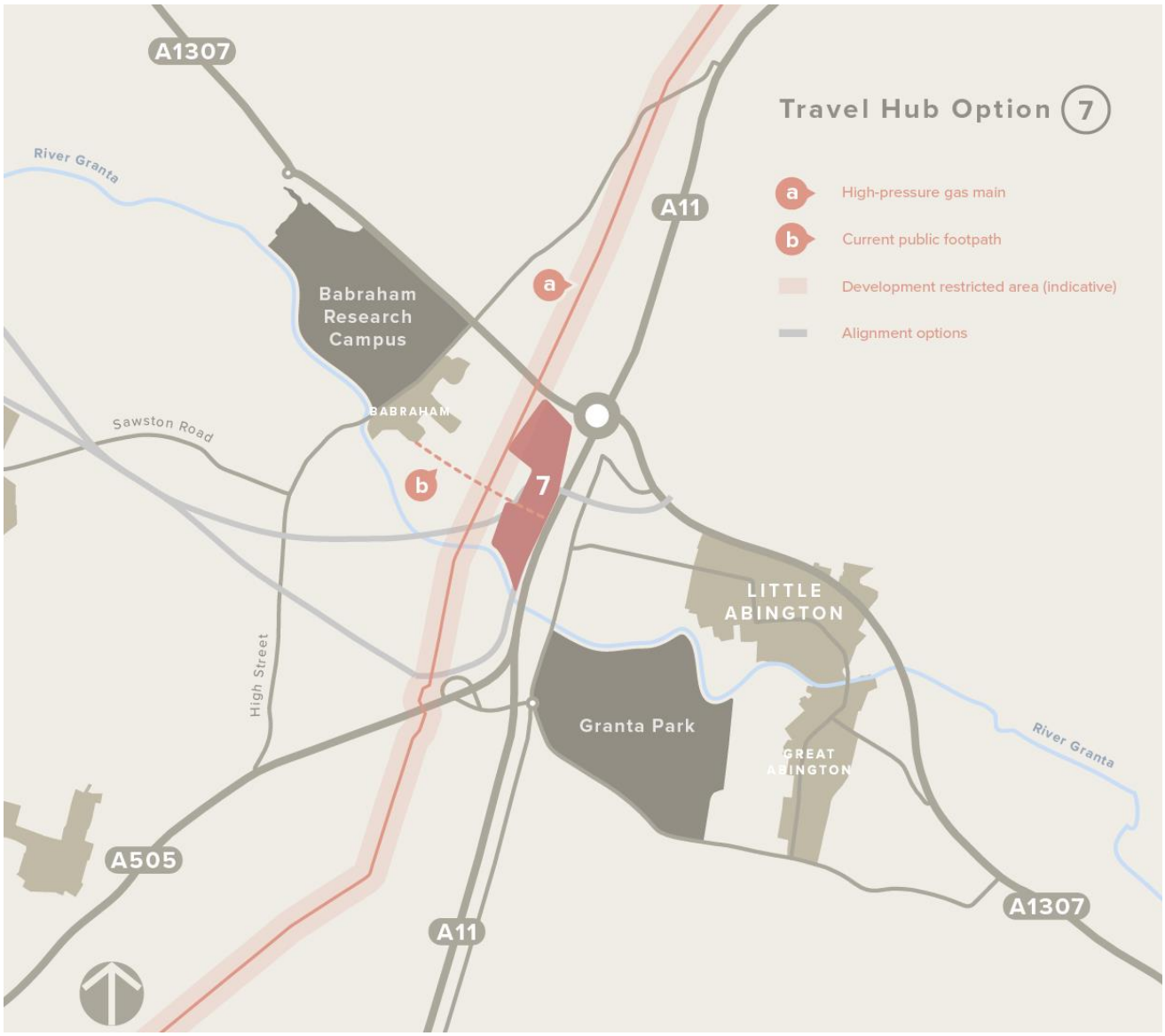
Figure 52: Location Plan: Travel Hub Site 5

Source: Mott MacDonald. Contains OS data © Crown copyright and database rights

Travel Hub Site 7 (Figure 53) is located west of the A11 and in a location which would be passed by all drivers travelling west into Cambridge on the A1307, avoiding route deviation and being visible which would encourage future use.

The site has a potential parking capacity of between 2,000 and 2,800 spaces but is subject to several constraints. It is located within the green belt, part of the site is situated in flood zones 2 and 3 and it is located adjacent to a high-pressure gas pipeline with the access from the A1307 crossing the pipeline. In addition, a public footpath runs through the site, connecting with the existing footbridge over the A11. All these would need careful consideration in planning the layout of the site and necessary mitigation measures.

Figure 53: Location Plan: Travel Hub Site 7



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

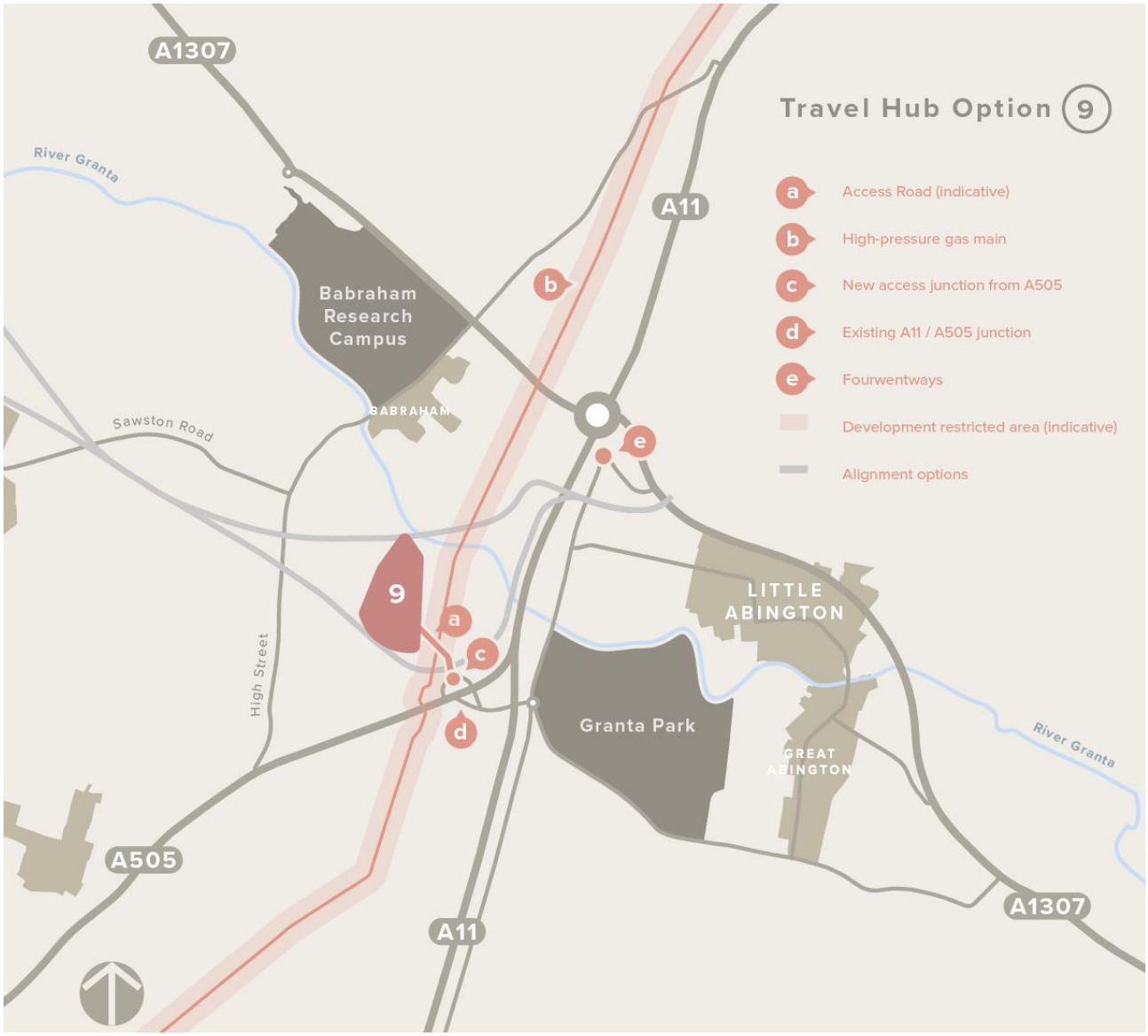
Travel Hub Site 9 (Figure 54) is located to the west of the A11/A505 junction. The site is set back from the A505 and an access road would need to be implemented for cars. The site has potential to provide between 2,000 and 3,000 spaces.

Public access to this site would require the improvement of the existing A505/A11 junction or potentially a new junction further south on the A505.

As with Site 7, the site is located on green belt land which is currently being used for arable farming. The site is located close to the high-pressure gas main and the impact of this would be dependent on the access location.

The location would require a diversion for those using the A1307 from the A11 (Fourwentways) junction and would be less visible to the majority of potential users.

Figure 54: Location Plan: Travel Hub Site 9



Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

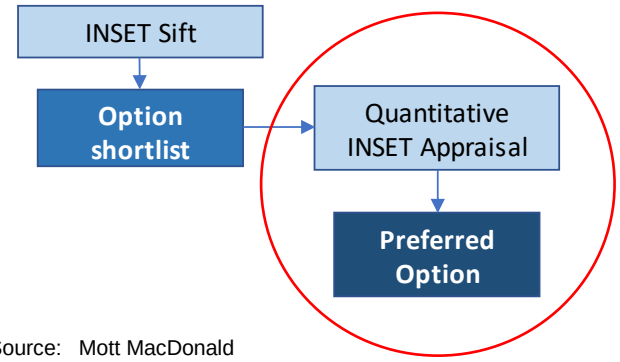
These seven shortlisted options were then taken forward to the final Stage of assessment – a quantitative/more detailed qualitative appraisal utilising modelling outputs.

7 Options Assessment: Stage 2 – Quantitative Appraisal to Inform Selection of the Preferred Option

7.1 Stage 2 – Quantitative Appraisal

This section focuses on the quantitative appraisal process applied to the shortlisted options identified through INSET and detailed in Section 6. It represents the second step in the Stage 2 process as illustrated in Figure 55.

Figure 55: Stage 2 Process - Define Option Shortlist through INSET Sift and then Quantitively Appraise Shortlist to Identify Preferred Option



Source: Mott MacDonald

7.2 Refining the Shortlist

Following stakeholder engagement, the seven options illustrated in Figure 47 in Section 6.4 were combined into four. This was on the basis that the central alignment between the CBC and Sawston Road was very similar for all options and that the variants of this were not deemed to be sufficiently different to present at public consultation. Instead, an optimum alignment between these two points, which seeks to maximise the proximity to urban areas and limit the impact on the environment, for example hedgerows and the greenbelt, was developed.

During this design development phase, the modification to the designs resulted in some options being effectively merged, specifically:

- Options 8 and 23;
- Options 11 and 26; and
- Options 161 and 197.

Along with Option 17 this reduced the shortlist to four options which were shared with GCP.

A fifth option was also identified that combined elements of options 8/23 and 161/197. This was in order to extend a route alongside the former railway and A11 to a dedicated public transport route towards Travel Hub Site 5 on the eastern side of the A11. Option packages combining a route alignment alongside the former railway with Site 5 were included in the longlist of options; however,

these featured a more southerly crossing of the A11 to join Newmarket Road rather than a dedicated public transport alignment to connect with Site 5.

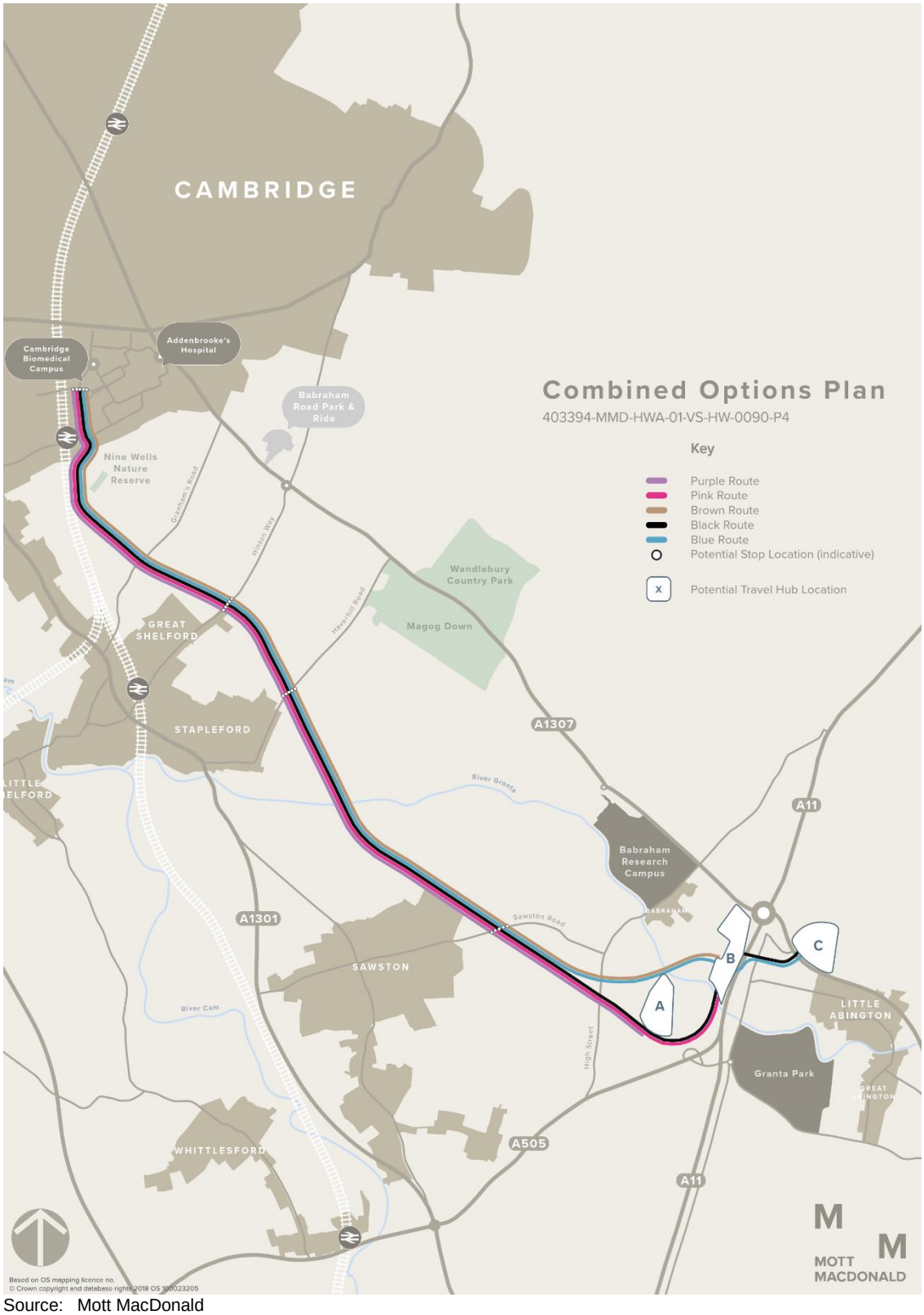
As key elements of the new options had previously been through the appraisal process and successfully progressed to the shortlist it was decided not to formally reappraise this amalgamated hybrid option; instead a desktop assessment was undertaken to ensure that the hybrid would still perform in a similar manner to its component parts. This resulted in a total of five options being progressed for appraisal, as shown in Figure 56.

Due to the merging and refinement of options, it was agreed at this stage, for simplicity and clarity of illustrations that the five route options would, from this point onward, be referred to by colour and the three Travel Hub locations by letter, as noted below:

Table 16: Revised Options Shortlist

Refined Shortlisted Option	Description	Original Shortlisted Option(s) Elements
Brown route from Travel Hub Site B	Direct to Travel Hub west of the A11 (Site 7)	11, 26
Blue route from Travel Hub Site C	Direct to Travel Hub east of the A11 (Site 5)	161, 197
Black route from Travel Hub Site C	Alongside former railway to Travel Hub east of the A11 (Site 5)	N/A (combines 8/23 and 161/197)
Pink route from Travel Hub Site B	Alongside former railway to Travel Hub west of the A11 (Site 7)	8, 23
Purple route from Travel Hub Site A	Alongside former railway to Travel Hub west of the A505 (Site 9)	17

Figure 56: Refined Options Shortlist



Source: Mott MacDonald

Figure 57 through to Figure 61 show each of the options in detail. All follow the same route between CBC and Sawston, from which point they diverge into five alternative alignments, leading to one of three Travel Hub sites. All options would have the same service frequencies and have similar levels of provision for pedestrians and cyclists. The main differences between each option and the Travel Hub sites are summarised below.

CBC to Sawston

The section of the route common to all options runs along Francis Crick Avenue before exiting on the southern side of the CBC and running parallel with the railway. It then diverts to the east of Great Shelford and Stapleford before crossing the River Granta and running to the east of Sawston. All four stops proposed at this stage are within this section and in the same locations for each option. These would be at the CBC, Hinton Way (Great Shelford), Haverhill Road (Stapleford) and Sawston Road (Sawston). The route would cross each of these roads and Granham's Road, via new at-grade junctions to be signalised with priority given to public transport vehicles. Before reaching High Street, the route options then diverge as outlined within the following sections.

Brown Option

The Brown (and Blue) route takes a direct alignment across fields towards the A11 which includes a second crossing of the River Granta. The Brown route ends at Travel Hub Site B, located to the south west of the junction between the A1307 and A11, as shown in Figure 57. General traffic would access it from the A1307 via a new junction whilst the site itself would have a linear arrangement in order to accommodate it between a high-pressure gas main, over which development is restricted, and the A11. The site could provide parking for up to 2,800 cars.

Figure 57: Brown Route from Travel Hub Site B

Source: Mott MacDonald

Blue Option

The Blue route extends beyond the Brown route to cross the A11 via a new bridge. The route would then cross Newmarket Road at a new junction, before running through the south of the former Comfort Café site and crossing the A1307 via a new junction to connect with Travel Hub Site C, located on the north side of the A1307 (see Figure 58). As with the junctions on the common section of route, all new junctions would be at-grade and signalised with priority for public transport vehicles. Site C would have a separate roundabout junction to provide general traffic with access into the site at the current junction between the A1307 and Newmarket Road. It could provide parking for up to 2,100 cars.

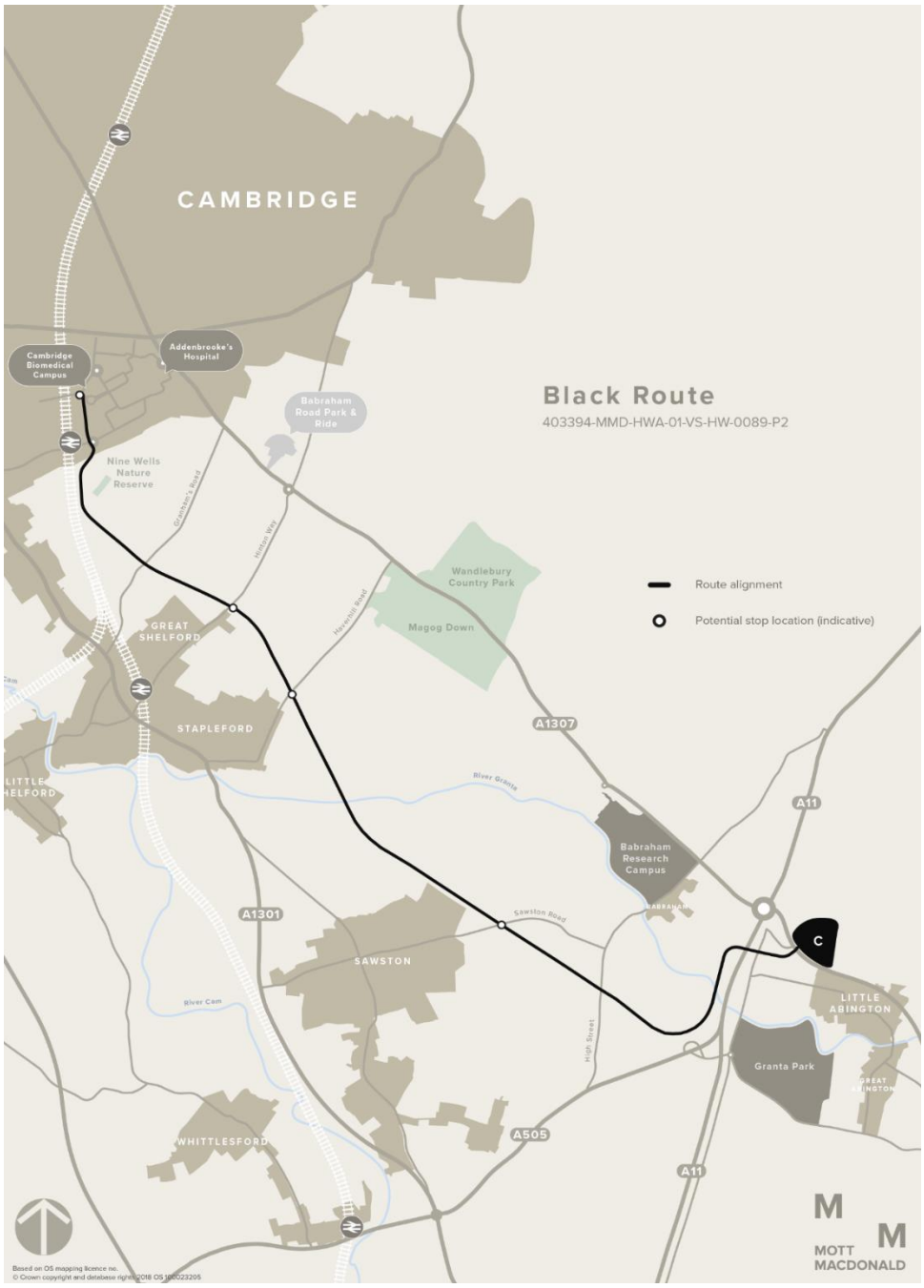
Figure 58: Blue Route from Travel Hub Site C

Source: Mott MacDonald

Black Option

The Black, Purple and Pink routes follow the route of a former railway; however, as this is now designated as a County Wildlife Site, the proposed alignment would be slightly to the north of this, also avoiding the need for a bridge or significant regrading works at the former High Street crossing. All three options follow the same route initially with the Black and Pink options continuing to the A505 junction before running parallel with the A11 and crossing the River Granta. The Black route would then cross the A11 before following the same alignment as the Blue option from Newmarket Road to Travel Hub Site C.

Figure 59: Black Route from Travel Hub Site C

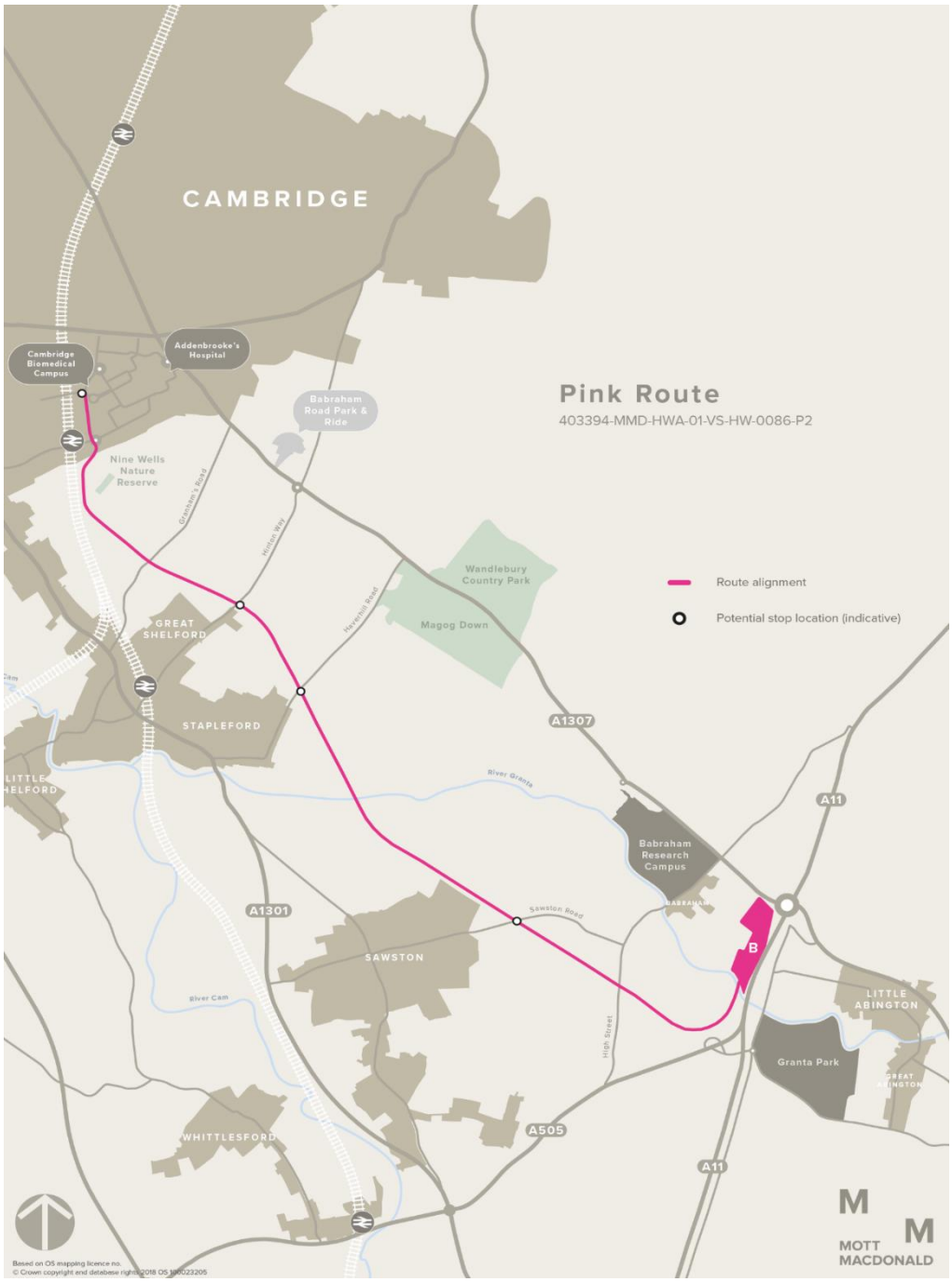


Mott MacDonald

Pink Option

The Pink option is the same as the Black option but, instead of crossing the A11, it terminates at Travel Hub Site B to the north of the River Granta. This would be the same as the Travel Hub site for the Brown route but have a slightly different layout in order to accommodate public transport vehicles entering the site from the south rather than west. This would result in a slightly lower capacity of up to 2,500 cars.

Figure 60: Pink Route from Travel Hub Site B

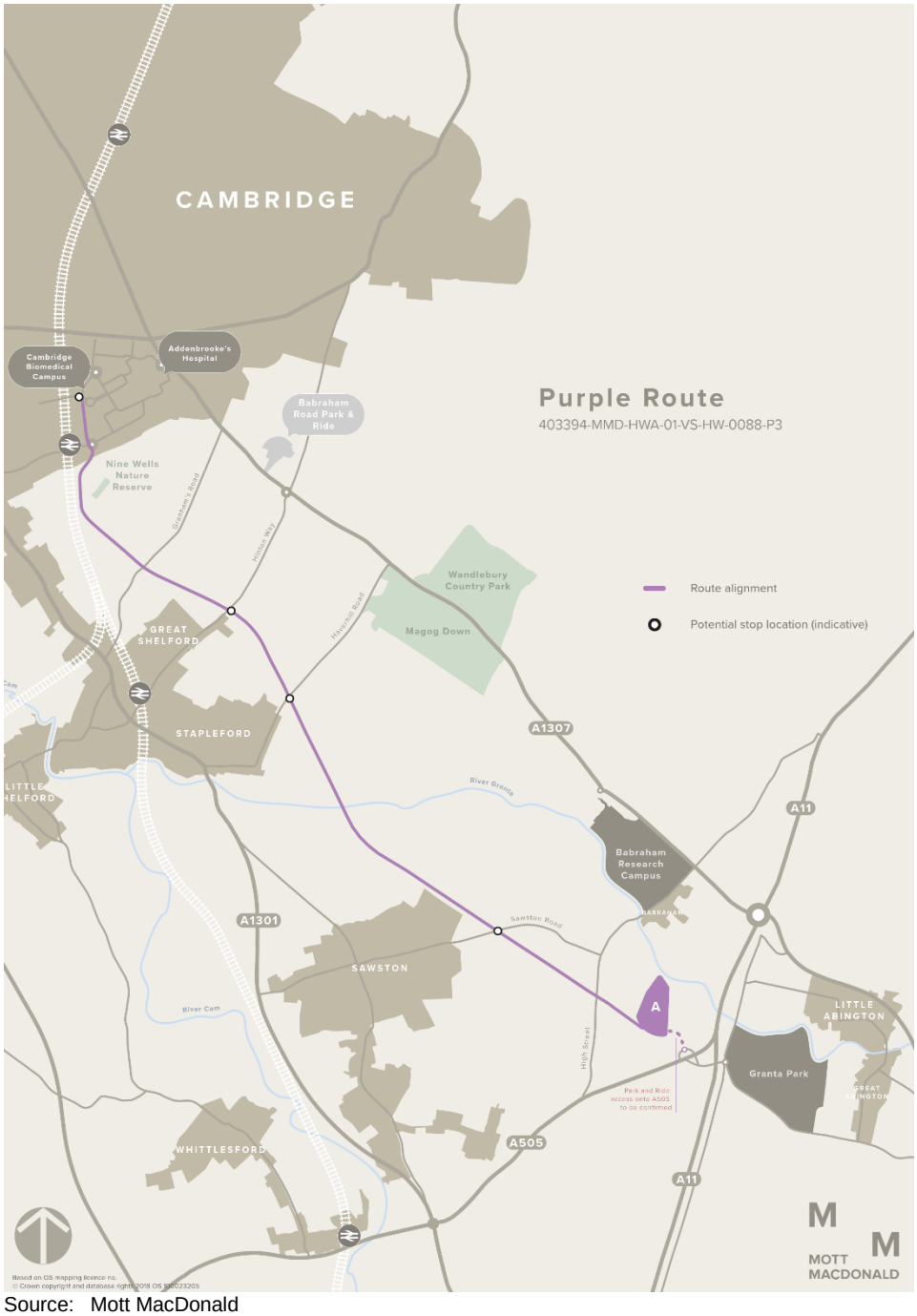


Source: Mott MacDonald

Purple Option

The Purple route is the shortest of all options and, unlike other options, crosses the River Granta once only. It follows the same route as the Pink and Black route but stops to the west of the A11/A505 junction and would serve Travel Hub Site A (see Figure 61). This would be accessed via a new roundabout junction to the north of the A505 slip road and require an extended access road to the site itself. This would be necessary in order to avoid the high-pressure gas pipeline. The site would provide capacity for approximately 2,000 cars but has potential for expansion.

Figure 61: Purple Route from Travel Hub Site A



Source: Mott MacDonald

7.2.1 Consideration of Merging Travel Hub Sites 10 and 11

The five shortlisted options noted in the previous section were presented to the Local Liaison Forum (LLF) established for the CSET scheme. Managed by local councillors and including representation from local businesses and universities, the LLF provides for regular dialogue between the CSET project team and members of the local community during option development. This is so that the public are kept informed and can continue to have their say outside of formal consultation processes.

In addition to the five shortlisted sites, the LLF suggested that sites 10 and 11 be considered in combination and together with the adjacent sites currently occupied by the Fourwentways service station and Travelodge, for possible inclusion in the shortlist. As such further work was undertaken to consider the feasibility of a larger, partly brownfield site at Fourwentways.

As noted in Section 5.3.2.1, alignment options including either site 10 or 11 were discounted prior to the assessment of the longlist of options to generate a shortlist. This was as a result of them individually failing to meet the gateway criterion relating to Travel Hub site capacity requiring sites to have a minimum of 1,000 spaces. Travel Hub sites are being planned for a minimum of 2,000 spaces; however, the lower threshold was used for the gateway criteria to avoid removing site and alignment combinations at this stage which may be advantageous in other respects and potentially warrant a reduction on 2,000 spaces.

Had Travel Hub Site Options 10 and 11 been considered together and with the surrounding land, they would not have been removed at the gateway stage as they would have a capacity of at least 1,000 spaces. Consequently, as a result of LLF feedback viable alignment options featuring a combined Site 10 and 11 were developed.

Five options were considered, These, together with their indicative capacities are described in Table 17.

Table 17 Additional options as a result of combining Travel Hub Sites 10 and 11

Layout description	Indicative Capacity
Layout 1 (combining Sites 10 and 11 only, but not expanding beyond these)	1,500
Layout 2 (combining Sites 10 and 11 with relocation of Fourwentways Travelodge)	1,900
Layout 3 (combining Sites 10 and 11 with the rerouting of Newmarket Road to the southern boundary of Site 11, and relocation of Fourwentways service station and Travelodge)	3,000
Layout 4 (as Layout 3 with extension to land to the south of the A1307)	3,900
Layout 5 (combining the northern part of Sites 10 and whole of Site 11 with reconstruction of Travelodge and service station, rerouting of Newmarket Road and land to the south of the A1307)	2,600

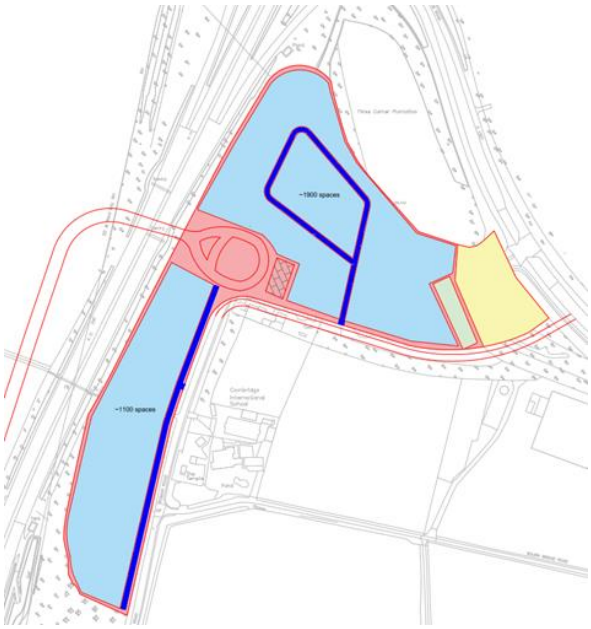
Source: Mott MacDonald

Additional detail on the sites and associated drawings can be found in Technical Note 403394-MMD-TRA-01-TN-TA-0096 entitled “Review of Feasibility of Combining Travel Hub Sites 10 and 11”.

Layouts 1 and 2 would have passed the gateway criteria of 1,000 minimum spaces but were estimated to provide less than the 2,000 planned spaces. In contrast, Layout 4 is considerably larger than is likely to be necessary. Therefore, these layouts were considered no further and only Layouts 3 and 5 were taken forward as they provide a capacity closest to 2,000 spaces.

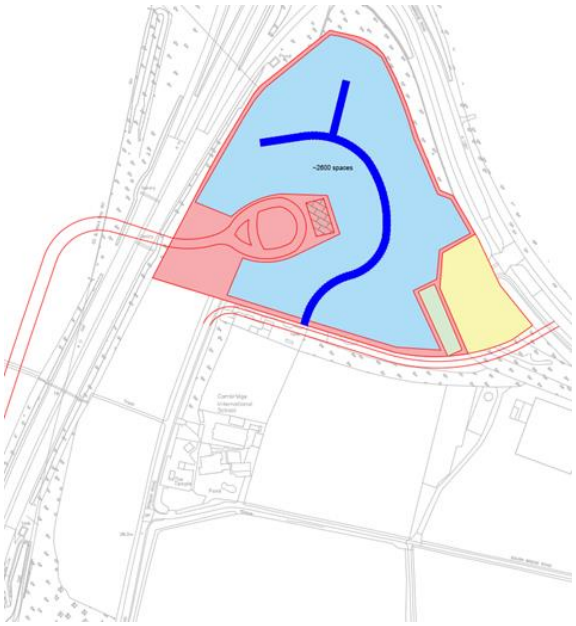
These two layouts are shown in Figure 62 and Figure 63.

Figure 62: Layout 3



Source: Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Figure 63: Layout 5



Source: Source: Mott MacDonald. Contains OS data © Crown copyright and database rights 2018 OS 100023205

Between them, they provided four further options for retrospective longlist assessment as follows:

- Shortlisted Blue route with Layout 3;
- Shortlisted Blue route with Layout 5;
- Shortlisted Black route with Layout 3; and
- Shortlisted Black route with Layout 5.

These four options were scored against the same assessment criteria and using the same scoring rationales as applied to the original longlist of 90 options detailed in Section 6.3.

Table 18 summarises the results of this assessment by theme, highlighting where each of the four new options would have been positioned in the ranking of the 94 options, had they been identified earlier in the process. The scores from the shortlisted options are also provided for comparison[8].

[8] Seven options were shortlisted. However, three pairs of these were very similar and as such were combined in the final shortlist to give four of the shortlisted options. These were renamed Blue, Brown, Purple and Pink for the purposes of the refined shortlist. The fifth shortlisted option (Black) is a hybrid of two of these options; namely, Pink and Blue.

Table 18: Summary of Assessment Scores

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
1/2	Option 11 (renamed Brown route)	1.88	-1.29	-1.12	0.61	2.00	1.68	2.80	0.94
3/4	Option 8 (renamed Pink route)	1.76	-1.29	-0.95	0.32	2.00	1.40	2.80	0.86
5	Option 17 (renamed Purple route)	1.48	-1.29	-0.74	0.28	2.00	1.37	2.80	0.84
6/7	Option 161 (renamed Blue route)	1.81	-1.57	-1.33	0.58	2.00	1.37	2.80	0.81
17	Blue and Travel Hub site 10/11- Layout 3	1.64	-1.86	-1.55	0.40	2.00	1.37	2.80	0.69
18	Blue and Travel Hub site 10/11- Layout 5	1.62	-1.86	-1.60	0.28	2.00	1.37	2.80	0.66
18	Black and Travel Hub site 10/11- Layout 3	1.52	-1.86	-1.55	0.36	2.00	1.37	2.80	0.66
20	Black and Travel Hub site 10/11- Layout 5	1.50	-1.86	-1.60	0.24	2.00	1.37	2.80	0.64

It can be seen that none of the additional options would have featured amongst the top performing options and therefore would not have been shortlisted had they been considered in this process from the outset.

7.2.2 Consideration of Options at Great Shelford and Stapleford

Prior to the optioneering process which was revisited at OBC stage, consideration was given to developing options under the initial Strategies 1 and 2 that would follow the former Haverhill railway to the south of Stapleford and through Shelford. These options included alignments alongside the A1307, to the edge of Great Shelford and closer to the village by cutting through buildings on Hinton Way.

As all options requiring the demolition of residential property at Hinton Way were rejected on the basis of cost and adverse public reaction, the initial conclusion of previous work was that a route via the former Haverhill railway to the south of Stapleford and through Great Shelford was infeasible. As such these options were not developed further or re-considered at OBC longlist stage.

However, once the shortlist of five options had been identified the feasibility of a route through Shelford via the former Haverhill railway was revisited following feedback from the Local Liaison Forum (LLF) and other local representations.

In principle, this alternative alignment would have some advantages including improved public transport frequency and accessibility for residents of the village as well as a greater potential catchment area for the service. It would also reduce the impact on the green belt to the east of the villages.

However, when the route was investigated further it can be seen from Figure 64 to Figure 67 that there are several barriers to its implementation including constraints within the main line railway corridor, the proximity to residential and business premises and expected significant additional costs.

Figure 64: Railway Infrastructure Constraints and Need for Vehicle Containment Structure

Source: Mott MacDonald

Figure 65: Space Constraints – Likely to Result in Demolition of Buildings and Relocation of Infrastructure

Source: Mott MacDonald

Figure 66: Width Constraints at Shelford Station and Need to Purchase Commercial Property

Source: Mott MacDonald

Figure 67: Land at Mill Court Business Park Would Need to be Purchased

Source: Mott MacDonald

An option for this alternative alignment to the five shortlisted options has not been designed because of the above constraints but it is estimated that additional costs in excess of £15m would be incurred based on the likely additional works required. These are expected to include substantial reconstruction of the A1301 road bridge, possessions of railway infrastructure, alterations to railway infrastructure, a vehicle containment structure alongside the railway,

relocation of a pumping station and purchase of commercial property, including part of Mill Court business park. Suggestions to tunnel under or deck over the existing railway would be substantially more expensive. For these reasons, the conclusion of the supplementary assessment was that a route alignment via the former railway would not provide a feasible alternative to the shortlisted options, supporting previous work undertaken.

7.3 Quantitative Appraisal Methodology

Having finalised the shortlist of five options, the following sections provide a brief narrative, in accordance with Appendix B: Appraisal Specification Report (ASR), outlining the approach used for quantitative or more robust qualitative appraisal of options against each of the criteria, on a theme by theme basis. The results of the appraisal of each of the shortlisted options against each of the themed criteria are also provided, together with a rationale or basis for assigning a -3 to +3 score that was input into INSET to enable appraisal and comparison of options using a uniform scoring system. A summary of the headline findings for each theme is also included.

7.3.1 Transport User Benefits Theme

The five shortlisted options were assessed in part quantitatively and in part qualitatively against the criteria under the Transport User Benefits theme. Modelling outputs were used to assess options against criteria that could be quantified. The overall approach to modelling and calculation of transport benefits (the basis of the assessment criteria under this theme) is outlined below.

Data and Surveys

Additional surveys consisting of automatic traffic counts and manual classified traffic counts were undertaken to ensure that suitable data was available for the quantitative assessment of the shortlisted options.

Model Preparation and Calibration

The Cambridge Sub Regional Model (CSRM) D-series highway base SATURN model with a 2015 base year was received from Atkins and was re-calibrated for the A428/A1303; A10/Hauxton Road and A1307 corridors to ensure a suitable and consistent base for assessing the options along these corridors. Recalibration included:

- A few additional links along the A1303 Madingley Road;
- Additional zoning detail along Grange Road;
- An additional zone within Trumpington Travel Hub to split out the John Lewis collection point into its own zone; and
- Further updates to signal timings, junction layouts and turning.

A public transport model was prepared using CUBE software. A synthetic matrix based on a previous public transport model was prepared as well as a matrix based on surveys carried out. These two sets of matrices were combined, and the model was calibrated/validated in line with WebTAG guidance.

Forecasting

The highway improvements from CSET Phase 1 were added to the D-series foundation case for 2026 and 2036 to create Do-Minimum (DM) highway models. Five Do-Something options were then modelled for these two forecast years.

The highway model inputs were prepared and CSRM demand model runs were undertaken. The differences between the forecast matrices output from the demand model and the D-series base year model were then calculated and applied to the re-calibrated base year highway and public

transport matrices to ensure any zone changes or flow adjustments undertaken as part of the base model calibration were reflected.

These revised forecast matrices were then assigned to the forecast highway and public transport networks to provide the final assignments for each option. The outputs from these assignments then informed the economic assessment in line with the agreed assessment criteria.

Sensitivity Testing

Sensitivity testing will be carried out for high growth scenarios, assuming a level of development consistent with the Cambridgeshire and Peterborough Independent Economic Review report (CPIER).

Sections 7.3.1.1 to 7.3.1.7 detail the results of appraisal against each of the criteria and sub-criteria under this theme and the basis or rationale for that appraisal.

7.3.1.1 Journey Reliability Criteria

There were two sub-criteria identified under Journey Reliability:

- Dedicated public transport routes; and
- Degree of priority at junctions.

Options were qualitatively assessed against both sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against these two sub-criteria and the rationale for assigning these scores are presented in Table 21 and Table 22.

Table 19: Rationale for Assigning Scores: Journey Reliability Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Dedicated public transport routes	Options re-assessed as a result of design development since assessment at longlist stage	Public transport vehicles running on fully segregated route for complete alignment. No interaction with general traffic.	Route follows a dedicated public transport alignment, separate from general traffic. May have very limited interaction with general traffic.	Route is typically in dedicated public transport lanes with limited interaction with general traffic	No advantage or disadvantage to reliability	Potential for some disruption as a result of junctions	Sharing with general traffic on routes with lower traffic levels	Sharing with general traffic on already congested routes
Degree of priority at junctions	Options re-assessed as a result of design development since assessment at longlist stage	Grade separated junctions where the public transport route crosses roads	Only junctions are where public transport route crosses roads. Priority signals for the public transport would be provided in these cases.	Route may join existing junctions but would continue to have priority in all cases	No advantage or disadvantage to reliability	Route has small number of junctions where public transport does not have priority, but these do not have high general traffic levels	Route likely to have no or limited priority at some junctions. Junctions are minor but higher flows.	Route has no priority and junctions are congested

Source: Mott MacDonald

Table 20: Option Assessment Results: Journey Reliability Criteria

	INSET Scores	
Option	**Dedicated public transport routes**	**Degree of priority at junctions**
Brown	+2	+2
Blue	+2	+2
Black	+2	+2
Pink	+2	+2
Purple	+2	+2

Source: Mott MacDonald

7.3.1.2 Journey Time (User Benefits) Criteria

There were two sub-criteria identified under Journey Time (User Benefits):

- Frequency of public transport stops; and
- Directness of route and extent of dedicated infrastructure.

The “Frequency of public transport stops” criterion was assessed based on the number of public transport stops along each route option. It could be viewed that the fewer the stops, the greater the journey reliability, and so non-stop routes would score highest. However, it can also be viewed that if there are insufficient stops in populated catchment areas along the route, then there is no opportunity for residents in these areas to use the service and they would be unlikely to drive to the Travel Hub at the end of the route to take a service back past their residence to the CBC campus or central Cambridge. On this basis all options have an equal number of stops (4) which means the service can still run efficiently but also serves key catchment areas. As there is no differentiation between options in respect of this criterion all options have been assigned a neutral score of 0.

Journey times were used to assess the “Directness of route and extent of dedicated infrastructure”, on the basis that a more direct route and a greater level of segregation and/or priority measures would facilitate faster journeys and offer greater user benefits. The existing 13B service from Cambridge Road bus stop at Fourwentways (close to the outer end of the CSET Phase 2 route) through to Addenbrookes Hospital was used as a baseline. Changes in journey time savings relative to this were used to assess each shortlisted option. Table 21 shows the rationale for assigning scores and Table 22 shows the actual modelled metrics and the assigned INSET scores based on the rationale.

Table 21: Rationale for Assigning Scores: Journey Time (User Benefits) Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Frequency of public transport stops	Number of public transport stops	N/A	N/A	N/A	4	N/A	N/A	N/A
Directness of route and extent of dedicated infrastructure	% change in bus journey time relative to the existing 13B service along the A1307 between Haverhill and the CBC.	Journey time ≥ 15% quicker than existing travel time	Journey time 15% - 10% quicker than existing travel time	Journey time 0% - 10% quicker than existing travel time	Journey time equal to existing travel time	Journey time 0% - 10% slower than existing travel time	Journey time 15% - 10% slower than existing travel time	Journey time ≥ 15% slower than existing travel time

Source: Mott MacDonald

Table 22: Option Assessment Results: Journey Time (User Benefits) Criteria

	INSET Scores			
Option	**Frequency of public transport stops**		**Directness of route and extent of dedicated infrastructure**	
	Number of public transport stops	Assigned INSET Score	% Change in Bus Journey Time relative to existing service 13B	Assigned INSET Score
Brown	4	0	-14%	+2
Blue	4	0	-11%	+2
Black	4	0	-11%	+2
Pink	4	0	-13%	+2
Purple	4	0	-19%	+3

Source: Mott MacDonald

7.3.1.3 Route Flexibility Criteria

There were three sub-criteria identified under Route Flexibility, all assessed qualitatively:

- Ability to be used by CAM vehicles;
- Compatibility with CAM alignments;
- Opportunities for benefits for users of existing public transport routes;

Options were assessed against sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against these three sub-criteria and the rationale for assigning these scores are presented in Table 23 and Table 26.

Table 23: Rationale for Assigning Scores: Route Flexibility Criteria (Qualitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Ability to be used by CAM vehicles	Options re-assessed as a result of design development since assessment at longlist stage	Fully segregated infrastructure which could be used by CAM vehicles. Very limited interaction with general traffic.	Fully segregated infrastructure which could be used by CAM vehicles. Some interaction with general traffic at junctions.	Running alongside existing road but with separate lanes. Some interaction with general traffic at junctions.	Not applicable, any option will have either positive or negative scores relative to this criterion	Minor overlap with general traffic routes which may reduce CAM optimisation	Route partly shared with other traffic (existing low flows)	Route shared with other traffic (existing high flows and congestion)
Compatibility with CAM alignments	Options re-assessed as a result of design development since assessment at longlist stage	Route fully supports planned connections into Cambridge	Route supports planned connections into Cambridge with very limited modification expected	Route supports planned connections into Cambridge with some minor diversion expected	Not applicable, any option will have either positive or negative scores relative to this criterion	Option expected to require diversion	Option expected to require significant diversion in order to serve Cambridge	Option likely to preclude a planned link with CAM into Cambridge
Opportunities for benefits for users of existing public transport routes	Options re-assessed as a result of design development since assessment at longlist stage	Existing services could access the Travel Hub site and alignment with no diversion from existing route with significant potential journey time savings	Existing services could access the Travel Hub site and alignment with minimal diversion from existing route with large potential journey time savings	Existing services could access the Travel Hub site and alignment with some diversion from existing route and potential journey time savings	Neither advantage nor disadvantage to existing public transport users	Existing services may have some increase in journey times	Existing services may have a large increase in journey times	Existing services would have significantly increased journey times

Source: Mott MacDonald

Table 24: Option Assessment Results: Route Flexibility Criteria (Qualitative Assessment)

	INSET Scores		
Option	**Ability to be used by CAM vehicles**	**Compatibility with CAM alignments**	**Opportunities for benefits for users of existing public transport routes**
Brown	+2	+3	+2
Blue	+2	+3	+2
Black	+2	+3	+2
Pink	+2	+3	+2
Purple	+2	+3	0

Source: Mott MacDonald

7.3.1.4 Impact on Existing Traffic Criteria

There were three sub-criteria identified under Impact on Existing Traffic:

- Loss of general traffic capacity along main alignment;
- Loss of capacity/priority at junctions; and
- Impact of delay caused by additional junctions.

The first two criteria on this list, whilst applicable at Stage 2A when there were both on-line and off-line options being assessed, are not applicable to the remaining shortlisted options. As these are all off-line, there can be no loss of capacity along the main alignment or at existing junctions as the alignment does not yet exist. For consistency in the assessment process all shortlisted options have been assigned a neutral score of zero which has no impact.

The third sub-criterion on this list has also been assigned a neutral score of zero. It was initially thought that this criterion could be assessed using data from the CSRM SATURN model, however due to the lack of granularity of the model it was not possible to produce meaningful results at this stage and so it has not been considered appropriate to include the results within this assessment process. Upon identification of a preferred option the impacts of this assessment criterion will be assessed using microsimulation modelling to provide a more robust and meaningful assessment.

Table 25: Rationale for Assigning Scores: Impact on Existing Traffic Criteria (Quantitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Loss of general traffic capacity along main alignment	N/A	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options
Loss of capacity/ priority at junctions	N/A	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options	N/A to remaining shortlisted options
Impact of delay caused by additional junctions	N/A	N/A not scored at this stage	N/A not scored at this stage	N/A not scored at this stage	N/A not scored at this stage	N/A not scored at this stage	N/A not scored at this stage	N/A not scored at this stage

Source: Mott MacDonald

Table 26: Option Assessment Results: Impact on Existing Traffic Criteria (Quantitative Assessment)

	INSET Scores					
Option	**Loss of general traffic capacity along main alignment**		**Loss of capacity/priority at junctions**		**Impact of delay caused by additional junctions**	
	N/A	Assigned INSET Score	N/A	Assigned INSET Score	N/A	Assigned INSET Score
Brown	N/A	0	N/A	0	N/A	0
Blue	N/A	0	N/A	0	N/A	0
Black	N/A	0	N/A	0	N/A	0
Pink	N/A	0	N/A	0	N/A	0
Purple	N/A	0	N/A	0	N/A	0

Source: Mott MacDonald.

7.3.1.5 Degree of Route Segregation Criteria

There were two sub-criteria identified under Degree of Route Segregation:

- Junctions; and
- General alignment.

Options were qualitatively assessed against both sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The rationale for assigning scores to the five shortlisted options against these two sub-criteria and the assessment results are presented in Table 27 and Table 28.

Table 27: Rationale for Assigning Scores: Degree of Route Segregation Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Junctions	Options re-assessed as a result of design development since assessment at longlist stage	Only interaction is where public transport route crosses existing minor road, junctions are grade separated	Only interaction is where public transport route crosses existing minor roads. Where public transport route crosses existing road, public transport route has priority	Greater number of junctions but public transport route has priority at all	Not applicable – route is either segregated or not	No segregation or priority at junctions. Junctions have low traffic levels	No segregation or priority at junctions. Junctions have moderate traffic levels	No segregation or priority at junctions. Junctions have high traffic levels
General alignment	Options re-assessed as a result of design development since assessment at longlist stage	Offline route, no interaction with existing traffic along main alignment	Parallel route with interaction with general traffic at junctions	Runs alongside existing carriageway but limited integration with existing traffic except at junctions	Not applicable – route is either segregated or not	Runs alongside existing traffic using separate lanes with some access points or junctions	Runs alongside existing traffic with interaction with existing traffic very likely	No route segregation

Source: Mott MacDonald

Table 28: Option Assessment Results: Degree of Route Segregation Criteria

	INSET Scores	
Option	**Junctions**	**General alignment**
Brown	+2	+3
Blue	+1	+3
Black	+1	+3
Pink	+2	+3
Purple	+2	+3

Source: Mott MacDonald

7.3.1.6 Walking and Cycling Connectivity Criteria

There were three sub-criteria identified under Walking and Cycling Connectivity; two that were assessed qualitatively and one that was assessed quantitatively:

- Quality and directness of new Non-Motorised User (NMU) route (qualitatively assessed);
- Catchment of NMU route (qualitatively assessed); and
- Severance of existing routes (quantitatively assessed).

Options qualitatively assessed against sub-criteria adopted the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against both criteria and the rationale for assigning these scores are presented in Table 29 and Table 30.

Options were assessed quantitively against the remaining sub-criterion based on the number of walking and cycling routes crossed by each shortlisted option; the more routes crossed or severed, the more negative the score. Table 31 shows the rationale for assigning scores and Table 32 shows the actual modelled metrics and the assigned INSET scores based on the rationale.

Table 29: Rationale for Assigning Scores: Walking and Cycling Connectivity Criteria (Qualitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Quality and directness of NMU route	Assessment based on more developed designs and their ability to address issues in the Review of NMU Access Study	Very direct, high quality route	Direct, good quality route	Direct but lower quality route	Not applicable- route is either direct or not	Route is indirect and broken or requires multiple crossings	Route is indirect, broken and/or likely to be poor quality	No NMU route provided
Catchment of NMU route	Households and employment premises within 1km of the NMU route (distance measured from entry points to the route and is the distance from these points that can be covered by travelling along existing roads and paths).	All settlements and employment campuses within 1km of an entry point to NMU route	Most settlements and employment campuses within 1km of an entry point to NMU route	Some residential and employment areas within 1km of an entry point to NMU route	Not applicable- route serves local facilities or not	Limited access to either residential or employment areas within 1km of an entry point to NMU route	Limited access to both residential and employment areas within 1km of an entry point to NMU route	No residential or employment areas within 1km of an entry point to NMU route

Source: Mott MacDonald

Table 30: Option Assessment Results: Walking and Cycling Connectivity Criteria (Qualitative Assessment)

	INSET Scores	
Option	**Quality and directness of NMU route**	**Catchment of NMU route**
Brown	+2	+2
Blue	+2	+2
Black	+2	+2
Pink	+2	+2
Purple	+2	+1

Source: Mott MacDonald

Table 31: Rationale for Assigning Scores: Walking and Cycling Connectivity (Quantitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Severance of existing routes	Number of walking and cycling routes crossed	Reduces severance of routes by 10+	Reduces severance of routes by 6-10	Reduces severance of routes by 1-5	No change	Severance of 1-5 routes	Severance of 6-10 routes	Severance of 10 + routes

Source: Mott MacDonald

Table 32: Option Assessment Results: Walking and Cycling Connectivity (Quantitative Assessment)

	INSET Scores	
Option	**Severance of existing routes**	
	Number of walking and cycling routes crossed	Assigned INSET Score
Brown	9	-2
Blue	11	-3
Black	11	-3
Pink	9	-2
Purple	9	-2

Source: Mott MacDonald

7.3.1.7 Suitability of Travel Hub Facility Criteria

There were six sub-criteria identified under Suitability of Travel Hub Facility, two that were assessed quantitatively and four that were assessed qualitatively:

- Site parking duration or restrictions (qualitatively assessed);
- Site deliverability – on site quality/provision for buses (qualitatively assessed);
- Site accessibility and permeability for public transport (qualitatively assessed);
- Site visibility from the A1307, A505 and A11 (qualitatively assessed);
- Capacity, noting a minimum of 2000 spaces (quantitatively assessed); and
- Site access from the A1307, A505 and A11 (quantitatively assessed).

Options qualitatively assessed against sub-criteria adopted the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against these four sub criteria and the rationale for assigning these scores are presented in Table 33 and Table 36**.**

Options were assessed quantitively against the remaining two sub-criteria. The number of car parking spaces was used as the basis of assessment for capacity. The proportion of traffic that would pass the site from the A1307, A505 and A11 without having to detour to access the site was used to assess option performance in terms of site access.

Assignment of INSET Scores to Capacity Sub-Criterion

Parking capacity for the options ranged between 2,016 and 2,756 spaces, based on the most recent designs at the time of scoring (Doc Ref: 403394-MMD-TRA-00-TN-TA-0076*)*. The range in parking capacity across the options provided a bandwidth of 741 spaces. As 2,000 spaces is the minimum requirement no options scored negatively; a negative score would have been assigned had the facility not met this minimum criterion. However, as all such sites were ruled out at the longlist assessment, negative INSET scores of -1 to -3 were deemed not applicable. This meant that only four INSET scores could be applied, 0, +1, +2 and +3. The scoring range of 741 spaces was split equally over the four scores, providing scoring bands of 185. Table 35 shows the rationale for assigning scores and Table 36 shows the actual capacities and the assigned INSET score based on the rationale.

Assignment of INSET Scores to Site Access Sub-Criterion

All shortlisted options were assigned a neutral score of zero under the Site Access sub-criterion as results produced by the CSRM SATURN model were deemed to be insufficiently detailed at this stage and inclusion of results under this sub-criterion was considered to be inappropriate and misleading. Further work will be undertaken using detailed microsimulation modelling to refine the assessment of this sub-criterion once a preferred option has been selected for CSET Phase 2.

Table 33: Rationale for Assigning Scores: Suitability of Travel Hub Facility (Qualitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Site parking duration or restrictions	Options re-assessed as a result of design development since assessment at longlist stage	Self-enforcing, no requirement for parking restrictions at any time	Self-enforcing, no requirement for parking restrictions at most times	Some potential demand from other uses but not expected to result in need for dedicated enforcement measures	Not applicable - either positive or negative	Parking restrictions and limited enforcement required to prevent unintended use of car park	Parking restrictions and frequent enforcement required to prevent unintended use of car park	Parking restrictions and continuous enforcement required to prevent unintended use of car park
Site deliverability – on site quality/ provision for buses	Options re-assessed as a result of design development since assessment at longlist stage	Site can easily provide high quality provision allowing for quicker public transport interchange, bus journeys, greater use and improved safety	Site delivers good on-site provision and amenities with constraints able to be mitigated at expected lower cost	Site delivers adequate on-site amenities with constraints mitigated at expected higher cost	Site delivers adequate quality on-site amenities with no cost implications	Site delivers minimum on-site amenities with constraints mitigated at expected lower cost	Site provides poor on-site amenities with constraints mitigated at expected higher cost	Site provides poor on-site amenities and with expected significant cost implications
Site accessibility and permeability for public transport	Options re-assessed as a result of design development since assessment at longlist stage	Provides access to the most frequent services with opportunity to increase based on demand and can incorporate multiple services to multiple destinations. Site is very permeable to offline route(s).	Provides access to services with the opportunity to increase based on demand and can incorporate multiple operating services to multiple destinations. Site is permeable to offline route(s).	Provides access to services with the opportunity to increase based on demand. Site is adequately permeable to offline route(s).	No particular advantages or disadvantages to site access location	Provides limited access to services. Site is not permeable to offline route(s).	Provides very limited access to services to the Travel Hub site, which can be influenced by online movements i.e. traffic making the services unreliable. Site is not permeable to offline route(s).	Provides restricted access to services to the Travel Hub site, which can be influenced by online movements. Site is not permeable to offline route(s).
Site visibility from the A1307, A505 and A11	Options re-assessed as a result of design development since assessment at longlist stage	Has good, clear visibility from A1307/A505/A11 with no visual obstructions	Has clear visibility with few visual obstructions	Is mostly visible however does have some visual obstructions for example land level	There is visibility however the site would be mostly reliant on a signage strategy only	Site is mostly obscured and relies on signage	Site is visually obscured and has few opportunities for signage	Visibility is poor and there are no opportunities for signage to the site

Source: Mott MacDonald

Table 34: Option Assessment Results: Suitability of Travel Hub Facility (Qualitative Assessment)

	INSET Scores			
Option	**Site parking duration or restrictions**	**Site deliverability – on site quality/provision for buses**	**Site accessibility and permeability for public transport**	**Site visibility from the A1307, A505 and A11**
Brown	+3	+2	+3	+2
Blue	+3	+3	+3	+1
Black	+3	+3	+3	+1
Pink	+3	+2	+3	+2
Purple	+3	+2	+3	-1

Source: Mott MacDonald

Table 35: Rationale for Assigning Scores: Suitability of Travel Hub Facility (Quantitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Travel Hub capacity	Number of spaces	2756-2571spaces	2571-2386 spaces	2386-2201 spaces	2201-2016 spaces	N/A at shortlist stage – all options meet minimum requirement	N/A at shortlist stage – all options meet minimum requirement	N/A at shortlist stage – all options meet minimum requirement
Site access from the A1307, A505 and A11	N/A	N/A not assessed at this stage	N/A not assessed at this stage	N/A not assessed at this stage	N/A not assessed at this stage	N/A not assessed at this stage	N/A not assessed at this stage	N/A not assessed at this stage

Source: Mott MacDonald

Table 36: Option Assessment Results: Suitability of Travel Hub Facility (Quantitative Assessment)

	INSET Scores			
Option	**Travel Hub Capacity**		**Site access from the A1307, A505 and A11**	
	Number of spaces	Assigned INSET Score	N/A	Assigned INSET Score
Brown	2,757	+3	N/A	0
Blue	2,108	0	N/A	0
Black	2,108	0	N/A	0
Pink	2,521	+2	N/A	0
Purple	2,016	0	N/A	0

Source: Mott MacDonald

7.3.2 Environment Theme

The qualitative approach to assessment of the five shortlisted options against the criteria under the Environment theme involved several desktop studies:

- Existing baseline air quality conditions (especially if near an Air Quality Management Area);
- Existing noise baseline information (if available);
- Historic Environment Record;
- Biological records office information;
- MAGIC (Multi Agency Geographic information for the Countryside);
- Local planning policies related to environment;
- Identification of areas with special protective measures/policies (e.g. Conservation Areas and Greenbelt);
- Any existing users of water resources such as licensed water abstractions, surface and groundwater discharge consents, private abstractions registered by local authority;
- Flood risk;
- Historic land use (especially any information on waste sites); and
- Land quality/soils – identification of soil classification.

Following on from this, several environmental surveys were undertaken:

- A Phase 1 habitat survey;
- A selection of key landscape viewpoint images (to inform consultation); and
- Seeking to address any gaps in air quality and noise monitoring that are key to OBC assessment (i.e. if we have no information in large sections where there could be sensitive receptors, or if there are specific community concerns that would benefit from more up to date/local information).

After this review and gathering of data, the interaction between environment and other disciplines was identified as indicated in the table below. This highlighted where primary data was required for environmental topics for assessment of the five shortlisted options.

Table 37: Interaction of Environmental Assessment Criteria with Other Disciplines

Topic	Traffic Modelling	Design	Social/Land use information	Planning
Air Quality	Yes	Yes	Yes	Yes
Biodiversity		Yes		Yes
Greenhouse Gases	Yes	Yes		Yes
Heritage		Yes		Yes
Landscape		Yes		Yes
Noise and vibration	Yes	Yes	Yes	Yes
Water	Yes	Yes		Yes

Source: Mott MacDonald

An assessment methodology for the main topics listed above was developed that generally followed WebTAG worksheets and produced the outputs required for INSET, in line with the assessment criteria that fall under the Environment theme.

A description was provided in respect of environmental constraints for the study area based on desk studies and site works. This was covered by maps and descriptions to illustrate the following:

- Sensitive social receptors (schools, hospitals etc – linked to air quality/noise);
- Air quality management areas (if applicable) and air quality monitoring locations (and contours/mapping if available);
- Noise monitoring locations (and results if available);
- Water resources including any Source Protection Zones and licensed abstractions using information provided by the Environment Agency;
- Flood zones (Environment Agency and local authority information);
- All protected sites related to biodiversity;
- Tree Preservation Order (TPO) sites;
- Public Rights of Way (PROW);
- Historic Environment Records (HER) records to show all listed buildings/scheduled monuments and other notable heritage assets;
- Green belt;
- Conservation Areas; and
- Any other location specific sensitivities/constraints not included above.

Section 7.3.2.1 details the results of appraisal against each of the criteria under this theme and the basis or rationale for that appraisal.

7.3.2.1 Environment Criteria

Unlike the Transport Benefits theme, no sub-criteria were identified under the Environment theme and assessment of options against all criteria was qualitative in nature; adopting the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against the seven Environment criteria and the rationale for assigning these scores are presented in Table 38 and Table 39.

It should be noted that at the time of writing insufficient data was available to robustly assess any of the options relative to the impact they may have on Greenhouse Gases. A score of zero has therefore been assigned in INSET for all options and has been used in this case to effectively negate this criterion. The zero score for Greenhouse Gases should not however be interpreted as having a neutral effect as is the case for zero scores against other Environment criteria.

Table 38: Rationale for Assigning Scores: Environmental Criteria

		Rationale/Basis for Assigning INSET Scores						
Criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Visual Impact	Based on desk studies and site works described in Section 7.3.2	Major Benefit: e.g. Route contributes to improvement of landscape that provide national benefit	Moderate Benefit: e.g. Route contributes to improvement of landscape that provide regional benefit (local plan)	Minor Benefit: e.g. Route contributes to improvement of landscape that provide local benefit	Neutral - no or negligible change	Minor Adverse: e.g. Route creates negative impact on landscape at local scale	Moderate Adverse: e.g. Route creates negative impact on landscape at regional (local plan) scale	Major Adverse: e.g. Route creates negative impact on nationally important landscape
Noise	Based on desk studies and site works described in Section 7.3.2	Major Benefit: e.g. Route leads to marked reduction in noise at substantial number of sensitive receptors along majority of route	Moderate Benefit: e.g. Route leads to reduction in noise at sensitive receptors along about half the route	Minor Benefit: e.g. Route leads to minor reduction in noise at sensitive receptors in some locations along route	Neutral - no or negligible change	Minor Adverse; e.g. Route will increase noise levels to some sensitive receptors along route	Moderate Adverse: e.g. Route leads to increased noise levels at sensitive receptors along half the route	Major Adverse: e.g. Route leads to market increase in noise at substantial number of receptors along majority of route.
Air Quality	Based on desk studies and site works described in Section 7.3.2	Major Benefit: e.g. Significant improvement in air quality in AQMA	Moderate Benefit: e.g. Moderate improvement in air quality in AQMA	Minor Benefit: e.g. Slight improvement in air quality outside AQMA	Neutral - no or negligible change	Minor Adverse: e.g. Slight deterioration in air quality due to option outside AQMA	Moderate Adverse; e.g. Moderate deterioration in air quality due to option in AQMA	Major Adverse: e.g. Significant deterioration in air quality due to option affecting AQMA
Water	Based on desk studies and site works described in Section 7.3.2	Major Benefit: e.g. improvement in Water Framework Directive water body status	Moderate Benefit: e.g. improvement in water quality from contaminated land clean up	Minor Benefit: e.g. local improvement to water conveyance or protection of sensitive water dependent ecosystem	Neutral - no or negligible change	Minor Adverse: e.g. Proposed route crosses flood zones of non-main rivers or Source Protection Zone (SPZ) 2	Moderate Adverse: e.g. Proposed route crosses flood zones of main rivers with some reduction in flood storage or crosses SPZ 1.	Major Adverse: e.g. Proposed route negatively affects status of WFD groundwater body or causes significant reduction in water conveyance.

		Rationale/Basis for Assigning INSET Scores						
Biodiversity	Based on desk studies and site works described in Section 7.3.2	Major Benefit: e.g. +20% increase in biodiversity net gain and no impacts on nationally protected sites	Moderate Benefit: e.g. 10% increase in BNG	Minor Benefit: e.g. 10% increase in BNG and impact on locally important sites that are not readily mitigated nearby	Neutral - no or negligible change	Minor Adverse: e.g. Neutral increase in BNG, Impact on hedgerows and woodlands.	Moderate Adverse: e.g. Negative impact on BNG, impact on locally important conservation sites with no mitigation nearby	Major Adverse: e.g. Negative impact on BNG - impact on SSSI or similar designated site or EPS with limited mitigation potential.
Heritage	Based on desk studies and site works described in Section 7.3.2	Major Benefit: e.g. Recovery of lost landscape features in nationally designated area that leads to improvement in status/condition rating of the asset.	Moderate Benefit; e.g. Improvements to nationally designated asset	Minor Benefit: e.g. Improvement to locally important asset	Neutral - no or negligible change	Minor Adverse: e.g. Slight indirect impact on setting of scheduled monuments / listed buildings / conservation areas. Works in area with limited buried archaeology potential based on HER and likely effect on buried archaeology of local importance	Moderate Adverse: e.g. Visual impact or partial full/partial loss of lower grade of listed buildings; work in a conservation area with some effect on setting; Works in area with good HER and likely effect on buried archaeology of regional importance	Major Averse: e.g. Severe direct impact or loss of scheduled monuments / grade I listed building. Direct changes to nature of conservation areas. Evidence for high value buried archaeology that is likely to be directly affected.
Impact on Green belt	Based on desk studies and site works described in Section 7.3.2	Major Benefit: e.g. option results in full restoration of green belt function through removal of inappropriate development	Moderate Benefit: e.g. option e results in some restoration of green belt functions in area of inappropriate development	Minor Benefit: e.g. option e results in minor improvements to green belt function in limited locations	Neutral - option not in green belt	Minor Adverse: e.g. Nature of development in green belt has no significant impacts on green belt function.	Moderate Adverse: e.g. Most of option in green belt with options to mitigate impacts on function of green belt.	Major Adverse; e.g. all option in green belt and nature of development is not likely to preserve functions of green belt (e.g. housing development).
Greenhouse Gases (GHG)	Insufficient modelling data to be able to make a valid assessment at this time	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Mott MacDonald

Table 39: Option Assessment Results: Environmental Criteria

	INSET Scores							
Option	**Visual Impact**	**Noise**	**Air Quality**	**Water**	**Biodiversity**	**Heritage**	**Impact on Greenbelt**	**Greenhouse gases**
Brown	-2	-1	0	0	-2	-3	-2	0
Blue	-2	-1	0	0	-2	-3	-2	0
Black	-2	-1	0	0	-2	-3	-2	0
Pink	-2	-1	0	0	-2	-3	-2	0
Purple	-2	-1	0	0	-2	-3	-2	0

Source: Mott MacDonald

7.3.3 Deliverability Theme

There are seven criteria under the Deliverability theme and as they are quite diverse several approaches were adopted to score the shortlisted options against criteria under this theme.

Public acceptability has been linked to the quantitative assessments relating to environment, traffic and impact on residential dwellings. Where stakeholder feedback was available, this was used to assess options against the “Degree of Objection Expected” criterion.

Each shortlisted option was developed to a greater level of detail, allowing cost estimates under the criterion of “Option Costs” to be refined with the forecast costs informing how options have been scored. Similarly, scoring against operating costs and potential subsidy was based on financial estimates.

Assessment against the criterion of “Engineering Feasibility - Construction Method” was based on a combined qualitative and quantitative assessment which took account of the difficulty in accessing sites and the number of structures such as bridges, embankments and cuttings required.

Scoring against the criterion of “Land Acquisition Required” reflected the value of land which would need to be purchased for each shortlisted option and the extent to which the route would divide existing field boundaries.

The shortlisted options were assessed against the “Impact on Other Transport Networks” using a qualitative assessment of the degree of impact expected and a quantitative assessment of the number of users expected to be affected, based on existing usage data where available.

Finally, the criteria of “Future Proofing” and “Risks to Delivery” were qualitative assessments which were updated from the scores provided at the previous stage to reflect the greater level of option development and, therefore, amount of information available to make these assessments.

Sections 7.3.3.1 to 7.3.3.7 detail the results of appraisal against each of the criteria and sub-criteria under this theme and the basis or rationale for that appraisal.

7.3.3.1 Degree of Objection Expected Criteria

There were three sub-criteria identified under Degree of Objection Expected:

- Loss of environmentally sensitive areas;
- Impact on existing residential dwellings; and
- Impact on general traffic.

Options were qualitatively assessed against these three sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against these sub-criteria and the rationale for assigning these scores are presented in Table 40 and Table 41.

Table 40: Rationale for Assigning Scores: Degree of Objection Expected Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Loss of environmentally sensitive areas	Options re-assessed as a result of design development since assessment at longlist stage and in view of stakeholder feedback (inc. LLF)	Expected to be very strongly supported with no impact on the environment	Expected to be well supported with no impact on the environment	Expected to generate moderate support	Not expected to generate significant public support or opposition	Expected opposition as a result of impact on environment	Expected strong opposition. Large impact on environmentally sensitive sites	Expected very strong opposition. Loss of environmentally sensitive sites
Impact on existing residential dwellings	Options re-assessed as a result of design development since assessment at longlist stage and in view of stakeholder feedback (inc. LLF)	Expected to be very strongly supported with no impact on residential amenity	Expected to be well supported with no impact on residential amenity	Expected to generate moderate support	Not expected to generate significant public support or opposition	Expected opposition. Slight impact on residential amenity	Expected strong opposition. Greater impact on residential amenity	Expected very strong opposition. Loss of residential premises
Impact on general traffic	Options re-assessed as a result of design development since assessment at longlist stage and in view of stakeholder feedback (inc. LLF)	Expected to be very strongly supported with no impact on general traffic	Expected to be well supported with no impact on general traffic	Expected to generate moderate support	Not expected to generate significant public support or opposition	Expected opposition. Slight impact on traffic	Expected strong opposition. Large impact on traffic	Expected very strong opposition. Major impact on traffic

Source: Mott MacDonald

Table 41: Option Assessment Results: Degree of Objection Expected Criteria

	INSET Scores		
Option	**Loss of environmentally sensitive areas**	**Impact on existing residential dwellings**	**Impact on general traffic**
Brown	-2	-1	0
Blue	-1	-1	0
Black	-1	-1	0
Pink	-2	-1	0
Purple	-2	-1	0

Source: Mott MacDonald

7.3.3.2 Option Costs Criteria

There were three sub-criteria identified under Option Costs, all assessed quantitatively:

- Capital costs;
- Operating costs; and
- Potential subsidy.

Options were assessed quantitively using the construction cost estimates prepared for the design developed options. Capital costs included the costs of building the infrastructure associated with both the route and the Travel Hub facility, land acquisition and compensation costs, legal and planning fees, statutory diversions, traffic management, archeological investigation and landscape maintenance. A risk allowance of 29% was also factored in based on P90 levels. The highest figure of the approximated cost range for each option was used. The costliest option was estimated at £141,684,832 and the least costly at £97,891,887. On the basis that incursion of costs is not positive as there is no value considered in these figures, all options have therefore been scored negatively (-1, -2 or -3). Scores have been assigned based on the percentage differential between the cost of each option cost and that of the lowest cost option.

Operating costs were based on the costs of operating and maintaining the bus services and took into account the size of fleet required, operating km and length of route – longer routes requiring more maintenance than shorter ones. Costs also included labour, maintenance, fuel, insurance and an allowance for depreciation. The costliest options were estimated at £3,391,708 per year and the least costly at £ 3,130,808. On the basis that incursion of costs is not positive as there is no value considered in these figures, all options have therefore been scored negatively (-1, -2 or -3). Scores have been assigned based on the percentage differential between the cost of each option and that of the lowest cost option.

It was initially thought that potential subsidy could be based on the annual forecast revenues derived from modelled forecast demand minus annual operating costs. However, with hindsight, revenue and subsidy calculations were found to be both speculative at this stage and complex; it was also felt that this one criterion would be unlikely to influence the selection of a preferred option. A decision was therefore made not to include an assessment against this criterion and INSET scores were all assigned zero so that overall scores were not impacted.

Table 42 shows the rationale for assigning scores and Table 43 shows the actual modelled metrics and the assigned INSET scores based on the rationale.

Table 42: Rationale for Assigning Scores: Option Costs Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Capital costs	Based on cost estimates	N/A	N/A	N/A	N/A	Capital costs within 0 to 5% of lowest cost option (£97,891,887 - £102,786,982)	Capital costs within 5 to 10% of lowest cost option (£102,786,983 - £107,681,076)	Capital costs > 10% higher than lowest cost option (£107,681,077 and upwards)
Annual operating costs	Based on annual cost estimates	N/A	N/A	N/A	N/A	Operating costs within 0 to 5% of lowest cost option (£3,130,808 - £3,287,348)	Operating costs within 5 to 10% of lowest cost option (£3,287,349 - £3,443,889)	Operating costs > 10% higher than lowest cost option (£3,443,890 and upwards)
Potential annual subsidy	Forecast revenues minus operating costs	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Mott MacDonald

Table 43: Option Assessment Results: Option Costs Criteria

	INSET Scores					
Option	**Capital costs**		**Annual operating costs**		**Potential annual subsidy**	
	Estimated capital costs	Assigned INSET Score	Estimated operating costs	Assigned INSET Score	Estimated subsidy	Assigned INSET Score
Brown	£112,739,063	-3	£3,130,808	-1	N/A	0
Blue	£141,684,832	-3	£3,391,708	-2	N/A	0
Black	£134,929,806	-3	£3,391,708	-2	N/A	0
Pink	£111,357,683	-3	£3,130,808	-1	N/A	0
Purple	£97,891,887	-1	£3,130,808	-1	N/A	0

Source: Mott MacDonald

7.3.3.3 Engineering Feasibility Criteria

There were three sub-criteria identified under Engineering Feasibility:

- Accessibility to site during construction;
- Complexity of junctions; and
- Structural complexity.

Options were qualitatively assessed against these three sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against these sub-criteria and the rationale for assigning these scores are presented in Table 44 and Table 47.

Table 44: Rationale for Assigning Scores: Engineering Feasibility Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Accessibility to site during construction	Options re-assessed as a result of design development since assessment at longlist stage	No work required with significant benefit over other options	No work required	Limited work required with few access constraints	Limited complexity or relative advantage	Route can be accessed alongside existing major roads (A1307)	Offline route requiring new construction access routes	Offline route with substantial access constraints
Complexity of junctions	Options re-assessed as a result of design development since assessment at longlist stage	No work required to existing junctions or new junctions created	Some minor modifications to existing junctions	Some minor new junctions created	Greater work required but no impact on project complexity foreseen	Greater changes to existing junctions but not expected to be complex	Changes to existing junctions likely to have large impact on existing junctions	Changes to existing junctions likely to have major impact on existing junctions
Structural complexity	Options re-assessed as a result of design development since assessment at longlist stage	Simple alignment with no structural requirements	Simple alignment with limited structural requirements	Requirement for single bridge or large structure only	Greater work required but no impact on project complexity foreseen	Requirement for single river bridge and single minor road bridge	Requirement for multiple river and minor road bridges and/ or bridge over strategic road network	Requirement for multiple river and minor road bridges and bridge over the strategic road network

Source: Mott MacDonald

Table 45: Option Assessment Results: Engineering Feasibility Criteria

	INSET Scores		
Option	**Accessibility to site during construction**	**Complexity of junctions**	**Structural complexity**
Brown	-2	-1	-2
Blue	-2	-1	-3
Black	-2	-1	-3
Pink	-2	-1	-2
Purple	-3	-2	+1

Source: Mott MacDonald

7.3.3.4 Land Acquisition Required Criteria

There were two sub-criteria identified under Land Acquisition Required, all assessed quantitatively:

- Quantity of land required for both route and Travel Hub facility; and
- Division of field boundaries as a result of the route.

Options were assessed quantitively, with the quantity of land required based on the amount of land needed for both the route alignment and the Travel Hub facility, measured in square metres ($m^{2)}$ and division of field boundaries based on the number of fields that needed to be divided (bisected) to construct the route. The approach to converting the quantitative metrics into an INSET score is noted below.

Quantity of Land Required

From the shortlist of options, the least land take was 930,537m^2 and the greatest was 1,109,488m^2. This is a range of 178,951m^2. Divided into equal bandwidths across the seven possible INSET scores, resulted in intervals of 25,564m^2. It was assumed the greater the land take, the more negative the score and this will have cost implications.

Division of Field Boundaries

All options caused fields to be divided; the fewest field divisions was 12 and the greatest 15, a range of 4. On the assumption that division of fields for the purposes of taking land to construct the route, potentially reducing the viability of the remaining parcels of land for agricultural use, was a negative impact, neutral and positive INSET scores were deemed not applicable. As such the range in the number of field divisions was spread over the three negative INSET scores as evenly as practically possible, noting that to split the range equally would have resulted in divisions across fractions of a single field, which is infeasible.

Table 46 shows the rationale for assigning scores and Table 47 shows the actual metrics and the assigned INSET scores based on the rationale.

Table 46: Rationale for Assigning Scores: Land Acquisition Required Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Quantity of land required	m^2 of land taken for the route alignment and the Travel Hub facility	930,537m^2 – 956,101^2	956,101m^2 - 981,666m^2	981,666m^2 - 1,007,230m^2	1,007,230m^2 - 1,032,795m^2	1,032,795m^2 – 1,058,359m^2	1,058,359m^2 - 1,083,924m^2	1,083,924m^2 - 1,109,488m^2
Division of field boundaries	Number of fields divided (bisected)	N/A	N/A	N/A	N/A	13 or fewer divisions	14 divisions	15 or more divisions

Source: Mott MacDonald

Table 47: Option Assessment Results: Land Acquisition Required Criteria

	INSET Scores			
Option	**Quantity of land required**		**Division of field boundaries**	
	m^2 (route and Travel Hub facility)	Assigned INSET Score	Number of fields divided (bisected)	Assigned INSET Score
Brown	99,082m^2	+1	12	-1
Blue	1,012,071m^2	0	14	-2
Black	1,109,488m^2	-3	15	-3
Pink	1,009,650m^2	0	13	-1
Purple	930,537m^2	+3	12	-1

Source: Mott MacDonald

7.3.3.5 Impact on Transport Networks During Construction Criteria

There were three sub-criteria identified under Impact on Transport Networks During Construction:

- Impact on road network;
- Impact on rail network; and
- Impact on Non-Motorised Users (NMUs).

Options were qualitatively assessed against these three sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The assessment against “Impact on road network” took into account the expected level of disruption that construction of the respective options would have on the existing road network, for example, as a result of the need for road closures. The assessment against “Impact on rail network” focused on the expected impact the options would have on rail services whilst the “Impact on NMUs” assessment addressed the disruption which is likely to be caused to pedestrians, cyclists and equestrians during the construction process and whether it is expected that these impacts could be mitigated, for example, through diversions.

The results of the assessment of the five shortlisted options against these sub-criteria and the rationale for assigning these scores are presented in Table 48 and Table 49.

Table 48: Rationale for Assigning Scores: Impact on Transport Networks During Construction Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Impact on road network	Based on design development since assessment at longlist stage	Not applicable – no possibility of a positive impact on the road network during construction	Not applicable – no possibility of a positive impact on the road network during construction	Not applicable – no possibility of a positive impact on the road network during construction	Work generally away from the existing road network	Some works alongside existing roads. Expected limited disruption to traffic using these.	Significant work alongside existing roads expected to result in disruption to existing traffic. Construction of bridge over existing minor road.	Closure or significant disruption to major road network expected (including bridge construction over strategic roads)
Impact on rail network	Based on design development since assessment at longlist stage	Not applicable – no possibility of a positive impact on the rail network during construction	Not applicable – no possibility of a positive impact on the rail network during construction	Not applicable – no possibility of a positive impact on the rail network during construction	Work completely away from the existing rail network	Some works alongside existing railway. Expected limited disruption.	Significant work alongside existing railway expected to result in disruption	Closure or significant disruption to railway network expected
Impact on Non-Motorised Users (NMUs)	Based on design development since assessment at longlist stage	Not applicable – no possibility of a positive impact on NMU network during construction	Not applicable – no possibility of a positive impact on NMU network during construction	Not applicable – no possibility of a positive impact on NMU network during construction	Work generally away from the existing NMU network	Some works alongside or across existing NMU routes. Expected mitigation to limit disruption to NMUs using these.	Significant work alongside existing NMU routes. Expected mitigation to minimise disruption to NMUs using these.	Closure or significant disruption to busy NMU routes required with no diversion

Source: Mott MacDonald

Table 49: Option Assessment Results: Impact on Transport Networks During Construction Criteria

	INSET Scores		
Option	**Impact on road network**	**Impact on rail network**	**Impact on NMU's**
Brown	-2	0	-1
Blue	-3	0	-1
Black	-3	0	-1
Pink	-2	0	-1
Purple	-2	0	-1

Source: Mott MacDonald

7.3.3.6 Future Proofing Criteria

There were two sub-criteria identified under Future Proofing:

- Range of vehicle usability; and
- Extension to Haverhill.

Options were qualitatively assessed against these two sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The assessment against "Range of vehicle usability" took into account the scope for different vehicle types to use the route options. The assessment against "Extension to Haverhill" focused on how feasible it would be to extend each option to the east side of the Abingtons and, if so, whether this would be via a dedicated alignment or the existing road network.

The results of the assessment of the five shortlisted options against these sub-criteria and the rationale for assigning these scores are presented in Table 50 and Table 51.

Table 50: Rationale for Assigning Scores: Future Proofing Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Range of vehicle usability	The scope for different vehicle types to use the option	No constraints to future extension and use by different vehicle types	Suitable for use by likely CAM vehicles	Route retains some flexibility for use by different vehicles in future	Route not expected to prohibit use by various vehicle types but not specifically designed for their use	Route may need modifying to allow future use by certain vehicle types	Route could be used by CAM vehicles but would not provide dedicated infrastructure	Future use by CAM vehicles not possible without significant redesign
Extension to Haverhill	Assessed based on design development and the likely feasibility of connecting each route option to the A1307 south of Great Abington via the former Haverhill railway	Route fully supports future extension towards Haverhill with no modification expected	Route supports extension towards Haverhill with very limited modification expected	Route supports extension towards Haverhill with some minor diversion expected	As a minimum, could re-join existing A1307. Not considered negative as alignment would not prevent future use of the A1307 but not positive as not linking to an opportunity to provide a dedicated route	Option expected to require diversion	Option expected to require significant diversion in order to serve Haverhill	Option likely to preclude a future extension to Haverhill

Source: Mott MacDonald

Table 51: Option Assessment Results: Future Proofing Criteria

	INSET Scores	
Option	**Range of vehicle usability**	**Extension to Haverhill**
Brown	+2	+3
Blue	+2	0
Black	+2	0
Pink	+2	+3
Purple	+2	+3

Source: Mott MacDonald

7.3.3.7 Risks to Delivery Criteria

There were two sub-criteria identified under Risks to Delivery:

- Consents; and
- Complexity.

Options were qualitatively assessed against these two sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The assessment against “Consents” was based on advice from Mott MacDonald’s planning team and for each option took into account the level of risk that planning consent may not be approved. The risk assessment looked at erosion of green belt, proximity of dwellings and businesses, and environmental impacts. The assessment against “Complexity” focused on the amount of infill and backfill required and number of structures and the type of land the route would cross.

The results of the assessment of the five shortlisted options against these sub-criteria and the rationale for assigning these scores are presented in Table 52 and Table 53.

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Table 52: Rationale for Assigning Scores: Risks to Delivery Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Consents	Level of risk that planning consent may not be given	No risk to delivery as a result of no need to go through planning process	Very low risk to project delivery on basis of all works being within the public highway and only local highway authority approvals being required	Low risk to project delivery on basis of simple consents process expected (may require local planning authority as well as highway authority approval)	Risk scored as either positive or negative based on risk category	Moderate risk to project delivery. Full planning consent process required. Routes alongside existing roads considered lower risk because of footprint, visual impact and impact on green belt.	High risk to project delivery. Full planning consent process required. Routes predominantly along new alignment considered higher risk because of associated impacts and potential opposition.	Very high risk to project delivery. Full planning consent process required. Routes predominantly along new route alignment and using unique/ untried design and technology meaning consents process has added uncertainty and risk.
Complexity	Based on amount of infill and backfill calculated and number of structures and the type of land the route would cross	No risk to delivery - option with no structural or embankment work	No risk to delivery - basic option with limited embankment work	Low risk to project delivery - basic option e with single bridge/ structure requirement, simple permissions process	Risk scored as either positive or negative based on risk category	Moderate risk to project delivery. Small bridge/ structure requirement, complex permissions process.	High risk to project delivery bridge/ structure requirement (s), complex permissions process OR land in non-farm use or development site. Could be mitigated.	Very high risk to project delivery bridge/ structure requirement (s), complex permissions process AND land in non-farm use or development site. Cannot be mitigated.

Source: Mott MacDonald

Table 53: Option Assessment Results: Risks to Delivery Criteria

	INSET Scores	
Option	**Consents**	**Complexity**
Brown	-2	-1
Blue	-2	-2
Black	-2	-2
Pink	-2	-1
Purple	-2	-1

Source: Mott MacDonald

7.3.4 Social Impacts (Quality of Life) Theme

There are six criteria under the Social Impacts theme and as they are quite diverse several approaches were adopted to score the shortlisted options under this theme.

Impacts on the criterion of “Safety” were quantified by using the Marginal External Costs (MEC) method. MEC is a DfT approved method which can be used to assess the economic benefits associated with Accident Saving benefits.

Route directness and accessibility to employment sites covered by the criteria “Links to Cambridge Biomedical Campus”, “Links to Babraham Research Park” and “Links to Granta Park” were assessed using journey time analysis from either end of the route to the site itself. For sites not served directly, this included an assessment of the transfer time on foot. The impact on masterplan proposals for each site and landowner acceptability was assessed qualitatively by updating the assessment undertaken at the previous stage.

Assessment of shortlisted options against the “Loss of Homes and Commercial Property” criterion was based on the number and size of properties lost as a result of the implementation of each option.

The “Improvements to Physical Wellbeing” criterion assessed the uptake of walking and cycling of each option in a quantitative manner using the outputs of modelling data.

Sections 7.3.4.1 to 7.3.4.6 detail the results of appraisal against each of the criteria and sub-criteria under this theme and the basis or rationale for that appraisal.

7.3.4.1 Safety Criteria

There were three sub-criteria identified under Safety; one that was assessed qualitatively and two that were assessed quantitatively:

- Changes to personal safety (qualitatively assessed);
- Changes to vehicular accident rates (quantitatively assessed) and
- Changes to NMU accident rates (quantitatively assessed).

Options qualitatively assessed against the personal safety sub-criterion adopted the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against this criterion and the rationale for assigning the scores are presented in Table 54 and Table 55. The rationale was based on guidance from Section 4 of WebTAG Unit 4.1 Social Impact Appraisal, and expert knowledge from a Social and Distributional Impact Appraisal practitioner within Mott MacDonald’s Economic and Social Development Division.

Options were assessed quantitively against the “Changes to vehicular accident rates” criterion, based on accident saving benefits calculated using the Marginal External Costs (MEC) method. Scoring bands have been assigned based on the latest cost per accident data produced by the DfT[9].

“Changes to NMU accident rates” were calculated by filtering out pedestrian and cyclist accidents from the 2014-2018 Cambridge STATS19 data to assess NMU accidents. The links for each option were buffered by 1km to create an accident study area. From here, all links in the wider network

[9] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/244913/rrcgb2012-02.pdf [Accessed 14/10/19]

that intersected this 1km buffer area were extracted. The NMU accident points were given the link ID of the link that was geographically closest to them.

It is important to note that in TAG Unit A4.2, the guidance is written to assess all casualties, not NMU casualties specifically. The guidance suggests that only links with over 50 casualties should be assessed. As NMU casualties make up a smaller proportion of the total profile, this was not appropriate. Analysis found that NMU casualties made up 41% of the total casualties in the Cambridge dataset, so this proportion was applied to the guide figure of 50 to make a figure appropriate for NMU analysis. This was rounded to 20. None of the five shortlisted options had links with sufficient NMU casualties, and as a result of this all options have been scored as neutral.

Table 56 shows the rationale for assigning scores and Table 57 shows the actual modelled metrics and the assigned INSET scores based on the rationale.

Table 54: Rationale for Assigning Scores: Safety Criteria (Qualitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Changes to personal safety	Assessment based on guidance from Section 4 of WebTAG Unit 4.1 Social Impact Appraisal	Areas used by passengers will be appropriately lit to daylight standards. Design and materials in the surrounding areas should encourage informal surveillance and formal surveillance will be in place using appropriately placed CCTV and manned staff facilities.	Most, but not all, passenger areas will be lit to daylight standards. Some evidence of positive use of design and materials in the surrounding areas to encourage informal surveillance and formal surveillance in place using CCTV and manned staff facilities.	Some passenger areas will be lit to daylight standards. Formal surveillance will be in place, but not in the most effective places and staff surveillance will be somewhat limited by design. Evidence of some positive landscaping features contributing to reasonable visibility levels and informal surveillance.	No real impact on real and perceived levels personal security.	CCTV surveillance would be limited and ineffective as a result of poorly placed cameras and obstructions which could inhibit views. Poor lighting in all areas and some isolation could have slight negative personal safety implications.	Formal surveillance will be very limited, and areas will be isolated which could inhibit visibility and encourage intruders. Lighting would be limited and design materials unfavourable.	Design will inhibit visibility and no formal surveillance will be in place. There will be segregation from other human activity which will limit informal surveillance and very poor or no lighting throughout would give negative personal safety implications.

Source: Mott MacDonald

Table 55: Option Assessment Results: Safety Criteria (Qualitative Assessment)

	INSET Scores
Option	**Changes to personal safety**
Brown	+2
Blue	+2
Black	+2
Pink	+2
Purple	+2

Source: Mott MacDonald

Table 56: Rationale for Assigning Scores: Safety (Quantitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Changes to vehicular accident rates	Accident Saving Benefits (2020 Prices, £,000)	>£10m	£5-£10m	£0m-£5m	N/A	N/A	N/A	N/A
Changes to NMU accident rates	Traffic speed and flow data combined with NMU STATS19 data on existing adjacent links	Over 20 NMU accidents per link and flow reduces by 30%	Over 20 NMU accidents per link and flow reduces by 20%	Over 20 NMU accidents per link and flow reduces by 10%	Less than 20 NMU accidents per link	Over 20 NM accidents per link and flow increases by 10%	Over 20 NM accidents per link and flow increases by 20%	Over 20 NM accidents per link and flow increases by 30%

Source: Mott MacDonald

Table 57: Option Assessment Results: Safety (Quantitative Assessment)

	INSET Scores			
Option	**Changes to vehicular accident rates**		**Changes to NMU accident rates**	
	Accident Saving Benefits (2010 Prices, £,000)	Assigned INSET Score	Modelling outputs (NMU accidents per link)	Assigned INSET Score
Brown	£26.9	+1	Less than 20 NMU accidents per link	0
Blue	£26.8	+1	Less than 20 NMU accidents per link	0
Black	£23.7	+1	Less than 20 NMU accidents per link	0
Pink	£23.8	+1	Less than 20 NMU accidents per link	0
Purple	£26.9	+1	Less than 20 NMU accidents per link	0

Source: Mott MacDonald

7.3.4.2 Access to Cambridge Biomedical Campus Criteria

There were four sub-criteria identified under Access to Cambridge Biomedical Campus; two that were assessed qualitatively and two that were assessed quantitatively:

- Compatibility with masterplan proposals (qualitatively assessed);
- Landowner support (qualitatively assessed);
- Degree to which campus is served (quantitatively assessed); and
- Directness of route (quantitatively assessed).

Options qualitatively assessed against sub-criteria adopted the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against these two sub-criteria and the rationale for assigning these scores are presented in Table 58 and Table 59.

Options were assessed quantitively against the remaining sub-criteria. The degree to which the campus is served is based on service frequency of bus services where routes extend to the campus, with a more negative score given where services have a low frequency or do not directly serve the campus. Directness of route is based on public transport journey times extracted from the Saturn model and added to the walking time from the closest public transport stop or Travel Hub site to the center of the campus. Table 60 shows the rationale for assigning scores and Table 63 shows the actual modelled metrics and the assigned INSET score based on the rationale.

Table 58: Rationale for Assigning Scores: Access to Cambridge Biomedical Campus Criteria (Qualitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Compatibility with masterplan proposals	Assessment based on more developed designs and stakeholder feedback	Public transport route proposal fundamental to delivery of masterplan	Public transport proposal will support implementation of masterplan	Public transport proposal not expected to impact on implementation of masterplan although may require some changes to road layout/ junctions and/or landscaping	Not applicable as either positive or negative criterion	Proposal may have some minor inconsistencies with masterplan proposals. Expected to require limited change to masterplan proposals.	Proposal highly likely to be incompatible with masterplan proposals but could be amended. Changes to route or masterplan proposals may be substantial.	Proposal incompatible with masterplan proposals and cannot be mitigated
Landowner support	Assessment based on more developed designs and stakeholder feedback	Route promoted by landowners	Route expected to be well supported by landowners	Landowner support likely	Landowners have expressed no preference	Limited opposition from landowners expected but could be mitigated	Strong opposition from landowners expected but could be mitigated	Very strong opposition from landowners expected. Unlikely that this could be mitigated.

Source: Mott MacDonald

Table 59: Option Assessment Results: Access to Cambridge Biomedical Campus (Qualitative Assessment)

	INSET Scores	
Option	**Compatibility with masterplan proposals**	**Landowner support**
Brown	+2	+2
Blue	+2	+2
Black	+2	+2
Pink	+2	+2
Purple	+2	+2

Source: Mott MacDonald

Table 60: Rationale for Assigning Scores: Access to Cambridge Biomedical Campus Connectivity (Quantitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Degree to which campus is served	Frequency of service	Every 10 minutes or less	Every 10-20 minutes	Every 20-30 minutes	Every 30-40 minutes	Every 40-50 minutes	Less frequent than every 50 minutes	No direct service
Directness of route	Public transport journey time plus walking time from the nearest public transport stop	Journey time ≥ 20% quicker than existing travel time	Journey time 20% - 10% quicker than existing travel time	Journey time 0% to 10% quicker than existing travel time	Journey time equal to existing travel time	Journey time 0% to 10% slower than existing travel time	Journey time 20% - 10% slower than existing travel time	Journey time ≥ 20% slower than existing travel time

Source: Mott MacDonald

Table 61: Option Assessment Results: Access to Cambridge Biomedical Campus (Quantitative Assessment)

	INSET Scores			
Option	**Degree to which campus is served**		**Directness of route**	
	Frequency of service	Assigned INSET Score	Public transport journey time plus walking time from closest public transport stop (mins)	Assigned INSET Score
Brown	Every 7.5 minutes	+3	22	+3
Blue	Every 7.5 minutes	+3	24	+2
Black	Every 7.5 minutes	+3	25	+2
Pink	Every 7.5 minutes	+3	22	+3
Purple	Every 7.5 minutes	+3	22	+3

Source: Mott MacDonald

7.3.4.3 Access to Babraham Research Campus Criteria

There were four sub-criteria identified under Access to Babraham Research Campus; two that were assessed qualitatively and two that were assessed quantitatively:

- Compatibility with masterplan proposals (qualitatively assessed);
- Landowner support (qualitatively assessed);
- Degree to which campus is served (quantitatively assessed); and
- Directness of route (quantitatively assessed).

Options qualitatively assessed against sub-criteria adopted the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against these two sub-criteria and the rationale for assigning these scores are presented in Table 62 and Table 63. Options were assessed quantitively against the remaining sub-criteria. The degree to which the campus is served is based on service frequency of bus services where routes extend to the campus, with a more negative score given where services have a low frequency or do not directly serve the campus. Directness of route is based on public transport journey times extracted from the SATURN model and added to the walking time from the closest public transport stop or Travel Hub site to the centre of the campus. Table 64 shows the rationale for assigning scores and Table 65 shows the actual modelled metrics and the assigned INSET scores based on the rationale.

Table 62: Rationale for Assigning Scores: Access to Babraham Research Campus Criteria (Qualitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Compatibility with masterplan proposals	Assessment based on more developed designs and stakeholder feedback	Public transport route proposal fundamental to delivery of masterplan	Public transport proposal will support implementation of masterplan	Public transport proposal not expected to impact on implementation of masterplan although may require some changes to road layout/ junctions and/or landscaping	Not applicable as either positive or negative criterion	Proposal may have some minor inconsistencies with masterplan proposals. Expected to require limited change to masterplan proposals.	Proposal highly likely to be incompatible with masterplan proposals but could be amended. Changes to route or masterplan proposals may be substantial.	Proposal incompatible with masterplan proposals and cannot be mitigated

		Rationale/Basis for Assigning INSET Scores						
Landowner support	Assessment based on more developed designs and stakeholder feedback	Route promoted by landowners	Route expected to be well supported by landowners	Landowner support likely	Landowners have expressed no preference	Limited opposition from landowners expected but could be mitigated	Strong opposition from landowners expected but could be mitigated	Very strong opposition from landowners expected. Unlikely that this could be mitigated.

Source: Mott MacDonald

Table 63: Option Assessment Results: Access to Babraham Research Campus (Qualitative Assessment)

	INSET Scores	
Option	**Compatibility with masterplan proposals**	**Landowner support**
Brown	+1	+2
Blue	+1	0
Black	+1	0
Pink	+1	+2
Purple	+1	0

Source: Mott MacDonald

Table 64: Rationale for Assigning Scores: Access to Babraham Research Campus (Quantitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Degree to which campus is served	Frequency of service	Every 10 minutes or less	Every 10-20 minutes	Every 20-30 minutes	Every 30-40 minutes	Every 40-50 minutes	Less frequent than every 50 minutes	No direct service
Directness of route	Public transport journey time plus walking time from the nearest public transport stop	Journey time ≥ 10% quicker than existing travel time	Journey time 10% - 5% quicker than existing travel time	Journey time 1% to 5% quicker than existing travel time	Journey time equal to existing travel time (+/- 1%)	Journey time 1% to 5% slower than existing travel time	Journey time 10% - 5% slower than existing travel time	Journey time ≥ 10% slower than existing travel time

Source: Mott MacDonald

Table 65: Option Assessment Results: Access to Babraham Research Campus (Quantitative Assessment)

	INSET Scores			
Option	**Degree to which campus is served**		**Directness of route**	
	Frequency of service	Assigned INSET Score	Public transport journey time plus walking time from closest public transport stop (mins)	Assigned INSET Score
Brown	No direct service	-3	38	0
Blue	No direct service	-3	38	0
Black	No direct service	-3	38	0
Pink	No direct service	-3	38	0
Purple	No direct service	-3	38	0

Source: Mott MacDonald

7.3.4.4 Access to Granta Park Criteria

There were four sub-criteria identified under Access to Granta Park; two that were assessed qualitatively and two that were assessed quantitatively:

- Compatibility with masterplan proposals (qualitatively assessed);
- Landowner support (qualitatively assessed);
- Degree to which campus is served (quantitatively assessed); and
- Directness of route (quantitatively assessed).

Options qualitatively assessed against sub-criteria adopted the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against these two sub-criteria and the rationale for assigning these scores are presented in Table 66 and Table 67.

Options were assessed quantitively against the remaining sub-criteria. The degree to which the campus is served is based on service frequency of bus services where routes extend to the campus, with a more negative score given where services have a low frequency or do not directly serve the campus.

Directness of route is based on public transport journey times extracted from the SATURN model and added to the walking time from the closest public transport stop or Travel Hub site to the centre of the campus. Table 68 shows the rationale for assigning scores and Table 71 shows the actual modelled metrics and the assigned INSET scores based on the rationale.

Table 66: Rationale for Assigning Scores: Access to Granta Park Criteria (Qualitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Compatibility with masterplan proposals	Assessment based on more developed designs and stakeholder feedback	Public transport route proposal fundamental to delivery of masterplan	Public transport proposal will support implementation of masterplan	Public transport proposal not expected to impact on implementation of masterplan although may require some changes to road layout/ junctions and/or landscaping	Not applicable as either positive or negative criterion	Proposal may have some minor inconsistencies with masterplan proposals. Expected to require limited change to masterplan proposals.	Proposal highly likely to be incompatible with masterplan proposals but could be amended. Changes to route or masterplan proposals may be substantial.	Proposal incompatible with masterplan proposals and cannot be mitigated
Landowner support	Assessment based on more developed designs and stakeholder feedback	Route promoted by landowners	Route expected to be well supported by landowners	Landowner support likely	Landowners have expressed no preference	Limited opposition from landowners expected but could be mitigated	Strong opposition from landowners expected but could be mitigated	Very strong opposition from landowners expected. Unlikely that this could be mitigated.

Source: Mott MacDonald

Table 67: Option Assessment Results: Access to Granta Park (Qualitative Assessment)

	INSET Scores	
Option	**Compatibility with masterplan proposals**	**Landowner support**
Brown	+1	+2
Blue	+1	0
Black	+1	0
Pink	+1	+2
Purple	+1	0

Source: Mott MacDonald

Table 68: Rationale for Assigning Scores: Access to Granta Park (Quantitative Assessment)

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Degree to which campus is served	Frequency of service	Every 10 minutes or less	Every 10-20 minutes	Every 20-30 minutes	Every 30-40 minutes	Every 40-50 minutes	Less frequent than every 50 minutes	No direct service
Directness of route	Public transport journey time plus walking time from the nearest public transport stop	Journey time ≥ 40% quicker than existing travel time	Journey time 40% - 20% quicker than existing travel time	Journey time 0% to 20% quicker than existing travel time	Journey time equal to existing travel time	Journey time 0% to 20% slower than existing travel time	Journey time 40% - 20% slower than existing travel time	Journey time ≥ 40% slower than existing travel time

Source: Mott MacDonald

Table 69: Option Assessment Results: Access to Granta Park (Quantitative Assessment)

	INSET Scores			
Option	**Degree to which campus is served**		**Directness of route**	
	Frequency of service	Assigned INSET Score	Public transport journey time plus walking time from closest public transport stop (mins)	Assigned INSET Score
Brown	Every 15 minutes	+2	26	+2
Blue	Every 15 minutes	+2	27	+2
Black	Every 15 minutes	+2	27	+2
Pink	Every 15 minutes	+2	27	+2
Purple	Every 15 minutes	+2	27	+2

Source: Mott MacDonald

7.3.4.5 Loss of Homes or Property Criteria

There were two sub-criteria identified under Loss of Homes or Property:

- Loss of commercial property; and
- Loss of residential property.

Options were assessed quantitively against these sub-criteria based on the number of properties lost. On the assumption that loss of a property should not be regarded as a positive, all positive INSET scores were deemed not applicable.

Table 70 shows the rationale for assigning scores and Table 71 shows the actual modelled metrics and the assigned INSET scores based on the rationale.

Table 70: Rationale for Assigning Scores: Loss of Homes or Property Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Loss of commercial property	Number of properties and development opportunities lost	N/A	N/A	N/A	Zero loss of property	Loss of 1-5 properties	Loss of 5- 10 properties	Loss of more than 10 properties
Loss of residential property	Number of properties lost	N/A	N/A	N/A	Zero loss of property	Loss of 1-5 properties	Loss of 5- 10 properties	Loss of more than 10 properties

Source: Mott MacDonald

Table 71: Option Assessment Results: Loss of Homes or Property Criteria

	INSET Scores			
Option	**Loss of commercial property**		**Loss of residential property**	
	Number of properties lost	Assigned INSET Score	Number of properties lost	Assigned INSET Score
Brown	0	0	0	0
Blue	1	-1	0	0
Black	1	-1	0	0
Pink	0	0	0	0
Purple	0	0	0	0

Source: Mott MacDonald

7.3.4.6 Improvements to Physical Wellbeing Criteria

There were two sub-criteria identified under Improvements to Physical Wellbeing:

- Increase in cycling uptake; and
- Increase in walking uptake.

Options were assessed quantitively against these sub-criteria using select link matrices extracted from the SATURN model to assess the percentage change in walking and cycling compared to the Do Minimum scenario. Table 72 shows the rationale for assigning scores and Table 73 shows the actual modelled metrics and the assigned INSET scores based on the rationale.

Table 72: Rationale for Assigning Scores: Improvements to Physical Wellbeing

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Increase in cycling uptake	% change in cycling compared to the Do Minimum	Increase in proportion of cycling greater than 1% of all demand	Increase in proportion of cycling 0.5% - 0.75% of all demand	Increase in proportion of cycling <0.5% of all demand	Proportion of cycling equal to DM	Reduction in proportion of cycling <0.5% of all demand	Reduction in proportion of cycling 0.5% - 0.75% of all demand	Reduction in proportion of cycling greater than 1% of all demand
Increase in walking uptake	% change in walking compared to the Do Minimum	Increase in proportion of walking greater than 1% of all demand	Increase in proportion of walking 0.5% - 0.75% of all demand	Increase in proportion of walking <0.5% of all demand	Proportion of walking equal to DM	Reduction in proportion of walking <0.5% of all demand	Reduction in proportion of walking 0.5% - 0.75% of all demand	Reduction in proportion of walking greater than 1% of all demand

Source: Mott MacDonald

Table 73: Option Assessment Results: Improvements to Physical Wellbeing

	INSET Scores			
Option	**Increase in cycling uptake**		**Increase in walking uptake**	
	Forecast increase (%)	Assigned INSET Score	Forecast increase (%)	Assigned INSET Score
Brown	0%	0	0%	0
Blue	0%	0	0%	0
Black	0%	0	0%	0
Pink	0%	0	0%	0
Purple	0%	0	0%	0

Source: Mott MacDonald

7.3.5 Wider Economic Impacts Theme

Mott MacDonald's proprietary Transparent Economic Assessment Model (TEAM) was applied to assess the performance of the shortlisted options against four of the six criteria under this theme:

- Supporting development and employment sites;
- Number of new homes supported;
- Number of new jobs created; and
- GVA uplift.

The approach consisted of two key stages; the selection of sites that may be impacted by the options, addressing the criteria of "Supporting Development and Employment Sites" and "Number of New Homes Supported"; and the analysis of those sites using TEAM to determine potential Wider Economic Benefits, addressing the criteria of "Number of New Jobs Created" and "GVA uplift".

Land Use Analysis - Site Level Analysis

This first stage focused on identifying the number of development and employment sites in and around the options that could potentially be unlocked for development or where development may be brought forward sooner than would otherwise be the case. The analysis of each development site identified:

- Proposed end uses (i.e. office, industrial, retail, leisure, residential);
- Potential development footprints and density of development (including the number of residential units where appropriate);
- Any existing job estimates that have been prepared for proposed/potential developments;
- Timescales and phasing; and
- Level of dependency with the proposed option.

A review of key local planning and economic development documents was then undertaken together with engagement with property agents, developers, and other key stakeholders in the area to ensure the most relevant and up to date information was being used to support this initial analysis. The actual number of new development sites and new homes derived from this analysis was used for options assessment.

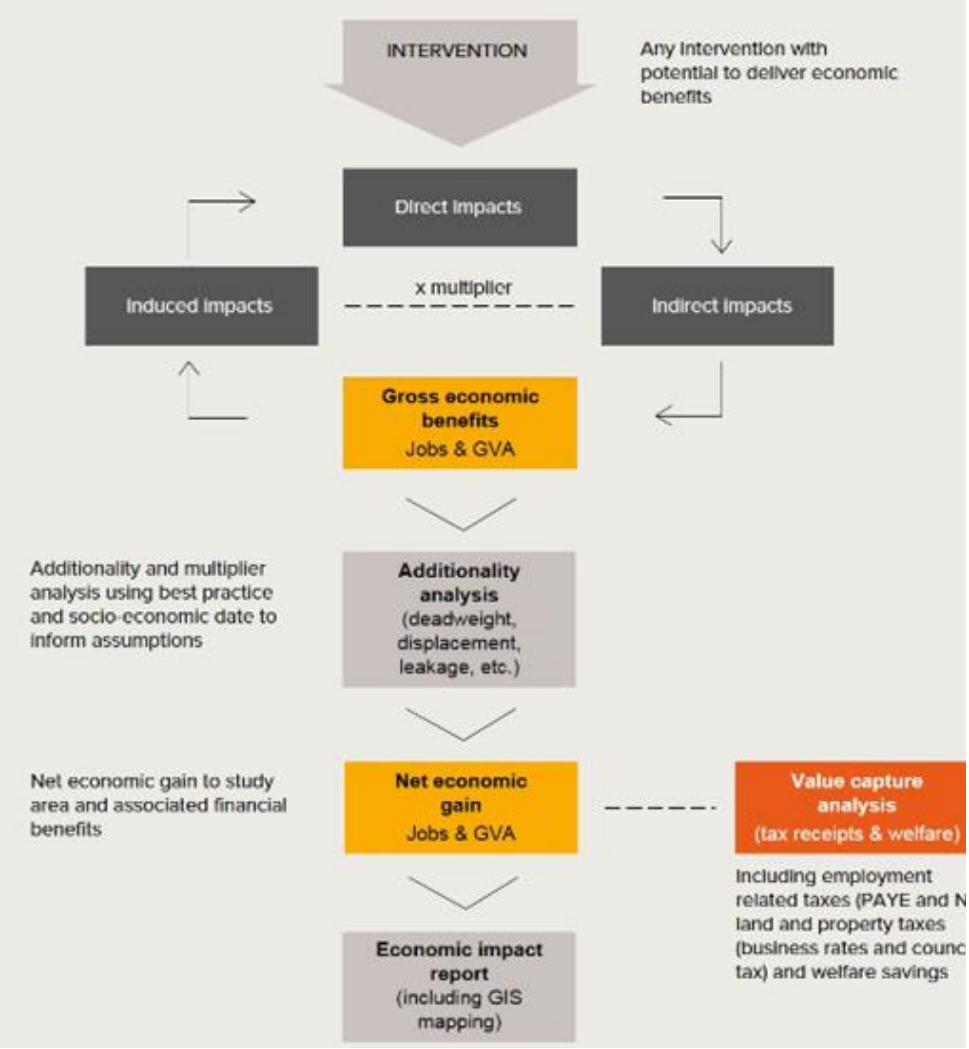
Land Use - Economic Impact Assessment Analysis (TEAM)

Using the site information gathered in the first stage, TEAM was then used to assess the potential gross and net economic benefits (in terms of jobs and GVA) to the local economy associated with developing those sites.

TEAM enables the assessment of employment impacts of an option and quantifies the increase in economic output, in the form of Gross Value Added (GVA), an internationally recognised metric of production.

The TEAM process is shown in Figure 68.

Figure 68: TEAM Logic Model



The criterion of “Land Value Uplift” was appraised at a more overarching level using land values produced by the Department of Housing, Communities and Local Government and the criterion of “Population who can access the site”, was appraised by looking at 15-minute car catchment areas which were generated around the potential Travel Hub locations for the AM peak period. The population within each catchment area was quantified to present a representative catchment size for each Travel Hub. The catchment populations have been generated to act as a proxy for the potential labour market catchment available within a suitable commutable distance to the Travel Hubs.

Section 7.3.5.1 details the results of appraisal against each of the criteria under this theme and the basis or rationale for that appraisal.

7.3.5.1 Wider Economic Benefits Criteria

No sub-criteria were identified under the Wider Economic Benefits theme and assessment of options against all criteria was quantitative in nature. The analysis was undertaken at a very high level and the outputs are gross values; no additionality has been applied.

Except for the “Increase in Job Catchment Area” criterion, none of the routes could reasonably be distinguished from one another in terms Wider Economic Benefits; as such all the options scored equally positively against all criteria. Positive scores were noted on the basis that the option has the ability to support the long-term success of the Cambridge Biomedical Campus which is anticipated by a Mott MacDonald 2018 study to deliver 10,000 net additional jobs over the next 15-20 years.

As all options scored equally against all criteria (excepting the “Increase in Job Catchment Area” criterion), a scoring range could not be established on which to base assignment of INSET scores. As all options had positive outputs a positive score of +3 was assigned to all. Although this does not impact the overall ranking of the options as there is no differentiation between them, the assessment is still recorded as it highlights how the scheme in general, regardless of preferred option outcome, can support economic growth.

For the “Increase in Job Catchment Area” criterion results ranged between 91,352 and 98,470 people, a bandwidth of 7,118 people. This bandwidth was then split into equal ranges of 1,016.85, rounded to 1,017 over the seven possible INSET scores (-3 to +3) The rationale for assigning scores to population ranges is shown in Table 74.

Table 75 and Table 76 show the actual modelled metrics and the assigned INSET scores for each of the five shortlisted options for all Wider Economic Benefits criteria.

Table 74: Rationale for Assigning Scores: Increase in Job Catchment Area

		Rationale/Basis for Assigning INSET Scores						
Criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Population who can access the site	Population within 15 minutes AM peak car catchment from proposed Hub location	97,455-98,471	96338-97,454	95,421-96,437	94,404-95,420	93,387-94,403	92,370- 93,386	91,352-92,369

Source: Mott MacDonald

Table 75: Option Assessment Results: Wider Economic Benefits Criteria (Table 1)

	INSET Scores					
Option	**Supporting the development of employment sites**		**Number of new housing sites supported**		**Number of new jobs created**	
	Number of new employment sites	Assigned INSET Score	Number of new housing sites	Assigned INSET Score	Number of new jobs	Assigned INSET Score
Brown	13	+3	9	+3	12,900	+3
Blue	13	+3	9	+3	12,900	+3
Black	13	+3	9	+3	12,900	+3
Pink	13	+3	9	+3	12,900	+3
Purple	13	+3	9	+3	12,900	+3

Source: Mott MacDonald

Table 76: Option Assessment Results: Wider Economic Benefits Criteria (Table 2)

	INSET Scores					
Option	**GVA uplift**		**Land value uplift**		**Increase in job catchment area**	
	GVA uplift (£m)	Assigned INSET Score	Land value uplift (£m)	Assigned INSET Score	Population within 15 minutes AM peak car catchment from proposed Travel Hub location	Assigned INSET Score
Brown	670	+3	370	+3	98,470	+3
Blue	670	+3	370	+3	98,418	+3
Black	670	+3	370	+3	98,418	+3
Pink	670	+3	370	+3	98,470	+3
Purple	670	+3	370	+3	91,352	-3

Source: Mott MacDonald

7.3.6 Alignment with Objectives Theme

Assessment of shortlisted options against the five criteria under this theme was semi-quantitative and drew on modelling outputs from SATURN, TEAM and the MEC method, used to assess options against specific criteria under the themes of “Transport User Benefits”, “Wider Economic Impacts”, “Social Impacts” and “Environment”. The five criteria (scheme objectives) under this theme of “Alignment with Objectives” are shown below, together with the theme(s), in parenthesis from which they drew their basis for assessment:

- Support Growth of the Local Economy (Transport User Benefits theme);
- Relieve Congestion and Improve Air Quality (Transport User Benefits and Environment themes);
- Improve Active Travel Infrastructure and Public Transport Provision, (Transport User Benefits and Social Impacts themes);
- Improve Road Safety (Social Impacts theme); and
- Improve Connectivity to Employment Sites (Transport User Benefits and Social Impacts themes).

As the scheme objectives (criteria) under this theme were essentially hybrids and combinations of specific criteria and sub-criteria under the other themes noted above an element of qualitative appraisal was used in conjunction with the quantitative metrics available to arrive at an INSET based score of -3 to +3 for the performance of each of the shortlisted options against each criterion under this theme.

Section 7.3.6.1 to Section 7.3.6.5 detail the results of appraisal against each of the five criteria and their related sub-criteria under this theme. They also note the basis and rationale for that appraisal.

7.3.6.1 Support Growth of Local Economy Criteria

There were three sub-criteria identified under Support the Growth of the Local Economy:

- Deliver journey time savings to jobs;
- Improve journey time reliability for public transport users; and
- Infrastructure necessary to sustain economic growth.

Options were qualitatively assessed against these sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The qualitative assessment looked at both the qualitative and quantitative results of assessments against criteria under other themes that related directly to the objective in question; in this case criteria from the Transport User Benefits theme.

The results of the assessment of the five shortlisted options against these three sub-criteria and the rationale for assigning these scores are presented in Table 77 and Table 78.

Table 77: Rationale for Assigning Scores: Support Growth of Local Economy Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Deliver journey time savings to jobs	% journey time savings from A1307/A505/A11 to CBC/ Babraham Research Campus and Granta Park relative to Do Minimum	Journey time ≥ 15% quicker than existing travel time	Journey time 15%-10% quicker than existing travel time	Journey time 0%-10% quicker than existing travel time	Journey time equal to existing travel time	Journey time 0% to 10% slower than existing travel time	Journey time 15%-10% slower than existing travel time	Journey time ≥15% slower than existing travel time
Improve journey time reliability for public transport users	Average of scores assigned to two sub-criteria under the 'Journey Time Reliability' criteria, as seen in Table 19	Average of scores assigned to sub-criteria under the 'Journey Time Reliability' criteria was +3	Average of scores assigned to sub-criteria under the 'Journey Time Reliability' criteria was +2	Average of scores assigned to sub-criteria under the 'Journey Time Reliability' criteria was +1	Average of scores assigned to sub-criteria under the 'Journey Time Reliability' criteria was 0	Average of scores assigned to sub-criteria under the 'Journey Time Reliability' criteria was -1	Average of scores assigned to sub-criteria under the 'Journey Time Reliability' criteria was -2	Average of scores assigned to sub-criteria under the 'Journey Time Reliability' criteria was -3
Infrastructure necessary to sustain economic growth	Average of INSET scores assigned to 'Supporting the development of employment sites' and 'Number of new jobs created' sub-criteria, as seen in Table 75	Average of score assigned to 'Supporting the development of employment sites' and 'Number of new jobs created' was +3	Average of score assigned to 'Supporting the development of employment sites' and 'Number of new jobs created' was +2	Average of score assigned to 'Supporting the development of employment sites' and 'Number of new jobs created' was +1	Average of score assigned to 'Supporting the development of employment sites' and 'Number of new jobs created' was 0	Average of score assigned to 'Supporting the development of employment sites' and 'Number of new jobs created' was -1	Average of score assigned to 'Supporting the development of employment sites' and 'Number of new jobs created' was -2	Average of score assigned to 'Supporting the development of employment sites' and 'Number of new jobs created' was -3

Source: Mott MacDonald

Table 78: Option Assessment Results: Support Growth of Local Economy Criteria

	INSET Scores					
Option	**Deliver journey time savings to jobs**		**Improve journey time reliability for public transport users**		**Infrastructure necessary to sustain economic growth**	
	% change in Bus Journey Time relative to the existing 13B service	Assigned INSET Score	Average of scores assigned to sub-criteria under 'Journey Time Reliability' criteria	Assigned INSET Score	Average of score assigned to 'Supporting the development of employment sites' and 'Number of new jobs created'	Assigned INSET Score
Brown	-14%	+2	+2	+2	+3	+3
Blue	-11%	+2	+2	+2	+3	+3
Black	-11%	+2	+2	+2	+3	+3
Pink	-13%	+2	+2	+2	+3	+3
Purple	-19%	+2	+2	+2	+3	+3

Source: Mott MacDonald

7.3.6.2 Relieve Congestion and Improve Air Quality Criteria

There were three sub-criteria identified under Relieve Congestion and Improve Air Quality:

- Encourage use of sustainable transport modes;
- Enhance quality of life; and
- Relieve pressure at network pinch points.

Options were qualitatively assessed against the first two of the three sub-criteria set out above using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The qualitative assessment looked at both the qualitative and quantitative results of assessments against criteria under other themes that related directly to the objective in question; in this case criteria under the Transport User Benefits and Environment themes.

In addition to scoring undertaken within the Transport User benefits theme, scoring of "Encourage use of sustainable transport modes" also incorporated metrics for percentage increase in bus patronage, calculated using the CSRM SATURN model demand matrices for 2026.

A neutral score of zero has been assigned to all options under the sub-criterion "Relieve pressure at network pinch points" as it was not possible to accurately assess this sub-criterion at this stage of appraisal. Further work will be undertaken upon identification of a preferred option to refine the assessment of this sub-criterion.

The results of the assessment of the five shortlisted options against these three sub-criteria and the rationale for assigning these scores are presented in Table 79 and Table 80.

Table 79: Rationale for Assigning Scores: Relieve Congestion and Improve Air Quality Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Encourage use of sustainable transport modes	Assessment based on the addition of % change in cycling, walking and bus patronage	Addition of % change in cycling, walking and bus patronage is ≥ 3%	Addition of % change in cycling, walking and bus patronage is 2%	Addition of % change in cycling, walking and bus patronage is 1%	Addition of % change in cycling, walking and bus patronage is 0%	Addition of % change in cycling, walking and bus patronage is -1%	Addition of % change in cycling, walking and bus patronage is -2%.	Addition of % change in cycling, walking and bus patronage is ≥-3%
Enhance quality of life	Assessment based on scores assigned to the 'Catchment of new NMU route' sub-criterion as seen in Table 29	All settlements and employment campuses within 1km of an entry point to NMU route	Most settlements and employment campuses within 1km of an entry point to NMU route	Some residential and employment areas within 1km of an entry point to NMU route	Not applicable- route serves local facilities or not	Limited access to either residential or employment areas within 1km of an entry point to NMU route	Limited access to both residential and employment areas within 1km of an entry point to NMU route	No residential or employment areas within 1km of an entry point to NMU route
Relieve pressure at network pinch points	N/A	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage	Not assessed at this stage

Source: Mott MacDonald

Table 80: Option Assessment Results: Relieve Congestion and Improve Air Quality Criteria

	INSET Scores					
Option	**Encourage use of sustainable transport modes**		**Enhance quality of life**		**Relieve pressure at network pinch points**	
	Assessment based on the addition of % change in cycling, walking and bus patronage (%)	Assigned INSET Score	Assessment based on scores assigned to the 'Catchment of new NMU route' sub-criterion as seen in Table 29	Assigned INSET Score	N/A	Assigned INSET Score
Brown	2.3	+2	+2	+2	N/A	0
Blue	2.1	+2	+2	+2	N/A	0
Black	2.2	+2	+2	+2	N/A	0
Pink	2.1	+2	+2	+2	N/A	0
Purple	2.5	+2	+1	+1	N/A	0

Source: Mott MacDonald

7.3.6.3 Improve Active Travel Infrastructure and Public Transport Provision Criteria

There were four sub-criteria identified under Improve Active Travel Infrastructure and Public Transport Provision:

- Deliver high quality public transport;
- Increase frequency of public transport during peaks;
- Reduce severance for pedestrians, cyclists and equestrians; and
- Increase uptake of sustainable modes for commuter journeys.

Options were qualitatively assessed against these sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The qualitative assessment looked at both the qualitative and quantitative results of assessments against criteria under other themes that related directly to the objective in question; in this case criteria under the Transport User Benefits and Social Impact themes.

The results of the assessment of the five shortlisted options against these three sub-criteria and the rationale for assigning these scores are presented in Table 81 and Table 82.

Table 81: Rationale for Assigning Scores: Improve Active Travel Infrastructure and Public Transport Provision Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Deliver high quality public transport	Assessment based the combined scores assigned to options under the 'Journey Reliability' and 'Journey Time' criteria as seen in Table 19 and Table 21	Combined INSET score greater than 10	Combined INSET score between 5 and 10	Combined INSET score between 5 and 2	Combined INSET score between 2 and -2	Combined INSET score between -5 and -2	Combined INSET score between -5 and -10	Combined INSET score less than -10
Increase frequency of public transport during peaks	Assessment based on the proposed number of additional public transport services at peak times	Greater than or equal to +6 an hour, compared to existing services	+4 an hour, compared to existing services	+2 an hour, compared to existing services	Equal to existing services	-2 an hour, compared to existing services	-4 an hour, compared to existing services	Less than or equal to -6 an hour, compared to existing services
Reduce severance for pedestrians, cyclists and equestrians	Assessment based on scores assigned under the 'Quality and directness of new NMU route' sub-criterion as seen in Table 30	Very direct, high quality route	Direct, good quality route	Direct but lower quality route	Not applicable- route is either direct or not	Route is indirect and broken or requires multiple crossings	Route is indirect, broken and/or likely to be poor quality	No NMU route provided
Increase uptake of active travel modes for commuter journeys	Assessment based on scores assigned to options under 'Increase in cycling uptake' and 'Increase in walking uptake' as seen in Table 73	Increase in proportion of walking and cycling greater than 1% of all demand	Increase in proportion of walking and cycling 0.5% - 0.75% of all demand	Increase in proportion of walking and cycling <0.5% of all demand	Proportion of walking & cycling equal to DM	Reduction in proportion of walking and cycling <0.5% of all demand	Reduction in proportion of walking and cycling 0.5% - 0.75% of all demand	Reduction in proportion of walking and cycling greater than 1% of all demand

Source: Mott MacDonald

Table 82: Option Assessment Results: Improve Active Travel Infrastructure and Public Transport Provision Criteria

	INSET Scores							
Option	**Deliver high quality public transport**		**Increase frequency of public transport during peaks**		**Reduce severance for pedestrians, cyclists and equestrians**		**Increase uptake of active travel modes for commuter journeys**	
	Combined INSET score assigned	Assigned INSET Score	Number of additional public transport services at peak times	Assigned INSET Score	Scores assigned under the 'Quality and directness of new NMU route' sub-criterion	Assigned INSET Score	Forecast increase of cycling and walking (%)	Assigned INSET Score
Brown	6	+2	8	+3	+2	+2	0%	0
Blue	6	+2	8	+3	+2	+2	0%	0
Black	6	+2	8	+3	+2	+2	0%	0
Pink	6	+2	8	+3	+2	+2	0%	0
Purple	6	+2	8	+3	+2	+2	0%	0

Source: Mott MacDonald

7.3.6.4 Improve Road Safety Criteria

There were three sub-criteria identified under Improve Road Safety:

- Reduce number of accidents;
- Reduce number of speed related incidents; and
- Improve safety of crossing movements for pedestrians, cyclists and equestrians.

Options were qualitatively assessed against these sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The qualitative assessment looked at both the qualitative and quantitative results of assessments against criteria under other themes that related directly to the objective in question; in this case criteria under the Social Impact theme.

At this stage it was determined that 'Improve safety of crossing movements for pedestrians, cyclists and equestrians' should be scored as neutral as the objective was considered to be applicable to CSET Phase 1 in the main and should not be considered a determinant of assessment for CSET Phase 2.

The results of the assessment of the five shortlisted options against these three sub-criteria and the rationale for assigning these scores are presented in Table 83 and Table 86.

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Table 83: Rationale for Assigning Scores: Improve Road Safety Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Reduce number of accidents	Scores based on an average of the scores assigned for 'Changes in vehicular accident rates' and 'Changes to NMU accident rates' as seen in Table 57	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reduce number of speed related incidents	Scores assigned based on the sub-criterion 'Change in vehicular accident rates' as seen in Table 57	>£10m	£5-10m	£0-5m	N/A	N/A	N/A	N/A
Improve safety of crossing movements for pedestrians, cyclists and equestrians	Quantitative assessment based on the number of new crossing points	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Mott MacDonald

Table 84: Option Assessment Results: Improve Road Safety Criteria

	INSET Scores					
Option	**Reduce number of accidents**		**Reduce number of speed related incidents**		**Improve safety of crossing movements for pedestrians, cyclists and equestrians**	
	Number of NMU accidents per link	Assigned INSET Score	Accident Saving Benefits (2010 Prices)	Assigned INSET Score	N/A	Assigned INSET Score
Brown	Less than 20 NMU accidents per link	0	£26,900	+1	N/A	0
Blue	Less than 20 NMU accidents per link	0	£26,800	+1	N/A	0
Black	Less than 20 NMU accidents per link	0	£23,700	+1	N/A	0
Pink	Less than 20 NMU accidents per link	0	£23,800	+1	N/A	0
Purple	Less than 20 NMU accidents per link	0	£26,900	+1	N/A	0

Source: Mott MacDonald

7.3.6.5 Improve Connectivity to Employment Sites Criteria

There were two sub-criteria identified under Improve Connectivity to Employment Sites:

- Improve access to CBC and Granta Park; and
- Increase modal options for commuters travelling to CBC and Granta Park.

Options were qualitatively assessed against these sub-criteria using the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The qualitative assessment looked at both the qualitative and quantitative results of assessments against criteria under other themes that related directly to the objective in question; in this case criteria under the Transport User Benefits and Social Impact themes.

The results of the assessment of the five shortlisted options against these two sub-criteria and the rationale for assigning these scores are presented in Table 85 and Table 86.

Table 85: Rationale for Assigning Scores: Improve Connectivity to Employment Sites Criteria

		Rationale/Basis for Assigning INSET Scores						
Sub-criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Improve access to CBC and Granta Park	Based on combined INSET scores assigned to 'Access to CBC' and 'Access to Granta Park' criteria as seen in Table 59, Table 63, Table 69 and Table 71	Combined INSET score greater than 15	Combined INSET score between 10 and 15	Combined INSET score between 5 and 10	Combined INSET score between -5 and 5	Combined INSET score between -5 and -10	Combined INSET score between -10 and -15	Combined INSET score less than -15
Increase modal options for commuters travelling to CBC and Granta Park	Based on the combined scores assigned to sub-criteria 'Degree to which campus/park is served' as seen in Table 63 and Table 71	Combined INSET score between 4 and 6	Combined INSET score between 2 and 4	Combined INSET score between 0 and 2	Combined INSET score of 0	Combined INSET score between 0 and -2	Combined INSET score between -2 and -4	Combined INSET score between -4 and -6

Source: Mott MacDonald

Table 86: Option Assessment Results Improve Connectivity to Employment Sites Criteria

	INSET Scores			
Option	**Improve access to CBC and Granta Park**		**Increase modal options for commuters travelling to CBC and Granta Park**	
	Combined Scores from "Access to CBC" and "Access to Granta Park" criteria	Assigned INSET Score	Combined Scores from "Degree to which each campus is served" sub-criteria	Assigned INSET Score
Brown	18	+3	5	+3
Blue	14	+2	5	+3
Black	14	+2	5	+3
Pink	18	+3	5	+3
Purple	16	+3	5	+3

Source: Mott MacDonald

7.3.7 Policy Alignment Theme

Assessment of the shortlisted options under this theme focused on alignment with five key policies:

- Alignment with the Mayoral Interim Transport Strategy;
- Alignment with Cambridgeshire's third Local Transport Plan (LTP3);
- Alignment with the Transport Strategy for Cambridge City and South Cambridge;
- Alignment with the Cambridgeshire Long Term Transport Strategy; and
- Level to which the option would permit implementation of City Access Plan (CAP) measures.

Assessment was qualitative in nature and used an INSET based score of -3 to +3 for the performance of each of the shortlisted options against each criterion under this theme. This is essentially the same process used at the previous stage of assessment; however, the more detailed development of the shortlisted options permitted a more in-depth analysis.

Section 7.3.7.1 details the results of appraisal against each of the criteria under this theme and the basis or rationale for that appraisal.

7.3.7.1 Policy Alignment Criteria

No sub-criteria were identified under the Policy Alignment theme and assessment of options against all criteria was qualitative in nature; adopting the INSET scoring range of -3 to +3, where -3 is a very large negative and +3 is a very large positive. The results of the assessment of the five shortlisted options against the five Policy Alignment criteria and the rationale for assigning these scores are presented in Table 87 and Table 88.

Table 87: Rationale for Assigning Scores: Policy Alignment Criteria

		Rationale/Basis for Assigning INSET Scores						
Criteria	**Basis for Assessment**	**Very Large Positive (+3)**	**Large Positive (+2)**	**Small Positive (+1)**	**Neutral (0)**	**Small Negative (-1)**	**Large Negative (-2)**	**Very Large Negative (-3)**
Alignment with Mayoral Interim Transport Strategy Statement	Options re-assessed as a result of design development and any policy updates	Very strongly aligned. Directly supports delivery of multiple aims and objectives of the statement	Strong alignment. Supports some key aims and objectives of the statement	Some alignment. Marginally supports a few key aims and objectives of the statement	Option has neither a positive nor adverse impact on the aims and objectives of the statement	No alignment. Marginal adverse impact on a few key aims and objectives of the statement	No alignment. Some adverse impact on a number of key aims and objectives of the statement	No alignment. High adverse impact on all key aims and objectives of the statement
Alignment with Cambridgeshire LTP3	Options re-assessed as a result of design development and any policy updates	Very strongly aligned. Directly supports delivery of multiple aims and objectives of the plan	Strong alignment. Supports some key aims and objectives of the plan	Some alignment. Marginally supports a few key aims and objectives of the plan	Option has neither a positive nor adverse impact on the aims and objectives of the plan	No alignment. Marginal adverse impact on a few key aims and objectives of the plan	No alignment. Some adverse impact on a number of key aims and objectives of the plan	No alignment. High adverse impact on all key aims and objectives of the plan
Alignment with Transport Strategy for Cambridge City and South Cambridgeshire	Options re-assessed as a result of design development and any policy updates	Very strongly aligned. Directly supports delivery of multiple aims and objectives	Strong alignment. Supports some key aims and objectives of the strategy	Some alignment. Marginally supports a few key aims and objectives of the strategy	Option has neither a positive nor adverse impact on the aims and objectives of the strategy	No alignment. Marginal adverse impact on a few key aims and objectives of the strategy	No alignment. Some adverse impact on a number of key aims and objectives of the strategy	No alignment. High adverse impact on all key aims and objectives of the strategy
Alignment with Cambridgeshire Long Term Transport Strategy	Options re-assessed as a result of design development and any policy updates	Very strongly aligned. Directly supports delivery of multiple aims and objectives	Strong alignment. Support toward some key aims and objectives of the Strategy	Some alignment. Marginally supports a few key aims and objectives of the Strategy	No alignment. Option has neither a positive nor adverse impact on the aims and objectives of the strategy	No alignment. Marginal adverse impact on a few key aims and objectives of the strategy	No alignment. Some adverse impact on a number of key aims and objectives of the strategy	No alignment. High adverse impact on all key aims and objectives of the strategy
Level to which the option would permit City Access Plan (CAP)	Options re-assessed as a result of design development and any policy updates	Strong support for all CAP measures	Some support for a number of CAP measures	Marginal support for a few CAP measures	Option will neither support nor adversely impact measures proposed as part of CAP	Slight adverse impact on a few CAP measures	Moderate adverse impact on some CAP measures	Strong adverse impact on all CAP measures

Source: Mott MacDonald

Table 88: Option Assessment Results: Policy Alignment Criteria

	INSET Scores				
Option	**Alignment with Mayoral Interim Transport Strategy Statement**	**Alignment with Cambridgeshire LTP3**	**Alignment with Transport Strategy for Cambridge City and South Cambridgeshire**	**Alignment with Cambridgeshire Long Term Transport Strategy**	**Level to which the option would permit City Access Plan (CAP)**
Brown	+3	+2	+3	+2	+1
Blue	+3	+2	+3	+2	+1
Black	+3	+2	+3	+2	+1
Pink	+3	+2	+3	+2	+1
Purple	+3	+2	+3	+2	+1

Source: Mott MacDonald

Sensitivity Test Against Emerging Policy

In addition to the qualitative assessment undertaken for the Policy Alignment theme, as outlined above, Mott MacDonald undertook a sensitivity test to determine how options would align against the emerging Cambridgeshire and Peterborough Local Transport Plan (LTP). Alignment with the Cambridgeshire and Peterborough LTP was not included as an assessment criterion in the initial assessment as a draft of the LTP was not available at the outset of appraisal and as the plan has yet to be formally adopted, the content is subject to change.

The sensitivity test was undertaken in the same qualitative manner as the initial assessment, applying the same scoring rationale. All options were considered to score +3 as they all demonstrated strong alignment with the three goals of the plan: Economy, Society and Environment and all options were considered to help deliver nine out of ten of the plan's objectives.

7.4 Shortlisted INSET Results by Theme

Final INSET results are set out below in ranked order, based on total the total score (which is the average of the total of the themed scores) in Table 89 and as shown the Brown Route from Travel Hub Site B scores best.

Table 89: Shortlisted Options- INSET Results

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
1	Brown Route from Travel Hub Site B	1.52	-1.25	-0.57	0.88	3.00	1.75	2.20	1.08
2	Pink Route from Travel Hub Site B	1.50	-1.25	-0.64	0.88	3.00	1.75	2.20	1.06
3	Blue Route from Travel Hub Site C	1.33	-1.25	-1.10	0.58	3.00	1.65	2.20	0.92
4	Purple Route from Travel Hub Site A	1.31	-1.25	-0.29	0.71	2.00	1.68	2.20	0.91
5	Black Route from Travel Hub Site C	1.33	-1.25	-1.38	0.58	3.00	1.65	2.20	0.88

Source: Mott MacDonald

7.5 Sensitivity Testing

In order to test the robustness of the ranking of the shortlisted options, the same sensitivity tests which were undertaken at the Stage 1B sift were applied. The weighting changes applied in each of the sensitivity test scenarios were as follows:

- **Scenario 1:** The weighting of the Environment theme was raised to 4 whilst the weightings of all other themes were held constant at 1.
- **Scenario 2:** The weighting of both the Transport Benefits and Social Impacts themes were raised to 2 and the weightings of all other themes were held constant at 1.
- **Scenario 3:** The Policy Alignment and Alignment with Objectives themes were weighted as zero, effectively removing them from consideration, whilst all other themes were held constant at 1.

The results of the three sensitivity tests undertaken are set out in the following three tables.

Table 90: Scenario 1

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
1	Brown Route from Travel Hub Site B	1.52	-5.00	-0.57	0.88	3.00	1.75	2.20	0.54
2	Pink Route from Travel Hub Site B	1.50	-5.00	-0.64	0.88	3.00	1.75	2.20	0.53
3	Blue Route from Travel Hub Site C	1.33	-5.00	-1.10	0.58	3.00	1.65	2.20	0.38
4	Purple Route from Travel Hub Site A	1.31	-5.00	-0.29	0.71	2.00	1.68	2.20	0.37
5	Black Route from Travel Hub Site C	1.33	-5.00	-1.38	0.58	3.00	1.65	2.20	0.34

Source: Mott MacDonald

Table 91: Scenario 2

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
1	Brown Route from Travel Hub Site B	3.05	-1.25	-0.57	1.75	3.00	1.75	2.20	1.42
2	Pink Route from Travel Hub Site B	3.00	-1.25	-0.64	1.75	3.00	1.75	2.20	1.40
3	Purple Route from Travel Hub Site A	2.62	-1.25	-0.29	1.42	2.00	1.68	2.20	1.20
4	Blue Route from Travel Hub Site C	2.67	-1.25	-1.10	1.17	3.00	1.65	2.20	1.19
5	Black Route from Travel Hub Site C	2.67	-1.25	-1.38	1.17	3.00	1.65	2.20	1.15

Source: Mott MacDonald

Table 92: Scenario 3

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
1	Brown Route from Travel Hub Site B	1.52	-1.25	-0.57	0.88	3.00	0.00	0.00	0.51
2	Pink Route from Travel Hub Site B	1.50	-1.25	-0.64	0.88	3.00	0.00	0.00	0.50
3	Blue Route from Travel Hub Site C	1.33	-1.25	-1.10	0.58	3.00	0.00	0.00	0.37
4	Purple Route from Travel Hub Site A	1.31	-1.25	-0.29	0.71	2.00	0.00	0.00	0.35
5	Black Route from Travel Hub Site C	1.33	-1.25	-1.38	0.58	3.00	0.00	0.00	0.33

Source: Mott MacDonald

It can be seen that the ranking of the shortlisted options remains the same under all three scenarios with only one exception; when increased weighting is applied to the Transport Benefits and Social Impacts theme, the Purple option moves up from fourth place to third. This is because, whilst Purple scored the least favourably of all the options under the Transport Benefits theme, its scored third best under the Social Impacts theme. As such the increased magnitude of weighting (x2) for Social Impacts, despite the poor scoring on Transport Benefits, which also had increased weighting (x2), relative to the other themes where weightings remained constant, caused a slight improvement in its overall score, which was only 0.01 behind Blue in the original scenario. This was sufficient to alter its rank under this one sensitivity test. The sensitivity tests do however confirm that the top two performing options perform consistently well under multiple scenarios, confirming the robustness of the final shortlist ranking.

7.6 Preferred Option Based on INSET Assessment Process

A robust and proportionate Options Appraisal process has been undertaken by Mott MacDonald to identify the indicative preferred option for the CSET Phase 2 scheme. The INSET assessment has identified the Brown Route from Travel Hub Site B as the indicative preferred option with a final total INSET score of 1.08 under the default scenario with all themes weighted equally.

It should be noted that Benefit Cost Ratios (BCRs) have also been calculated for the shortlisted options and a high-level Social and Distributional Impacts (SIDI) assessment has been undertaken. These assessments do not form part of the INSET assessment process and so have not been documented in this OAR. However, this work has been undertaken in support of the identification of the indicative preferred option and will be documented in the Economic Case of the OBC which will be the subject of a report to the GCP Executive Board in early 2020.

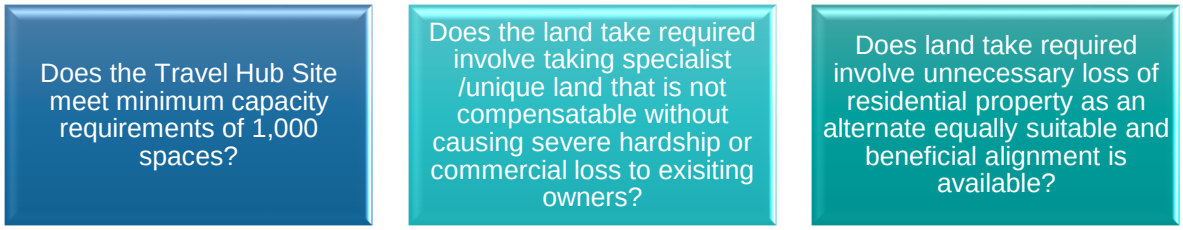
Stakeholder and public consultation feedback are also considered to be crucial to the confirmation of the preferred option. Therefore, although an indicative preferred option has been identified based on the results of this formal assessment process as set out above, the shortlisted options were, following the conclusion of this process taken to public consultation in the Autumn of 2019. The responses to this consultation will be analysed and reported separately and together with the BCR calculations will either affirm or refine the results of the assessment. The outcomes of this subsequent refinement will be documented in the OBC for CSET Phase 2.

Appendices

A. Packaged Options: Feasible Route Alignments from Stage 1B Packaged with Feasible Travel Hub Sites

This table lists the 231 options packages which were developed in Section 5. The 231 option packages were subject to three Gateway Assessment criteria which were effectively Yes/No responses. These are shown in Figure 41.

Figure 69: Gateway Assessment Criteria for Option Packages



Source: Mott MacDonald

Through this Gateway Assessment, 141 of the 231 options were sifted out of the initial longlist. These are highlighted in grey in This left 90 options in the revised longlist to be progressed to Stage 2.

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
1	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
2	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9
3	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
4	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5
5	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
6	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10
7	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
8	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
9	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR4

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
10	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR5
11	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR7
12	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR8
13	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR10
14	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR11
15	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5D	Connection to BRC Travel Hub			PR3
16	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
17	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9
18	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
19	1A	Western alignment via	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Francis Crick Ave											
20	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
21	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10
22	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
23	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
24	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR4
25	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR5
26	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR7
27	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR8
28	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR10

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
29	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR11
30	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5D	Connection to BRC Travel Hub			PR3
31	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4C	East with northern BRC Travel Hub connection					PR6
32	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4D	East with southern BRC Travel Hub connection					PR6
33	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4E	West with northern BRC Travel Hub connection					PR6
34	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4F	West with southern BRC Travel Hub connection					PR6
35	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
36	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9
37	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
38	1A	Western alignment via	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Francis Crick Ave											
39	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
40	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10
41	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
42	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
43	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR4
44	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR5
45	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR7
46	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR8
47	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR10

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
48	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR11
49	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5D	Connection to BRC Travel Hub			PR3
50	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4E	West with northern BRC Travel Hub connection					PR6
51	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4F	West with southern BRC Travel Hub connection					PR6
52	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
53	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9
54	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
55	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5
56	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
57	1B	Western alignment via	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (east)											
58	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
59	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
60	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR4
61	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR5
62	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR7
63	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR8
64	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR10
65	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR11
66	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5D	Connection to BRC Travel Hub			PR3

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
67	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
68	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9
69	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
70	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5
71	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
72	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10
73	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
74	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
75	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR4
76	1B	Western alignment via	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR5

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description	Travel Hub Site
		Robinson Way (east)										
77	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307		PR7
78	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307		PR8
79	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307		PR10
80	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307		PR11
81	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5D	Connection to BRC Travel Hub		PR3
82	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4C	East with northern BRC Travel Hub connection				PR6
83	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4D	East with southern BRC Travel Hub connection				PR6
84	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4E	West with northern BRC Travel Hub connection				PR6
85	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4F	West with southern BRC Travel Hub connection				PR6

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
86	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
87	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9
88	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
89	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5
90	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
91	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10
92	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
93	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
94	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR4
95	1B	Western alignment via	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR5

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (east)											
96	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR7
97	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR8
98	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR10
99	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR11
100	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5D	Connection to BRC Travel Hub			PR3
101	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4E	West with northern BRC Travel Hub connection					PR6
102	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4F	West with southern BRC Travel Hub connection					PR6
103	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
104	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
105	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
106	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5
107	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
108	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10
109	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
110	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
111	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR4
112	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR5
113	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR7
114	1C	Western alignment via	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR8

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (west)											
115	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR10
116	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR11
117	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5D	Connection to BRC Travel Hub			PR3
118	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
119	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9
120	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
121	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5
122	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
123	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
124	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
125	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
126	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR4
127	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR5
128	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR7
129	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR8
130	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR10
131	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307			PR11
132	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5D	Connection to BRC Travel Hub			PR3
133	1C	Western alignment via	2A	West of Nine Wells	3A	West avoiding urban area	4C	East with northern BRC					PR6

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (west)						Travel Hub connection					
134	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4D	East with southern BRC Travel Hub connection					PR6
135	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4E	West with northern BRC Travel Hub connection					PR6
136	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4F	West with southern BRC Travel Hub connection					PR6
137	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR1
138	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6C	Direct from western alignment	PR9
139	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR4
140	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR5
141	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR8
142	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR10

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
143	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6F	Parallel with A11 with crossing	PR11
144	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5C	North of railway	6E	Parallel with A11 without crossing	PR7
145	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR4
146	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR5
147	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR7
148	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR8
149	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR10
150	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307			PR11
151	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5D	Connection to BRC Travel Hub			PR3
152	1C	Western alignment via	2A	West of Nine Wells	3B	West through urban area	4E	West with northern BRC					PR6

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (west)						Travel Hub connection					
153	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4F	West with southern BRC Travel Hub connection					PR6
154	1F	A1307 alignment via Francis Crick Ave	2D	A1307 link road (field boundary)	3C	A1307 widening	4G	A1307 widening					PR6
155	1F	A1307 alignment via Francis Crick Ave	2E	A1307 link road (direct)	3C	A1307 widening	4G	A1307 widening					PR6
156	1F	A1307 alignment via Francis Crick Ave	2D	A1307 link road (field boundary)	3C	A1307 widening	4G	A1307 widening	5E	A1307 widening	6A	A1307 widening	PR3
157	1F	A1307 alignment via Francis Crick Ave	2D	A1307 link road (field boundary)	3C	A1307 widening	4G	A1307 widening	5E	A1307 widening	6A	A1307 widening	PR7
158	1F	A1307 alignment via Francis Crick Ave	2E	A1307 link road (direct)	3C	A1307 widening	4G	A1307 widening	5E	A1307 widening	6A	A1307 widening	PR3
159	1F	A1307 alignment via Francis Crick Ave	2E	A1307 link road (direct)	3C	A1307 widening	4G	A1307 widening	5E	A1307 widening	6A	A1307 widening	PR7
160	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
161	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
162	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
163	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
164	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
165	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
166	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
167	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
168	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
169	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
170	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
171	1B	Western alignment via	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins	PR11

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (east)										Newmarket Road	
172	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
173	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
174	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
175	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
176	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
177	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
178	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
179	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
180	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
181	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
182	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
183	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
184	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
185	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
186	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
187	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
188	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
189	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
190	1C	Western alignment via	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins	PR5

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (west)										Newmarket Road	
191	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
192	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
193	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
194	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
195	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4A	West with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
196	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
197	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
198	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
199	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
200	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
201	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
202	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
203	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
204	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
205	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
206	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
207	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
208	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
209	1C	Western alignment via	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (west)											
210	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
211	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
212	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
213	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3A	West avoiding urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
214	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
215	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
216	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
217	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
218	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
219	1A	Western alignment via Francis Crick Ave	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
220	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
221	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
222	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR4
223	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
224	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
225	1B	Western alignment via Robinson Way (east)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11
226	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR5
227	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F_B	Crosses A11 with dedicated route to A1307	PR5
228	1C	Western alignment via	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins	PR4

Option #	Segment 1: Route Alignment # and Description		Segment 2: Route Alignment # and Description		Segment 3: Route Alignment # and Description		Segment 4: Route Alignment # and Description		Segment 5: Route Alignment # and Description		Segment 6: Route Alignment # and Description		Travel Hub Site
		Robinson Way (west)										Newmarket Road	
229	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR8
230	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR10
231	1C	Western alignment via Robinson Way (west)	2A	West of Nine Wells	3B	West through urban area	4B	East with no Travel Hub connection	5G	Direct to A11/A1307	6F	Crosses A11 and joins Newmarket Road	PR11

B. Stage 2 Scoring Rationale against Themed Criteria

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Theme: Transport Benefits							
Journey Reliability							
Dedicated public transport routes	Public transport vehicles running on fully segregated route for complete alignment. No interaction with general traffic	Route follows a dedicated public transport alignment, separate from general traffic. May have very limited interaction with general traffic	Route is typically in dedicated public transport lanes with limited interaction with general traffic	No advantage or disadvantage to reliability	Potential for some disruption as a result of junctions	Sharing with general traffic on routes with lower traffic levels	Sharing with general traffic on already congested routes
Degree of priority at junctions	Grade separated junctions where the public transport route crosses roads	Only junctions are where public transport route crosses roads. Priority signals for the public transport would be provided in these cases	Route may join existing junctions but would continue to have priority in all cases	No advantage or disadvantage to reliability	Route has small number of junctions where public transport does not have priority, but these do not have high general traffic levels	Route likely to have no or limited priority at some junctions. Junctions are minor but higher flows	Route has no priority and junctions are congested
Journey Time (Scheme Users)							
Frequency of stops	No stops, public transport vehicle runs at optimum speed for full alignment	Small number of stops, vehicle can run at optimum speed for most of route	Stops are spaced at infrequent intervals, minimising deceleration and acceleration requirements	No advantage or disadvantage to journey time	Regular stops, small impact on journey time	High frequency of stops, large impact on journey time	Very frequent stops, significantly impact on journey time

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Directness of route and extent of dedicated infrastructure	Very direct, segregated route, no limitations to achieving optimum speed	Direct, segregated route, some sections where reduced speed restriction is likely. May be some junctions but transit route would have priority	Route less direct but largely segregated. May be some junctions but public transport route would have priority	No change	Route is segregated but will have higher interaction with general traffic as a result of access points	Route not fully segregated with greater interaction with existing traffic. May be greater transfer time to Travel Hub as public transport alignment does not serve directly	Public transport vehicles share with general traffic on existing congested roads
Route flexibility- Links to CAM and Public Transport							
Can be used by CAM vehicles	Fully segregated infrastructure which could be used by CAM vehicles. Very limited interaction with general traffic	Fully segregated infrastructure which could be used by CAM vehicles. Some interaction with general traffic at junctions	Running alongside existing road but with separate lanes. Some interaction with general traffic at junctions	Not applicable, any option will have either positive or negative scores relative to this criterion	Minor overlap with general traffic routes which may reduce CAM optimisation	Route partly shared with other traffic (existing low flows)	Route shared with other traffic (existing high flows and congestion)
Compatibility with CAM alignments	Route fully supports planned connections into Cambridge	Route supports planned connections into Cambridge with very limited modification expected	Route supports planned connections into Cambridge with some minor diversion expected	Not applicable, any option will have either positive or negative scores relative to this criterion	Option expected to require diversion	Option expected to require significant diversion in order to serve Cambridge	Option likely to preclude a planned link with CAM into Cambridge
Opportunities for benefits for users of existing public transport routes	Existing services could access the Travel Hub site and alignment with no diversion from existing route with significant potential journey time savings	Existing services could access the Travel Hub site and alignment with minimal diversion from existing route with large potential journey time savings	Existing services could access the Travel Hub site and alignment with some diversion from existing route and potential journey time savings	Neither advantage nor disadvantage to existing public transport users	Existing services may have some increase in journey times	Existing services may have a large increase in journey times	Existing services would have significantly increased journey times
Impact on Existing Traffic							

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Loss of general traffic capacity along main alignment	Not applicable as if option mixes with existing traffic then it is a negative impact	Not applicable as if option mixes with existing traffic then it is a negative impact	Not applicable as if option mixes with existing traffic then it is a negative impact	Completely segregated	Some sharing with existing traffic on lower traffic sections	Shares with existing traffic on quieter sections. May have some localised impacts	Shares with existing traffic on busy sections. Congestion likely to worsen
Loss of capacity/priority at junctions	Not applicable as if option mixes with existing traffic then it is a negative impact	Not applicable as if option mixes with existing traffic then it is a negative impact	Not applicable as if option mixes with existing traffic then it is a negative impact	Route does not affect existing junctions	Route will require minor modifications to existing junctions but expected limited impact on capacity for existing traffic	Number of junctions affected. These are on busier routes meaning a greater impact on capacity and general traffic journey times can be expected	Large number of junctions and congested junctions are seriously affected
Impact of delay caused by additional junctions	Not applicable as if option mixes with existing traffic then it is a negative impact	Not applicable as if option mixes with existing traffic then it is a negative impact	Not applicable as if option mixes with existing traffic then it is a negative impact	No new junctions required, or grade separated junctions introduced where public transport route crosses existing route	At-grade junctions introduced where public transport route crosses existing route, but flows are light and minimal delay expected	Additional junction(s) required on major road. Likely to result in some additional delay	Additional junction(s) required on major road. Likely to result in significant additional delay
Degree of Route Segregation							
Junctions	Only interaction is where public transport route crosses existing minor road, junctions are grade separated	Only interaction is where public transport route crosses existing minor roads. Where public transport route crosses existing road, public transport route has priority	Greater number of junctions but public transport route has priority at all	Not applicable – route is either segregated or not	No segregation or priority at junctions. Junctions have low traffic levels	No segregation or priority at junctions. Junctions have moderate traffic levels	No segregation or priority at junctions. Junctions have high traffic levels

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
General alignment	Offline route, no interaction with existing traffic along main alignment	Parallel route with interaction with general traffic at junctions	Runs alongside existing carriageway but limited integration with existing traffic except at junctions	Not applicable – route is either segregated or not	Runs alongside existing traffic using separate lanes with some access points or junctions	Runs alongside existing traffic with interaction with existing traffic very likely	No route segregation
Walking and Cycling Connectivity							
Quality and directness of new Non-Motorised User (NMU) route	Very direct, high quality route	Direct, good quality route	Direct but lower quality route	Not applicable- route is either direct or not	Route is indirect and broken or requires multiple crossings	Route is indirect, broken and/or likely to be poor quality	No NMU route provided
Catchment of new NMU route	Serves all settlements and employment campuses	Serves most settlements and employment campuses	Serves both residential and employment areas	Not applicable- route serves local facilities or not	Route provides limited access to either residential or employment areas	Route provides limited access to both residential and employment areas	Route does not serve any residential or employment areas
Severance of existing routes	No severance or impact on existing routes	Smaller number of routes crossed, or minor deviations required but mitigation expected to be possible and/or impact expected to be limited (direct route and/or limited crossing time)	Larger number of routes crossed, or diversions required but mitigation expected to be possible and/or impact expected to be limited (direct route and/or limited crossing time)	Not applicable- either positive or negative	Some minor severance or minor diversions required. No mitigation and/or greater impact on NMU route users (indirect replacement routes and/or greater crossing time)	Greater severance or greater diversions required. No mitigation and/or greater impact on NMU route users (indirect replacement routes and/or greater crossing time)	Major severance or diversions required. No mitigation and significant impact on NMU route users
Suitability of Travel Hub Facility							
Capacity (min 2,000 spaces)	Site provides above minimum capacity with potential for future growth	Provides minimum capacity with some potential for future growth	Provides minimum capacity but no potential for future growth	Not applicable - either positive or negative	Provides under minimum capacity but with potential for future growth	Provide under minimum capacity with no room for expansion	Site does not provide adequate capacity with no room for expansion
Site parking duration/ restrictions (linked to parking availability)	Self-enforcing, no requirement for parking restrictions.	Self-enforcing, no requirement for parking restrictions. Site caters for	Parking restrictions required. Site	Not applicable - either positive or negative	No parking restriction required. Site full by end of peak period	Parking restrictions required. Site full by end of peak period	Site requires on-going enforcement (e.g. ANPR) to prevent usage by

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
	Site caters for all off-peak demand	majority of off-peak demand	caters for majority of off-peak demand				unintended users (e.g. adjacent businesses/land uses)
Site access from A1307/ A505/ A11	Very direct car access into Travel Hub for all users from A1307/A505/A11. High potential to minimise driving distance	Less direct car access time into Travel Hub from A1307/A505/A11, but access from all these possible	Less direct car access into Travel Hub from A1307/A505/A11 but access from all of these possible. Access further from A1307	No particular advantages or disadvantages to site access location	Route would preclude access for some users accessing Cambridge via A1307, A505 or A11	Number of routes that not served. Route is indirect, broken and/or likely to add to journey times and distance	No direct access provided for any users travelling from the A1307/A505/A11
Site deliverability – on-site quality/provision for buses (i.e. lighting, interchange facilities, charge point installation)	Site can easily provide high quality provision providing for quicker public transport interchange, bus journeys, greater use and improved safety	Site delivers good on-site provision and amenities with constraints able to be mitigated at expected lower cost	Site delivers adequate on-site amenities with constraints mitigated at expected great cost	Site delivers adequate quality on-site amenities with no cost implications	Site delivers minimum on-site amenities with constraints mitigated at expected lower cost	Site provides poor on-site amenities with constraints mitigated at expected higher cost	Site provides poor on-site amenities and with expected significant cost implications
Site accessibility & permeability (for public transport)	Provides access to the most frequent services with opportunity to increase based on demand and can incorporate multiple operating services to multiple destinations. Site is very permeable to offline route(s)	Provides access to services with the opportunity to increase based on demand and can incorporate multiple operating services to multiple destinations. Site is permeable to offline route(s)	Provides access to services with the opportunity to increase based on demand. Site is adequately permeable to offline route(s)	No particular advantages or disadvantages to site access location	Provides limited access to services. Site is not permeable to offline route(s)	Provides very limited access to services to the Travel Hub site, which can be influenced by online movements i.e. traffic making the services unreliable. Site is not permeable to offline route(s)	Provides restricted access to services to the Travel Hub site, which can be influenced by online movements. Site is not permeable to offline route(s)
Site visibility from the A1307/A505/A11	Has good, clear visibility from A1307/A505/A11	Has clear visibility with few visual obstructions	Is mostly visible however does have some visual	There is visibility however the site would be	Site is mostly obscured and relies on signage	Site is visually obscured and has	Visibility is poor and there are no

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
	with no visual obstructions		obstructions for example land level	mostly reliant on a signage strategy only		few opportunities for signage	opportunities for signage to the site
Theme: Environment							
Visual Impact	Route contributes to physical improvement of parkland or areas of historic interest	Improvement /sustainability of landscape alongside parkland	Tree planting or tidying of road verge	No impact	Loss of trees or intrusions onto road verge	Construction of physical infrastructure alongside parkland	Construction of physical infrastructure encroaches parkland or areas of historic importance
Noise	Route diverts a substantial amount of traffic away from most housing	Route is a substantial distance away from housing	Route is partially away from residences and may cause reduction in noise pollution	No impact	Route is much closer to residences and will cause some local increases in noise pollution	Route is directly alongside housing causing major local increases in noise pollution in most areas	Route is directly alongside housing causing major local increases in noise pollution in all areas
Air Quality	Significant improvement in air quality	Moderate improvement in air quality	Slight improvement n in air quality	No impact	Slight deterioration in air quality due to option along route	Major deterioration in air quality due to s option along route	Extreme deterioration in air quality due to option along route
Water/Flood Risk	Not applicable – no intervention will improve flood risk	Not applicable – no intervention will improve flood risk	Not applicable – no intervention will improve flood risk	No impact	Proposed route crosses flood zones of non-main rivers or Source Protection Zone (SPZ) 2	Proposed route crosses flood zones of main rivers or SPZ 1	Proposed route crosses flood zones of all waterways
Biodiversity	Significant increase in vegetation or trees	Moderate increase in vegetation or trees	Small increase in vegetation or trees	No impact	Small loss of some vegetation or trees, as well as loss of hedgerows at field boundaries	Major loss of vegetation / trees or loss of key habitats	Severe loss of vegetation / trees or loss of key habitats with no mitigation measures
Heritage	Not applicable – no intervention will improve heritage	Not applicable – no intervention will improve heritage	Not applicable – no intervention will improve heritage	No impact	Slight impact on setting of scheduled monuments / listed buildings / conservation areas	Major visual impact or partial demolition of scheduled monuments / listed buildings / conservation areas	Severe visual impact and demolition of multiple scheduled monuments / listed buildings / conservation areas

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Impact on Greenbelt	Not applicable – no intervention will improve greenbelt	Not applicable – no intervention will improve greenbelt	Not applicable – no intervention will improve greenbelt	No impact	Route partially in green belt (majority outside)	Route encroaches significantly or totally onto greenbelt	Route encroaches totally onto green belt and/or there are significant structures impacting the open nature of the greenbelt
Theme: Deliverability							
Degree of Objection Expected							
Loss of environmentally sensitive areas	Expected to be very strongly supported with no impact on the environment	Expected to be well supported with no impact on the environment	Expected to generate moderate support	Not expected to generate significant public support or opposition	Expected opposition as a result of impact on environment	Expected strong opposition. Large impact on environmentally sensitive sites	Expected very strong opposition. Loss of environmentally sensitive sites
Impact on existing residential dwellings	Expected to be very strongly supported with no impact on residential amenity	Expected to be well supported with no impact on residential amenity	Expected to generate moderate support	Not expected to generate significant public support or opposition	Expected opposition. Slight impact on residential amenity	Expected strong opposition. Greater impact on residential amenity	Expected very strong opposition. Loss of residential premises
Impact on general traffic	Expected to be very strongly supported with no impact on general traffic	Expected to be well supported with no impact on general traffic	Expected to generate moderate support	Not expected to generate significant public support or opposition	Expected opposition. Slight impact on traffic	Expected strong opposition. Large impact on traffic	Expected very strong opposition. Major impact on traffic
Option **Cost**							
Capital costs	Not applicable – cost not viewed as a positive	Not applicable – cost not viewed as a positive	Not applicable – cost not viewed as a positive	No or limited cost expected	Lower cost - Widening and junction changes only	Higher cost - new road alignment	Highest cost - new road alignment
Operating costs	Not applicable – cost not viewed as a positive	Not applicable – cost not viewed as a positive	Not applicable – cost not viewed as a positive	No or limited cost expected	Predominantly offline option, providing greater reliability	Potential for disruption at shared sections or junctions	Potential for significant disruption at shared sections or junctions

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Potential subsidy	Greater potential for operating surplus as a result of two-way flows- routes serving terminating at or close to employment sites	Potential for operating surplus as a result of two-way flows	Some potential for operating surplus	No or limited cost expected	Potential slight negative impact on patronage levels because of alignment, catchment and journey reliability (reduced potential for high patronage levels)	Expected moderate negative impact on patronage levels because of alignment, catchment and journey reliability (reduced potential for high patronage levels)	Expected significant negative impact on patronage levels because of poor alignment, catchment and journey reliability (reduced potential for high patronage levels)
Engineering Feasibility- Construction Method							
Accessibility to site during construction	No work required with significant benefit over other options	No work required	Limited work required with few access constraints	Limited complexity or relative advantage	Route can be accessed alongside existing major roads (A1307)	Offline route requiring new construction access routes	Offline route with substantial access constraints
Complexity of junctions	No work required to existing junctions or new junctions created	Some minor modifications to existing junctions	Some minor new junctions created	Greater work required but no impact on project complexity foreseen	Greater changes to existing junctions but not expected to be complex	Changes to existing junctions likely to have large impact on existing junctions	Changes to existing junctions likely to have major impact on existing junctions
Structural complexity	Simple alignment with no structural requirements	Simple alignment with limited structural requirements	Requirement for single bridge or large structure only	Greater work required but no impact on project complexity foreseen	Requirement for single river bridge and single minor road bridge	Requirement for multiple river and minor road bridges and/ or bridge over strategic road network	Requirement for multiple river and minor road bridges and bridge over the strategic road network
Land Acquisition Required							
Quantity of land required	Net sale of highway land for other uses	Significant reallocation of existing highway to other uses, partially offsetting acquisition	Minor reallocation of existing highway to other uses, partially offsetting acquisition	Limited or no land purchase	Some land purchase required or limited current use	Significant purchase of farmland	Significant land purchase including buildings and/ or gardens required

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
		requirements elsewhere	requirements elsewhere				
Division of field boundaries	Not applicable – not possible to have benefit	Not applicable – not possible to have benefit	Not applicable – not possible to have benefit	Route does not require any division of field boundaries	Route requires limited division of field boundaries	Route creates some parcels of land from divided fields	Route creates significant parcels of redundant land from divided fields
Impact on Transport Networks During Construction							
Impact on road network	Not applicable – no possibility of a positive impact on the road network during construction	Not applicable – no possibility of a positive impact on the road network during construction	Not applicable – no possibility of a positive impact on the road network during construction	Work generally away from the existing road network	Some works alongside existing roads. Expected limited disruption to traffic using these	Significant work alongside existing roads expected to result in disruption to existing traffic. Construction of bridge over existing minor road	Closure or significant disruption to major road network expected (including bridge construction over strategic roads)
Impact on rail network	Not applicable – no possibility of a positive impact on the rail network during construction	Not applicable – no possibility of a positive impact on the rail network during construction	Not applicable – no possibility of a positive impact on the rail network during construction	Work completely away from the existing rail network	Some works alongside existing railway. Expected limited disruption	Significant work alongside existing railway expected to result in disruption	Closure or significant disruption to railway network expected
Impact on Non-Motorised Users (NMUs)	Not applicable – no possibility of a positive impact on NMU network during construction	Not applicable – no possibility of a positive impact on NMU network during construction	Not applicable – no possibility of a positive impact on NMU network during construction	Work generally away from the existing NMU network	Some works alongside or across existing NMU routes. Expected mitigation to limit disruption to NMUs using these	Significant work alongside existing NMU routes. Expected mitigation to minimise disruption to NMUs using these	Closure or significant disruption to busy NMU routes required with no diversion
Future Proofing							
Range of vehicle usability	No constraints to future extension and use by different vehicle types	Suitable for use by likely CAM vehicles	Route retains some flexibility for use by different vehicles in future	Route not expected to prohibit use by various vehicle types but not	Route may need modifying to allow future use by certain vehicle types	Route could be used by CAM vehicles but would not provide	Future use by CAM vehicles not possible without significant redesign

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
				specifically designed for their use		dedicated infrastructure.	
Extension to Haverhill	Route fully supports future extension towards Haverhill with no modification expected	Route supports extension towards Haverhill with very limited modification expected	Route supports extension towards Haverhill with some minor diversion expected	As a minimum, could re-join existing A1307. Not considered negative as alignment would not prevent future use of the A1307 but not positive as not linking to an opportunity to provide a dedicated route	Option expected to require diversion	Option expected to require significant diversion in order to serve Haverhill	Option likely to preclude a future extension to Haverhill
Risks to Delivery							
Consents	No risk to delivery	Very low risk to project delivery	Low risk to project delivery	Risk scored as either positive or negative based on risk category	Moderate risk to project delivery. Routes alongside existing roads considered lower risk	High risk to project delivery. Routes predominantly along new alignment considered higher risk	Very high risk to project delivery
Complexity	No risk to delivery	Very low risk to project delivery	Low risk to project delivery	Risk scored as either positive or negative based on risk category	Moderate risk to project delivery. Routes alongside existing road considered lower risk	High risk to project delivery	Very high risk to project delivery
Theme: Social Impacts							
Safety							

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Changes to vehicular accident rates	Significant demonstrable benefit. As impact on safety has not been quantified at this stage, this score has not been assigned to any options	Large demonstrable benefit. As impact on safety has not been quantified at this stage, this score has not been assigned to any options	Likely benefit over alternative options- expected where route has a dedicated alignment with limited interaction with general traffic	Route not necessarily expected to reduce current vehicle accident rates but dedicated infrastructure and no additional junctions on major roads means that an increase is not expected	Some disbenefit possible as a result of sharing between public transport route and general traffic or introduction of new junctions on major roads	Greater disbenefit expected as a result of sharing between public transport route and general traffic or introduction of new junctions on major roads	Significant disbenefit expected as a result of sharing between public transport route and general traffic.
Changes to Non-Motorised User (NMU) accident rates	Very direct, high quality route with wide catchment. Very likely to have high usage and contribute to NMU collision savings elsewhere	Direct, good quality route serving residential areas and/or employment sites. Likely to contribute to NMU collision savings elsewhere	Direct but lower quality route. Still offers benefit over existing facilities	No NMU route provided	Route is indirect and broken and unlikely to be well used or contribute to reduced NMU accidents	Route is indirect, broken and/or likely to be poor quality resulting in very low use. Not expected to contribute to reduction in NMU accidents	Risks overall increase in NMU accident rates
Changes to personal safety	Expected to have a major beneficial impact on personal safety	Expected to have a large beneficial impact on personal safety	Expected to have a slight beneficial impact on personal safety	No change expected to personal safety	Expected to have a slight negative impact on personal safety	Expected to have a large negative impact on personal safety	Expected to have a major negative impact on personal safety
Access to Cambridge Biomedical Campus							
Degree to which campus is served	Route provides excellent access to centre of campus with dedicated infrastructure	Route provides excellent access to centre of campus but not with	Route provides good access to campus	Not applicable as either positive or negative criterion	Route does not serve campus directly	Route does not serve the campus	Route would not serve campus and deviates from it significantly

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
		dedicated infrastructure					
Directness of route	Campus served via the quickest, most direct alignment	Route generally direct with some minor deviation	Route generally direct with some greater deviation	Not applicable as either positive or negative criterion	Route serving the campus diverts in order to do so	Route serving the campus diverts significantly in order to do so	Route would not serve campus
Compatibility with masterplan proposals	Public transport route proposal fundamental to delivery of masterplan	Public transport proposal will support implementation of masterplan	Public transport proposal not expected to impact on implementation of masterplan although may require some changes to road layout/ junctions and/or landscaping	Not applicable as either positive or negative criterion	Proposal may have some minor inconsistencies with masterplan proposals. Expected to require limited change to masterplan proposals	Proposal highly likely to be incompatible with masterplan proposals but could be amended. Changes to route or masterplan proposals may be substantial	Proposal incompatible with masterplan proposals and cannot be mitigated
Landowner support	Route promoted by landowners	Route expected to be well supported by landowners	Landowner support likely	Landowner support or opposition not known at time of assessment	Limited opposition from landowners expected but could be mitigated	Strong opposition from landowners expected but could be mitigated	Very strong opposition from landowners expected. Unlikely that this could be mitigated
Access to Babraham Research Campus							
Degree to which campus is served	Route provides excellent access to centre of campus with dedicated infrastructure	Route provides excellent access to centre of campus but not with dedicated infrastructure	Route provides good access to campus	Not applicable as either positive or negative criterion	Route does not serve campus directly	Route does not serve the campus	Route would not serve campus and deviates from it significantly

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Directness of route	Campus served via the quickest, most direct alignment	Route generally direct with some minor deviation	Route generally direct with some greater deviation	Not applicable as either positive or negative criterion	Route serving the campus diverts in order to do so	Route serving the campus diverts significantly in order to do so	Route would not serve campus
Compatibility with masterplan proposals	Public transport route proposal fundamental to delivery of masterplan	Public transport proposal will support implementation of masterplan and require no change	Public transport proposal not expected to impact on implementation of masterplan although may require some changes to road layout/junctions and/or landscaping	Not applicable as either positive or negative criterion	Proposal may have some minor inconsistencies with masterplan proposals. Expected to require limited change to masterplan proposals	Proposal highly likely to be incompatible with masterplan proposals but could be amended. Changes to route or masterplan proposals may be substantial	Proposal incompatible with masterplan proposals and cannot be mitigated
Landowner support	Route promoted by landowners	Route expected to be well supported by landowners	Landowner support likely	Landowner support or opposition not known at time of assessment	Limited opposition from landowners expected but could be mitigated	Strong opposition from landowners expected but could be mitigated	Very strong opposition from landowners expected. Unlikely that this could be mitigated
Access to Granta Park							
Degree to which park is served	Route provides excellent access to centre of campus with dedicated infrastructure	Route provides excellent access to centre of campus but not with dedicated infrastructure	Route provides good access to campus	Not applicable as either positive or negative criterion	Route does not serve campus directly	Route does not serve the campus	Route would not serve campus and deviates from it significantly
Directness of route	Campus served via the quickest, most direct alignment	Route generally direct with some minor deviation	Route generally direct with some greater deviation	Not applicable as either positive or negative criterion	Route serving the campus diverts in order to do so	Route serving the campus diverts significantly in order to do so	Route would not serve campus
Compatibility with masterplan proposals	Public transport route proposal	Public transport proposal will	Public transport proposal not	Not applicable as either	Proposal may have some minor	Proposal highly likely to be	Proposal incompatible with

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
	fundamental to delivery of masterplan	support implementation of masterplan and require no change	expected to impact on implementation of masterplan although may require some changes to road layout/ junctions and/or landscaping	positive or negative criterion	inconsistencies with masterplan proposals. Expected to require limited change to masterplan proposals	incompatible with masterplan proposals but could be amended. Changes to route or masterplan proposals may be substantial	masterplan proposals and cannot be mitigated
Landowner support	Route promoted by landowners	Route expected to be well supported by landowners	Landowner support likely	Landowner support or opposition not known at time of assessment	Limited opposition from landowners expected but could be mitigated	Strong opposition from landowners expected but could be mitigated	Very strong opposition from landowners expected. Unlikely that this could be mitigated
Loss of Buildings and Physical Infrastructure	Not applicable – no possibility loss of buildings being viewed as largely positive	Not applicable – no possibility loss of buildings being viewed as largely positive	Alignment avoids loss of buildings other options for section would result in	All options for section avoid loss of buildings	Route may result in some loss of property but not homes of buildings	Likely to result in loss of property including residential properties	Likely to result in loss of property including impact on multiple residential properties
Loss of Homes or Property							
Commercial property	Not applicable – impact either neutral or negative	Not applicable – impact either neutral or negative	Not applicable – impact either neutral or negative	Avoids any loss of property	Route may result in some loss of property but not buildings	Likely to result in small loss of property including commercial buildings	Likely to result in loss of multiple commercial buildings
Residential Property	Not applicable – impact either neutral or negative	Not applicable – impact either neutral or negative	Not applicable – impact either neutral or negative	Avoids any loss of property or impact on residential amenity	Route may result in loss of some gardens or adversely impact on residential amenity but will not result in loss of properties	Likely to result in small loss of property including residential dwellings	Likely to result in loss of multiple residential dwellings
Improvements to Physical Wellbeing							
Increase in cycling uptake	Very high potential for increase in cycling uptake.	High potential for increase in cycling uptake.	Potential for increase in cycling uptake.	Not applicable- route serves	Low potential for cycling uptake.	Very low potential for cycling uptake.	No potential for cycling uptake.

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
	Serves all settlements and employment campuses with good quality, direct cycle route	Serves most settlements and employment campuses	Route serves either residential or employment areas but with more limited access to them. Lower quality route	local facilities or not	Route provides limited access to either residential or employment areas	Route provides very limited access to both residential and employment areas	Route does not serve any residential or employment areas
Increase in walking uptake	Very high potential for increase in walking uptake. Serves all settlements and employment campuses with good quality, direct cycle route	High potential for increase in walking uptake. Serves most settlements and employment campuses	Potential for increase in walking uptake. Route serves either residential or employment areas but with more limited access to them. Lower quality route	Not applicable- route serves local facilities or not	Low potential for walking uptake. Route provides limited access to either residential or employment areas	Very low potential for walking uptake. Route provides very limited access to both residential and employment areas	No potential for walking uptake. Route does not serve any residential or employment areas
Theme: Wider Economic Impacts							
Supporting development of employment sites	Very high potential for the option to support the development of employment sites, both at each end of the route (Granta Park and the Cambridge Biomedical Campus) and along the route	High potential to support the development of employment sites along the route and at each end	Some potential to support the development of employment sites along the route and at each end	No potential to directly support the development of employment sites in this area	Some potential to negatively impact the development of employment sites in this area	Large potential for option to negatively impact the development of employment sites in this area	Very large potential for option to negatively impact the development of employment sites in this area
Number of new homes supported	Very high potential for option to support the delivery of allocated housing sites in this area	High potential for option to support the delivery of allocated housing sites in this area	Some potential for option to support the delivery of allocated housing sites in this area	No potential for option to support the delivery of allocated	Some potential for option to inhibit or prevent the delivery of allocated housing sites in this area	Large potential for option to inhibit or prevent the delivery of allocated housing sites in this area	Very large potential for option to inhibit or prevent the delivery of allocated housing sites in this area

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
				housing sites in this area			
Number of new jobs created	Very high potential for option to support the creation of a large number of new jobs that are net additional to this area	High potential for option to support the creation of a large number of new jobs that are net additional this area	Some potential for option to support the creation of some new jobs that are net additional to this area	No potential for option to support the creation of new jobs that are net additional to this area	Some potential for this option to prevent the creation of new net additional jobs in this area	Large potential for this option to prevent the creation of jobs in this area or to lead to a reduction in total employment in this area	Very large potential for this option to result in the reduction of existing jobs in this area and to prevent the creation of new net additional jobs
GVA uplift	Linked to supporting the creation of net additional new jobs in this area, the option is likely to have a very large impact on supporting an increase in local GVA	Linked to supporting the creation of net additional new jobs in this area, the option is likely to have a large impact on supporting an increase in local GVA	Linked to supporting job growth, the option may have some impact on localised GVA growth	Linked to supporting job creation, the option is likely to have no impact on localised GVA growth	As with supporting job creation, the option has the potential to prevent or inhibit GVA growth in this area	As with supporting job creation, the option has a large amount of potential to prevent the localised increase in GVA or to reduce overall GVA in this area	As with supporting job creation, the option is very likely to prevent an uplift in GVA in this area and result in an overall reduction in GVA in this area
Land value uplift	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage
Increase in job catchment areas	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage	N/A at this stage. Will be assessed at next stage
Theme: Alignment with Objectives							
Support Growth of Local Economy							
Deliver journey time savings to jobs	Very strong alignment with scheme objective. Significant journey	Strong alignment with scheme objective. Large journey time	Marginal alignment with scheme objective. Some journey time	Where possible, any option will have either positive or negative	Poor alignment with scheme objective. Slight increase in journey times to jobs expected	Very poor alignment with scheme objective. Large increase in	No alignment with scheme objective. Significant increase

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
	time savings to jobs expected	savings to jobs expected	savings to jobs expected	scores relative to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage		journey time to jobs expected	in journey time to jobs expected
Improve journey time reliability for public transport users	Very strong alignment with scheme objective. Significant improvements to journey time reliability for public transport users expected	Strong alignment with scheme objective. Large improvements to journey time reliability for public transport users expected	Marginal alignment with scheme objective. Some improvements to journey time reliability for public transport users expected	Where possible any option will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage	Poor alignment with scheme objective. Slight deterioration in journey time reliability for public transport users expected	Very poor alignment with scheme objective. Large deterioration in journey time reliability for public transport users expected	No alignment with scheme objective. Significant deterioration in journey time reliability for public transport users expected
Infrastructure necessary to sustain economic growth	Very strong alignment with scheme objective. Significant improvements to infrastructure necessary to sustain economic growth expected	Strong alignment with scheme objective. Large improvements to infrastructure necessary to sustain economic growth expected	Marginal alignment with scheme objective. Some improvements to infrastructure necessary to sustain economic growth expected	Where possible, any option will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this	Poor alignment with scheme objective. Slight deterioration of infrastructure necessary to sustain economic growth expected	Very poor alignment with scheme objective. Large deterioration of infrastructure necessary to sustain economic growth expected	No alignment with scheme objective. Significant deterioration of infrastructure necessary to sustain economic growth expected

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
				criterion at this stage			
Relieve Congestion and Improve Air Quality							
Encourage use of sustainable transport modes	Very strong alignment with scheme objective. Significant increase in use of sustainable transport modes expected	Strong alignment with scheme objective. Large increase in use of sustainable transport modes expected	Marginal alignment with scheme objective. Some increase in use of sustainable transport modes expected	Where possible all options will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage	Poor alignment with scheme objective. Slight decrease in the use of sustainable transport modes expected	Very poor alignment with scheme objective. Large decrease in the use of sustainable transport modes expected	No alignment with scheme objective. Significant decrease in the use of sustainable transport modes expected
Enhance quality of life	Very strong alignment with scheme objective. Significant enhancement to quality of life expected	Strong alignment with scheme objective. Large enhancement to quality of life expected	Marginal alignment with scheme objective. Some enhancement to quality of life expected	Where possible all options will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage	Poor alignment with scheme objective. Slight deterioration to quality of life expected	Very poor alignment with scheme objective. Large deterioration to quality of life expected	No alignment with scheme objective. Significant deterioration to quality of life expected
Relieve pressure at network pinch points	Very strong alignment with	Strong alignment with scheme	Marginal alignment with scheme	Where possible all	Poor alignment with scheme objective. Slight	Very poor alignment with	No alignment with scheme objective.

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
	scheme objective. Significant improvement at network pinch points expected	objective. Large improvement at network pinch points expected	objective. Some improvement at network pinch points expected	options will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage	deterioration at network pinch points expected	scheme objective. Large deterioration at network pinch points expected	Significant deterioration at network pinch points expected
Improve Active Travel Infrastructure and Public Transport Provision							
Deliver high quality public transport	Very strong alignment with scheme objective. Significant improvement to public transport along the corridor expected	Strong alignment with scheme objective. Large improvement to public transport along the corridor expected	Marginal alignment with scheme objective. Some improvement to public transport along the corridor expected	Where possible all options will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage	Poor alignment with scheme objective. Slight deterioration to public transport along the corridor expected	Very poor alignment with scheme objective. Large deterioration to public transport along the corridor expected	No alignment with scheme objective. Significant deterioration to public transport along the corridor expected
Increase frequency of public transport during peaks	Very strong alignment with scheme objective. Significant improvement to frequency of public	Strong alignment with scheme objective. Large improvement to frequency of public transport during peaks expected	Marginal alignment with scheme objective. Some improvement to frequency of public transport during peaks expected	Where possible all options will have either positive or negative scores relative	Poor alignment with scheme objective. Slight deterioration to frequency of public transport during peaks expected	Very poor alignment with scheme objective. Large deterioration to public transport frequency during peaks expected	No alignment with scheme objective. Significant deterioration to public transport frequency during peaks expected

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
	transport during peaks expected			to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage			
Reduce severance for pedestrians, cyclists and equestrians	Very strong alignment with scheme objective. Significant reduction in severance for pedestrians, cyclists and equestrians	Strong alignment with scheme objective. Large reduction in severance for pedestrians, cyclists and equestrians	Marginal alignment with scheme objective. Some reduction in severance for pedestrians, cyclists and equestrians	Where possible all options will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage	Poor alignment with scheme objective. Slight increase in severance for pedestrians, cyclists and equestrians	Very poor alignment with scheme objective. Large increase in severance for pedestrians, cyclists and equestrians	No alignment with scheme objective. Significant increase in severance for pedestrians, cyclists and equestrians
Increase uptake of sustainable modes for commuter journeys	Very strong alignment with scheme objective. Significant increase in uptake of sustainable modes for commuter journeys	Strong alignment with scheme objective. Large increase in uptake of sustainable modes for commuter journeys	Marginal alignment with scheme objective. Some increase in uptake of sustainable modes for commuter journeys	Where possible all options will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this	Poor alignment with scheme objective. Slight decrease in uptake of sustainable modes for commuter journeys	Very poor alignment with scheme objective. Large decrease in uptake of sustainable modes for commuter journeys	No alignment with scheme objective. Significant decrease in uptake of sustainable modes for commuter journeys

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
				criterion at this stage			
Improve Road Safety							
Reduce number of accidents	Very strong alignment with scheme objective. Significant reduction in number of accidents	Strong alignment with scheme objective. Large reduction in number of accidents	Marginal alignment with scheme objective. Some reduction in number of accidents	Not expected to result in change to current accident levels	Poor alignment with scheme objective. Slight increase in number of accidents possible	Very poor alignment with scheme objective. Large increase in number of accidents	No alignment with scheme objective. Significant increase in number of accidents
Reduce number of speed related incidents	Very strong alignment with scheme objective. Significant reduction in number of speed related incidents	Strong alignment with scheme objective. Large reduction in number speed related incidents	Marginal alignment with scheme objective. Some reduction in number of speed related incidents	Not expected to result in change to current accident levels	Poor alignment with scheme objective. Slight increase in number of speed related incidents	Very poor alignment with scheme objective. Large increase in number of speed related incidents	No alignment with scheme objective. Significant increase in number of speed related incidents.
Improve safety of crossing movements for pedestrians, cyclists and equestrians	Very strong alignment with scheme objective. Significant improvements to safety of crossing movements for pedestrians, cyclists and equestrians	Strong alignment with scheme objective. Large improvements to safety of crossing movements for pedestrians, cyclists and equestrians	Marginal alignment with scheme objective. Some improvements to safety of crossing movements for pedestrians, cyclists and equestrians	Not expected to result in change to current accident levels	Poor alignment with scheme objective. Slight deterioration to safety of crossing movements for pedestrians, cyclists and equestrians	Very Poor alignment with scheme objective. Large deterioration to safety of crossing movements for pedestrians, cyclists and equestrians	No Alignment with scheme objective. Significant deterioration to safety of crossing movements for pedestrians, cyclists and equestrians
Improve Connectivity to Employment Sites							
Improve access to CBC and Granta Park	Very strong alignment with scheme objective. Significant access improvements to CBC and Granta Park	Strong alignment with scheme objective. Large access improvements to CBC and Granta Park	Marginal alignment with scheme objective. Some access improvements to CBC and Granta Park	Options will score neutral when scores assigned for access to Cambridge Biomedical Campus and access to	Poor alignment with scheme objective. Slight deterioration to access to CBC and Granta Park	Very Poor alignment with scheme objective. Large deterioration to access to CBC and Granta Park	No Alignment with scheme objective. Significant deterioration to access to CBC and Granta Park

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
				Granta Park are averaged to equal neutral			
Increase modal options for commuters travelling to these sites	Very strong alignment with scheme objective. Significant increase in modal options for commuters travelling to these sites	Strong alignment with scheme objective. Large increase in modal options for commuters travelling to these sites	Marginal alignment with scheme objective. Some increase in modal options for commuters travelling to these sites	Where possible all options will have either positive or negative scores relative to this criterion. Neutral will be used only when the option cannot be scored under this criterion at this stage.	Poor alignment with scheme objective. Slight reduction in modal options for commuters travelling to these sites	Very poor alignment with scheme objective. Large reduction in modal options for commuters travelling to these sites	No Alignment with scheme objective. Significant reduction in modal options for commuters travelling to these sites
Theme: Policy Alignment							
Alignment with Mayoral Interim Transport Strategy Statement	Very strongly aligned with the Mayoral Interim Transport Statement. Directly supports delivery of multiple aims and objectives of the statement	Strong alignment with the Mayoral Interim Transport Statement. Supports some key aims and objectives of the statement	Some alignment with the Mayoral Interim Transport Statement. Marginally supports a few key aims and objectives of the statement	No alignment with the Mayoral Interim Transport Statement. Option has neither a positive nor adverse impact on the aims and objectives	No alignment with the Mayoral Interim Transport Statement. Marginal adverse impact on a few key aims and objectives of the statement	No alignment with the Mayoral Interim Transport Statement. Some adverse impact on a number of key aims and objectives of the statement	No alignment with the Mayoral Interim Transport Statement. High adverse impact on all key aims and objectives of the statement

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
				of the statement			
Alignment with Cambridgeshire LTP3	Very strongly aligned with the Cambridgeshire LTP3. Directly supports delivery of multiple aims and objectives of the plan	Strong alignment with the Cambridgeshire LTP3. Supports some key aims and objectives of the plan	Some alignment with Cambridgeshire LTP3. Marginally supports a few key aims and objectives of the plan	No alignment with Cambridgeshire LTP3. Option has neither a positive nor adverse impact on the aims and objectives of the plan	No alignment with Cambridgeshire LTP3. Marginal adverse impact on a few key aims and objectives of the plan	No alignment with Cambridgeshire LTP3. Some adverse impact on a number of key aims and objectives of the plan	No alignment with the South Cambridgeshire Local Plan. High adverse impact on all key aims and objectives of the plan
Alignment with Transport Strategy for Cambridge City and South Cambridgeshire	Very strongly aligned with the Transport Strategy for Cambridge City and South Cambridgeshire. Directly supports delivery of multiple aims and objectives	Strong alignment with the Transport Strategy for Cambridge City and South Cambridgeshire. Supports some key aims and objectives of the strategy	Some alignment with the Transport Strategy for Cambridge City and South Cambridgeshire. Marginally supports a few key aims and objectives of the strategy	No alignment with South Cambridgeshire Local Plan. Option has neither a positive nor adverse impact on the aims and objectives of the strategy	No alignment with the Transport Strategy for Cambridge City and South Cambridgeshire. Marginal adverse impact on a few key aims and objectives of the strategy	No alignment with the Transport Strategy for Cambridge and South Cambridgeshire. Some adverse impact on a number of key aims and objectives of the strategy	No alignment with the Transport Strategy for Cambridge and South Cambridgeshire. High adverse impact on all key aims and objectives of the strategy
Alignment with Cambridgeshire Long-Term Transport Strategy	Very strongly aligned with Cambridgeshire's Long-Term Transport Strategy. Directly supports delivery of multiple aims and objectives	Strong alignment with Cambridgeshire's Long-Term Transport Strategy. Support toward some key aims and objectives of Cambridgeshire's Long-Term Transport Strategy	Some alignment with Cambridgeshire's Long-Term Transport Strategy. Marginally supports a few key aims and objectives of Cambridgeshire's Long-Term Transport Strategy	No alignment with Cambridgeshire Long-Term Transport Strategy. Option has neither a positive nor adverse impact on the aims and objectives of the strategy	No alignment with Cambridgeshire's Long-Term Transport Strategy. Marginal adverse impact on a few key aims and objectives of the strategy	No alignment with Cambridgeshire's Long-Term Transport Strategy. Some adverse impact on a number of key aims and objectives of the strategy	No alignment with Cambridgeshire's Long-Term Transport Strategy. High adverse impact on all key aims and objectives of the strategy

Criteria	Very Large Positive (+3)	Large Positive (+2)	Small Positive (+1)	Neutral (0)	Small Negative (-1)	Large Negative (-2)	Very Large Negative (-3)
Level to which the option would permit City Access Plan (CAP)	Strong support for all CAP measures	Some support for a number of CAP measures	Marginal support for a few CAP measures	Option will neither support nor adversely impact measures proposed as part of CAP	Slight adverse impact on a few CAP measures	Moderate adverse impact on some CAP measures	Strong adverse impact on all CAP measures

C. INSET Scores of the Revised Long List of 90 Option Packages

The table below shows the score of each of the 90 options. Scores are shown for each of the assessment themes as well as the total score, which is an average of the themed scores. The results are presented in ranked order.

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
1	26-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR7	1.88	-1.00	-1.12	0.61	2.00	1.68	2.80	**0.98**
2	11-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR7	1.88	-1.29	-1.12	0.61	2.00	1.68	2.80	**0.94**
3	23-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 without crossing-PR7	1.76	-1.00	-0.95	0.32	2.00	1.40	2.80	**0.90**
4	8-Western alignment via Francis Crick Ave-	1.76	-1.29	-0.95	0.32	2.00	1.40	2.80	**0.86**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 without crossing-PR7								
5	17-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Direct from western alignment-PR9	1.48	-1.29	-0.74	0.28	2.00	1.37	2.80	**0.84**
6	197-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	1.81	-1.43	-1.33	0.58	2.00	1.37	2.80	**0.83**
7	161-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	1.81	-1.57	-1.33	0.58	2.00	1.37	2.80	**0.81**
8	2-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-	1.48	-1.57	-0.74	0.28	2.00	1.37	2.80	**0.80**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	North of railway-Direct from western alignment-PR9								
9	30-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Connection to BRC Travel Hub-PR3	1.67	-1.43	-1.14	0.40	2.00	1.23	2.80	**0.79**
10	16-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Direct from western alignment-PR1	1.52	-1.86	-0.74	0.28	2.00	1.37	2.80	**0.77**
10	20-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR8	1.52	-1.86	-1.00	0.57	2.00	1.33	2.80	**0.77**
10	25-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR5	1.33	-1.29	-1.21	0.61	2.00	1.15	2.80	**0.77**
13	1-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no	1.52	-2.00	-0.74	0.28	2.00	1.37	2.80	**0.75**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	Travel Hub connection-North of railway-Direct from western alignment-PR1								
13	10-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR5	1.38	-1.57	-1.21	0.61	2.00	1.22	2.80	**0.75**
13	15-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Connection to BRC Travel Hub-PR3	1.67	-1.71	-1.14	0.40	2.00	1.23	2.80	**0.75**
16	5-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR8	1.52	-2.14	-1.10	0.57	2.00	1.60	2.60	**0.72**
17	4-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR5	0.62	-1.57	-1.00	0.40	2.00	1.20	2.80	**0.64**
17	19-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban	0.57	-1.43	-1.10	0.40	2.00	1.20	2.80	**0.64**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	area-East with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR5								
19	196-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR5	0.29	-1.43	-1.33	0.64	2.00	1.37	2.80	**0.62**
20	160-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR5	0.29	-1.57	-1.33	0.64	2.00	1.37	2.80	**0.60**
21	12-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR8	1.31	-2.14	-1.21	0.61	2.00	0.88	2.60	**0.58**
21	27-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR8	1.31	-2.14	-1.21	0.61	2.00	0.88	2.60	**0.58**
23	199-Western alignment via Francis Crick Ave-West of Nine Wells-	0.14	-1.86	-1.29	0.81	2.00	1.20	2.80	**0.54**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR8								
24	163-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR8	0.14	-2.14	-1.29	0.81	2.00	1.33	2.80	**0.52**
25	128-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR7	0.24	-1.14	-1.45	0.49	2.00	0.85	2.00	**0.43**
26	32-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with southern BRC Travel Hub connection-PR6	1.45	-1.43	-1.40	0.17	0.67	0.98	2.40	**0.41**
26	33-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with northern BRC Travel Hub connection-PR6	1.45	-1.43	-1.40	0.17	0.67	0.98	2.40	**0.41**
26	77-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with	0.24	-1.29	-1.45	0.49	2.00	0.85	2.00	**0.41**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	no Travel Hub connection-Direct to A11/A1307-PR7								
29	125-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 without crossing-PR7	0.19	-1.14	-1.29	0.19	2.00	0.63	2.00	**0.37**
30	31-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-East with northern BRC Travel Hub connection-PR6	1.45	-1.71	-1.40	0.17	0.67	0.98	2.40	**0.36**
30	34-Western alignment via Francis Crick Ave-West of Nine Wells-West avoiding urban area-West with southern BRC Travel Hub connection-PR6	1.40	-1.71	-1.40	0.17	0.67	0.98	2.40	**0.36**
30	113-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR7	0.24	-1.29	-1.55	0.49	2.00	0.85	1.80	**0.36**
33	62-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub	0.24	-1.43	-1.45	0.49	2.00	0.78	1.80	**0.35**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	connection-Direct to A11/A1307-PR7								
33	74-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 without crossing-PR7	0.19	-1.29	-1.29	0.19	2.00	0.63	2.00	**0.35**
33	110-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 without crossing-PR7	0.19	-1.29	-1.29	0.19	2.00	0.63	2.00	**0.35**
33	208-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR5	0.07	-1.43	-1.67	0.56	2.00	0.90	2.00	**0.35**
33	209-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	0.17	-1.43	-1.67	0.50	2.00	0.90	2.00	**0.35**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
38	59-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 without crossing-PR7	0.19	-1.43	-1.29	0.19	2.00	0.63	2.00	**0.33**
38	127-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR5	0.02	-1.43	-1.55	0.49	2.00	0.78	2.00	**0.33**
38	172-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR5	0.10	-1.57	-1.67	0.56	2.00	0.90	2.00	**0.33**
38	173-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	0.17	-1.57	-1.67	0.50	2.00	0.90	2.00	**0.33**
38	202-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding	0.07	-1.57	-1.67	0.56	2.00	0.90	2.00	**0.33**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR5								
38	203-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	0.17	-1.57	-1.67	0.50	2.00	0.90	2.00	**0.33**
44	76-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR5	0.02	-1.57	-1.55	0.49	2.00	0.78	2.00	**0.31**
44	112-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR5	0.02	-1.57	-1.55	0.49	2.00	0.78	2.00	**0.31**
44	166-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR5	0.07	-1.71	-1.67	0.56	2.00	0.90	2.00	**0.31**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
44	167-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 with dedicated route to A1307-PR5	0.17	-1.71	-1.67	0.50	2.00	0.90	2.00	**0.31**
48	119-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Direct from western alignment-PR9	-0.17	-1.43	-1.07	0.15	2.00	0.53	2.00	**0.29**
48	121-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR5	0.00	-1.43	-1.43	0.28	2.00	0.63	2.00	**0.29**
50	68-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Direct from western alignment-PR9	-0.17	-1.57	-1.07	0.15	2.00	0.53	2.00	**0.27**
50	70-Western alignment via Robinson Way (east)-West of Nine	0.00	-1.57	-1.43	0.28	2.00	0.63	2.00	**0.27**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR5								
50	104-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Direct from western alignment-PR9	-0.17	-1.57	-1.07	0.15	2.00	0.53	2.00	**0.27**
50	106-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR5	0.00	-1.57	-1.43	0.28	2.00	0.63	2.00	**0.27**
54	205-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR8	-0.05	-2.14	-1.62	0.72	2.00	0.73	2.20	**0.26**
54	211-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to	-0.07	-2.00	-1.62	0.72	2.00	0.80	2.00	**0.26**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	A11/A1307-Crosses A11 and joins Newmarket Road-PR8								
56	53-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Direct from western alignment-PR9	-0.17	-1.71	-1.07	0.15	2.00	0.53	2.00	**0.25**
56	55-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR5	0.00	-1.71	-1.43	0.28	2.00	0.63	2.00	**0.25**
56	61-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR5	0.02	-1.71	-1.55	0.49	2.00	0.72	1.80	**0.25**
59	175-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR8	-0.05	-2.14	-1.62	0.72	2.00	0.73	2.00	**0.24**
60	67-Western alignment via Robinson Way	0.00	-2.00	-1.07	0.15	2.00	0.53	2.00	**0.23**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	(east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Direct from western alignment-PR1								
60	118-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Direct from western alignment-PR1	-0.12	-1.86	-1.07	0.15	2.00	0.53	2.00	**0.23**
62	122-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR8	-0.05	-2.00	-1.43	0.44	2.00	0.57	2.00	**0.22**
63	103-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Direct from western alignment-PR1	-0.12	-2.00	-1.07	0.15	2.00	0.53	2.00	**0.21**
63	169-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with	-0.07	-2.29	-1.62	0.72	2.00	0.73	2.00	**0.21**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	no Travel Hub connection-Direct to A11/A1307-Crosses A11 and joins Newmarket Road-PR8								
65	107-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR8	-0.05	-2.14	-1.43	0.44	2.00	0.57	2.00	**0.20**
66	52-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Direct from western alignment-PR1	-0.12	-2.14	-1.07	0.32	2.00	0.53	1.80	**0.19**
67	78-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR8	-0.05	-2.14	-1.55	0.49	2.00	0.52	2.00	**0.18**
68	71-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR8	-0.05	-2.14	-1.43	0.44	2.00	0.57	1.80	**0.17**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
68	114-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR8	-0.05	-2.14	-1.45	0.49	2.00	0.52	1.80	**0.17**
70	56-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-North of railway-Parallel with A11 with crossing-PR8	-0.05	-2.29	-1.43	0.44	2.00	0.57	1.80	**0.15**
70	129-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Direct to A11/A1307-PR8	-0.10	-2.14	-1.55	0.49	2.00	0.52	1.80	**0.15**
72	132-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Connection to BRC Travel Hub-PR3	0.02	-1.57	-1.48	0.32	1.33	0.33	1.80	**0.11**
73	81-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with no Travel Hub connection-Connection	0.02	-1.71	-1.48	0.36	1.33	0.33	1.80	**0.09**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	to BRC Travel Hub-PR3								
73	117-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Connection to BRC Travel Hub-PR3	0.02	-1.71	-1.48	0.32	1.33	0.33	1.80	**0.09**
75	63-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Direct to A11/A1307-PR8	-0.05	-2.43	-1.55	0.49	2.00	0.45	1.60	**0.07**
75	66-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with no Travel Hub connection-Connection to BRC Travel Hub-PR3	0.02	-1.86	-1.48	0.32	1.33	0.33	1.80	**0.07**
77	85-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with southern BRC Travel Hub connection-PR6	-0.12	-1.71	-1.74	0.08	1.33	0.28	1.80	**-0.01**
78	82-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with	-0.12	-1.71	-1.74	0.08	1.00	0.28	1.60	**-0.09**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	northern BRC Travel Hub connection-PR6								
79	83-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-East with southern BRC Travel Hub connection-PR6	-0.12	-1.43	-1.74	0.08	0.67	0.22	1.60	**-0.10**
79	84-Western alignment via Robinson Way (east)-West of Nine Wells-West avoiding urban area-West with northern BRC Travel Hub connection-PR6	-0.12	-1.43	-1.74	0.08	0.67	0.22	1.60	**-0.10**
81	159-A1307 alignment via Francis Crick Ave-A1307 link road (direct)-A1307 widening-A1307 widening-A1307 widening-PR7	0.21	-1.71	-0.93	0.03	0.00	0.03	1.60	**-0.11**
82	157-A1307 alignment via Francis Crick Ave-A1307 link road (field boundary)-A1307 widening-A1307 widening-A1307 widening-PR7	0.21	-1.71	-0.93	-0.01	0.00	0.03	1.60	**-0.12**
83	134-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with southern BRC Travel Hub connection-PR6	-0.12	-1.86	-1.74	0.08	0.67	0.22	1.60	**-0.16**
83	135-Western alignment via Robinson Way	-0.12	-1.86	-1.74	0.08	0.67	0.22	1.60	**-0.16**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
	(west)-West of Nine Wells-West avoiding urban area-West with northern BRC Travel Hub connection-PR6								
83	155-A1307 alignment via Francis Crick Ave-A1307 link road (direct)-A1307 widening-A1307 widening-PR6	0.00	-1.86	-0.93	0.03	0.00	0.03	1.60	**-0.16**
83	156-A1307 alignment via Francis Crick Ave-A1307 link road (field boundary)-A1307 widening-A1307 widening-A1307 widening-PR3	0.05	-1.86	-0.93	-0.01	0.00	0.03	1.60	**-0.16**
87	154-A1307 alignment via Francis Crick Ave-A1307 link road (field boundary)-A1307 widening-A1307 widening-PR6	0.00	-1.86	-0.93	-0.01	0.00	0.03	1.60	**-0.17**
88	158-A1307 alignment via Francis Crick Ave-A1307 link road (direct)-A1307 widening-A1307 widening-A1307 widening-PR3	0.05	-2.00	-0.93	0.03	0.00	-0.10	1.60	**-0.19**
89	133-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-East with northern BRC Travel Hub connection-PR6	-0.12	-2.14	-1.74	0.08	0.67	0.22	1.60	**-0.20**

Rank	Option	Transport Benefits	Environment	Deliverability	Social Impacts (Quality of Life)	Wider Economic Benefits	Alignment with Objectives	Policy Alignment	Total Score
89	136-Western alignment via Robinson Way (west)-West of Nine Wells-West avoiding urban area-West with southern BRC Travel Hub connection-PR6	-0.12	-2.14	-1.74	0.08	0.67	0.22	1.60	**-0.20**