



M11 J11 Park and Ride: Strategic Outline Business Case

04 September 2018

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M11 J11 Park and Ride: Strategic Outline Business Case

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Executive summary

Introduction

Cambridge is one of the UK's most successful, fastest growing and most productive cities. The city helps the UK economy to compete on the international stage, attracting high calibre knowledge-based individuals to fill skills gaps and increase economic growth.

The Greater Cambridge Partnership (GCP), as the local delivery body for the Greater Cambridge City Deal, has a mandate to maintain and grow Greater Cambridge. It aims to deliver 33,500 new homes and 44,000 new jobs by 2031, with 'better greener transport connecting people to homes, jobs, study and opportunity'. The next major phase of rapid development in Cambridge is taking place within the Southern Fringe, close to M11 Junction 11, incorporating substantial employment development at the Cambridge Biomedical Campus. The existing transport network is already constrained and will need to be improved in order to cater for demand associated with this development.

This document presents the Strategic Outline Business Case (SOBC) for a scheme involving major enhancement to Park and Ride facilities in close proximity to M11 Junction 11, along with complementary public transport priority measures along the A1309 Hauxton Road / High Street / Trumpington Road. The scheme forms a key component of the GCP West of Cambridge Package.

In line with Department for Transport requirements, this SOBC defines the scheme scope, makes the case for change, outlines options, presents evidence on expected impacts, and outlines costs, programme, governance and assurance arrangements. It follows the five-case model structure – Strategic, Economic, Financial, Commercial, and Management Cases. Greater emphasis is placed on the Strategic and Economic Cases at SOBC stage. A key output from this SOBC is an option short list to be considered for further assessment and public consultation as part of the next business case stage, Outline Business Case.

Strategic Case

Greater Cambridge is a world-leading centre for research, innovation and technology, with significant levels of inward investment creating jobs and prosperity. Its success brings jobs and opportunities for the whole region and beyond. The Cambridge Southern Fringe is home to the internationally significant Cambridge Biomedical Campus, which is expected to employ 30,000 people by 2031.

Despite this economic success, Cambridge faces supply side threats to its economic growth. Investments in transport infrastructure will be critical, ensuring transport network capacity, high congestion levels, and poor reliability issues are addressed to unlock the city's growth potential. Major enhancements to Park and Ride facilities in close proximity to M11 Junction 11 can contribute to the economic growth of Cambridge, in particular the Cambridge Biomedical Campus, and will be ideally positioned to support the Cambridge Autonomous Metro proposals.

A range of existing and future transport problems, which have the potential to constrain economic growth within the Southern Fringe, have been identified:

- Congestion on the A1309, between M11 Junction 11 and the Biomedical Campus and city centre. Average speeds are currently less than 10mph on multiple sections of the road

during peak periods, making the A1309 the most congested route between the M11 and central Cambridge.

- Congestion at M11 Junction 11, including the A10 approach from the south-west which experiences delays of approximately 16 minutes during the morning peak hour.
- Higher private car mode share for journeys from the south and south-west.
- Forecast significant increase in private car trips, with the next phase of the Biomedical Campus alone expected to generate an additional 2,400 daily private car trips by the time it is fully operational.
- Insufficient parking capacity at the existing Trumpington Park and Ride site. Under a medium demand scenario approximately 800-900 additional spaces will be required (by 2031) to serve demand on an average day, or almost 2,500 spaces under a high demand scenario.
- Congestion currently affecting Park and Ride bus services along the A1309.

Ensuring good connectivity to key employment areas will continue to be important for Cambridge's current and future economic success. Failure to provide additional capacity and ensure the efficient movement of people and goods risks fundamentally compromising the city's growth potential.

Investment in Park and Ride facilities, and in particular at a location close to M11 Junction 11, is supported by regional and local policy and strategy – the Greater Cambridge Greater Peterborough Strategic Economic Plan, Greater Cambridge City Deal, Cambridge Local Plan, South Cambridgeshire Local Plan, Cambridgeshire Local Transport Plan, and Transport Strategy for Cambridge and South Cambridgeshire. Park and Ride is a long established and successful method in Cambridge, evidenced by the existing Trumpington site reaching capacity.

Park and Ride facilities are also complementary to the proposed Cambridgeshire Autonomous Metro (CAM), providing locations where trips from outside the area can be aggregated and loaded onto the system. Park and Ride facilities will help to maximise CAM patronage and minimise service subsidy requirements.

A set of six specific objectives has been identified to guide option selection. Compared to a future potential scenario without major enhancements to Park and Ride facilities, the scheme will need to:

1. Reduce (or avoid a negative impact on) general traffic levels and congestion

- i. Reduce traffic north east of M11 J11 (along Hauxton Road and through Trumpington), by encouraging trips headed for the city centre and Cambridge Biomedical Campus to transfer to another mode.
- ii. Reduce traffic flow and delay at M11 J11, particularly in the AM peak, including reducing flows associated with non-motorway traffic that pass across the junction (A10-A1309).
- iii. Reduce delays on the A10 through Harston and Hauxton, on the approach to M11 J11.

2. Maximise the potential for journeys to be undertaken by sustainable modes of transport

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

- ii. Increase Park and Ride capacity, in particular to serve forecast economic growth at the Cambridge Biomedical Campus key employment area, with delivery aligned to overall Campus development timescales.
- iii. Reduce public transport journey times between Trumpington and the city centre, enabling Park and Ride / other public transport to compete more effectively with the private car.

An option sifting process has been followed, which has identified that if a new site is to be provided then it should be to the west of the M11, as this would be best able to meet the scheme objectives. In particular, it would be able to intercept trips along the A10 before they reach Junction 11. A site west of the M11 is also expected to be more deliverable within the required timescales, due to land availability, and to have the least adverse environmental impacts.

In line with the Department for Transport's WebTAG appraisal process and the GCP assurance framework, a multi-criteria assessment approach has been used to short list potential options for a new site on land to the west of the M11. Four new site options (referred to as Cyan, Purple, White and Yellow in this document) are to be considered further as part of the Outline Business Case stage, alongside an option for major expansion at Trumpington (referred to as Magenta). Concept drawings are provided in **Appendix A**.

Options for complementary public transport priority measures along the A1309 and public transport service provision will also be considered further and assessed as part of the Outline Business Case.

As part of the Outline Business Case, the options short list will be assessed under alternative demand scenarios, also taking account of the influence of interdependent schemes – Foxton rural travel hub, Whittlesford rural travel hub, Cambridge South station, Cambourne to Cambridge scheme, and the M11 smart motorway.

Economic Case

The Economic Case has been prepared using methods that are appropriate for an early stage of scheme development. At this stage a value for money category has not been identified, although there are clear benefits associated with each of the short list options.

A high-level assessment of the short list options has been undertaken, based on the standard WebTAG economic, environmental, and social impact headings.

For any of the short list options, there is expected to be a net economic benefit for road users, as mode shift decisions (particularly by those making commuting journeys) will reduce traffic flows and delay in an area where significant congestion is experienced. Users of a new Park and Ride site adjacent to Junction 11 would also benefit from reduced access times into the site, as well as an improved ability to find a parking space and a reliable onward public transport journey time.

In terms of wider economic impacts, the short list options might widen the travel to work area and increase the supply of labour for the major employment growth areas. More detailed wider economic assessments will be undertaken for the Outline Business Case.

A high-level desktop environmental assessment has noted varied impacts by option, although significant negative impacts are highly unlikely. The new site options are expected to perform more strongly than expanding Trumpington in terms of noise, local air quality, and townscape. A

major expansion at Trumpington is expected to perform more strongly with regard to landscape, historic environment, biodiversity, and water environment impacts.

A range of social benefits are possible, including an increase in the number of people walking as part of their end to end journey, improvements to cycling routes across Junction 11 and reduced traveller frustration associated with oversubscribed parking facilities. Impacts on road accidents will need to be considered further at Outline Business Case.

Financial Case

At SOBC stage, the Financial Case sets out anticipated expenditure and potential funding sources.

High-level cost estimates have been prepared, based on unit rates and approximate quantities. Basic construction costs range from £13 million to £28 million for all long list options, or from £20 million to £25 million for short list options (all 2018 prices). All-in risk-adjusted costs range from £36 million to £81 million for all long list options, or from £56 million to £71 million for short list options (all 2018 prices), excluding land costs and costs for complementary public transport priority measures along the A1309. More detailed cost estimates, including annual maintenance, site operating and public transport operating costs, will be prepared as part of the Outline Business Case.

The GCP West of Cambridge Package, of which the M11 Junction 11 Park and Ride is a component, is expected to be funded through the £1 billion Greater Cambridge City Deal investment. Cost estimates, along with other elements of this SOBC, will inform the overall affordability assessment to be undertaken by the Greater Cambridge Partnership.

Commercial Case

At SOBC stage, the Commercial Case demonstrates that there are appropriate ways in which the scheme and associated public transport services can be procured.

Park and Ride site works are likely to be procured in three parts – scheme design, main site works, and works outside the site boundary. Several established procurement routes exist for design and construction works, including existing term contracts and frameworks, selective tendering through local government procurement portals, and open tendering through the Official Journal of the European Union (OJEU).

Separate procurement exercises might be required for Park and Ride site transport services, site operation, and site maintenance. However, it is also possible that existing arrangements could be extended to cover the new or expanded site.

The procurement process will commence following a decision from the Greater Cambridge Partnership Executive Board to proceed with a preferred option. This is likely to be at the end of the Outline Business Case stage.

Management Case

A preliminary Management Case is presented in this SOBC, including an indicative programme and commentary on governance, quality assurance, communications, and risk management.

The scheme is being promoted and managed by the Greater Cambridge Partnership, applying a consistent governance and reporting structure to other schemes. On completion, it is expected that the enhanced Park and Ride facilities will be managed by Cambridgeshire County Council.

The constituent members of the Greater Cambridge Partnership have an extensive record of successful public transport scheme delivery, including five successful Park and Ride sites.

The scheme will pass through three business cases stages, of which this SOBC is the first. Approval to progress to the next business case stage (Outline Business Case) is a key decision to be taken by the Greater Cambridge Partnership Executive Board.

An indicative programme has been prepared, with the Outline Business Case due for completion in July 2019 (following public consultation towards the end of 2018), followed by final option approval and then detailed design completion by the middle of 2020. Construction is anticipated for 2022/23.

A Consultation Plan has been prepared for the SOBC / Outline Business Case phases, which will remain as a live document. Non-statutory stakeholder engagement and public consultation will be undertaken throughout scheme development.

A risk register has been prepared, which currently identifies 37 risks (as at July 2018). The risk register will continue to be reviewed and updated as the project progresses. A Quantified Risk Assessment will be undertaken at Outline Business Case stage to improve cost estimate accuracy.

Draft Benefits Realisation and Monitoring and Evaluation Plans will be prepared at Outline Business Case stage.

1 Introduction

This document presents the Strategic Outline Business Case for a major enhancement to Park and Ride facilities in close proximity to M11 Junction 11, along with complementary public transport priority measures along the A1309 Hauxton Road / High Street / Trumpington Road. Park and Ride and public transport priority measures form a key component of the overall GCP West of Cambridge Package, a key transport solution for the Cambridge Southern Fringe development area.

1.1 Context

1.1.1 Cambridge

Cambridge is one of the UK's most successful, fastest growing and most productive cities. The Greater Cambridge Partnership, as the local delivery body for the Greater Cambridge City Deal, has a mandate to maintain and grow Greater Cambridge. It aims to deliver 33,500 new homes and 44,000 new jobs by 2031 with 'better greener transport connecting people to homes, jobs, study and opportunity'. Growth is occurring all around Greater Cambridgeshire including developments at Cambridge North West, Cambridge Southern Fringe, Cambourne, Bourn Airfield and employment hubs at West Cambridge and the Cambridge Biomedical Campus. As these developments come to fruition they will add pressure to the already congested transport network. In order to ensure continued economic growth, the Greater Cambridge Partnership must implement strategies to accommodate new and existing employers and employees which includes ensuring ease of movement.

Cambridge is critical to the UK's long term economic plan, which seeks to improve productivity and international competitiveness. The city helps the UK economy to compete on the international stage, attracting high calibre knowledge-based individuals to fill skills gaps and increase economic growth.

1.1.2 Future Development

The next major phase of rapid development in Cambridge is taking place within the Southern Fringe (Figure 1) incorporating substantial employment and residential development opportunities. Extensive development is to take place over the 2011-2031 plan period and the vision for the Southern Fringe is 'to create attractive, well-integrated, accessible and sustainable new neighbourhoods for Cambridge'¹.

Addenbrooke's Hospital south of Cambridge is a major employment centre and renowned teaching hospital linked to Cambridge University. The hospital is part of the rapidly growing Cambridge Biomedical Campus which currently employs approximately 17,250 workers and is expected to employ 30,000 workers by the time it is complete². The Biomedical Campus is therefore expected to be home to 15-20% of all employment within the Cambridge City boundary³.

¹ Cambridge Local Plan 2014: Proposed Submission, July 2013

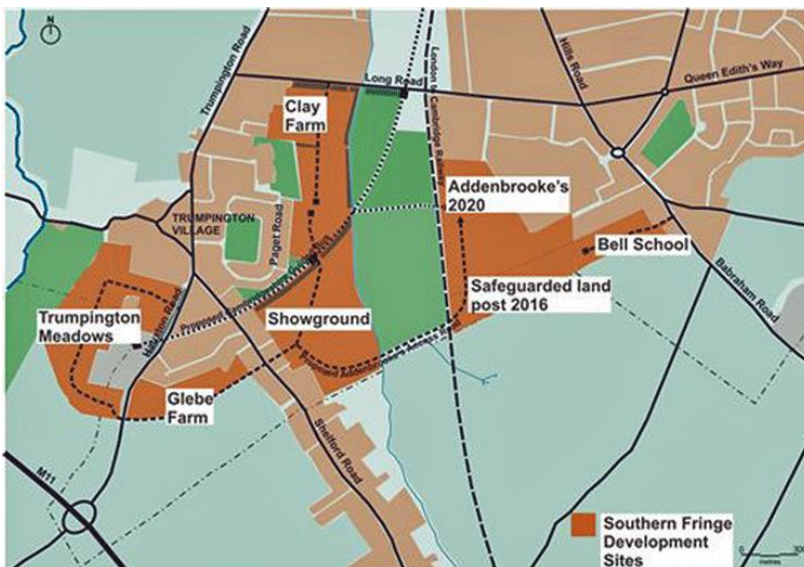
² Cambridgeshire Local Transport Plan 2011-2031 (2015)

³ Nomis official labour market statistics estimate that in 2016 there were 101,000 employee jobs within the Cambridge City area.

Given the nature of the biomedical industry, excellent transport provision will be required so that the highly skilled workforce and visitors are able to travel to the campus, by sustainable means wherever possible, allowing the campus to reach its full economic growth potential.

There are a number of other housing and mixed-use developments west of the Cambridge Biomedical Campus. Two major developments, both under construction, are at Clay Farm (up to 2,300 homes) and Trumpington Meadows / Glebe Farm (up to 1,000 homes).

Figure 1: Cambridge Southern Fringe major developments



Source: Cambridge Local Plan 2014: Proposed Submission, July 2013

Development in the Southern Fringe is expected to enable significant economic growth, although the existing transport network is already constrained and will need to be improved in order to cater for demand associated with this development.

1.2 Scope of this Strategic Outline Business Case (SOBC)

This Strategic Outline Business Case (SOBC) is for a major enhancement to Park and Ride facilities in close proximity to M11 Junction 11, along with complementary public transport priority measures along the A1309 Hauxton Road / High Street / Trumpington Road corridor. The purpose of an SOBC is to set out the need for intervention, provide suggested or preferred solutions and present evidence for a decision to be made on whether to proceed with a scheme⁴.

In line with Department for Transport requirements, this SOBC:

- Defines the scope of the proposed scheme
- Makes the case for change (the Strategic Case), confirming how the scheme fits with national, regional and local objectives
- Outlines options and carries out an initial sift to produce an option short list
- Presents evidence on expected impacts, stating the assumptions made (the Economic Case)

⁴ The Transport Business Cases, Department for Transport, January 2013.

- Outlines the likely costs, governance structures, delivery programme, assurance arrangements, and key stakeholders for the scheme (in the Financial, Commercial, and Management Cases)

Best practice suggests that an SOBC should start without defining the type of solution required. SOBCs are therefore generally 'mode agnostic' and assess a wide range of options to address the issues identified. This SOBC, however, has a different starting point and takes its direction from previous published documentation regarding transport issues and solutions for the Cambridge Southern Fringe. The need for a new Park and Ride solution in the vicinity of M11 Junction 11 is well documented and is identified in the Cambridgeshire Local Transport Plan (2011-2031), and the Transport Strategy for Cambridgeshire and South Cambridgeshire (2014).

In common with most SOBCs, and reflecting the early stage of scheme development, the primary focus of this document is the Strategic and Economic Cases.

A key output from this SOBC is an option short list to be considered for further assessment and public consultation as part of the next business case stage, Outline Business Case.

1.3 The Scheme

The M11 Junction 11 Park and Ride scheme is a component of the larger GCP West of Cambridge Package, and is expected to comprise the following key measures:

- Major expansion to Park and Ride facilities in close proximity to M11 Junction 11, either by expanding the existing Trumpington site or by delivering a new complementary site
- Capacity improvements at Junction 11
- Public transport priority measures along the A1309 Hauxton Road / High Street / Trumpington Road corridor
- Enhanced high quality public transport services between the Park and Ride site(s) and Cambridge city centre / Cambridge Biomedical Campus.

This SOBC provides the rationale for enhancing Park and Ride provision and sets out a range of options. The precise nature of any Park and Ride enhancements, whether expansion of the existing site or using a completely new site, will be determined at a later stage of business case development and following public and stakeholder engagement.

Together these measures are expected to relieve congestion and provide additional capacity at Junction 11 and within the Southern Fringe of Cambridge, allowing for continued economic growth in the area.

1.4 Document Structure

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

- Section 2 presents the **Strategic Case**, considering the 'case for change', including expected wider economic benefits, policy context, scheme objectives, discussion of options, and key influences on the scheme.
- Section 3 sets out the **Economic Case**, identifying the range of economic, environmental, social, and public accounts impacts that are expected to arise from the scheme and, therefore, the scheme's anticipated value for money.
- Section 4 presents the initial **Financial Case**, including anticipated expenditure and potential funding sources.

- Section 5 contains a high-level outline of the **Commercial Case** for procuring the scheme, including the potential options for Park and Ride public transport service provision.
- Section 6 contains the **Management Case**, including an indicative programme, governance structure, and outline quality, communications, and risk management strategies.

2 Strategic Case

The purpose of the Strategic Case is to demonstrate the need for the scheme. It considers the 'case for change', including expected wider economic benefits, the policy context, scheme objectives, and alternative scheme options to meet the objectives.

2.1 Business Strategy

The Government intends to continue investing in transport infrastructure across the UK in support of an industrial strategy for post-Brexit Britain which creates the right conditions for businesses to invest for the long term. Achieving economic growth and improved living standards are key objectives for Government.

The 2017 Transport Investment Strategy command paper, prepared by the Department for Transport, states that through investment the Department must seek to:

- Create a more reliable, less congested and better-connected transport network that works for the users who rely on it
- Build a stronger, more balanced economy by enhancing productivity and responding to local growth priorities
- Support the creation of new housing

Providing a sustainable mode of transport for those who would otherwise travel by private car to the Cambridge Southern Fringe or city centre, thereby reducing congestion along the A1309, is aligned with the Department's Transport Investment Strategy. The Park and Ride scheme set out in this SOBC will connect major employment sites in the Southern Fringe, such as Addenbrooke's Hospital and the wider Biomedical Campus, and the city centre, to the strategic road network. Investment in this area therefore responds to local growth priorities by supporting existing business entities and encouraging future ones in the Southern Fringe.

The Greater Cambridge Partnership is the local delivery body for a City Deal which aims to deliver up to £1billion of investment, providing vital improvements to infrastructure, supporting and accelerating the creation of 44,000 new jobs and 33,500 new homes to Greater Cambridge by 2031. The Partnership works with central government, local authorities, businesses, academia and community members to identify potential infrastructure improvements. It envisions creating greener transport networks which connect people, housing, employment and opportunities. The Partnership's aims are 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 time
- Keep the Greater Cambridge area well connected to the regional and national transport network, opening up opportunities by working closely with partners
- Reallocate limited road space in the city centre and invest in public transport (including Park and Ride) to make bus travel quicker and more reliable
- Build an extensive network of new cycleways, 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

By investing in better and greener transport networks, the Greater Cambridge Partnership will help secure future growth with the right level of supporting infrastructure. The Partnership is promoting enhancements to Park and Ride provision in close proximity to M11 Junction 11 due to the scheme's alignment with the Partnership's transport aims and overall vision and strategy for Greater Cambridge.

2.2 The Case for Change

2.2.1 Strategic Economic Case

Greater Cambridge is a world-leading centre for research, innovation and technology which has led to the 'Cambridge Phenomenon' – a unique ecosystem of bright minds, commerce and local investment. The inward investment, brought by the 'Cambridge Phenomenon', has created jobs and prosperity in Greater Cambridge.

Greater Cambridge is one of only a small number of city regions that contribute to the UK economy. Its success brings jobs and opportunities for the whole region and beyond and helps the UK economy to compete on the international stage, attracting high calibre knowledge-based individuals to fill gaps and increase economic growth. Cambridge is projected to be the UK's fastest growing city in 2018⁵.

Despite this economic success, Cambridge faces supply side threats to its economic growth, as evidenced in part by increasing congestion. Cambridge's recent economic success is founded upon the connectedness across the city, and its surrounds, that has allowed overlapping networks to develop and facilitated a culture of cooperation and cross-fertilisation between entrepreneurs, businesses and academia. The infrastructure of the area needs to keep up with the area's pace of growth and the opportunities that exist in order to continue growing an advanced economy and compete on the international stage.

A significant level of development is planned in Greater Cambridge over the Local Plan period (2011-2031), which will provide employment space to underpin the growth targets. Furthermore, there is a strong pipeline of employment space beyond 2031. Investments in transport infrastructure will be critical, ensuring transport network capacity, high congestion levels, and poor reliability issues are addressed, to unlock the city's growth potential.

Major enhancements to Park and Ride facilities in close proximity to M11 Junction 11 can contribute to the economic growth of Cambridge, and in particular the Cambridge Biomedical Campus. The enhancements will address congestion in the surrounding area and by connecting key employment sites with employees and other businesses beyond the Greater Cambridge area.

2.2.2 Issues Identified

The ambitious economic growth proposals within Cambridge, especially within the Southern Fringe, and the scale and type of growth taking place, necessitates improving the existing transport infrastructure. Congestion and transport network capacity issues will need to be addressed to ensure that they do not become constraints to economic growth, and to keep the city connected as it expands.

⁵ Source: UK Powerhouse Report, Irwin Mitchell and CEBR (2018)

A range of existing and future transport problems, which have the potential to constrain economic growth within the Southern Fringe in particular, have been identified and are summarised in this sub-section:

- Congestion along the A1309 Hauxton Rd, which connects the Biomedical Campus to the M11 at Junction 11 and the A1309 High Street / Trumpington Road corridor
- Congestion at M11 Junction 11, particularly in the AM peak, including the A10 approach through Harston and Hauxton
- Higher private car mode share for journeys from the south and south-west via the M11 and A10
- Significant increase in private car trips forecast as result of rapid growth.
- The existing Trumpington Park and Ride has insufficient capacity to cater for employment growth at Cambridge Biomedical Campus
- Park and Ride buses, and other bus services, are caught in congestion along the A1309 into the city centre

Congestion along the A1309 Hauxton Road / High Street / Trumpington Road corridor

The A1309 connects the A10 and M11 (at Junction 11) to the Southern Fringe, including Cambridge Biomedical Campus, and onward via the A1134 to Cambridge city centre. Currently the A1309 is congested, with an annual average daily traffic flow of more than 24,000 vehicles and average speeds of less than 10mph on multiple road segments for traffic travelling northbound during the morning (AM) peak period and southbound during the evening (PM) peak period⁶. The A1309 is the most congested of the three main routes that connect the M11 into central Cambridge.

The issue of congestion along the A1309 corridor is translated into scheme objective 1.i (section 2.3.3) to reduce traffic flows along the corridor.

Other than rail services, which by their nature serve a limited number of places (and currently do not serve the Southern Fringe directly), there is limited public transport connecting settlements along the A10 and M11 corridors to the Southern Fringe and Cambridge city centre.

Existing and future commuters on the A10 or M11 travelling to the Southern Fringe may not have a sustainable form of transport for their entire journey, although it is possible to encourage use of a sustainable form of transport for the final leg of the journey. This type of Park and Ride sustainable transport provision has proved successful across Cambridge, reducing the strain on key road corridors.

Scheme objective 1.i addresses the need for car trips to transfer to another mode of transport in order to reduce traffic flows and objective 2.i focuses on increasing the sustainable transport mode share for trips approaching Cambridge on the M11 and A10.

Congestion at M11 J11

Journey to work data for commuters into Cambridge from surrounding areas⁷ demonstrates that the car is the dominant mode (Table 1), reaching 80-90% mode share from some areas. As a result, peak period congestion is a significant problem for Cambridge, especially at M11 Junction 11, and particularly during the morning (AM) peak period. Junction 11 is a critical pinch point where two main corridors (M11 and A10) join.

⁶ 2015 Western Orbital Study Options Report – Trafficmaster Data

⁷ Census 2011

The congestion issues that already exist around M11 Junction 11 and north-east to the Cambridge Biomedical Campus are concerning, as this will almost certainly be exacerbated by continued employment growth. The sustainable transport offer will need to be increased considerably to mitigate this issue and to prevent congestion becoming a constraint to economic growth.

The congestion and delays are exacerbated closer to Cambridge but begin further out. According to Trafficmaster data, the A10 to the south-west of the M11 experiences delays of approximately 16 minutes in the morning peak hour, affecting villages such as Harston and Hauxton⁸.

The need to reduce traffic flow and congestion at Junction 11 is captured by scheme objective 1.ii and the need to reduce delays on the A10 approaching Junction 11 is captured by scheme objective 1.iii (section 2.3.3).

High Private Car Mode Share

Commuters from areas immediately to the south and west of Greater Cambridge (Table 1, rows 2-6), on average have a higher car mode share than those commuting from the north and east (Table 1, rows 7-10)⁹. A high proportion of commuters from the south and west will travel through M11 Junction 11 and contribute to congestion both at the motorway junction and along the A1309, particularly if heading to the Biomedical Campus.

Scheme objective 2.i sets out the need to increase the public transport mode share for journeys that approach the city on the M11 and A10 (via M11 Junction 11).

Table 1 Mode Split for Journey for Work in Cambridge

| | Area / District | Car Drive (%) | Bus (%) | Cycle (%) |
|----|----------------------|---------------|---------|-----------|
| 1 | South Cambridgeshire | 63.8% | 11.3% | 14.3% |
| 2 | Uttlesford | 81.2% | 2.2% | 0.4% |
| 3 | East Hertfordshire | 76.8% | 0.5% | 0.2% |
| 4 | North Hertfordshire | 66.8% | 2.6% | 0.7% |
| 5 | Central Bedfordshire | 91.2% | 0.9% | 0.2% |
| 6 | Bedford | 78.9% | 11.5% | 0.6% |
| 7 | East Cambridgeshire | 70.5% | 4.4% | 1.7% |
| 8 | Huntingdonshire | 77.4% | 14.4% | 0.8% |
| 9 | Fenland | 70.9% | 6.4% | 1.5% |
| 10 | Peterborough | 63.1% | 5.6% | 8.8% |

Source: Census 2011 travel to work data

Forecast Increase in Private Car Trips

The Southern Fringe, including the Cambridge Biomedical Campus, is experiencing a high level of employment growth. When no viable alternative is available, private car usage increases and becomes the dominant mode of travel. Based on previous background work undertaken by Atkins in 2016, the Biomedical Campus alone (excluding Addenbrooke's Hospital) is expected to generate an additional 8,000 daily trips by employees by the time it is fully operational. The

⁸ 2015 Western Orbital Study Options Report

⁹ Census 2011 travel to work data

current assumption is that at least 30% (2,400) of these additional trips are expected to be made by private car. These trips will be added to an already congested road network.

One of the corridors that is forecast to experience the greatest increase in trips to Cambridge is the A10, which will be affected by a 23% increase in trips (2011-2031) to the Cambridge Biomedical Campus and Addenbrooke's Hospital area⁸.

Scheme objective 2.i sets out the need to increase the public transport mode share for trips to the Cambridge Biomedical Campus. Scheme objective 2.ii identifies the need to enhance a solution (Park and Ride) that already works to remove car trips from the road network.

Capacity at Existing Trumpington Park and Ride

Parking availability at the existing 1385-space Park and Ride site at Trumpington is constrained and has reached capacity as the Southern Fringe continues to develop. In 2017 the existing Park and Ride at Trumpington was reported to be at 80-85% capacity¹⁰ (on average) and it is generally considered that a car park is operationally approaching capacity when the level of occupancy is at 85-90%. Anecdotal evidence suggests that the site is regularly operating at greater than 90% occupancy, reaching 100% occupancy more frequently in 2018.

The Greater Cambridge Partnership commissioned Skanska and Atkins in 2017 to test different scenarios, using the Cambridgeshire Sub-Regional Model (CSRM), to understand how Park and Ride usage would increase in the future. The tests considered whether the existing Trumpington Park and Ride could support future demand¹⁰. This work has been refined by Mott MacDonald in 2018, also using CSRM, reaching similar conclusions.

Demand forecasts are summarised in Table 2. The 'Medium' scenario accounts for Local Plan levels of development and increased parking restrictions at the Biomedical Campus. The 'High' scenario accounts for higher levels of demand resulting from further restrictions on car usage in the city centre. Previous work undertaken by Atkins had also identified a 'Low' demand scenario, limited to Local Plan levels of development only. However, recent work led by the Cambridgeshire and Peterborough Independent Economic Commission¹¹ has suggested that actual employment growth is running higher than the Local Plan trajectory. The 'Low' demand scenario is therefore already being exceeded and is no longer considered to be relevant.

Table 2 Trumpington Park and Ride Forecast Demand Summary

| Year | Medium | High |
|------|--------|-------|
| 2022 | 1,825 | 2,194 |
| 2027 | 2,049 | 3,034 |
| 2031 | 2,274 | 3,874 |

Source: Mott MacDonald

Taking into account the existing 1,385 spaces at Trumpington, the demand forecasts suggest that approximately 800-900 additional spaces would be required by 2031 to accommodate additional users of the Park and Ride site under the 'Medium' demand scenario. Further expansion would be required, up to almost 2,500 spaces, to cater for the 'High' demand scenario.

¹⁰ Trumpington Park & Ride Assessment Report (2017)

¹¹ Cambridge & Peterborough Independent Economic Review – Interim Report May 2018

Although approximately 230 new spaces are proposed as part of an existing surface level expansion project at Trumpington, the existing site would not be able to accommodate the additional 'Medium' demand without major expansion. Due to land availability constraints (with the Park and Ride due to be surrounded by development within the next five years), a multi-storey solution (whether above or below ground) would be required. A new site would be required to cater for 'High' demand as it would not be physically possible to provide a further 2,500 spaces at the existing site.

The need to increase Park and Ride capacity to serve employment growth in the Southern Fringe is covered by scheme objective 2.ii.

2.2.3 Impact of Not Changing

Taking into account the current opportunities, aspirations and issues (and without further significant investment in public transport infrastructure within the Southern Fringe and Cambridge Biomedical Campus area), the following impacts are likely:

- Increased levels of highway congestion at M11 Junction 11, and local routes throughout the Southern Fringe, specifically on the A1309 Hauxton Road / High Street / Trumpington Road corridor and on the A10 approach to Junction 11 through Harston and Hauxton for longer periods of the day. Increased congestion will constrain the connectivity of the Cambridge Biomedical Campus, upon which its success is founded.

Addressed by scheme objectives 1.i, 1.ii, and 1.iii.

- Accessibility problems for employees and residents in the Southern Fringe due to highway congestion, constrained parking availability and indirect public transport journeys. These accessibility problems have the potential to become a real constraint to economic growth within the Cambridge Biomedical Campus.

Addressed by scheme objectives 1.i, 1.ii, 1.iii, and 2.ii.

- Increase in private car mode share due to increased development and the number of trips generated, especially those originating from the south and south-west, further increasing congestion.

Addressed by scheme objective 2.i, which seeks to increase the sustainable transport mode share.

- Increase in public transport journey times and reduction in reliability due to congestion, making public transport and Park and Ride comparatively less attractive.

Addressed by scheme objective 2.iii, which deals with the need to reduce public transport journey times along the A1309 corridor.

- Existing Park and Ride facility at Trumpington reaching full capacity and therefore being unable to accommodate any new users. This will lead to overspill parking problems in the local area, at the Biomedical Campus and in the city centre. An inability to use the Park and Ride would also act as a disincentive for highly skilled workers choosing to work in Cambridge.

Addressed by scheme objective 2.ii, which seeks to increase Park and Ride capacity.

Together these problems have the potential to affect the ability for businesses in the Southern Fringe, especially at the Biomedical Campus, to retain their highly skilled employees and ultimately will constrain economic growth.

Ensuring good connectivity to key employment areas will continue to be important for Cambridge's current and future economic success. Failure to provide additional capacity and

ensure the efficient movement of people and goods risks fundamentally compromising the city's growth potential.

2.3 Policy Context

2.3.1 Policy Review

Any investment in transport infrastructure in the Southern Fringe needs to align with national, regional, and local policy and strategy. Alignment with national (Department for Transport) strategy is outlined in section 2.1. Key relevant points identified in regional and local policy and strategy documents are set out in Table 3.

Table 3: Alignment with local and regional policy and strategy

| Policy / Strategy | Scheme Alignment |
|--|---|
| Greater Cambridge Greater Peterborough SEP (Strategic Economic Plan) | <p>Building a Park & Ride, located before the southern fringe and central Cambridge, connected to a high-quality public transport system will reduce congestion into Cambridge thereby reducing capacity constraints and allowing for future growth in the city. This fits with the objectives to:</p> <ul style="list-style-type: none"> • Create a transport network fit for an economically vital high growth area. • Identify interventions, including improving sustainable transport capacity, that open up access along significant growth corridors and hubs. • Improve key corridors to address main barriers, capacity constraints and pinch points thereby enabling more efficient and reliable travel between key destinations and economic clusters. • Implement low cost sustainable transport options which make the best use of existing infrastructure to accommodate housing and employment growth. |
| Greater Cambridge City Deal (GCCD) | <p>To support economic growth, the region must accommodate new and growing businesses/developments and the people who work in them whilst ensuring ease of movement between key economic hubs. Greater Cambridge needs to connect new and existing centres / developments to each other, and to Cambridge city centre and transport hubs. Building Park & Ride sites linked to high quality public transport, which connects various businesses and services can reduce private car use and congestion within the city, thereby ensuring ease of movement.</p> |
| Cambridge Local Plan | <p>Includes provision for the extension of existing conventional bus services, the Cambridgeshire Busway and Park and Ride services to Addenbrooke's Hospital and other Southern Fringe developments. This supports the objectives and goals in the document which include:</p> <ul style="list-style-type: none"> • Promoting and supporting economic growth in environmentally sustainable and accessible locations...while maintaining the quality of life and place that contribute to economic success. • Minimising the distance people need to travel, and designing an environment which makes it easy for people to move around the city and access jobs and services by sustainable modes of transport. • Improving the sustainable transport network and capacity around the economic hubs, clusters and where people live and access services in and around the city, by improving linkages across the region and making movement between them straightforward and convenient. |
| South Cambridgeshire Local Plan | <p>The Local Plan is based on the three principles of sustainability:</p> <ul style="list-style-type: none"> • <i>Economic</i> – contributing to building a strong, responsive and competitive economy by...including the provision of infrastructure • <i>Social</i> – supporting strong, vibrant and healthy communities.... with accessible local services • <i>Environmental</i> – contributing to protecting and enhancing our...environment...minimising...pollution, and mitigating and adapting to climate change including moving to a low carbon economy. <p>Alignment between this SOBC and the Local Plan is summarised by:</p> <ul style="list-style-type: none"> • The common objective to maximise potential for journeys to be undertaken by sustainable modes of transport |

| Policy / Strategy | Scheme Alignment |
|--|--|
| Cambridgeshire Local Transport Plan (LTP) 2011-2031 & Cambridgeshire Long Term Transport Strategy (LTTS) | <ul style="list-style-type: none"> ● Acknowledgment that high levels of congestion exist on radial routes into Cambridge at peak times. A park and ride site which intercepts this traffic will reduce the congestion continuing into southern and central Cambridge. ● By providing a public transport link into the city and reducing car use, air quality and noise pollution will improve within southern and central Cambridge. This will help to address air quality issues within South Cambridgeshire (linked directly to the volume of traffic that runs through the district) for which an Air Quality Action Plan has been formulated to bring about improvements in air quality. <p>The LTP suggests that growth of the Greater Cambridge economy is already being limited by current congestion levels and will worsen if traffic levels increase unchecked.</p> <p>The LTP seeks to address existing transport challenges as well as ensuring that planned large-scale development can take place in the county in a sustainable way.</p> <p>Enhancing Park and Ride provision close to M11 Junction 11 will contribute directly to addressing various challenges set out in the LTP. Challenges identified include:</p> <ul style="list-style-type: none"> ● Challenge 1: Improving the reliability of journey times by managing demand for road space, where appropriate and maximising the capacity and efficiency of the existing network ● Challenge 2: Reducing the length of the commute and the need to travel by private car ● Challenge 3: Making sustainable modes of transport a viable and attractive alternative to the private car <p>The LTP supports Park and Ride because the expansion of the five main Cambridge Park and Ride sites, in conjunction with other improvements (busways and cycleways), has led to nearly 4 million Park and Ride journeys per year. The LTP also has objectives which enhanced Park and Ride provision close to M11 Junction 11 will contribute towards:</p> <ul style="list-style-type: none"> ● Objective 3: Managing and delivering the growth and development of sustainable communities. Achieving this will mean encouraging use of sustainable transport. ● Objective 5: Meeting the challenges of climate change. Suggested solutions include actions to address traffic growth, particularly car use, encouraging travel behaviour away from single occupancy car use. <p>Other LTP goals to which enhanced Park and Ride provision will contribute are:</p> <ul style="list-style-type: none"> ● To keep Cambridge traffic at current levels while accommodating major growth. ● Dropping the transport CO2 emissions per person from 2008 and 2020 by 34.2% to meet the Carbon Budget of the Climate Change Act 2008. ● Policy TSCSC 17: Improve air quality and achieve targets in Cambridge. <p>The LTTS considers a new Park and Ride as a necessary scheme to support major development.</p> |
| Transport Strategy for Cambridge & South Cambridgeshire (TSCSC), 2014 | <p>The TSCSC contains 21 policies, many of which point towards Park and Ride solutions:</p> <ul style="list-style-type: none"> ● Policy TSCSC 2: Catering for travel demand in Cambridge-measures which allow for more travel demand to be accommodated on the constrained network within the city. ● Policy TSCSC 7: Supporting sustainable growth- will seek to make sustainable travel a mode of choice for an increasing proportion of trips. Bus priority measures will be introduced on key links where congestion severely impacts services. Buses linking Addenbrooke's and the Biomedical Campus to other key developments will be developed. Outer Park and Ride sites will be introduced and existing Park and Ride sites will be expanded or relocated. ● Policy TSCSC 9: Access to jobs and services-access to areas of employment and services will be maximised by sustainable modes of travel. This includes providing accessible, efficient, and effective high quality public transport. ● Policy TSCSC 11: Improving community transport services-creating new and improved interchange areas- such as Park and Ride sites which allow for |

| Policy / Strategy | Scheme Alignment |
|-------------------|---|
| | <p>commuters to reduce their car journey and conveniently switch to sustainable modes.</p> <ul style="list-style-type: none"> • Policy TSCSC 12: Encouraging cycling and walking- those who live too far to cycle or walk into south or central Cambridge will be able to use the Park and Ride site and cycle/walk the remainder of their journey. • Policy TSCSC 17: Air Quality- by reducing car trips into the south and centre of Cambridge the Park and Ride will help to improve air quality in critical areas. • Policy TSCSC 19: Carbon Emissions- by offering commuters a sustainable option for a portion of their journey, enhanced Park and Ride will reduce carbon emissions per person, helping reduce the transport related carbon emissions and achieve targets. <p>The A10 has been Identified as one of the main corridors to improve. The TSCSC plans for vehicular trips to be intercepted further along the A10 through the provision of a new Park and Ride site adjacent to M11 Junction 11. This will intercept Cambridge-bound traffic, freeing up capacity at the existing Trumpington Park and Ride for additional trips from the M11.</p> |

2.3.2 Opportunities

The Cambridgeshire and Peterborough Combined Authority is investigating the potential for a Cambridgeshire Autonomous Metro (CAM) system which would serve central Cambridge, the Cambridge Biomedical Campus and the surrounding regional network. This proposal is supported by the Mayor and local authorities and is considered crucial to create a world class transit system in Cambridgeshire. It would have autonomous capabilities and potentially operate without rails or physical guidance. The network could be approximately 42 kilometres in total length and would integrate with existing modes, including busways. The network could begin operations in 2021 with potential for the full network to be operating by 2027¹².

To be successful in terms of maximising patronage and minimising service subsidy requirements, the CAM proposal will need to include sites on the edge of the Cambridge urban area where trips from outside the area can be aggregated and loaded onto the system. Park and Ride facilities close to M11 Junction 11 would provide such a site for aggregating trips from the A10 and M11 (south) corridors. Public transport priority measures could be integrated into CAM and amended as appropriate. This approach to trip aggregation for rapid transit systems has been applied to schemes in Belfast (520-space Dundonald Park and Ride at easternmost part of Glider network), Bristol (250-space Lyde Green Park and Ride at m3 MetroBus route terminus), and Nottingham (Park and Ride sites at all terminus points on the Nottingham Express Transit).

The CAM, which would link to various destinations in Cambridge, would be able to encourage drivers from outside the area to leave their vehicles at a Park and Ride facility near Junction 11.

2.3.3 Scheme Objectives

A set of scheme objectives has been established to guide option assessment for a significant investment in Park and Ride facilities in the Cambridge Southern Fringe. The objectives take account of the opportunities, aspirations and problems identified. They are also aligned to national, regional and local policy and strategy. The primary purpose of the objectives is to guide solution and option selection, so that the option short list is targeted towards meeting the needs of Greater Cambridge.

¹² Cambridge Rapid Mass Transit Options Appraisal - Cambridgeshire Autonomous Metro' (CAM): The Proposition (2018)

A draft set of five objectives was presented at a stakeholder information meeting in Harston village (located along the A10 approximately two miles from M11 Junction 11) on 13 February 2018. Based on feedback provided by attendees, an additional objective has been added to reflect stakeholder concerns relating to traffic delays that occur on the A10 through the village. The delays are generally associated with traffic heading towards M11 Junction 11 and Cambridge. The additional objective is referenced as 1(iii).

Compared to a future potential scenario in which no major enhancements to Park and Ride facilities are delivered close to M11 Junction 11, the scheme will need to:

1. Reduce (or avoid a negative impact on) general traffic levels and congestion

- i. Reduce traffic north east of M11 J11 (along Hauxton Road and through Trumpington), by encouraging trips headed for the city centre and Cambridge Biomedical Campus to transfer to another mode.
- ii. Reduce traffic flow and delay at M11 J11, particularly in the AM peak, including reducing flows associated with non-motorway traffic that pass across the junction (A10-A1309).
- iii. Reduce delays on the A10 through Harston and Hauxton, on the approach to M11 J11.

2. Maximise the potential for journeys to be undertaken by sustainable modes of transport

- i. Increase sustainable transport mode share for trips into the city centre and Cambridge Biomedical Campus, focused on trips originating from the south and south west (M11 and A10).
- ii. Increase Park and Ride capacity, in particular to serve forecast economic growth at the Cambridge Biomedical Campus key employment area, with delivery aligned to overall Campus development timescales.
- iii. Reduce public transport journey times between Trumpington and the city centre, enabling Park and Ride / other public transport to compete more effectively with the private car.

These revised objectives were presented at a stakeholder workshop, also in Harston, on 8 March 2018. Attendees were asked to provide written feedback on the objectives. Additional comments were focused primarily on widening the geographic scope to include the A10 through Foxton and Shepreth. Given that other projects, such as the Foxton rural travel hub are already considering this section of the A10 as part of their scope, the objectives have not been amended to widen the scope further at this stage. However, the objectives will be reviewed in conjunction with the objectives for the Foxton rural travel hub as part of the Outline Business Case stage.

2.3.4 Measures for Success

For each objective, at least one indicator is proposed to allow the performance of any scheme that is delivered to be measured over time, as shown in Table 4.

Table 4: Proposed success indicators

| Proposed indicator | Relating to objective |
|--|--|
| Traffic flow on A1309 Hauxton Road | 1.i – reduction in traffic NE of M11 J11 |
| Traffic flow on A1309 High Street | 1.i – reduction in traffic NE of M11 J11 |
| Traffic flow on J11 circulatory | 1.ii – reduction in traffic flow and delay J11 |
| Overall delay at J11 | 1.ii – reduction in traffic flow and delay J11 |
| Journey times on the A10 Harston to J11 | 1.iii – reduced delays on A10 |
| P&R patronage from Trumpington / J11 area to city centre / Cambridge Biomedical Campus | 2.i – increase sustainable mode share |
| Number of Park and Ride spaces in Trumpington / J11 area | 2.ii – increase P&R parking capacity |
| P&R journey time Trumpington to city centre | 2.iii – reduce P&R journey times |

Source: Mott MacDonald

Further detail on how scheme performance is to be assessed will be provided in the Benefits Realisation Plan at the next business case stage, Outline Business Case.

2.4 Geographic Scope

The geographic scope of infrastructure options to be assessed extends from land immediately adjacent to M11 Junction 11 (for a potential new Park and Ride site) and along the A1309 through Trumpington to Cambridge city centre (for complementary public transport priority measures).

The benefits associated with a major enhancement to Park and Ride facilities in close proximity to M11 Junction 11 are expected to be experienced across a wider area, including:

- M11 Junction 11 and the surrounding road network, in particular the A1309 through Trumpington, but also the A10 between Harston and Junction 11, depending on site access arrangements
- Cambridge Biomedical Campus and Cambridge city centre

Enhanced Park and Ride provision is expected to intercept car trips that would otherwise continue to a location nearer to their ultimate destination. For this reason, the scheme is expected to have neither a beneficial nor detrimental impact further afield on the M11 and A10 corridors.

2.5 Option Assessment

2.5.1 Method Overview

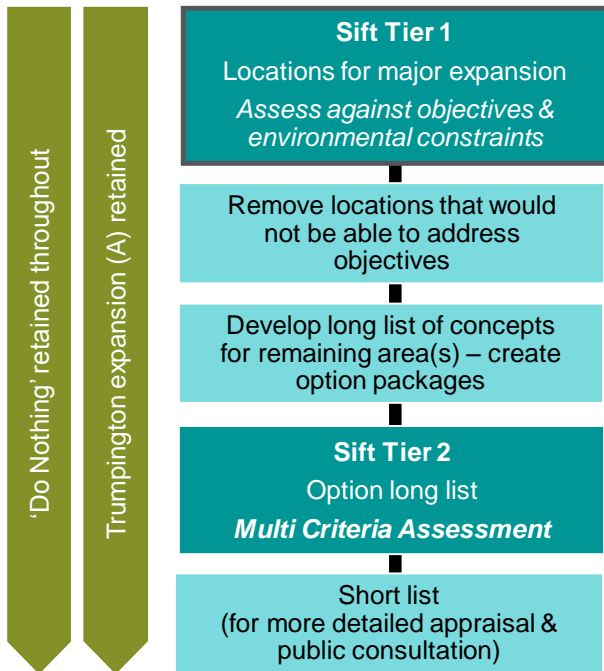
The popularity of Park and Ride as a travel option in Cambridge, and the need for new, expanded or relocated Park and Ride sites, is set out in the Cambridgeshire Local Transport Plan (2011-2031). More specifically, the requirement for new Park and Ride facilities in the vicinity of M11 Junction 11 is identified in the Transport Strategy for Cambridgeshire and South Cambridgeshire (2014), as part of a range of multi-modal interventions along the A10 corridor. Other interventions, including the Foxton rural travel hub and a new Cambridge South station, are being progressed as separate projects. The option assessment process in this SOBC

therefore focuses specifically on a range of potential Park and Ride options close to M11 Junction 11.

To produce a scheme option short list which best matches the objectives presented in section 2.3.3, and which is likely to offer the best value for money overall, the steps shown in Figure 2 (and as summarised here) have been followed:

1. Potential locations for Park and Ride enhancements have been identified and assessed against the scheme objectives and environmental constraints. The locations include expanding the existing Park and Ride at Trumpington as well as new site locations. A preferred new site has then been identified, with the existing Trumpington site remaining in the process as a logical option.
2. Concepts for elements such as public transport priority, capacity enhancements to Junction 11, and the access / egress arrangements for vehicles for a new Park and Ride site have been generated.
3. The various concepts have been packaged into a deliverable long list of options.
4. The options long list has been sifted using a multi-criteria assessment framework, which is outlined in section 2.5.5. The multi-criteria assessment combines the scheme objectives with a wide range of scheme impact considerations as listed in WebTAG, the Department for Transport's online appraisal guidance. The multi-criteria assessment approach is also in accordance with the GCP assurance framework.
5. From this, an option short list has been produced. The short list is assessed at a high level in the Economic Case (section 3) and will be examined in more detail as part of the Outline Business Case. The primary purpose of creating options (by combining and packaging elements) is to allow for transport modelling and appraisal, as individual elements cannot be appraised in isolation. However, public consultation will consider each element separately, allowing the possibility for a new alternative option to be generated.
6. Complementary measures, including public transport priority measures on Trumpington Road, can be added to any of the short list options.

Figure 2: Option short listing process

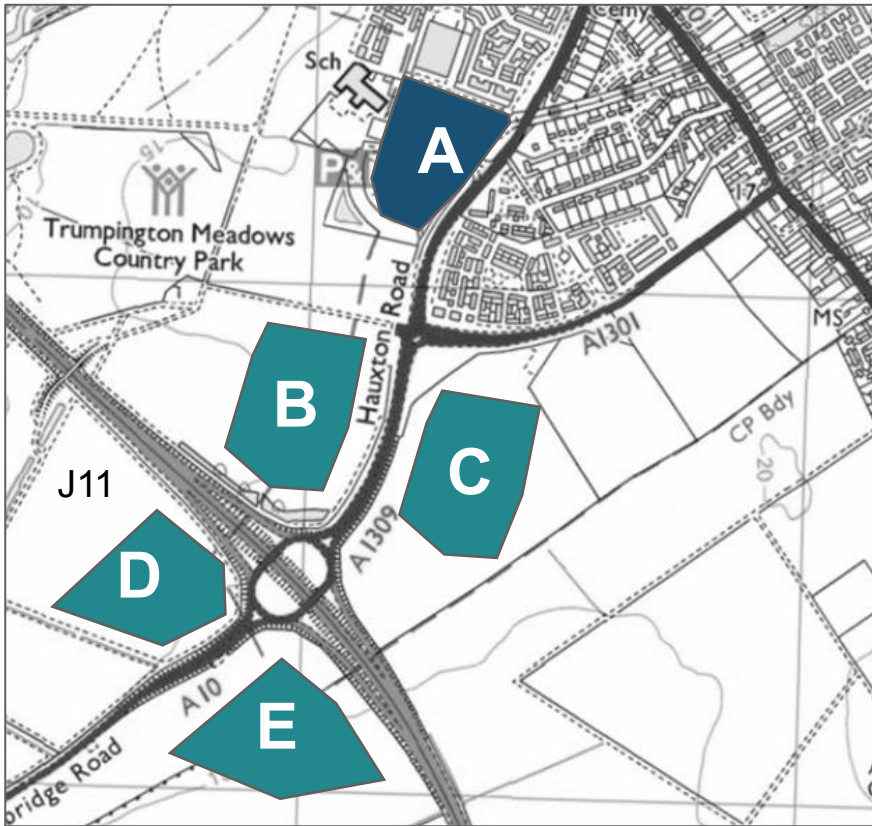


Source: Mott MacDonald

2.5.2 Step 1: Park and Ride Location Assessment

A major expansion to Park and Ride facilities in close proximity to M11 Junction 11 can be delivered by expanding the existing Trumpington site (A), by delivering a new complementary site, or potentially by a combination of the two. Given that the objectives point to a need to reduce traffic flows on the A1309 and to intercept trips from the both the M11 and A10 then the most suitable locations will be immediately adjacent to Junction 11. Potential locations are shown in Figure 3, comprising the existing Trumpington site (A) and the four quadrants adjacent to Junction 11 (B to E).

Figure 3 Proposed Park and Ride locations



The five locations have been assessed based on the extent to which they would be able to meet the six scheme objectives and based on environmental constraints. Scoring uses the seven point scale recommended in WebTAG, from -3 (large adverse) to +3 (large beneficial) and where 0 indicates a neutral impact. A summary scoring matrix against the objectives is presented in Table 5, and a high-level environmental constraints assessment in Table 6.

It is clear from the assessment against objectives (Table 5) that, if a new Park and Ride site is to be provided, Site D would be best able to meet the scheme objectives. It would be able to intercept trips along the A10 before they reach Junction 11 and is expected to be more deliverable within the required timescales (due to land availability).

Table 5: Park and Ride location assessment against objectives

| # | Objective | A Trumpington | B North | C East | D West | E South | Comments |
|-------|---|--|------------|-----------|-----------|------------|--|
| 1.i | Reduce traffic north east of M11 J11 (along Hauxton Road and through Trumpington), by encouraging trips headed for the city centre and Cambridge Biomedical Campus to transfer to another mode. | 0 | 1 | 1 | 2 | 2 | <ul style="list-style-type: none"> * Major expansion at Site A would not have any impact on reducing flows, as it is located along Hauxton Rd. * Sites B and C would have a slight beneficial impact on reducing flows on Hauxton Rd, as trips can be intercepted much closer to J11. * Sites D and E would have at least a moderate beneficial impact on reducing flows, with trips intercepted earlier. |
| 1.ii | Reduce traffic flow and delay at M11 J11, particularly in the AM peak, including reducing flows associated with non-motorway traffic (A10-A1309) that pass across the junction. | 0 | 0 | 0 | 1 | 1 | <ul style="list-style-type: none"> * For Sites A, B and C, trips approaching on the A10 would still need to travel across the motorway junction as at present. * For Sites D and E, trips approaching on the A10 would be intercepted before reaching the motorway junction, leading to at least a slight beneficial impact. |
| 1.iii | Reduce delays on the A10 through Harston and Hauxton, on the approach to M11 J11. | 0 | 0 | 0 | 1 | -1 | <ul style="list-style-type: none"> * Sites A, B and C would make no difference to delay on A10, as all existing traffic would continue to pass through the same sets of signals at J11 on the way to a Park and Ride site. * Site D has the potential to reduce delays slightly by allowing for unhindered northbound access from the A10 into the P&R, removing some traffic from the queues approaching the J11 signals. * Site E would be likely to have a negative impact due to a need to introduce a new junction for traffic to turn right into the Park and Ride from the A10, through which all A10 traffic would need to pass. |
| 2.i | Increase sustainable transport mode share for trips into the city centre and Cambridge Biomedical Campus, focused on trips originating from the south and south west (M11 and A10). | 1 | 2 | 2 | 2 | 2 | <ul style="list-style-type: none"> * Due to its location beyond the Addenbrooke's Road junction, major expansion at Site A would be less suitable for intercepting A10 or M11 trips heading for the Cambridge Biomedical Campus. * Sites B, C, D and E would all be able to intercept trips from the A10 and M11, heading for both the city centre and Cambridge Biomedical Campus. |
| 2.ii | Increase Park and Ride capacity, in particular to serve forecast growth at the Cambridge Biomedical Campus key employment area, with delivery aligned to overall Campus development timescales. | 1 | 1 | -1 | 2 | -1 | <ul style="list-style-type: none"> * All sites would lead to an overall increase in capacity. * The benefits of a major expansion at Site A would be limited as it is not in the optimum location for serving the Biomedical Campus. There would also be significant loss of capacity during construction. * The benefits of Site B would be limited by timescales and the need to agree a land swap or land purchase with developers. * Sites C and E would require long lead-in times due to land acquisition needs. * Site D is expected to be deliverable in a shorter timescale as the scheme promoter has options to obtain the land. |
| 2.iii | Reduce public transport journey times between Trumpington and the city centre, enabling Park and Ride / other public transport journeys to compete more effectively with the private car. | N/A for location assessment - dependent on separate but complementary public transport priority measures | | | | | |

Table 6: High-level environmental constraints assessment

| Constraint | A | B | C | D | E |
|----------------------|------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Noise | Slight adverse | Slight adverse | Slight adverse | Neutral | Neutral |
| Local air quality | Moderate adverse | Slight adverse | Slight adverse | Neutral | Neutral |
| Landscape | Neutral | Neutral | Slight adverse | Slight adverse | Slight adverse |
| Townscape | Moderate adverse | Neutral | Neutral | Neutral | Neutral |
| Biodiversity | Neutral | Neutral | Neutral | Neutral | Neutral |
| Historic environment | Neutral | Neutral or Slight adverse | Neutral or Slight adverse | Neutral or Slight adverse | Neutral or Slight adverse |
| Water environment | Neutral | Neutral | Neutral | Neutral | Neutral |
| Land use | Neutral | Neutral | Neutral | Neutral | Neutral |

Source: Mott MacDonald

Site A, the existing Trumpington Park and Ride, is located in a built-up area close to residential properties. Work on the Trumpington Meadows development is also ongoing, which will mean that the site will be surrounded by residential development within the next two to three years. Increased emissions levels in a greatly expanded Park and Ride site is likely to have a negative impact on local air quality close to sensitive residential receptors.

There are only subtle differences in expected environmental impacts, which relate to noise, local air quality, and landscape (visual) impacts. In general terms, sites closer to existing or committed residential development areas (Sites B and C) will have slight adverse noise and local air quality impacts. Sites further from the existing development boundary (Sites C, D and E) will have slight adverse landscape impacts. All proposed new site locations are within the Green Belt.

Based on the high-level assessments undertaken, Sites D and E have equal environmental ranking, but the opportunities to provide enhancements at Site D, contiguous with the Trumpington Meadows Country Park mean this is the most suitable location for a new Park and Ride site in close proximity to M11 Junction 11. Although major expansion of the existing Trumpington site (A) is not expected to meet the objectives particularly well, it remains under consideration as a logical option.

2.5.3 Step 2: Park and Ride Concepts

The Park and Ride, whether located at the existing Trumpington site (A) or the preferred location for a new site (D), will comprise a number of elements which together will achieve the scheme objectives. Besides location, these elements are:

- Suitable access / egress arrangements for light vehicles
- M11 Junction 11 improvements (capacity enhancements)
- For a new site (D), public transport access measures which include crossing the M11
- Complementary public transport priority measures between Trumpington and the city centre, along the A1309 Hauxton Road / High Street / Trumpington Road corridor
- Enhanced high quality public transport services between the Park and Ride site(s) and Cambridge city centre / Cambridge Biomedical Campus

The latter two elements of complementary public transport priority measures and enhanced services are expected to be broadly similar regardless of the preferred Park and Ride option. There are, however, a range of concepts associated with light vehicle access, public transport

vehicle access, and J11 improvements. Various combinations of these concepts are included in the options long list.

Potential site access arrangements – light vehicles

The following site access concepts have been considered for light vehicles:

- Extended dedicated lanes for vehicles heading to the existing Trumpington site (A), which are extended back from the northbound side of the A1309 across the junction to the A10, and on to both motorway off-slips
- Junction(s) for a new Park and Ride site (D) directly from the A10
- Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site (D), removing the need for these vehicles to pass through a new junction or to pass through the motorway junction
- Dedicated northbound off-slip from the M11, passing below the A10 through a tunnel and into a new Park and Ride site (D)
- Slip road for southbound A10 / southbound M11 traffic to access the site (D) without needing to turn right across the A10, diverging from the A10 close to Junction 11 and passing through the same tunnel structure as for the dedicated M11 northbound off-slip
- Dedicated exit slip from the Park and Ride site (D) onto the A10 southbound, avoiding the need for vehicles leaving the site to turn right across the A10. This slip road would again pass through the same tunnel structure as the two slip roads listed previously, passing under the A10. This concept was suggested by attendees at the stakeholder workshop in Harston on 8 March 2018.

Two other access/egress concepts were suggested by attendees at the stakeholder workshop:

- New site (D) without direct access from the A10. This arrangement would not intercept any A10 traffic, which would need to continue on to the existing Trumpington site across the motorway junction. This arrangement would also cause a major issue if the Trumpington site became full, as vehicles would not be able to return to access the new site. It therefore does not meet objectives 1.ii, 1.iii, or 2.i.
- Free-flow slip road into the new site (D) for M11 southbound traffic, in addition to a slip road for northbound traffic. However, as M11 southbound traffic can be easily directed to the existing Trumpington site, the considerable land take requirements and cost for the extra slip road are considered to be unnecessary.

M11 Junction 11 capacity enhancements

Capacity enhancement options have been considered for Junction 11 as follows:

- Additional lanes dedicated to Park and Ride access (as outlined above), without removing existing traffic capacity. For access to the existing Trumpington site (A) this could involve widening the junction overbridge to provide for an additional lane.
- Additional free-flow left turn lanes from both motorway off-slips, removing these turning movements from the gyratory.
- Enlarged roundabout, involving junction reconstruction / reconfiguration, allowing for greater stacking capacity on the roundabout.

Potential site access arrangements – public transport services

The following possible arrangements for public transport vehicle access to a new site (D) have been considered:

- Public transport vehicles to enter / exit via the same junctions as light vehicles and to pass across Junction 11 with general traffic
- Widening the existing junction overbridges to provide a public transport vehicle lane in each direction, without removing capacity from general traffic
- Providing a new bridge structure in the centre of Junction 11, allowing public transport vehicles to pass directly through the junction, controlled using the existing signals
- Using an existing accommodation bridge to the north of the site, allowing public transport vehicles to avoid Junction 11 entirely. This arrangement could include a new parallel walking / cycling / equestrian bridge to avoid negative impacts for these modes of travel. A variation on this arrangement would be to provide a new public transport only bridge to the south of the accommodation bridge (but still to the north of Junction 11), closer to the Park and Ride site.

2.5.4 Step 3: Options Long List

Access / egress concepts associated with light vehicle access, public transport access, and J11 improvements have been packaged together into eight technically deliverable options for a new Park and Ride at location D. The primary purpose of creating options (by combining and packaging elements) is to allow for transport modelling and appraisal, as individual elements cannot be appraised in isolation. However, public consultation will consider elements separately, allowing the possibility for a new alternative option to be generated.

The options long list, which includes a 'Do Nothing' option, the eight options for a new site and an additional option for major expansion of the existing Trumpington site, is summarised in Table 7. Concept drawings are presented in **Appendix A**.

Table 7: Park and Ride options long list for appraisal

| Option | Description / Elements |
|------------|---|
| Do Nothing | <ul style="list-style-type: none"> • No major expansion of Park and Ride provision in close proximity to Junction 11. Minimal surface level expansion of existing Trumpington site only, being developed as part of a separate planning application. |
| Magenta | <ul style="list-style-type: none"> • Major Park and Ride expansion at Trumpington, likely to involve adding a new deck above the existing site (as there is no available land for expansion immediately surrounding the site). • New dedicated Park and Ride access lanes for general traffic extended back to the motorway off-slips and A10. Likely to involve overbridge widening at J11. |
| Red | <ul style="list-style-type: none"> • New site with general traffic and public transport access/egress at a single new junction on the A10. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Public transport vehicles to pass across Junction 11 with general traffic. |
| Blue | <ul style="list-style-type: none"> • New site with general traffic and public transport vehicle access / egress at two new junctions on the A10. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Additional free-flow left turn lanes from both motorway off-slips. • Widening the existing J11 overbridges to provide a public transport vehicle lane in each direction. |
| Purple | <ul style="list-style-type: none"> • New site with dedicated northbound off-slip from the M11, passing below the A10 through a tunnel, and a new junction on the A10. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Free-flow left turn lane from southbound motorway off-slip to A1309 for Trumpington Park and Ride. • Public transport vehicles pass directly through the centre of J11 using new bridge structure across M11. |

| Option | Description / Elements |
|---|--|
| Orange | <ul style="list-style-type: none"> • New site with dedicated northbound off-slip from the M11, passing below the A10 through a tunnel, and a new junction on the A10. • Reconfigured J11 with larger circulatory and realigned slip roads, allowing greater stacking capacity on the roundabout. Includes new bridge structure to the southern side. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Public transport vehicles pass directly through the centre of J11 using former circulatory alignment. |
| Yellow | <ul style="list-style-type: none"> • New site with general traffic and public transport vehicle access/egress at two new junctions on the A10. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Additional free-flow left turn lanes from both motorway off-slips. • Public transport vehicles cross motorway using existing accommodation bridge to the north, then run alongside southbound off-slip. |
| Black | <ul style="list-style-type: none"> • As Yellow option, but with public transport vehicles crossing motorway using existing accommodation bridge and then running directly across existing open land to the Trumpington Meadows development. |
| White | <ul style="list-style-type: none"> • New site with dedicated northbound off-slip from the M11, passing below the A10 through a tunnel, and a new junction on the A10. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Free-flow left turn lane from southbound motorway off-slip to A1309 for Trumpington Park and Ride. • Public transport vehicles cross motorway using existing accommodation bridge to the north, then run alongside southbound off-slip. |
| Cyan | <ul style="list-style-type: none"> • New site with dedicated northbound off-slip from the M11, passing below the A10 through a tunnel. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Dedicated slip road for southbound A10 traffic to access the site without needing to turn right across the A10, using the same tunnel as for the dedicated M11 northbound off-slip. • Dedicated exit slip from the Park and Ride site onto the A10 southbound, avoiding the need for vehicles leaving the site to turn right across the A10, again using the same tunnel. • Free-flow left turn lane from southbound motorway off-slip to A1309 for Trumpington Park and Ride. • Public transport vehicles cross motorway using existing accommodation bridge to the north, then run alongside southbound off-slip. |
| <p>All options retain the existing Park and Ride site at Trumpington.</p> <p>All options include complementary public transport priority measures between Trumpington and the city centre.</p> <p>All options (other than Do Nothing) include enhanced public transport services between the Park and Ride site(s) and Cambridge city centre / Cambridge Biomedical Campus.</p> | |

Source: Mott MacDonald

The Cyan option, with additional dedicated slip roads, was developed following feedback provided at the stakeholder workshop on 8 March 2018. At the workshop, attendees raised concerns regarding the potential impact of any new at-grade junctions on the A10.

2.5.5 Step 4: Multi Criteria Assessment

The multi-criteria assessment step involved scoring each of the packaged long list options (Table 7) against a total of 26 indicators grouped within four selection themes, combining the scheme objectives with a wide range of scheme impact considerations as listed in WebTAG:

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

The full set of indicators is set out in Table 8. Using the same approach as for the Park and Ride location assessment, scores have been awarded using the WebTAG seven point scale, ranging from -3 (large adverse) to +3 (large beneficial) and where 0 indicates a neutral impact. Scores are provided in **Appendix B**.

Table 8 Multi-Criteria Assessment indicators

| Selection Theme 1: Reducing traffic levels and congestion | Selection Theme 2: Maximising potential for journeys to be undertaken by sustainable modes | Selection Theme 3: Quality of life and environment | Selection Theme 4: Scheme deliverability |
|--|--|---|---|
| <i>Expected impact in AM peak on...</i> | <i>Compare options based on...</i> | <i>Compare options based on impact on...</i> | <i>Compare options based on...</i> |
| <ul style="list-style-type: none"> • Traffic flow on J11 circulatory • Overall delay at J11 • Traffic flow on A1309 Hauxton Rd • Traffic flow on A1309 High St • Traffic flow on A10, Harston • Delay on A10 between Harston and M11 | <ul style="list-style-type: none"> • Time to access P&R site from A10 • Time to access P&R site from M11 northbound • P&R public transport journey time • Potential to link with existing public transport • Potential to link with future public transport proposals | <ul style="list-style-type: none"> • Potential for road accidents • Walking and cycling networks • Noise • Local air quality • Landscape • Townscape • Historic environment • Biodiversity • Water environment | <ul style="list-style-type: none"> • Construction risks • Disruption during construction • Land acquisition requirements • Infrastructure maintenance / renewals complexity • Ongoing cost implications – site • Ongoing cost implications - PT |

Source: Mott MacDonald

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

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

Normalised multi-criteria assessment scores, and option ranking for both weighting tests, are shown in Table 9.

In both versions of the multi-criteria assessment the top three scoring options are **Cyan**, **Purple**, and **White**. These options score well against the scheme objectives, reflected by higher scores for indicators in Selection Themes 1 and 2. Although Cyan demonstrates higher deliverability risks (due to the greater number of slip roads and need for greater land take), the lower deliverability score is outweighed by expected traffic congestion and sustainable transport mode shift benefits. Cyan, Purple, and White are therefore included in the option short list.

Based on the assessment scores there are three options which can be ruled out:

- Orange – due to the complete reconfiguration of Junction 11 as an element packaged within this option it has a deliverability score considerably lower than all other options and is eighth out of nine in the ranking when themes are given equal weighting.
- Blue – this option ranked seventh of nine in both versions of the weightings
- Red – due to its reliance on a single new junction on the A10 to provide site access this option was given the lowest (or joint lowest) score for the objective related themes (Selection Themes 1 and 2) and therefore cannot be considered to meet the scheme objectives. Red was also the least popular option at the stakeholder engagement meetings.

Although the major Trumpington expansion option (Magenta) was ranked ninth of nine in both versions of the weightings, expanding the existing site remains as a logical option.

The three top scoring options (Cyan, Purple, White) include a dedicated M11 northbound off-slip into the Park and Ride site and tunnel under the A10. The top scoring options are therefore also expected to be the highest cost options. A lower cost option that does not include a dedicated off-slip and tunnel has therefore been selected for inclusion in the option short list. The next best performing option that does not include a dedicated off-slip is **Yellow**.

Stakeholder workshop attendees raised concerns regarding using the accommodation bridge as part of a public transport link, due to potential conflict with a future walking and cycling route for the Trumpington Meadows development. Two of the short list options (White and Yellow) include the bridge as part of a public transport link. A possible mitigation measure would be to construct a parallel walk / cycle / equestrian bridge crossing of the M11 at the same location.

Table 9 Multi-criteria assessment normalised scores and option ranking

| <i>Max score = 10</i> | RED | BLUE | PURPLE | WHITE | YELLOW | BLACK | ORANGE | CYAN | Major Trumpington expansion (MAGENTA) |
|---|------|------|--------|-------|--------|-------|--------|------|---------------------------------------|
| Selection Theme 1: Reducing (or avoiding negative impact on) traffic levels and congestion | 6.1 | 6.7 | 6.9 | 7.8 | 6.9 | 6.9 | 6.9 | 8.1 | 6.1 |
| Selection Theme 2: Maximising potential for journeys to be undertaken by sustainable modes | 4.7 | 6.0 | 7.3 | 7.0 | 6.3 | 6.3 | 7.3 | 7.0 | 5.3 |
| Selection Theme 3: Quality of life & environment | 4.1 | 4.1 | 4.8 | 3.9 | 3.3 | 3.1 | 4.4 | 3.9 | 3.9 |
| Selection Theme 4: Scheme deliverability | 6.1 | 3.9 | 3.3 | 2.8 | 4.4 | 4.4 | 1.1 | 2.8 | 3.3 |
| | | | | | | | | | |
| Weighting test 1 | | | | | | | | | |
| Normalised score (max.10) | 5.24 | 5.16 | 5.61 | 5.36 | 5.26 | 5.22 | 4.96 | 5.43 | 4.67 |
| Rank | 5 | 7 | 1 | 3 | 4 | 6 | 8 | 2 | 9 |
| | | | | | | | | | |
| Weighting test 2 | | | | | | | | | |
| Normalised score (max.10) | 5.33 | 5.86 | 6.53 | 6.58 | 6.09 | 6.07 | 6.27 | 6.69 | 5.30 |
| Rank | 8 | 7 | 3 | 2 | 5 | 6 | 4 | 1 | 9 |

Source: Mott MacDonald

2.5.6 Step 5: Options Short List

The options short list to be considered further at the Outline Business Case stage, and from which the individual elements will be taken for public consultation, includes four options for a new site – **Cyan, Purple, White** and **Yellow** (lower cost option). Due to concerns raised by stakeholders, the White and Yellow options include a new walk and cycle bridge across the M11, adjacent to the accommodation bridge.

The **Magenta** option (major Trumpington expansion) is also taken forward to the Outline Business Case stage, as a logical option.

Summaries for these options are in Table 7 and concept drawings in **Appendix A**.

The short list options are compared to the Do Nothing option in the Economic Case.

2.5.7 Step 6: Complementary Measures

To address objective 2.iii (reduce public transport journey times between Trumpington and the city centre), complementary public transport priority measures will need to be provided along the A1309 Hauxton Road / High Street / Trumpington Road corridor, regardless of the preferred Park and Ride option. The exact nature of these measures is to be determined during the Outline Business Case stage, informed by stakeholder engagement. Measures might include new public transport lanes/gates and selective vehicle detection at traffic signals.

2.5.8 Public Transport Service Options

Any new or expanded Park and Ride provision close to M11 Junction 11 will need to be served by a high quality public transport service to connect site users to their destination. This is likely to be a road-based public transport service in the first instance, although it could be tied into a Cambridge Autonomous Metro system in later years. At present, the services for the existing Trumpington Park and Ride serve two main corridors – the city centre via the A1309 Hauxton Road / High Street / Trumpington Road corridor (the primary Park and Ride service), and Cambridge Biomedical Campus and station via the busway.

If a new site is provided then options for the public transport service(s) are to:

- Serve the same destinations along the two main corridors from both the existing Park and Ride and the new site – City centre, Cambridge rail station and the Cambridge Biomedical Campus; or
- Operate the two sites in a coordinated manner, for which a range of sub-options exist:
 - Continue to serve both corridors from the Trumpington site, but only the Cambridge Biomedical Campus corridor via the busway from the new site.
 - Amend the Trumpington site services to serve only the Cambridge Biomedical Campus corridor via the busway, but serve both corridors from the new site.
 - Serve only one corridor from each site.

For options that involve co-ordinating the services, Park and Ride users would need to be directed by signage to use the most appropriate site for their destination. For the first option, serving both corridors from both sites, Park and Ride users could be directed to the site that is easiest to access – Trumpington for M11 southbound traffic, and the new site for all other traffic.

During morning peak periods, it would not be feasible to have services calling at both Park and Ride sites as services could be full at the first site with no capacity available at the second. Outside peak periods, service sharing may be feasible.

Given the objectives set for the scheme (section 2.3.3), it appears likely that the preferred service option will be to serve the two main corridors from both sites. This arrangement would allow users to be directed to the site that is easiest to access according to their journey origin. A decision on the public transport service arrangements will be made at the Outline Business Case stage.

2.6 Strategic Influences

Any major enhancement to Park and Ride facilities in close proximity to M11 Junction 11, regardless of which options are progressed, will need to take account of the constraints, interdependencies, and stakeholder needs set out in this section.

2.6.1 Constraints

In designing enhanced Park and Ride facilities, scheme designs will need to consider how best to overcome, incorporate or mitigate impacts relating to the following constraints:

- Trumpington Meadows Country Park – a nature reserve created for wildlife and people (The Wildlife Trusts, 2012¹³) located to the north of Junction 11 (Figure 3). If a new site is progressed, mitigation measures will be included in the scheme design to avoid detrimental impacts to the Country Park. It might also be feasible to expand the country park.
- M11 motorway which creates a severance impact for vehicles, pedestrians and cyclists travelling between Cambridge and areas to the west and south-west of the city. The short list options include a range of measures to assist public transport, pedestrian and cycle movements crossing the M11.
- Traffic congestion on the A10 and A1309 and surrounding M11 Junction 11, which has the potential to delay vehicles entering and leaving the Park and Ride site, including public transport vehicles. Through the multi-criteria assessment, the short list options have been selected in part on their expected ability to address traffic congestion issues.

2.6.2 Interdependencies

Other schemes currently being progressed to serve trips arriving into Cambridge along the A10 and M11 corridors will influence the level of demand for Park and Ride at Junction 11, as well as affecting travel flows in the local area. The influence of these schemes on Park and Ride demand and effectiveness, under alternative development scenarios, will need to be considered as part of Outline Business Case appraisal.

Foxton rural travel hub and bridge replacement for level crossing

The Foxton rural travel hub scheme is expected to include a larger car park at Foxton rail station, providing trips approaching Cambridge along the A10 with the option to transfer to rail. Cambridge-bound trips that might be attracted to transfer to rail at Foxton are expected to be those with a destination within a short walk of Cambridge or Cambridge North stations. This would represent a small proportion of total trips and a smaller proportion of trips than would be attracted to use a Park and Ride site that can serve Cambridge city centre directly.

The Foxton scheme might also attract trips in the opposite direction, from developments across the Cambridge Southern Fringe (such as Trumpington Meadows), to transfer to rail at Foxton for London.

¹³ The Wildlife Trusts (2012). Trumpington Meadows. Available online at: <http://www.wildlifecbn.org/reserves/trumpington-meadows>

Together with avoiding the level crossing, the Foxton rural travel hub could change the traffic flow profile in both directions on the A10 through Harston and at M11 Junction 11.

Whittlesford rural travel hub

The Whittlesford rural travel hub would include a larger car park at Whittlesford Parkway station, providing an improved ability for trips approaching Cambridge from the south along the M11 to leave at Junction 10 (A505), park at the station and transfer to rail. As with the Foxton rural travel hub, Cambridge-bound trips that might be attracted to transfer to rail at Whittlesford Parkway are expected to be those with a destination within a short walk of Cambridge or Cambridge North stations. Again, this would represent a small proportion of total trips and a smaller proportion of trips than would be attracted to use a Park and Ride site that can serve Cambridge city centre directly.

Cambridge South station

The proposed new rail station at Cambridge South, serving the Biomedical Campus, aims to improve connectivity between the emerging Biomedical Campus and international gateways, to reduce reliance on Cambridge station for travel to the southern fringe, and to improve sustainable transport access into the Southern Fringe. A new station is likely to remove some car trips from the M11 and A10 corridors.

Interdependencies between Foxton / Whittlesford and Cambridge South

The interdependencies between the Foxton and Whittlesford rural travel hubs and Cambridge South will also have an impact on the level of demand for Park and Ride at Junction 11. For example, if either or both of the rural travel hubs are progressed but Cambridge South station is not, then the rural travel hubs will not be suitable facilities for trips to the Cambridge Biomedical Campus. The Park and Ride facilities at Junction 11 would therefore need to cater for a larger number of trips to the Biomedical Campus.

Cambourne to Cambridge Scheme

The Cambourne to Cambridge scheme is at an early stage of development. It seeks to deliver improved, faster and more reliable public transport services, high quality walking and cycling facilities, and a new travel hub for people arriving into Cambridge along the A428 from the west. This scheme would be expected to remove some trips that might otherwise use Park and Ride facilities close to Junction 11, approaching from the A428/A1303 on the M11 southbound.

M11 Smart Motorway

Highways England is currently progressing with a modernisation programme of technology-led 'smart motorway' upgrades, to increase capacity, improve journey time reliability and therefore reduce congestion on the motorway network. As part of Highways England's second Road Investment Strategy (RIS2), for the 2020/21 to 2024/25 period, a smart motorway upgrade for the M11 between Junctions 8 and 14 is being considered.

The case for a smart motorway upgrade to this section of the M11 was made in the London to Leeds (East) Route Strategy, published by Highways England in April 2015. The upgrade is likely to include measures that will increase the throughput of traffic on the M11, with a resulting increase in flow at motorway junctions including Junction 11.

While the smart motorway scheme might not lead to an increase in Park and Ride demand, increased flows on the motorway slip-roads and changes to the motorway mainline and slip-road layout will need to be incorporated into Park and Ride scheme designs.

2.6.3 Stakeholders

The key stakeholders for the proposed major enhancements to Park and Ride provision in close proximity to M11 Junction 11 are:

- Local authorities – Cambridgeshire County Council as the Local Highway Authority, and Cambridge City Council and South Cambridgeshire District Council as the local planning authorities. The local authorities have identified the opportunity for a major enhancement to Park and Ride provision in close proximity to M11 Junction 11 as part of their Transport Strategy for Cambridge and South Cambridgeshire (TSCSC) 2014.
- Greater Cambridge Partnership as the local delivery body for the City Deal. The Partnership includes the three local authorities, University of Cambridge and the Greater Cambridge Greater Peterborough Local Enterprise Partnership.
- Organisations and businesses that are investing in the Cambridge Biomedical Campus, including AstraZeneca, Cambridge University Hospitals NHS Foundation Trust, The MRC Laboratory of Molecular Biology, and Papworth Hospital NHS Foundation Trust. Cambridge University NHS Foundation Trust has a vision to be one of the best academic healthcare organisations in the world and, as such, requires good accessibility to specialist staff and visiting experts who may travel long distances. The Trust has made great progress in encouraging sustainable travel by staff, but has ambitions to improve levels of public transport use among visitors. Patients and visitors travelling from a wide area would benefit from a major enhancement to Park and Ride provision.
- Cambridge Ahead, a business and academic member group dedicated to the successful growth of Cambridge and its region in the long-term
- Highways England as the organisation responsible for the M11
- Parish councils, including Harston, Hauxton, and Trumpington
- Residents in Cambridge City and South Cambridgeshire local authority areas who will be affected by the changes to the transport network that result from the scheme
- Schools and the Nuffield Hospital located along Trumpington Road who may benefit from complementary public transport priority measures

Other stakeholders, who will need to be involved during the design process are:

- Emergency services
- Groups which represent people with limited mobility or a sensory impairment and wheelchair users
- Cycling groups
- Landowners

The methods through which stakeholders will be engaged in the Outline Business Case (including SOBC) stage of the project are set out in the Outline Business Case Consultation Plan, which has been prepared in draft (**Appendix D**).

2.7 Strategic Case Summary

- Greater Cambridge is a world-leading centre for research, innovation and technology, with significant levels of inward investment creating jobs and prosperity. Its success brings jobs and opportunities for the whole region and beyond and helps the UK economy to compete on the international stage. The Cambridge Southern Fringe is home to the internationally significant Cambridge Biomedical Campus, which is expected to employ 30,000 people by 2031.
- Despite this economic success, Cambridge faces supply side threats to its economic growth. Investments in transport infrastructure will be critical, ensuring transport network capacity, high congestion levels and poor reliability issues are addressed, to unlock the city's growth potential. Major enhancements to Park and Ride facilities in close proximity to M11 Junction 11 can contribute to the economic growth of Cambridge, in particular the Cambridge Biomedical Campus, and complement the Cambridge Autonomous Metro proposals.
- A range of existing and future transport problems which have the potential to constrain economic growth within the Southern Fringe have been identified in relation to congestion, high private car mode share and lack of Park and Ride capacity to cater for future employment growth. These problems have been translated into a set of six specific objectives to guide solution and option selection.
- An option short listing process has identified that, if a new site is to be provided, a site to the west of the M11 would be best able to meet the scheme objectives. The process has also short listed four options for a new site, to be assessed alongside a major expansion of the existing Trumpington site.
- At the next business case stage, Outline Business Case, the short list will be assessed under alternative demand scenarios, also taking account of the influence of interdependent schemes – Foxton rural travel hub, Whittlesford rural travel hub, Cambridge South station, Cambourne to Cambridge scheme, M11 smart motorway.

3 Economic Case

The Economic Case identifies the range of economic, environmental, social, and public accounts impacts that are expected to arise from the short list options.

3.1 Overview

3.1.1 Assessing Value for Money

In line with WebTAG and the GCP assurance framework, a multi-criteria assessment approach has been used in this SOBC to identify how each of the packaged long list options is expected to perform against 26 indicators grouped into four selection themes, alongside a high-level cost estimate for each option. The multi-criteria assessment considers the likely effectiveness of each option in terms of addressing the scheme objectives (primarily economic impact related) and the expected impacts against a wider range of environmental and social impacts. A short list has been developed from the assessment. The multi-criteria assessment is documented in section 2.5.

The expected impacts of the short listed options are summarised in qualitative terms in this section (the Economic Case), under each of the WebTAG Appraisal Summary Table headings. More detailed economic, environmental and social impact appraisal will be undertaken on each of the short list options at the Outline Business Case stage. The Outline Business Case appraisal will involve transport modelling, including estimating monetised benefits and a Benefit to Cost Ratio (BCR), and a completed WebTAG Appraisal Summary Table for each option.

3.1.2 Options Appraised

This Economic Case provides a high-level assessment of the packaged short listed options. Four of these options (**Cyan, Purple, White, Yellow**) provide a new Park and Ride site to the west of the M11 at Junction 11, as summarised in Table 10.

An alternative option, **Magenta**, involves major expansion of the existing Trumpington Park and Ride site. This option is likely to involve adding a new deck above the existing site, as there is no available land immediately surrounding the existing site. New dedicated Park and Ride access lanes for general traffic would also be provided, extended back to the motorway off-slips and the A10, with overbridge widening at Junction 11.

Concept drawings for each option, including other options not selected for the short list, are provided in **Appendix A**.

Each of the short listed options is compared to a 'Do Nothing' scenario, in which no major enhancement of Park and Ride facilities takes place in close proximity to M11 Junction 11. Instead, minimal surface expansion of the existing Trumpington site (approximately 230 spaces) is assumed to take place.

Table 10: Park and Ride options short list for appraisal – new sites

| Option | Description / Elements |
|--------|--|
| Cyan | <ul style="list-style-type: none"> • New site with dedicated northbound off-slip from the M11, passing below the A10 through a tunnel. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Dedicated slip road for southbound A10 traffic to access the site without needing to turn right across the A10, using the same tunnel as for the dedicated M11 northbound off-slip. • Dedicated exit slip from the Park and Ride site onto the A10 southbound, avoiding the need for vehicles leaving the site to turn right across the A10, again using the same tunnel. • Free-flow left turn lane from southbound motorway off-slip to A1309 for Trumpington Park and Ride. • Public transport vehicles cross motorway using existing accommodation bridge to the north, then run alongside southbound off-slip. |
| Purple | <ul style="list-style-type: none"> • New site with dedicated northbound off-slip from the M11, passing below the A10 through a tunnel, and new junction on the A10 for traffic approaching from the south-west via the A10. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Free-flow left turn lane from southbound motorway off-slip to A1309 for Trumpington Park and Ride. • Public transport vehicles pass directly through the centre of J11 using new bridge structure across M11. |
| White | <ul style="list-style-type: none"> • New site with dedicated northbound off-slip from the M11, passing below the A10 through a tunnel, and new junction on the A10 for traffic approaching from the south-west via the A10. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Free-flow left turn lane from southbound motorway off-slip to A1309 for Trumpington Park and Ride. • Public transport vehicles cross motorway using existing accommodation bridge to the north, then run alongside southbound off-slip. |
| Yellow | <ul style="list-style-type: none"> • New site with general traffic and public transport vehicle access/egress at two new junctions on the A10. • Dedicated left-turn lane from the A10 at Hauxton into the Park and Ride site. • Additional free-flow left turn lanes from both motorway off-slips. • Public transport vehicles cross motorway using existing accommodation bridge to the north, then run alongside southbound off-slip. |

All short list options retain the existing Park and Ride site at Trumpington.

All short list options include complementary public transport priority measures between Trumpington and the city centre.

All short list options (other than Do Nothing) include enhanced public transport services between the Park and Ride site(s) and Cambridge city centre / Cambridge Biomedical Campus.

Source: Mott MacDonald

3.1.3 Assumptions

In assessing the short list options, a series of working assumptions have been applied, at a scheme-specific level and for background conditions. Key assumptions are set out here.

Scheme-specific

- Assessments for each short list option are made in relation to an assumed 'Do Nothing' (or strictly speaking a 'Do Minimum'), in which only a relatively small surface level expansion (approximately 230 spaces) takes place at the existing Trumpington site.
- Existing signal-controlled junctions at M11 Junction 11, Addenbrooke's Road, and the Trumpington Park and Ride site are assumed to remain, with modifications only where required by an option.
- In new site options, direction signage by origin is assumed, directing vehicles to the Park and Ride site which is most convenient to access. Traffic approaching on the A10 and M11 northbound is assumed to be directed to the new site. Traffic approaching on the M11 southbound is assumed to be directed to the existing Trumpington site.
- Also for new site options, the Trumpington Road and busway corridors would be served from both sites. This means that it will be possible to access the city centre and Cambridge Biomedical Campus regardless of which site is used.

Background assumptions

The working assumption for the SOBC is that demand for the existing Trumpington Park and Ride facility is exceeding capacity and will continue to increase as a result of major developments taking place:

- Over the next four years approximately 3,750 additional jobs will be based at Addenbrooke's Hospital and the Cambridge Biomedical Campus.
- The Cambridge Biomedical Campus, including Addenbrooke's Hospital and the relocated Papworth Hospital, will account for 15-20% of all jobs across the Cambridge City local authority area by the end of the Local Plan period (2031).
- Interdependent schemes, including Foxton rural travel hub and Cambridge South station, will have only a small impact on Park and Ride demand at Junction 11. Sensitivity testing to take account of changes in demand associated with interdependent schemes will be undertaken at the Outline Business Case stage.

Further detail on scheme assumptions will be documented as part of the transport modelling work being undertaken at the Outline Business Case stage. This will include alternative demand scenarios (medium, high) for Cambridge, which will impact on future traffic flows and Park and Ride demand.

3.2 Appraisal Summary

3.2.1 Appraisal Summary Table

The main economic, environmental, social and public accounts impacts of the packaged short list options are summarised under the standard WebTAG Appraisal Summary Table (AST) headings in this section.

3.2.2 Economic Impacts

Business users

Business user benefits relate to journey time reductions and vehicle operating costs savings for those undertaking business journeys. Commuting journeys are covered under the social impacts heading, in line with the WebTAG Appraisal Summary Table.

While Park and Ride use for business journeys (in comparison to commuting) tends to be relatively modest, Table 11 compares options in terms of benefits to business users. The assessment here is informed by the scores from the six indicators within multi-criteria assessment Selection Theme 1 (reducing traffic levels and congestion).

Table 11: Business user impacts

| Option | Expected business user impacts |
|---------------------------------------|--|
| Cyan | <i>Moderate Beneficial:</i> By intercepting trips from both the A10 and M11 northbound via dedicated slip roads into a new Park and Ride site, this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction including business journeys. With dedicated slip roads, this option does not require traffic to turn right across the A10 and will remove traffic from queues approaching Junction 11. This option also routes public transport services via the accommodation bridge, avoiding any conflict with general traffic. It is therefore expected to be the most beneficial in reducing delay on the A10, again benefiting business journeys. Business users using the Park and Ride site will benefit from the ability to find a parking space more quickly, and to use an onward public transport service that is not delayed by congestion. |
| Purple | <i>Slight Beneficial:</i> By intercepting trips from both the A10 northbound and M11 northbound via dedicated slip-roads into a new Park and Ride site, this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction including business journeys. Due to the need to adjust the signals at Junction 11 to allow public transport services to pass across the junction, this option is not expected to be as beneficial as the Cyan and White options. |
| White | <i>Moderate Beneficial:</i> By intercepting trips from both the A10 northbound and M11 northbound via dedicated slip-roads into a new Park and Ride site, this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction including business journeys. Public transport vehicles would be routed via the accommodation bridge (avoiding Junction 11). |
| Yellow | <i>Slight Beneficial:</i> By intercepting trips from both the A10 northbound and M11 northbound into a new Park and Ride site, this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction including business journeys. While public transport vehicles are routed via the accommodation bridge, avoiding any conflict with general traffic at Junction 11, the presence of two new junctions on the A10 may lead to an increase in delay between Harston and the M11. |
| Major Trumpington expansion (Magenta) | <i>Slight Beneficial:</i> Although this option would not remove trips from the circulatory at Junction 11, new dedicated Park and Ride lanes would increase traffic capacity, with some potential to reduce delays to all journeys passing through the junction including business journeys. The presence of a much larger site at Trumpington will also reduce search time for parking spaces. |

Source: Mott MacDonald

Overall there is expected to be a net benefit for business users, as mode shift decisions made by other road users (including those making commuting and other journeys) will reduce traffic flows and delay in an area where significant congestion is experienced.

More detailed monetised analyses of journey time benefits by journey purpose will be undertaken at the Outline Business Case stage.

Journey time reliability impact on business users

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

Table 12: Business user journey time reliability impacts

| Option(s) | Expected business user journey time reliability impacts |
|---------------------------------------|---|
| Cyan | <i>Moderate Beneficial:</i> The free-flow off-slip site for M11 northbound traffic will improve journey time reliability for accessing the Park and Ride site, as well as the free-flow left turn slip lane into the site from the A10. Although the public transport leg of the journey will be longer than for the existing site, the segregated route for the additional length will mean that the journey time is reliable. Further complementary public transport priority measures on Trumpington Road are also expected to improve journey time reliability for Park and Ride users. |
| Purple | |
| White | |
| Yellow | <i>Slight Beneficial:</i> Although a free-flow left turn slip lane into the site from the A10 has the potential to improve journey time reliability for site access, right turning vehicles from the M11 may cause some delay. While the public transport leg of the journey will be longer than for the existing site, the segregated route for the additional length will mean that the journey time is reliable. Further complementary public transport priority measures on Trumpington Road are also expected to improve journey time reliability for Park and Ride users. |
| Major Trumpington expansion (Magenta) | <i>Neutral:</i> Although new extended dedicated Park and Ride access lanes will increase traffic capacity at Junction 11, the greater number of vehicles using these lanes is likely to mean that there is no significant difference in site access journey time reliability. Complementary public transport priority measures on Trumpington Road are expected to improve journey time reliability for Park and Ride users. |

Source: Mott MacDonald

Business users using a new Park and Ride site adjacent to Junction 11 would benefit from reduced access times into the site, improved ability to find a parking space, and a reliable onward public transport journey time.

Regeneration

The areas immediately surrounding M11 Junction 11 and the Cambridge Southern Fringe are not designated as regeneration areas under any specific UK or EU regeneration programmes. Neither does the area suffer from major transport accessibility constraints, in terms of the absence of transport services (when taking all modes into consideration). For these reasons a regeneration impact assessment is not considered necessary.

Wider economic impacts

Wider economic impacts are those economic impacts which are additional to transport user benefits. WebTAG¹⁴ identifies three categories of wider impact – induced investment (dependent development and output change in imperfectly competitive markets), employment effects (labour supply and move to more productive jobs), and productivity (agglomeration) impacts.

Due to the nature of scheme and the types of businesses and organisations locating in the Cambridge Biomedical Campus, benefits associated with output change in imperfectly competitive markets are unlikely to be significant.

Employment benefits at the local level might be expected as a result of major Park and Ride enhancements, as reduced generalised travel costs could widen the travel to work area for the Cambridge Biomedical Campus. Park and Ride enhancements might therefore increase the supply of labour to an important area for economic growth.

Agglomeration, where economic activity is concentrated in a particular area, can increase as a result of transport network improvements. As the scheme is located within a core Functional Urban Area, as defined within TAG Unit A2.4, agglomeration benefits have the potential to be significant. The extent to which agglomeration benefits could be attributed to major Park and

¹⁴ Based on the TAG Units A2.1 to A2.4 released in May 2018 as part of changes to assessing wider economic impacts.

Ride enhancements is uncertain, although Park and Ride will play a role as part of a package of measures across the Cambridge Southern Fringe.

Wider economic impacts scoping, followed by more detailed assessments as required, will take place during the Outline Business Case stage.

3.2.3 Environmental Impacts

The environmental assessments set out in this sub-section are based on a high-level desktop assessment only. Further work will be required at the Outline Business Case stage. Where relevant, the assessments are informed by multi-criteria assessment scores from the seven environmental impact indicators in Selection Theme 3 (Quality of life and environment).

Noise

Noise from the M11 and A10 are currently the dominant noise sources in the area and are expected to remain the main sources of future noise. While a new Park and Ride site (Cyan, Purple, White, and Yellow options) would represent a new source of noise, there are no sensitive receptors nearby and the site would be adjacent to the more notable A10 and M11 noise sources.

The suggested variations of the entry and exit routes to the new Park and Ride site would have different effects on the noise environment at the local level (Table 13). None of the options are expected to result in a significant noise impact.

With regard to a major expansion of the existing Trumpington site (Magenta option), there would be an increase in noise resulting from the increased parking capacity, and with a decked solution the noise from car movements would be at the same level as adjacent upper floors of residential properties along the northern boundary of the site.

Table 13: Noise impacts

| Option | Expected noise impacts |
|---------------------------------------|--|
| Cyan | <i>Slight Adverse:</i> Introducing a source of noise (public transport route via the accommodation bridge), but unlikely to be significant due to the proximity of the M11 and noise sources in the new Trumpington Meadows housing development. |
| Purple | <i>Neutral:</i> Unlikely the proposed scheme would have a significant effect on the noise environment as traffic and public transport vehicle access/egress routes would mostly follow the M11 and A10. |
| White | <i>Slight Adverse:</i> Introducing a source of noise (public transport route via the accommodation bridge), but unlikely to be significant due to the proximity of the M11 and noise sources in the new Trumpington Meadows housing development. |
| Yellow | |
| Major Trumpington expansion (Magenta) | <i>Slight Adverse:</i> Likely increase in noise from increased capacity of existing Park and Ride site and at an elevated level above the ground, in close proximity to residential receptors adjacent to the site. |

Source: Mott MacDonald

Local air quality

All options are expected to be beneficial for local air quality within Cambridge city centre, as vehicle-kilometres will be removed from the local road network, including the Cambridge Air Quality Management Area.

In the area surrounding the Park and Ride, the M11, A10, and A1309 are likely to be the main source of impact on air quality in the area. It is therefore unlikely that a new Park and Ride site (Cyan, Purple, White, Yellow) would significantly increase any negative effect on local air quality. The suggested variations of the access / egress routes to the new site may cause minor differences in air quality, none of which are likely to be significant at a local level. In general,

sites that best reduce traffic congestion and delay are likely to have the most positive impact on air quality.

Decking the existing Trumpington site (Magenta) would likely impact on local air quality due to increased traffic within the site, close to sensitive receptors in residential areas in Trumpington.

Greenhouse gases

The scheme is expected to have a slight beneficial impact on greenhouse gas emissions as a result of mode shift from private car to public transport for the part of the journey undertaken within the Cambridge City local authority area. Options are unlikely to be differentiated by their impact on greenhouse gas emissions.

Landscape

All short list options involve construction within the Green Belt, either within the Cambridge City Council or South Cambridgeshire District Council area.

Options involving a new site (Cyan, Purple, White, Yellow) are covered by Local Plan policies to improve the landscape. While the policy refers to hedge improvements more than entirely re-landscaping the arable land, any landscape work benefitting the area should align with policy objectives. Such improvements would be included as part of the Park and Ride design, partially satisfying the policy requirements.

The landscape impact of options where public transport vehicles are routed via the accommodation bridge over the M11 (Cyan, Purple, White) might be slightly greater, due to the proximity of the Trumpington Meadows Country Park.

A new Park and Ride site on land that is currently arable would also have a lighting effect on the landscape.

Townscape

Options involving a new Park and Ride site (Cyan, Purple, White, Yellow) would be located within arable land, just over a mile south-west of Trumpington village. These options would be unlikely to have an impact on the townscape.

In comparison, a major expansion of Trumpington (Magenta) would be likely to have a detrimental impact on the townscape.

Historic environment

There are currently no heritage or archaeology records available covering the area of land identified for a new Park and Ride site (Cyan, Purple, White, Yellow). However, given the presence of extensive archaeological complexes and discrete sites across the wider area, archaeological remains can be expected. Geophysical surveys of the Park and Ride site have identified two linear features that are not visible on aerial photographs or other available information. It is anticipated these are features are field boundaries linked to other archaeological features in the area. Any impact on the features is unknown at this time but the impact would be common for all new site options.

The major expansion at Trumpington option (Magenta) would be unlikely to impact on heritage as the solution is expected to involve decking above the existing site, rather than increasing the site footprint (due to lack of land availability).

Biodiversity

A new Park and Ride site (Cyan, Purple, White, Yellow) would be located on an intensively farmed arable field with Trumpington Meadows Country Park, a nature reserve created for wildlife and people, located immediately to the north of the site. The land presents a potential habitat for reptiles in the field boundaries, particularly along the Country Park, and it also provides habitat to wintering birds.

It is expected that any negative impacts of a new Park and Ride site adjacent to Trumpington Meadows Country Park can be offset by mitigation measures to increase biodiversity. As the site is part of the area covered by the Ecological Management Plan¹⁵, prepared for the Trumpington Meadows residential development, any mitigation measures considered for the new Park and Ride site would consider mitigation included in the Ecological Management Plan.

A review of the MAGIC dataset¹⁶ confirms that there are no designated sites of biodiversity importance in close proximity to M11 Junction 11.

The suggested variations for new site access and egress may have a different impact on biodiversity at a very local scale (Table 14).

Table 14: Biodiversity impacts

| Option | Expected biodiversity impacts |
|---------------------------------------|--|
| Cyan | <i>Neutral:</i> The public transport route via the accommodation bridge would be likely to impact on the Trumpington Meadows Country Park and on the recently planted woodland on the eastern site of the M11. However, it is assumed the proposed scheme would have a reasonable level of planting mitigation around the site boundary. |
| Purple | <i>Slight Beneficial:</i> The new site would be unlikely to have a direct negative impact on the Trumpington Meadows Country Park and it is assumed the proposed scheme would have a reasonable level of planting mitigation around the site boundary. |
| White | <i>Neutral:</i> The public transport route via the accommodation bridge would be likely to impact on the Trumpington Meadows Country Park and on the recently planted woodland on the eastern site of the M11. However, it is assumed the proposed scheme would have a reasonable level of planting mitigation around the site boundary. |
| Yellow | |
| Major Trumpington expansion (Magenta) | <i>Neutral:</i> Unlikely to impact on biodiversity as the proposed works are within the footprint of the existing site. |

Source: Mott MacDonald

Water environment

The Environment Agency's flood map for the site and surrounding area shows that the new site options (Cyan, Purple, White, Yellow) lie within Flood Zone 1, defined as little or no flood risk at all with a less than 0.1% chance of flooding from rivers in any one year. The new site options are not located within a groundwater protection zone and do not have any water feature crossing the main site. Small ponds are present to north of the site, although any option would be designed to avoid any significant impact on the ponds.

Given the scale of development taking place in the surrounding area, the option to expand the Trumpington site (Magenta) is unlikely to have a significant impact on the water environment.

¹⁵ Trumpington Meadows Land Company Ltd (2010). Ecological Management Plan (amended). Prepared by the Wildlife Trust for Bedfordshire, Cambridgeshire, Northamptonshire & Peterborough on behalf of Trumpington Meadows Land Company Ltd.

¹⁶ Natural England (2018). MAGIC. Available online at: <http://www.magic.gov.uk/>

3.2.4 Social Impacts

Commuting and other users

Commuting and other user benefits relate to journey time reductions and vehicle operating cost savings for those undertaking these types of journeys. Commuting journeys are expected to form the greatest proportion of trips that will benefit from major enhancements to Park and Ride facilities, particularly focused on trips to the growing Cambridge Biomedical Campus.

Table 15 compares options in terms of their benefits to commuting and other users. As with the business user benefits, the assessment is informed by the scores from the six indicators within multi-criteria assessment Selection Theme 1 (reducing traffic levels and congestion).

Table 15: Commuting and other user impacts

| Option | Expected commuting and other user impacts |
|---------------------------------------|--|
| Cyan | <i>Large Beneficial:</i> By intercepting trips from both the A10 and M11 northbound via dedicated slip roads into a new Park and Ride site, this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction. With dedicated slip roads, this option does not require traffic to turn right across the A10 and will remove traffic from queues approaching Junction 11. This option also routes public transport services via the accommodation bridge, avoiding any conflict with general traffic. It is therefore expected to be the most beneficial in reducing delay on the A10. Park and Ride users will benefit from the ability to find a parking space more quickly, and to use an onward public transport service that is not delayed by congestion. |
| Purple | <i>Moderate Beneficial:</i> By intercepting trips from both the A10 northbound and M11 northbound via dedicated slip-roads into a new Park and Ride site, this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction. Due to the need to adjust the signals at Junction 11 to allow public transport services to pass across the junction, this option is not expected to be as beneficial as the Cyan and White options. |
| White | <i>Large Beneficial:</i> By intercepting trips from both the A10 northbound and M11 northbound via dedicated slip-roads into a new Park and Ride site, this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction. Public transport vehicles would be routed via the accommodation bridge (avoiding Junction 11). |
| Yellow | <i>Moderate Beneficial:</i> By intercepting trips from both the A10 northbound and M11 northbound into a new Park and Ride site, this option is expected to reduce traffic flow on the circulatory at Junction 11, therefore reducing delays to all journeys passing through the junction. While public transport vehicles are routed via the accommodation bridge, avoiding any conflict with general traffic at Junction 11, the presence of two new junctions on the A10 may lead to an increase in delay between Harston and the M11. |
| Major Trumpington expansion (Magenta) | <i>Slight Beneficial:</i> Although this option would not remove trips from the circulatory at Junction 11, new dedicated Park and Ride lanes would increase traffic capacity, with some potential to reduce delays to all journeys passing through the junction. The presence of a much larger site at Trumpington will also reduce search time for parking spaces. |

Source: Mott MacDonald

A significant net benefit is expected for commuting and other users, as mode shift will reduce traffic flows and delay in an area where significant congestion is experienced.

More detailed monetised analyses of journey time benefits by journey purpose will be undertaken at the Outline Business Case stage.

Journey time reliability impact on commuting and other users

Journey time reliability benefits for commuting and other users are expected to be identical to those experienced by business users, as summarised in Table 12.

Commuters and other users of a new Park and Ride site adjacent to Junction 11 would benefit from reduced access times into the site, improved ability to find a parking space, and a more reliable onward public transport journey time.

Physical activity

An increase in the number of people using Park and Ride services is likely to lead to a general increase in walking as part of an end to end journey. The scale of benefit would be similar for all short list options.

More specifically, the scheme design may have an impact on walking and cycling in the vicinity, depending on the impact to local walking and cycling routes, as summarised in Table 16. The assessment is based on the scores for the walking and cycling multi-criteria assessment indicator within Selection Theme 3 (Quality of life and environment).

Table 16: Physical activity impacts

| Option | Expected physical activity impacts |
|---------------------------------------|--|
| Cyan | <i>Neutral:</i> Benefits from additional Park and Ride users would be offset by the impact of three new crossing points for existing pedestrians and cyclists – at the Park and Ride entrance for northbound A10 traffic, at the Park and Ride egress for A10 northbound / M11 traffic, and at the M11 southbound dedicated left turn slip lane. |
| Purple | <i>Slight Beneficial:</i> Potential additional benefits associated with allowing cyclists to use the segregated public transport route through M11 Junction 11. |
| White | <i>Neutral:</i> Benefits from additional Park and Ride users would be offset by the impact of two new crossing points for existing pedestrians and cyclists – at the Park and Ride entrance for northbound A10 traffic, and at the M11 southbound dedicated left turn slip lane. |
| Yellow | <i>Slight adverse:</i> Potentially disruptive to existing pedestrians and cyclists due to the presence of two new junctions on the A10 permitting a range of traffic turning movements. Pedestrians and cyclists would also need to cross the new M11 southbound dedicated left turn slip lane. |
| Major Trumpington expansion (Magenta) | <i>Neutral:</i> Benefits from additional Park and Ride users would be offset by the impact of the M11 southbound dedicated left turn slip lane on existing pedestrians and cyclists crossing at Junction 11. |

Source: Mott MacDonald

Journey quality

Journey quality benefits are expected to arise from:

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

Journey quality benefits for new site options with a dedicated slip-road from the M11 northbound into the Park and Ride (Cyan, Purple, White) are expected to be greater.

Accidents

While increased use of Park and Ride is expected to reduce vehicle-kilometres and therefore road accidents within Cambridge, new road junctions can introduce new conflict points on the network. The advantages and disadvantages of the short list options are summarised in Table 17. The assessment is based partly on the scores for the road accidents multi-criteria assessment indicator within Selection Theme 3 (Quality of life and environment).

Table 17: Accident impacts

| Option | Expected accident impacts |
|---------------------------------------|--|
| Cyan | <i>Slight adverse:</i> Reduced vehicle-kms on the road network will lead to a reduced number of accidents within Cambridge City. However, new merge / diverge movements on the A10, in close proximity to the Junction 11 gyratory, introduces new conflict points. |
| Purple White | <i>Slight adverse:</i> Reduced vehicle-kms on the road network will lead to a reduced number of accidents within Cambridge City. However, a new junction on the A10, with traffic able to turn right across the A10 when leaving the Park and Ride site, introduces a new conflict point for both options. |
| Yellow | <i>Moderate adverse:</i> Reduced vehicle-kms on the road network will lead to a reduced number of accidents within Cambridge City. However, two new junctions on the A10 with traffic able to turn right across the A10 into and out of the Park and Ride site, introduces new conflict points. |
| Major Trumpington expansion (Magenta) | <i>Neutral:</i> Reduced vehicle-kms on the road network will lead to a reduced number of accidents within Cambridge City, although this reduction is not expected to be as high as for new site options. This option does not introduce new junctions, although additional dedicated Park and Ride lanes at Junction 11 may introduce new conflict points. |

Source: Mott MacDonald

Further analysis of expected accident impacts for each short list option will be undertaken at the Outline Business Case stage.

Security

The scheme is not expected to give rise to a change in personal security. Further work will be undertaken at the Outline Business Case stage.

Access to services

The scheme is not expected to have a significant impact on public transport accessibility for those without access to a car. However, the Purple option is likely to have a slight beneficial impact on existing bus routes along the A10, which would be able to use new public transport priority measures through Junction 11.

Affordability

The scheme is not expected to change the personal affordability of travel (when compared to the existing situation). Further work will be undertaken at the Outline Business Case stage.

Severance

Other than the impacts noted under the 'physical activity' heading, the scheme is not expected to lead to other severance impacts, whether positive or negative.

Option and non-use values

An option value is the willingness-to-pay to preserve the option of using a transport service for trips not yet anticipated (or currently undertaken by other modes), over and above the expected value of any such future use. A non-use value is the value that is placed on the continued existence of a service regardless of any possibility of future use by the individual in question¹⁷.

The scheme is not expected to give rise to option and non-use value benefits.

¹⁷ Definitions provided in TAG Unit A4.1 (Social Impact Appraisal)

3.2.5 Impact on Public Accounts

Cost to broad transport budget

High-level cost estimates for each option, including those not included in the short list, are provided in the Financial Case (section 4). The all-in risk-adjusted cost estimates range from £36 million to £81 million, or from £56 million to £71 million for short list options (all 2018 prices), excluding land and costs for complementary public transport priority measures along the A1309.

For economic appraisal purposes, including BCR calculation, a Present Value of Costs (PVC) will be estimated for each packaged short list option at the Outline Business Case stage. In addition to the option cost estimates, the PVC will also need to include the net increase in maintenance and renewals costs associated with the scheme, and any public subsidy requirements for service operation (if relevant). The PVC will also need to include Optimism Bias, to reflect the tendency of scheme promoters to underestimate costs.

Indirect tax revenues

The scheme is expected to lead to a slight reduction in indirect tax revenues, due to reduced vehicle-kilometres on the road network and therefore reduced fuel sales. An indirect tax revenue calculation will be undertaken in the economic appraisal at Outline Business Case stage.

3.3 Outline Value for Money Statement (Economic Case Summary)

- The Economic Case has been prepared using methods that are appropriate for an early stage of scheme development. At this stage a value for money category has not been identified, although there are clear benefits associated with each of the short list options.
- A high-level assessment of the short listed options is provided, under the standard WebTAG economic, environmental, and social impact headings, using information from the multi-criteria assessment. Four options relate to a new Park and Ride site to the west of the M11 at Junction 11, alongside an option for major expansion of the existing Trumpington site.
- For any of the short list options, there is expected to be a net economic benefit for road users, as mode shift decisions (particularly by those making commuting journeys) will reduce traffic flows and delay in an area where significant congestion is experienced.
- Users of a new Park and Ride site adjacent to Junction 11 would benefit from reduced access times into the site, as well as improved ability to find a parking space and a reliable onward public transport journey time.
- In terms of wider economic impacts, the short list options might widen the travel to work area and increase the supply of labour for the major employment growth areas. More detailed wider economic assessments will be undertaken for the Outline Business Case.
- A high-level desktop environmental assessment has noted varied impacts by option, although significant negative impacts are highly unlikely. The new site options are expected to perform more strongly than expanding Trumpington in terms of noise, local air quality, and townscape. While expanding Trumpington is expected to perform more strongly with regard to landscape, historic environment, biodiversity, and water environment.
- A range of social benefits are possible, including increased numbers of people walking as part of their end to end journey, improvements to cycling routes across Junction 11, and reduced traveller frustration associated with oversubscribed parking facilities.
- The all-in risk-adjusted cost estimates range from £56 million to £71 million for short list options (all 2018 prices), excluding land costs and costs for complementary public transport priority measures along the A1309. Costs will be converted to Present Values and compared to the Present Value of Benefits for each option at the Outline Business Case stage.

4 Financial Case

At SOBC stage, the Financial Case sets out anticipated expenditure and potential funding sources. Detailed cost estimates and funding sources would need to be confirmed as part of the next business case stage, Outline Business Case.

4.1 Introduction

Department for Transport business case guidance identifies the expected level of detail for each of the five cases (Strategic, Economic, Financial, Commercial, Management) at each business case stage. At the SOBC stage, two requirements are identified for the Financial Case:

- Outline the approach being taken to assess affordability; and
- Outline the budget and funding cover for the project.

Detailed cost estimates are required as part of the next stage, the Outline Business Case, along with confirmed funding sources.

4.2 Scheme Affordability

Scheme affordability is based on two key considerations:

- Availability of sufficient capital funding, or a suitable borrowing and financing solution, for scheme implementation, including scheme development (preparatory) work. High-level scheme cost estimates are provided in section 4.3.1.
- Extent to which the scheme leads to additional maintenance and operating cost liabilities. For example, if a new or expanded Park and Ride cannot be operated on a fully commercial basis then operators may require annual service subsidies from the public sector.

Cost range information, along with other elements of this SOBC, will inform the overall affordability assessment to be undertaken by the Greater Cambridge Partnership. More detailed cost estimates, including annual maintenance and operating costs, for the short list options and public transport services, will be prepared as part of the Outline Business Case.

4.3 Scheme Costs

4.3.1 Investment Cost Summary

A high-level cost estimate has been prepared for each of the Park and Ride long list options, based on unit rates and approximate quantities (Table 18). High-level cost estimates include:

- Construction costs for the Park and Ride site and amendments to the road network surrounding Junction 11, including new structures and slip-roads as required
- Uplifts to allow for preliminary and detailed design, statutory planning processes, consultation, future business case development, procurement, monitoring and evaluation (preparatory costs)
- Uplifts for construction preliminaries including site clearance and traffic management
- Uplifts for project management and site supervision
- Allowances for environmental mitigation measures

- Risk and estimating tolerance allowance uplift of 66%, in lieu of a Quantified Risk Assessment (QRA), which will be undertaken at Outline Business Case stage. Key cost uncertainties relate to:
 - Ground conditions including contaminants and groundwater levels
 - Traffic management requirements, particularly on the M11 for slip-road amendments and installing new structures across the motorway
 - Retaining wall structures close to the tunnel entrances (for some options)
 - Extent of environmental mitigation measures
 - Future changes to design standards
 - Design changes required following consultation
- Land purchase and associated legal costs

Costs for complementary public transport priority measures along the A1309 Hauxton Road / High Street / Trumpington Road corridor are not included as further work is required to define the measures. These measures, and therefore the additional costs, would be the same regardless of the Park and Ride site option progressed.

The high-level cost estimates have been prepared based on:

- Unit prices as at the second quarter of 2018
- Assumed methods of working, with some night time working
- A minimal need to make any amendments to utilities
- Basic functional bridge construction (rather than iconic structures) where new bridges across the M11 are required
- The existing accommodation bridge being suitable for public transport use, and provision of a new parallel cycling and footpath bridge for options that make use of the accommodation bridge
- No delays for archaeological finds and digs

Table 18: High-level cost estimates (2018 prices, £millions)

| Option(s) | Construction cost – P&R site (excluding land) | Construction cost – access routes & J11 (excluding land) | Uplifts for preparatory costs, preliminaries, project management | Risk adjustment (66%) | Total estimated risk-adjusted cost (excluding land) |
|-----------|---|--|--|-----------------------|---|
| Red | 9 | 4 | 9 | 14 | 36 |
| Black | 9 | 9 | 13 | 20 | 51 |
| Yellow* | 9 | 11 | 14 | 22 | 56 |
| Magenta* | 12 | 8 | 14 | 23 | 57 |
| Purple* | 9 | 15 | 17 | 28 | 69 |
| Blue | 9 | 16 | 17 | 28 | 70 |
| White* | 9 | 16 | 18 | 28 | 71 |
| Cyan* | 9 | 16 | 18 | 28 | 71 |
| Orange | 9 | 19 | 20 | 33 | 81 |

*Indicates option included in short list. The short listing process is explained in the Strategic Case (section 2).

Appendix A contains concept drawings for each option.

Source: Mott MacDonald

4.3.2 Ongoing Operation and Maintenance Costs

Ongoing operating and maintenance cost liabilities associated with the scheme are those additional costs that have occurred as result of the enhanced Park and Ride facilities. These costs include:

- Park and Ride site maintenance, including surface repairs and re-lining, shelter / building maintenance, site cleaning, real time passenger information repairs and upgrades, grass-cutting and winter gritting, drain clearance and repairs
- Electric charging bay maintenance (if provided)
- Park and Ride site security, including CCTV
- National non-domestic rates (NNDR) for the Park and Ride site
- Additional utility charges – electricity, water, sewerage
- Additional carriageway surface repairs, for widened roads and new lanes
- Structural inspections, repairs, and renewals for new bridges, tunnels, and decking
- Park and Ride public transport service (or equivalent) operating costs

Operating and maintenance cost estimates for each short list option will be prepared at the Outline Business Case stage.

4.4 Budgets and Funding Sources

The entirety of the GCP West of Cambridge Package, of which the M11 Junction 11 Park and Ride is a component, is expected to be funded through the £1 billion Greater Cambridge City Deal investment. The City Deal includes £500 million from government and £500 million from local and private sector investment between 2016 and 2031. Funding for scheme development and delivery will be required between 2018 and 2023, with the majority of funding being provided during 2022 for scheme construction.

4.5 Financial Case Summary

- At SOBC stage, the Financial Case sets out anticipated expenditure and potential funding sources.
- A high-level cost estimate has been prepared for each option, based on unit rates and approximate quantities. Basic construction costs range from £13 million to £28 million for all long list options, or from £20 million to £25 million for short list options (all 2018 prices). All-in risk-adjusted costs range from £36 million to £81 million for all long list options, or from £56 million to £71 million for short list options (all 2018 prices), excluding land costs and costs for complementary public transport priority measures along the A1309.
- More detailed cost estimates, also including annual maintenance, site operating, and public transport operating costs, will be prepared as part of the Outline Business Case.
- The scheme will be funded through the Greater Cambridge City Deal.

5 Commercial Case

At SOBC stage, the Commercial Case should demonstrate that there are appropriate ways in which the scheme can be procured. This includes public transport services to serve any new Park and Ride site, or enhanced services for a major expansion to the Trumpington site.

5.1 Introduction

Early stage commercial considerations are:

- How many scheme elements need to be procured through some form of competitive process?
- What potential procurement routes exist for each scheme element?
- Is the scheme commercially viable, or will some form of public sector subsidy be necessary?

This Commercial Case is based on a high-level review undertaken by WYG.

5.2 Output-based Specification

The following works will need to be procured:

- Scheme design and associated preparatory works
- Park and Ride site main works, whether at a new site or expanding the existing Trumpington site
- Associated main works beyond Park and Ride site boundary. These works vary by option, as summarised in **Appendix C** for each of the long list options.

Separate procurement exercises might also be required for operation and maintenance activities:

- High quality public transport services to connect the Park and Ride site to Cambridge city centre and the Cambridge Biomedical Campus, whether new services or enhancements to existing services
- Site operation and maintenance (if a new site is delivered)

A full output-based specification for procurement will need to be presented with the Outline Business Case.

5.3 Procurement Options

5.3.1 Design and Construction Elements

At this early (conceptual) stage procuring the design and construction of the works will largely depend upon the type, complexity and estimated cost of the options under consideration. Some of the options show standard modifications to the road and junctions which would not require specialist construction considerations and could be procured locally through the following established routes:

- Cambridgeshire County Council Term Contract – the threshold amount for the ‘services and goods’ that the Term Contractor can undertake would need to be assessed before opting for either a selective or open procurement under The Public Contracts Regulations 2015.

- Selective tendering through the local government portals such as, Local Government Shared Services, Eastern Highway Alliance framework
- Highways England frameworks such as Routes to Market – approval for works to the Highways England network (M11 slip roads) would need to be obtained. This would ascertain whether works would need to be procured under the Highways England frameworks.
- Open tendering to include the European market published through the Official Journal of the European Union (OJEU) – the procurement regulations which provide the basis for procuring goods and services open to the public within the European Union, published under the Official Journal of the European Union (OJEU), would be applicable if the construction value of a specific works package exceeds the current threshold of £4,104,394.

For simple construction works, traditional procurement methods can be adopted where the scheme can be designed and constructed under separate contracts. In considering a high-level procurement strategy for concepts that require a greater level of buildability consideration, Early Contractor Involvement (ECI) arrangement should be considered to de-risk the project and provide a more cost-effective solution.

In the options long list, the more basic Red option would attract either a traditional form of procurement which can be let under separate design and construction contracts. The Orange option, which has more complicated construction elements, would require detailed buildability consideration and would attract an ECI arrangement.

In **Appendix C**, the procurement considerations identified are based on the type of work that is associated with each long list option. Since the options are yet to be fully developed and the full extent and type of works with the associated cost is yet to be fully defined, the options have been grouped broadly with those that require structural works and those that do not. The options that require structural works would require early contractor input to assess buildability. In the options where it is unclear what level of structural work is needed, an alternative procurement strategy can be suggested.

The procurement process for design and construction will commence following a decision from the Greater Cambridge Partnership Executive Board to proceed with a preferred option. This decision is expected during autumn 2019.

5.3.2 Operation and Maintenance Elements

Public transport operations procurement will be considered by Cambridgeshire County Council as the Local Transport Authority (and as one of the constituent members of the Greater Cambridge Partnership), independent of design and construction activities. Service operations might not involve a formal procurement exercise, instead corresponding to the current arrangements that are in place between public transport operators and the Local Transport Authority, in the form of an Access Agreement for any operator serving a Park and Ride site. The Access Agreement sets out minimum frequencies, days and hours of operation, processes for agreeing timetable amendments, emissions standards, and livery requirements for operators who wish to serve the Park and Ride site.

Should insufficient interest in operating services on a commercial basis exist, current legislation gives powers to the Local Transport Authority to introduce franchising or a new partnership arrangement called an Enhanced Partnership. Legislative changes in 2017 have also made amendments to the existing Quality Partnership provisions and renames this an Advanced Quality Partnership with aims to make it easier to introduce multi-operator ticketing and improvements to enhance passenger accessibility and information.

Enhanced Partnership arrangements would blend in with the current practices where an Enhanced Partnership Plan may cover all, or parts, of the Local Transport Authority area. It would analyse local service performance, set improvement objectives, define the geographical area or areas of application and explain how long the proposal would last.

The procurement of site maintenance and operating elements would resemble existing Cambridgeshire County Council practices. Park and Ride site maintenance would fall into the regime that is currently adopted.

New highway links and surface space would be maintained through the Term Contract for Highway Maintenance.

5.4 Commercial Case Summary

- At SOBC stage, the Commercial Case demonstrates that there are appropriate ways in which the scheme and associated public transport services can be procured.
- Park and Ride site works are likely to be procured in at least three parts – scheme design, main site works, and works outside the site boundary.
- Several established procurement routes exist for design and construction works. The procurement process will commence following a decision from the Greater Cambridge Partnership Executive Board to proceed with a preferred option.
- Separate procurement exercises might be required for Park and Ride site transport services, site operation and site maintenance. However, it is also possible that existing arrangements could be extended to cover the new or expanded site.

6 Management Case

At SOBC stage, the Management Case includes an indicative programme and commentary on governance, quality assurance, communications, and risk management.

6.1 Introduction

This Management Case is preliminary in nature and will need to be developed as the scheme is progressed through the business case stages. Department for Transport business case guidance¹⁸ identifies the most important areas of the Management Case at SOBC stage as:

- Providing evidence of similar projects that have been successful
- Describing the proposed project governance structure
- Identifying key assurance and approval milestones

6.2 Evidence of Similar Projects

The constituent members of the Greater Cambridge Partnership have an extensive record of successful public transport scheme delivery. Cambridgeshire County Council has delivered five Park and Ride sites around Cambridge, and the Cambridge Busway connecting to additional Park and Ride sites beyond the Cambridge urban area, in partnership with public transport operators.

The success of Park and Ride, combined with connecting busways at some sites, is evidenced by high annual patronage of approximately four million Park and Ride journeys per year. Furthermore, the number of Cambridge residents using road-based public transport for their commute increased by approximately 50% between 2001 and 2011. Guided busways in Cambridge, such as the one between St Ives and Cambridge have seen 25% increase in ridership¹⁹. The success of Park and Ride, and road-based public transport patronage in general, is due to the wide range of destinations served directly, including the city centre core and the Southern Fringe.

6.3 Project Programme

6.3.1 Milestones

The scheme to enhance Park and Ride facilities in close proximity to M11 Junction 11 is at an early stage of development. A draft outline programme, with key milestone dates, is shown in Table 19.

¹⁸ The Transport Business Cases, January 2013

¹⁹ Transport Strategy for Cambridge and South Cambridgeshire

Table 19: Outline Programme

| Milestone | Date |
|--|-------------------------|
| Draft Strategic Outline Business Case (SOBC) completion | April 2018 |
| Completion of wider option analysis and SOBC Addendum, confirming option short list | July 2018 |
| SOBC / SOBC Addendum completion | September 2018 |
| Public consultation on options | October – December 2018 |
| Draft Outline Business Case (OBC) completion | December 2018 |
| Consultation findings confirmed | February 2019 |
| OBC completion | July 2019 |
| Final (preferred) option recommendation to Greater Cambridge Partnership Executive Board | Summer 2019 |
| Detailed design completion | Mid 2020 |
| Statutory procedures completion | Mid 2021 |
| Construction start | 2022 |
| Construction completion | 2023 |
| New Park and Ride site opening | 2023 |

Source: Mott MacDonald

6.3.2 Dependencies

The success and financial viability of a major enhancement to Park and Ride facilities in close proximity to M11 Junction 11, along with complementary public transport priority measures along the A1309 Hauxton Road / High Street / Trumpington Road corridor will be dependent on various factors. Scheme design and delivery will therefore need to take the following dependencies into account:

- Extent and rate of development at the Cambridge Biomedical Campus, which is expected to provide a significant proportion of the demand for Park and Ride close to M11 Junction 11. Enhanced Park and Ride facilities will need to keep pace with Biomedical Campus development.
- Interdependencies with other proposed schemes serving demand on the A10 and M11 corridors:
 - New station at Cambridge South, potentially reducing the proportion of commuters travelling by car to the Cambridge Biomedical Campus
 - Foxton rural travel hub, which includes expanding car park capacity at Foxton rail station (on the London Kings Cross to Cambridge line), potentially intercepting a proportion of Cambridge-bound trips in advance of them reaching M11 Junction 11.
 - Travel hubs in other locations to serve trips into Cambridge, including at Whittlesford Parkway station close to M11 Junction 10.
 - New Park and Ride to serve the Cambourne to Cambridge (A428/A1303) corridor, which might reduce the number of vehicles approaching Junction 11 along the M11 southbound carriageway.
 - M11 smart motorways upgrade, which is likely to allow for increased traffic flows on the M11 and its junctions.
- Timescales in relation to statutory processes that must be followed in order to deliver the scheme, for example the need to obtain planning permission

6.4 Governance Arrangements

6.4.1 Governance Structure

The scheme is being promoted and managed by the Greater Cambridge Partnership, applying a consistent governance structure to other schemes. There are several levels within the project management structure with various responsibilities and functions, as summarised in Table 20.

The upper management levels (Executive Board, Joint Assembly, Programme Board, Project Board) focus on key issues at a programme and project level while technical issues are addressed by the officer levels.

Table 20 Governance Structure

| Management level | Function |
|---|--|
| Greater Cambridge Partnership (GCP) Executive Board | The key decision-making group. Overall strategic direction of City Deal programme and overall scope of projects, aligned with GCP aims and local and national policy. Leader from each partner organisation. |
| GCP Joint Assembly | Strategic, local advisory, and scrutiny body for GCP Executive Board. Elected members from the constituent local authorities and representatives from other constituent organisations – 17 members in total. |
| Programme Board | Key officers and stakeholders, prioritising schemes, managing programme level risks and capturing shared benefits. |
| Programme Manager | Technical and procedural oversight of projects and programme level benefit management. Reports to the Project Boards. |
| Project Board | Overall control of each project. Senior representative from each partner organisation. |
| Project Manager | Day to day management of each project and delivery of technical work streams. Leads project team. |

On completion, it is expected that the enhanced Park and Ride facilities will be managed by Cambridgeshire County Council in line with the five existing Park and Ride sites in Cambridge.

Although not yet confirmed, Park and Ride public transport services might operate on a commercial or part-commercial basis. The ability to attract interest from commercial operators will be dependent on expected patronage.

6.4.2 Reporting

Standard Greater Cambridge Partnership reporting processes are to be adopted. The Project Manager prepares the Project Manager's Report to present at Project Board meetings. This report is the main source of documentation which summarises progress and change in the scheme. The Project Manager's Report sets out the:

- Progress of each work stream (for example, business case and appraisal, design, consultation)
- Key activities to be undertake before the next reporting meeting
- Budget update
- Review of strategic risks and issues

6.5 Quality Assurance

The scheme will be progressed through the Greater Cambridge Partnership's standard approval processes, with all decisions made by the management level with the appropriate level of authority. There are four main types of decision:

- Key decisions – to define the scope of the project and provide overall approval for the scheme. Key decisions are the responsibility of the GCP Executive Board.
- Scope change decisions – these decisions take the project outside the originally agreed scope and impact cost, quality and/or time. Scope change decisions are the responsibility of the GCP Executive Board.
- Major decisions within scope – these decisions are within the agreed project parameters, but have an impact on cost, quality, and/or time. Major decisions within scope are the responsibility of the Project Board.
- Project management decisions – these decisions do not impact cost, quality and/or time and are the responsibility of the Project Manager.

The scheme will pass through three business cases stages as part of the overall approvals process. Approval to progress to the next business case stage is a key decision taken by the GCP Executive Board. The three stages are aligned to the Department for Transport's 'The Transport Business Cases' (January 2013) approach:

- Strategic Outline Business Case (SOBC), consisting of high-level analyses which establish the need for the project and identify the options to be short listed
- Outline Business Case (OBC), containing more detailed analysis of short list options to identify a preferred option, and setting out the financial, commercial, and management strategies
- Full Business Case (FBC), updating the preferred option analysis and confirming the final financial, commercial, and management strategies

6.6 Communications Strategy

Non-statutory stakeholder engagement and public consultation will be undertaken throughout scheme development. A Consultation Plan has been prepared for the SOBC/OBC phases (**Appendix D**), setting out the list of stakeholders with whom consultation will take place, the proposed approach to stakeholder engagement, specific consultation activities and proposed forms of communication. The Consultation Plan is a live document and will be updated throughout the SOBC/OBC phases. Following OBC completion, statutory consultation will commence as part of the planning application process.

The scheme will have three distinct stages of consultation during the SOBC and OBC phases to help determine the most suitable scheme option:

1. Option short listing stakeholder engagement – to review scheme objectives, option selection criteria, and to help identify the options that will be taken forward for general public consultation. This stage will include a range of meetings and workshops.
2. Public consultation (six to eight weeks) on the elements associated with the short list options.
3. Further stakeholder engagement to assist in identifying a preferred option..

The first stage of consultation has involved engagement with key stakeholders via group meetings and workshops in the local area. Feedback from this first stage has been used to

refine the scheme objectives, refine the assessment criteria, and gain general opinions in advance of actual option short listing and SOBC completion.

The second stage of consultation will present details for the option short list to all stakeholders including the general public via a range of communication channels. Public consultation is programmed for February to April 2019. The public consultation materials will set out the case for change, explaining why the Greater Cambridge Partnership is proposing the scheme. To understand opinion, a survey will be developed to provide an opportunity for public consultation participants to indicate their preferred option.

Once the public consultation has taken place, the responses and feedback will be collated, reviewed, and published in a Consultation Report. After Consultation Report publication, the third stage of consultation will involve discussing consultation feedback with key stakeholders to inform preferred option selection.

6.7 Risk Management

Risk management is a structured approach to identifying, assessing, and responding to risks that arise during a project. There are two types of risks:

- Strategic risks, which impact overall project scope delivery and are presented in the Project Manager's Report
- Technical risks associated with specific work streams, owned by the Project Manager.

It is important to identify key risks at an early stage in scheme development. A risk register has been prepared (**Appendix E**), setting out the threat, consequences, scale of impact if realised, likelihood of realisation, risk control measures, and the risk owner. A total of 37 risks are currently identified (as at July 2018), of which the following are the most significant risks for the project:

- Potential lack of support from key organisations, including the Cambridgeshire and Peterborough Combined Authority, with other schemes preferred
- The option which emerges as the preferred option, following analysis and consultation, might not be supported by the GCP Executive Board
- Planning permission for the scheme is refused
- Project delays due to new processes and procedures for GCP funding approvals
- Options forecast a negative impact on the trunk road network (M11), managed and maintained by Highways England, with subsequent objection
- Public opposition to key elements of the scheme
- Delay to public consultation as a result of changes requested by the CGP Executive Board, therefore delaying preferred options selection

To account for risks that, if realised, would lead to a scheme cost increase, a 66% risk allowance has been included in the high-level scheme costs in the Financial Case (section 4). At the Outline Business Case stage, a Quantified Risk Assessment will be undertaken based on the project risk register, to identify a risk budget more that is more closely matched to the actual risk profile.

6.8 Benefits Realisation Plan

A draft Benefits Realisation Plan will be prepared at the Outline Business Case stage, to set out how the Greater Cambridge Partnership will track scheme benefits and ensure successful scheme outcomes.

6.9 Monitoring and Evaluation

To evaluate the impact and understand the effectiveness of the scheme in meeting its objectives, the Greater Cambridge Partnership will arrange to collect and publish relevant data, comparing the conditions before and after scheme opening. Data collection will be aligned to the 'measures of success' set out in Table 4, examining changes in traffic flow at Junction 11 and on the A1309, delay at Junction 11, journey times along the A10, Park and Ride patronage and public transport journey times.

Data collection may involve using nationally purchased datasets such as Trafficmaster and data provided by Park and Ride operators, as well as specifically commissioned surveys.

A draft Monitoring and Evaluation Plan will be prepared in conjunction with the draft Benefits Realisation Plan at the Outline Business Case stage.

6.10 Management Case Summary

- This preliminary Management Case includes an indicative programme, and commentary on governance, quality assurance, communications, and risk management.
- The scheme is being promoted and managed by the Greater Cambridge Partnership, applying a consistent governance and reporting structure to other schemes. On completion, it is expected that the enhanced Park and Ride facilities will be managed by Cambridgeshire County Council.
- The scheme will pass through three business cases stages, of which this SOBC is the first. Approval to progress to the next business case stage is a key decision taken by the Greater Cambridge Partnership Executive Board.
- The constituent members of the Greater Cambridge Partnership have an extensive record of successful public transport scheme delivery, including five successful Park and Ride sites.
- An indicative programme has been prepared, with the Outline Business Case due for completion in July 2019 (following public consultation towards the end of 2018), followed by final option approval and then detailed design completion by the middle of 2020. Construction is anticipated for 2022/23.
- A Consultation Plan has been prepared for the SOBC / Outline Business Case phases, and will remain as a live document. Non-statutory stakeholder engagement and public consultation will be undertaken throughout scheme development.
- A risk register has been prepared, which identifies 37 risks (as at July 2018). The risk register will be reviewed and updated as the project progresses. A Quantified Risk Assessment will also be undertaken at Outline Business Case stage to improve cost estimate accuracy.
- Draft Benefits Realisation and Monitoring and Evaluation Plans will be prepared at Outline Business Case stage.

Appendices

- A. Options Long List
- B. Multi-Criteria Assessment Scores
- C. Output-Based Procurement Specification
- D. M11 J11 P&R Outline Business Case Consultation Plan
- E. Risk Register

A. Options Long List

B. Multi-Criteria Assessment Scores

Options

Major Trumpington expansion (MAGENTA)

Selection Theme 1: Reducing (or avoiding negative impact on) traffic levels and congestion [Linked to objectives 1.i, 1.ii, 1.iii - Strategic & Economic Cases]
Compare options based on expected impact in AM peak on.....

| | RED | BLUE | PURPLE | WHITE | YELLOW | BLACK | ORANGE | CYAN | | |
|----|-----|------|--------|-------|--------|-------|--------|------|---|---|
| 1a | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 1 | * Blue, Purple, Orange score 2 rather than 3 as they would introduce new high frequency PT vehicle movements across the gyratory (although traffic levels reduced overall by P&R and PT vech would have own lanes). * Red scores 1 as high frequency PT services would be within general traffic flow (although overall traffic levels reduced by P&R). * Magenta scores 1 as new lanes provided for Trumpington P&R at gyratory (although traffic flows not reduced). |
| 1b | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | * Blue, White, Yellow, Black, Cyan score 2 as A10 traffic intercepted and they would not remove any general traffic capacity / increase signal delay at J11. * Red scores 1 rather than 2 as PT vech would be introduced into the traffic flow at J11. * Purple and Orange score 1 as J11 signals would need to be adjusted to allow for PT vech to cross the gyratory. * Magenta scores 1 as additional capacity introduced at junction, but flows not reduced. |
| 1c | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | * Increase in PT vehicles for all new site options, so cannot score a +3. |
| 1d | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | * Increase in PT vehicles, so cannot score a +3. All options would intercept flows before the High St. |
| 1e | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * Traffic passing through anyway - P&R intercepts trips that would exist anyway - so no change expected. |
| 1f | -2 | -2 | 0 | 1 | -2 | -2 | 0 | 2 | 0 | N.B. Free-flow northbound A10 offslip for all options * Red, Blue, Yellow, Black score -2 as traffic approaching P&R from M11 would need to turn right across A10, delaying A10 northbound traffic. * Purple and Orange score 0 as although some traffic removed from A10 by P&R, adjusted signal timings for PT vech at J11 could offset the benefits. * Cyan avoids need for any P&R traffic to turn right across A10, while also intercepting A10 traffic at P&R. * Magenta would have no impact on delays on A10. |

Selection Theme 2: Maximising potential for journeys to be undertaken by sustainable modes [Linked to objectives 2.i, 2.ii, 2.iii - Strategic & Economic Cases]
Compare options based on:

| | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|---|---|
| 2a | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 0 | * Purple, White, Orange, Cyan score 2 as include free-flow off-slip for M11, reducing chance of queues on A10 northbound and improving access from A10 into P&R. Direct access from A10. * Red, Blue, Yellow, Black score 1 as although there is direct free-flow access into the site from A10, right-turning vehicles from M11 direction may cause some delay. * Magenta - no change from existing situation for traffic approaching from A10. |
| 2b | 1 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | * Purple, White, Orange, Cyan score 3 as easy direct access from M11 northbound via dedicated slip. * Blue, Yellow, Black score 2 as dedicated left turn from M11 northbound to A10 for P&R (avoiding need to enter gyratory), but then traffic must turn right across A10. * Red scores 1 as M11 traffic would be able to turn left at gyratory for P&R but then need to turn right across A10. * Magenta - new dedicated P&R lane added to gyratory. |
| 2c | -3 | -2 | -1 | -1 | -1 | -1 | -1 | -1 | 0 | * All new site options will have a longer PT leg of a journey. * Red scores -3 as no PT priority measures at J11. * Blue scores -2 as PT priority measures limited. |
| 2d | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 0 | * Purple, Orange score 2 as would provide high level of PT vehicle priority at J11, directly on existing bus route. * Blue scores 1 as would provide limited new PT priority at J11, directly on existing bus route. * Yellow, White, Black, Cyan score 1 as PT link would involve a detour for existing bus routes to use. |
| 2e | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | * All options scoring 1 provide new infrastructure that could be used by future high quality PT services. |

Selection Theme 3: Quality of life & environment [other aspects of WebTAG Appraisal Summary Table - Economic Case]
Compare options based on impact on.....

| | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|---|
| 3a | -2 | -2 | -1 | -1 | -2 | -2 | -1 | -1 | 0 | * Red, Blue, Black, Yellow score -2 as involve two new junctions being introduced with right-turning into and out of site on A10. * Purple, White, Orange introduce one new junction, with traffic exiting turning right across A10. * Cyan introduces new merge / diverge movements on A10 and in close proximity to J11 gyratory. |
| 3b | -1 | -1 | 1 | -1 | -2 | -2 | 1 | -1 | -1 | * Yellow, Black score -2 as potentially disruptive to existing cycle route (2 new junctions on A10) and to proposed meadows cycle route (due to s-bound offslip rerouting). * White, Cyan score -1 as one new junction on A10 and new offslip to cross. * Magenta scores -1 as new offslip to cross. * Red scores -1 as one new junction on A10 to cross. * Blue score -1 as although two new junctions and offslip to cross, the impact could be offset to some extent by providing new cycling facilities with the PT vehicle lanes. * Orange, Purple score 1 as potential to provide new cycling facility with PT vehicle lane straight across J11. |
| 3c | 0 | 0 | 0 | -1 | -1 | -2 | 0 | -1 | -1 | * Yellow, White, Cyan score -1 as PT vehicle entry/exit route does not follow the A10 or M11, bringing higher noise levels to country park. Black scores -2 as PT route would pass adjacent to Trumpington Meadows residential development. * Magenta scores -1 as works at the existing Trumpington would increase noise. |
| 3d | -1 | -1 | 0 | 0 | -1 | -1 | 0 | 0 | -2 | * Red, Blue, Yellow, Black score -1 as potential to increase congestion on A10, which would have an impact on air quality through Hauxton / Harston. * Magenta scores -1 as expanding the existing Trumpington site would increase the concentration of emissions. |
| 3e | -1 | -1 | -1 | -2 | -2 | -2 | -2 | -2 | 0 | * Negative scores for all new site locations as new construction on green belt land. * White, Yellow, Black, Cyan score -2 due to potential visual impact of PT link to north. * Orange scores -2 due to visual impact of expanded M11 gyratory and relocated slip roads. |
| 3f | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -2 | * No impact on townscape for new sites. * Magenta scores -2 as decking would have visual impact in urban area, adjacent to houses and school. |
| 3g | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | 0 | * Potential for heritage impacts at a new P&R site, but no impact on heritage from works at the existing Trumpington. |
| 3h | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | * No impacts expected for any option. * Blue, Red, Purple score 1 as high potential for expansion to Country Park to north of P&R site land. * Orange cannot score 1 due to J11 enlargement into different areas of land. |
| 3i | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * No expected impact on the water environment. |

Selection Theme 4: Scheme deliverability [Financial & Management Cases]
Compare options based on.....

MAX SCORE IN THIS SECTION WILL BE 0 (SCORES -3 TO 0)

| | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|--|
| 4a | 0 | -2 | -2 | -2 | -1 | -1 | -3 | -2 | -3 | * Orange scores -3 due to complexity of completely reconfiguring a live motorway junction, and constructing tunnel under A10. * Magenta scores -3 as enlargement solution would need to involve decking at a live P&R site. * White, Purple, Cyan score -2 as need for tunnel under A10, and a new structure across M11. * Blue scores -2 as need to expand existing bridge structures at J11. |
| 4b | -1 | -2 | -2 | -2 | -1 | -1 | -3 | -2 | -3 | * Magenta scores -3 as would be need to close / relocate existing P&R site during construction. * Orange scores -3 due to expected severe disruption to all traffic, including traffic on M11. * Blue, Purple, White, Cyan score -2 due to expected disruption to A10 traffic while tunnel is being constructed. |
| 4c | -1 | -2 | -2 | -3 | -3 | -3 | -3 | -3 | -1 | * White, Yellow, Black, Cyan score -3 due to need to also use land for PT link to north, as well as land close to J11 for slip roads. Orange scores -3 due to need to obtain land in all four quadrants around J11. * Blue, Purple score -2 as land take less than options scoring -3. * Red scores -1 as land take limited to the P&R site only - no PT link or new slip roads. * Magenta scores -1 as would need temporary P&R site during construction period. |
| 4e | -1 | -1 | -2 | -2 | -1 | -1 | -3 | -2 | -3 | * Magenta scores -3 as decking lifespan generally fairly short - need for regular inspections, replacement / closures * Orange scores -3 as new bridge over motorway (high flows) to be maintained, as well as new tunnel under A10. * Purple, White, Cyan score -2 as new tunnel under A10 to be maintained. |
| 4f | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -1 | * Magenta scores -1 as does not introduce a completely new site to be operated. |
| 4g | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -1 | * Magenta scores -1 as does not introduce a new set of PT services to be operated. |

C. Output-Based Procurement Specification



Procurement Considerations – M11 Junction 11 Park and Ride Long List Options

| OPTIONS | ASSOCIATED MAIN WORKS (outside Park & Ride site boundary) | | | | | | | | |
|-----------------|---|---|---|---|--|---------------------------------------|--|--|---|
| | A10 Access into P&R | New Public Transport Vehicle Lane | J11 Traffic Signal Improvements | M11 Motorway Slip Lanes @J11 | Tunnel Under A10 | Accommodation Bridge Over M11 | New Structure over M11 | J11 Structure Improvement Works | Procurement Considerations |
| Red | For all traffic (Priority Roundabout/Traffic Signal Controlled; type to be decided later at OBC) | Single public transport vehicle lane for priority access on to A10 from new P&R | | | | | | | Procured under the CCC Term Contract Or: Separate Design and Construct contracts |
| White | For all traffic (excluding PT) (Priority Roundabout/Traffic Signal Controlled; type to be decided later at OBC) | Dedicated 2-lane PT route between new P&R and Trumpington P&R, over the accommodation bridge | | <ul style="list-style-type: none"> Dedicated S/B off-slip heading to Trumpington P&R Dedicated N/B off-slip directed to new P&R, through tunnel. | N/B off-slip on M11 requires tunnel | Upgraded to cater for 2-lane PT route | | | Either: Combination of procuring structural works through an ECI by specialist contractor and remainder by CCC term contractor Or: ECI Design and Build contract/part HE Framework |
| Purple | For all traffic (excluding PT) (Priority Roundabout/Traffic Signal Controlled; type to be decided later at OBC) | Dedicated 2-lane PT route between new P&R and Trumpington P&R, along A10 and over M11 new bridge | May be required to provide PT vehicle priority. | <ul style="list-style-type: none"> Dedicated S/B off-slip heading to Trumpington P&R Dedicated N/B off-slip directed to new P&R, through tunnel. | N/B off-slip on M11 requires tunnel | | Located in the J11 central island for PT route | | ECI Design and Build contract/part HE Framework |
| Black | 2 new traffic signal-controlled junctions for all traffic (excluding PT) | Same as White Option but using line of accommodation road to Trumpington P&R | | <ul style="list-style-type: none"> Dedicated S/B off-slip same as White option Dedicated N/B off-slip directed to new P&R | | Upgraded to cater for 2-lane PT route | | | Either: Combination of procuring structural works through an ECI by specialist contractor and remainder by CCC term contractor Or: ECI Design and Build contract/part HE Framework |
| Orange | For all traffic (excluding PT) (Priority Roundabout/Traffic Signal Controlled; type to be decided later at OBC) | Dedicated 2-lane PT route between new P&R and Trumpington P&R, combining the S/B M11 off-slip from the accommodation bridge | Required to provide PT vehicle priority | <ul style="list-style-type: none"> Dedicated S/B off-slip heading to Trumpington P&R diverted around existing accommodation bridge Dedicated N/B off-slip directed to new P&R, through tunnel | N/B off-slip on M11 requires tunnel | | J11 to be upgraded with new structure | J11 to be upgraded with new structure | ECI Design and Build contract/part HE Framework |
| Yellow | 2 new traffic signal-controlled junctions for all traffic (excluding PT) | Dedicated 2-lane PT route between new P&R and Trumpington P&R, over the accommodation bridge | | <ul style="list-style-type: none"> Dedicated S/B off-slip same as Orange option Dedicated N/B off-slip same as Black option | | Upgraded to cater for 2-lane PT route | | | Either: Combination of procuring structural works through an ECI by specialist contractor and remainder by CCC term contractor Or: ECI Design and Build contract/part HE Framework |
| Blue | 2 new traffic signal-controlled junctions for all traffic (excluding PT) | 2 single PT vehicle lanes to J11 between new P&R and Trumpington P&R | May be required to provide PT vehicle priority. | <ul style="list-style-type: none"> Dedicated S/B off-slip same as White option Dedicated N/B off-slip directed to new P&R | | | | Widening north section of J11 to accommodate new PT vehicle lane | ECI Design and Build contract/part HE Framework |
| Cyan | Dedicated 300m P&R lane | Dedicated 2-lane PT route between new P&R and Trumpington P&R, over the accommodation bridge | | <ul style="list-style-type: none"> Same as White Option with off ramp from J11 leading to P&R access tunnel | N/B off-slip on M11 and exit lane require tunnel | Upgraded to cater for 2-lane PT route | | | ECI Design and Build contract/part HE Framework |
| Magenta* | N/A – Option involves large scale expansion of Trumpington P&R | | Required to provide PT vehicle priority | <ul style="list-style-type: none"> Dedicated S/B off-slip heading to Trumpington P&R Dedicated N/B off-slip directed to Trumpington P&R | | | | Widening north section of J11 to accommodate new P&R Access | Either: Combination of procuring structural works through an ECI by specialist contractor and remainder by CCC term contractor Or: ECI Design and Build contract/part HE Framework |

*Note the Magenta concept is the only option that does not include a new Park and Ride site. This option considers a major expansion of the existing Trumpington Park and Ride.

D. M11 J11 P&R Outline Business Case Consultation Plan



M11 J11 P&R Outline Business Case Consultation Plan (updated for SOBC)

31 August 2018

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M11 J11 P&R Outline Business Case Consultation Plan (updated for SOBC)

31 August 2018

Issue and Revision Record

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| 3 | 31/08/18 | Eddie Jackson | Paul Chase | James Pearson | For SOBC Appendix |
| | | | | | |
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1 Consultation Plan

1.1 Context

The proposed M11 J11 Park and Ride scheme involves a major enhancement to Park and Ride facilities in close proximity to Junction 11, along with complementary public transport priority measures along the A1309 Hauxton Road / High Street / Trumpington Road corridor. The scheme is a component of the overall Greater Cambridge Partnership (GCP) West of Cambridge Package, supporting the future economic growth of Greater Cambridge.

A draft set of objectives has been developed for the M11 J11 Park and Ride scheme:

1. Reduce (or avoid a negative impact on) general traffic levels and congestion

- i. Reduce traffic NE of M11 J11 (along Hauxton Road and through Trumpington), by encouraging trips headed for the city centre and Cambridge Biomedical Campus to transfer to another mode
- ii. Reduce traffic flow and delay at M11 J11, particularly in the AM peak, including reducing flows associated with non-motorway traffic that pass across the junction (A10-A1309)
- iii. Reduce delays on the A10 through Harston and Hauxton, on the approach to M11 J11

2. Maximise the potential for journeys to be undertaken by sustainable modes of transport

- i. Increase sustainable transport mode share for trips into the city centre and Cambridge Biomedical Campus, focused on trips originating from the south and south west (M11 and A10)
- ii. Increase Park and Ride capacity, in particular to serve forecast growth at the Cambridge Biomedical Campus key employment area, with delivery aligned to overall Campus development timescales
- iii. Reduce public transport journey times between Trumpington and the city centre, enabling Park and Ride / other public transport to compete more effectively with the private car

A Strategic Outline Business Case (SOBC) is being developed for the scheme, to identify the options for further consideration. An Outline Business Case (OBC) will then be developed to include a more detailed appraisal of the short list options. The OBC is due to be complete by July 2019.

1.2 Document Purpose

The purpose of this document is to outline the stakeholder engagement and public consultation planned for the SOBC and OBC phases of M11 Junction 11 Park and Ride scheme development. This document sets out:

- A proposed stakeholder list (section 1.3)
- The proposed approach to engagement, including key event dates (section 1.4)
- Specific stakeholder engagement activities proposed (section 1.5)
- Proposed forms of communication, including the tone of messaging (section 1.6)

This document is for the SOBC and OBC phases only. Although stakeholder engagement and public consultation is non-statutory at the business case stage, it is seen as good practice to take account of stakeholder opinion as part of option selection. Early stakeholder engagement also feeds into the project risk assessment process.

This is a live document which will continue to be updated during business case development.

1.3 Stakeholders

A stakeholder mapping exercise has been completed in order to understand the different requirements of stakeholders and the times at which they need to be involved during scheme development. This stakeholder mapping exercise has been undertaken for the purpose of statutory consultation across the range of transport schemes currently being promoted by the Greater Cambridge Partnership. However, the outputs from this exercise are also of relevance for the non-statutory stakeholder engagement.

For the M11 J11 Park and Ride scheme, the following are considered to be key stakeholders for the non-statutory business case stakeholder engagement element. These key stakeholders will need to be involved during the option selection process:

- Highways England, due to the close proximity of the M11
- Parish Councils, including Harston, Hauxton and Trumpington
- Cambridgeshire County Council as the Local Highway Authority
- South Cambridgeshire District Council and Cambridge City Council as the local planning authorities
- Cambridge Biomedical Campus
- Cambridge University
- Resident groups / associations
- Schools located along Trumpington Road (in relation to the complementary public transport priority measures)
- Nuffield Hospital (in relation to the complementary public transport priority measures)
- Other local engagement groups

A further group of stakeholders will need to be involved during the design process, where they will be able to contribute to a considerable degree:

- Emergency services
- Groups which represent people with limited mobility or a sensory impairment or wheelchair users
- Cycling groups
- Landowners

1.4 Proposed Approach to Consultation

1.4.1 Overview

The M11 J11 Park and Ride scheme has three distinct stages of consultation during the SOBC and OBC phases, to help determine the most suitable option:

1. Option short listing stakeholder engagement – to review scheme objectives, option selection criteria, and to help identify the options and demand scenarios that will be taken forward for general public consultation. This stage includes a range of meetings and workshops.

2. Public consultation on the demand scenarios and potential options
3. Further stakeholder engagement to assist in identifying a preferred option. This stage will involve a small number of workshops

1.4.2 Engagement Process

The first stage of the consultation, which took place in early 2018, involved engaging with the key stakeholders via group meetings and workshops in the local area. Feedback from this first stage was used to refine the scheme objectives, refine the assessment criteria, and gain general opinions on the options long list in advance of the second stage of consultation and SOBC completion.

The second stage of consultation, from October to December 2018, will present more detail on the proposed options and demand scenarios to stakeholders including the general public. This will be undertaken through a range of communication channels, including providing materials on the GCP website and at specific consultation events.

The public consultation materials will set out information on anticipated demand scenarios and appropriate interventions to accommodate the growth. The consultation will explain clearly why the GCP is proposing the scheme, and present justification for each option and demand scenario using plans, visualisations and descriptive, non-technical text.

A survey will be developed to provide an opportunity for public consultation participants to indicate their views on expected demand and express a preference for appropriate measures to accommodate the growth. In addition to this, the survey will capture concerns on potential impacts and benefits of the options. The survey will be available in both paper and online formats.

Once the public consultation has taken place, the responses and feedback will be collated, reviewed and published in the Consultation Report in February 2019. The responses will inform the OBC, which is due for completion in July 2019.

After Consultation Report publication, the third stage of consultation will involve discussing consultation feedback with key stakeholders to inform preferred option selection.

1.4.3 Key Dates

Table 1: M11 Park and Ride Consultation Events

| Date | Activity | Purpose |
|-------------------------|--|--|
| 13 February 2018 | Information meeting in Harston [Stage 1] | To share information on the consultation and business case processes to be followed |
| 8 March 2018 | Stakeholder engagement group workshop In Harston [Stage 1] | To gain feedback on scheme objectives, short listing criteria, and options long list for P&R |
| October – December 2018 | Public Consultation [Stage 2] | Feedback and response to demand scenarios and potential options |
| Early 2019 | Stakeholder workshops [Stage 3] | To gain views on which option should be identified as preferred |

1.4.4 Fit with Business Case Process

The approach set out in this document is aligned with the approach recommended by the Department for Transport in 'The Transport Appraisal Process' document (part of the WebTAG suite of guidance), namely:

- The option development process (broadly aligned to the SOBC stage) should be informed by stakeholder engagement on an ongoing basis, in a manner which is proportionate to the scale and complexity of the project
- All interested parties should be involved and wide participation should be encouraged
- The consultation plan (or strategy) should distinguish between information provision, consultation, and participation activities
- The further appraisal stage (broadly aligned to the OBC stage) should involve some form of public consultation on appraised options, prior to final option selection

1.5 Specific Activities

The following specific information and consultation activities are proposed:

1.5.1 Inform

- Meet with stakeholders to outline the proposed option short listing and business case development process
- Advertise the public consultation – online and specific event locations
- Update the project website and social media, send out relevant information, and prepare visuals to inform the public and residents most affected by the scheme
- Provide background and more detailed information on the project website with references provided in the consultation material.

1.5.2 Consult

- Meet with the key stakeholders via workshops to gain feedback on scheme objectives, short listing criteria, and the options long list.
- Public consultation over an eight-week period to share more detailed appraisal information on the short list options, and to gain formal feedback
- Use social media and Greater Cambridge Partnership's contacts database to encourage people to comment on the options
- Meet with key stakeholders following public consultation to gain views on which option should be identified as preferred
- Once the Executive Board makes a recommendation for their preferred option for the Park & Ride site and Trumpington Road Proposals, further consultation will be undertaken in 2020 as part of both final scheme design / Full Business Case and statutory processes. A new Consultation Plan will be prepared for this phase of scheme development

1.5.3 Reporting

- Produce a Consultation Report which summarises the consultation process and feedback obtained up to February 2019
- Release the Joint Assembly papers which inform on their recommendation for the location of the Park & Ride site and Trumpington Road Proposal

1.6 Communications

The Greater Cambridge Partnership communications team and Mott MacDonald will work together to agree a detailed approach to communications. Of critical importance is timing, to ensure that stakeholders are informed on the purpose of the scheme and the consultation events to which they can contribute. The joint team will need to consider carefully the communications roll-out. All advertising should be clear and aimed at the relevant groups. Bookings, information and visuals shall be prepared, reviewed, and ready for relevant consultation workshops and meetings.

1.6.1 Tone of messaging

Published documents have already identified major Park and Ride enhancements to be a suitable transport solution for the current and forecast problems in South Cambridge. Consultation has previously taken place as part of the Local Development Plan, Local Transport Plan, and Transport Strategy for Cambridge and South Cambridgeshire development. All communications and consultation material therefore needs to clarify this starting point.



E. Risk Register

| Area of Work | Threat | Consequences | Impact | | Likelihood | | Risk | | Risk Control Measures / Actions to Mitigate | Owner | Status of Implementation |
|------------------------|---|---|--------|-----------|---------------|-----------------|------|-----------|---|-----------------|--|
| | | | Cost | Programme | No Mitigation | With Mitigation | Cost | Programme | | | |
| Governance | Lack of combined Authority support | Challenge to terms of GCP approval process and subsequently any public inquiry | VH | VH | M | M | 15 | 15 | Escalation of issues via political process | Client | |
| Governance | Other schemes are brought forward on Trumpington Rd in the short term | Options available for public transport priority will be further limited | M | M | M | L | 6 | 6 | Regular communication with other department heads to ensure schemes along the corridor are cognicent of each other | Client | |
| Governance | City Access vision is not clearly defined | Options considered for public transport priority to the City Centre may not be feasible | H | H | L | VL | 4 | 4 | Regular liaison with the City Access team to ensure their thinking is included in our optioneering. | Client | |
| Governance | Decision has not been made on the PT mode and therefore infrastructure required is not clearly defined | Design changes if assumptions are incorrect, leading to cost and programme increases. | H | H | M | L | 8 | 8 | Design needs to be developed so as to be CAM-compliant as much as possible | Client | |
| Governance | Political/governance change within the City Deal could introduce new or conflicting priorities | Delay to delivery and scope creep. Potential for project to be significantly amended or cancelled | M | M | M | L | 6 | 6 | Continued communication with senior officers/project board on benefits of the project | Client | |
| Governance | New LTP does not support Park & Ride | Undermine strategic case for scheme | L | M | M | M | 9 | 12 | Escalation of issues via political process. Engagement with CCC policy team. | Client | |
| Governance | Emerging recommended scheme not supported by the Board | Delay / abandonment of OBC | VH | VH | M | M | 12 | 12 | Inform board of preferred option prior to board meeting. | Client | |
| Governance | A new decking proposal is favoured | Attracts more objections from local residents | M | H | M | M | 6 | 8 | Engagement with stakeholders and effective project governance | Project team | |
| Governance | Developemnt of processes and procedures related to GCP funding introduces new decision points and reporting requirements. | Delay to programme and increased costs. | H | H | M | M | 12 | 12 | Emphasis on need for clear decision making framework. | Client | |
| Governance | Changes to client's key decision points. | Programme may not fit requirements. | M | H | M | L | 6 | 8 | Communicate effectively to agree programme. | Client | |
| Governance | Conflict with other scheme sensitivities, aims or objectives. E.g. Foxton, Cambridge South Station East West Rail, A1307 project, C2C | Further restrictions on options development, delay to programme and / or erosion of W.O. Scheme objectives. | H | H | M | L | 8 | 8 | Regular communication with other department heads to ensure adjacent or overlapping schemes are cognicent of each other. Develop a shared approach to assessment. | Client | |
| Governance | Commuted sum for maintenance cannot be agreed | Potential delay in agreeing signoff of scheme | H | H | M | L | 8 | 8 | Engagement with County Council. Public transport operational plan within management case. | Client | |
| Governance | Impact of new P&R on existing local bus services. | Local bus services become unviable. | H | H | M | L | 8 | 8 | Liaise with bus service providers. | Client | |
| Programme | Lack of clarity on programme - Is CPO required for the park and ride site? | Delay to programme and increased costs. | H | H | M | VL | 4 | 4 | Seek an agreement / liaise with Grosvenor when preferred option is known. | Project Manager | Advice has been obtained. Depends on nature of options developed. |
| SOBC | SOBC and Addendum recommendations not accepted by Board | delay, cost, programme | M | M | M | M | 6 | 6 | Provide basis for evidence-based decision making. | Project team | |
| Scheme development | Junctions options negatively impact Highways Englands network | Highway England will not allow that section of the scheme to be implemented | H | H | M | M | 12 | 12 | Include Highways England in the optioneering process and ensure they accept the modelling results. | Project team | Requested formal engagement of AECOM by HE |
| Scheme development | Delay in receipt of procurement information from WYG | Delay in finalising OBC | M | M | M | L | 6 | 6 | Early and timely supply if information to WYG to ensure sufficient time for procurement information to be developed | Project team | |
| Scheme development | Discrepancy with AECOMs modelling approach at J11 | Modelling has to be amended to suit HE's needs. Delay to programme further junction options required. | H | H | M | L | 8 | 8 | Ongoing management to ensure both modelling teams communicate early on to prevent change for the project. | Project team | Technical brief submitted - awaiting response. |
| Scheme development | Lack of interaction between HE strategic models and CSRM wrt M11. | Programme delay & business case impact | H | H | M | L | 8 | 8 | Ongoing management to ensure both modelling teams communicate early on to prevent change for the project. | Project team | Technical brief submitted - awaiting response. |
| Scheme development | Designs require amendment of existing GCP Schemes | Cost, reputation | M | M | M | L | 6 | 6 | Regular communication with other cycle team heads | Project team | |
| Scheme development | Significant Statutory Undertakers diversions required | Increased construction costs and delays to programme. Greater disrupction during construction. | VH | H | M | L | 10 | 8 | Early consultation with Stats bodies to understand the need for diversionary works. C3 estimates to be sent out to provide accurate cost estimates. | Project team | |
| Scheme development | Unfavourable ground conditions, particulairly for the P&R and tunnel options | Increased construction costs and delays to programme. Possibly also future maintenance liabilities | H | H | L | VL | 4 | 4 | Geotechnical investigations when preferred scheme identified to ensure full costs are captured in the business case | Project team | |
| Scheme development | The accomodation bridge is required by Highways England for other purposes | Access options that don't interact with the J11 are limited to new structures | H | H | M | L | 12 | 12 | Include Highway England in the optioneering process to secure an agreement on use of bridge is permissable. | Project team | Obtain copies of legal agreements from HE and present to Francis Tyrrel to explore options |
| Scheme development | Slip road enforcement | Rat running traffic causing increased traffic congestion and delays. Potential dispute with HE. | L | L | M | L | 4 | 4 | Investigate traffic control and enforcement options | Project team | |
| Scheme development - T | Scheme BCR shows poor or low value for money | Makes scheme approval more challenging and threatens scheme progression. | H | H | M | L | 8 | 8 | Scheme shortlisting process (MCA criteria) will need to direct sifting towards schemes likely to offer higher vfm. Consideration of wider economic benefits to inform wider business case issues. | Project team | |
| Scheme development - T | Waitrose not amenable to amendments to their access | Options available for PT vehicle priority along this section will be limited | M | M | M | L | 6 | 6 | Work within highway boundary and early engagement with Waitrose | Project team | |

| Area of Work | Threat | Consequences | Impact | | Likelihood | | Risk | | Risk Control Measures / Actions to Mitigate | Owner | Status of Implementation |
|---------------------|---|---|--------|-----------|---------------|-----------------|------|-----------|--|--------------|--------------------------|
| | | | Cost | Programme | No Mitigation | With Mitigation | Cost | Programme | | | |
| Scheme development | J11 Structure cannot be easily widened | Numbers of options reduced / costs increase. | M | M | M | L | 6 | 6 | Early assessment of structures / obtain as-built drawings from HE. | Project team | |
| Scheme development | Tunnel into site from M11 impacts vertical alignment. | Increased costs, increased visual impacts | M | M | M | L | 6 | 6 | Identify vertical alignment, discuss with LPA. Ensure costs are considered as part of options sift. | Project team | |
| Consultation | August Board meeting results in different instruction wrt consultation approach / direction | May not be able to meet November consultation start date | M | VH | M | L | 6 | 15 | Evidence-based Board briefing highlighting consequences. | Client | |
| Consultation | Delays in approving consultation material results in delay to consultation period | May not be able to meet November consultation start date | M | VH | M | L | 12 | 15 | Early engagement with Comms team to discuss whether period is likely to be sufficient | Client | |
| Consultation | County Council objects to proposed options. | Application rejected. | VH | VH | M | M | 15 | 15 | Early identification of proposals to ensure options taken to public consultation already have stakeholder support. | Project team | |
| Public consultation | Public opposition to the M11 to City Centre public transport priority improvements | Political support for PT priority on Trumpington Road is reduced, potentially impacting effectiveness of P&R services operating from Trumpington. | H | H | M | M | 12 | 12 | Early identification of proposals to ensure options taken to public consultation already have stakeholder support. | Project team | |
| Public consultation | Risk that A428, CSETS (A1307) and M11/J11 consultation programmes clash | Programme impacts - potentially resulting in insufficient preparation time. | H | H | M | M | 12 | 12 | Engagement with GCP Comms team | Project team | |
| Environment | Scoping for EIA not well defined | We do more than is needed, or not enough. Cost incurred unnecessarily for the first case, programme and cost delay for the latter. | M | H | L | VL | 3 | 4 | Carry out scoping and consultation with statutory bodies and LPA asap once preferred scheme defined. This will require scoping to commence before final OBC produced. | EIA lead | |
| Environment | Surveys not carried out in time to inform EIA process | Delay to programme and increased costs. | M | H | M | L | 6 | 8 | Agree planning programme with EIA so we can properly plan for survey works (to cover all appropriate seasons). Ensure business case programme is aligned with EIA and planning application programme. | EIA lead | |
| Environment | Access to land denied | Unable to carry out required surveys | M | M | M | VL | 3 | 3 | Early identification of land ownership and discussion with owners to seek approval to gain access. Where access not likely, develop approach to EIA that ensures this is not a show stopper for the EIA. | EIA lead | |
| Construction Phase | Impact on the strategic network could be significant | Extended detailed TM development stage to ensure impacts are minimised | M | M | M | VL | 3 | 3 | Construction phasing to be developed in conjunction with HE / detailed design. | Project team | |

