

Cambourne to Cambridge Better Public Transport Project

Report to: Greater Cambridge Partnership Executive Board

Date: 10th December 2020

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1. Background

- 1.1 The A428/A1303 Cambourne to Cambridge (C2C) corridor is one of the key radial routes into Cambridge and suffers considerably from congestion during peak periods, particularly on the approach to the city and at the junction with the M11.
- 1.2 The route has seen significant increases in traffic over the last decade and large development sites along this corridor, including West Cambridge, Bourn Airfield and Cambourne West, mean that pressure on already congested roads and the limited public transport service is set to rise.
- 1.3 Current conditions on the corridor include: long delays on the eastbound A1303 particularly on the Madingley Road from the Madingley Mulch Roundabout to the M11 junction in the morning peak period, and increasing levels of congestion westbound in the evening peak period; as well as significant journey time variability, particularly eastbound in the morning peak and westbound in the evening peak periods.
- 1.4 The paper reviews the technical work, environmental assessment, and public consultation undertaken to date contributing to the production of the Outline Business Case (OBC) – see Appendix 1. Work on the detailed design of the scheme will continue in the next phase of development and will continue to involve local stakeholders.
- 1.5 The proposal has been reviewed following the publication of the Cambridgeshire and Peterborough Combined Authority's (CPCA) CAM sub-strategy, and further interventions by CPCA relating to a potential northern alignment. The GCP is satisfied that it is compliant with the CAM sub-strategy, specifically GCP and CPCA officers have collaborated to ensure alignment between C2C and the CAM. The CPCA has concluded that *"there are no current technical and design compatibility issues of material concern that would prevent or constrain the delivery of the full Integrated CAM scheme"*.

CPCA Alternative Northern Alignment;

- 1.6 The planned GCP Executive Board decision on the OBC and preferred route in February 2020 was delayed as a result of the CPCA raising concerns about the scheme, and planning to bring forward an alternative route.
- 1.7 The CPCA Transport and Infrastructure (T&I) Committee on 4 November considered the alternative route corridor developed by CPCA officers. The report is attached in Appendix 6. The CPCA's route ran north of the A1303/A428 and had been subject to technical appraisal by the CPCA consultants. A further recommendation was proposed at the meeting that sought the T&I Committee's approval to request GCP to replace its recommended preferred route with the new CPCA alignment.
- 1.8 CPCA officers at the T&I Committee confirmed that this new CPCA northern alternative was more expensive and performs less favourably than the GCP recommended preferred route. It was also confirmed that the alternative had been subject to a limited technical appraisal and agreed the appraisal would be published, which has not yet happened. In contrast, the GCP proposal had been subject to a full and transparent Department for Transport (DfT) compliant appraisal process. The GCP has readily and regularly considered, documented and published deliberation of alternative routes, including northern alignments and proposals from stakeholders.
- 1.9 The T&I Committee did not support the recommendations and the CPCA has no mandate to progress further with the proposals. The GCP's Cambourne to Cambridge proposals are therefore now being brought back to the Executive Board.
- 1.10 It is however also important to note that the CPCA recommendation to replace the GCP's preferred route with its own proposals is entirely outwith of the DfT's prescribed process for developing major transport schemes and would be the subject of challenge when trying to progress any scheme.
- 1.11 Further, the CPCA scheme performed poorly against the GCP's preferred route. Any decision to adopt a more expensive and less advantageous solution would be challenged when applying for consent to construct the scheme.

Independent Audit;

- 1.12 The Cambourne to Cambridge scheme has been in development for a number of years and the subject of considerable discussion between local agencies including the GCP and CPCA. The scheme has been developed in accordance with the DfT's Transport Analysis Guidance (TAG). However, given the nature of the scheme and the number of years that has elapsed since it was selected as the preferred route, it is appropriate to validate the key assumptions and constraints and to determine whether they remain appropriate. These key assumptions and constraints underpin the analysis that have led to the elimination of alternative options. It is therefore proposed to undertake an independent audit, in order to review assumptions and constraints and to provide input and advice to the Board on this point. The audit would be started immediately and report to the Board in June 2021. The

independent party will consider the extensive evidence submitted to date, and provide the opportunity for representative groups to submit further written comment on the assumptions and constraints.

Covid-19 Pandemic

- 1.13 The implications of the global pandemic remain unknown. The impact of this on the GCP programme has been discussed previously, but whilst there has clearly been a short-term impact on the use of public transport, the now more pressing need to get the economy moving again suggests that the case for schemes such as Cambourne to Cambridge will be stronger as a result of Covid-19. New DfT Guidance on GDP growth is anticipated, and this matter will remain under review. Scheme economics will be revisited at Full Business Case stage.

2.0 Recommendations

- 2.1 The Executive Board is requested to:

- (a) Note the outcome of Phase 2 public consultation;
- (b) Note the conclusions of the Outline Business Case presenting a preferred high quality public transport, walking and cycling route;
- (c) Note the conclusions of the Outline Business Case in relation to a travel hub location;
- (d) Agree to undertake an Independent Audit Review of the Cambourne to Cambridge scheme to validate the key assumptions and constraints and to determine whether they remain appropriate;
- (e) Report the findings of this Independent Audit Review to the June Board; and
- (f) Request that officers initiate the process of an Environmental Impact Assessment (EIA), however recognising the potential impact of the Independent Audit Review and the need to conclude the Independent Audit Review in advance of any public consultation on the EIA.

3. Joint Assembly Feedback

- 3.1 Details of feedback from the Joint Assembly are set out in the reports from the Joint Assembly Chairperson for the meetings of 30th January and 4th June 2020. These contain details of matters discussed at both of these Joint Assembly meetings where the scheme was discussed. The first meeting considered the OBC as a whole. The second followed the publication of the draft LTP Sub-Strategy.
- 3.2 The first Joint Assembly meeting (January 2020) heard public questions and concerns followed by the GCP Officer responses to these questions. The members had comprehensive discussions on the sections of the route corridor coupled with the concerns raised by the public. The key elements of discussion were:

Environmental Issues - discussion of environmental impact and mitigation raised the need to clearly demonstrate appropriate consideration of environmental implications, in particular regarding removal of trees and Green Belt impact. Attention was drawn to mitigation against the impact of removal of trees at St Neots Road and the current unacceptable level of noise from the existing A428. Officers noted that the next stage of the process is the full Environmental Impact Assessment.

Assessing Alternatives - in relation to the recommended route alignment, there was some acknowledgement of an off-road alignment as best meeting the scheme's objectives. The transparency of, and approach to, 'optioneering' was challenged with regard to the exploration and discounting of on-road alternatives. Officers noted that the Business Case and website contained extensive information regarding the sifting and assessment process.

Adams Road - during a more detailed discussion of Adams Road alignment, significant public concern was noted, with particular focus on the need to consider cyclists and cycling safety along with forecast growth of cycling from the West Cambridge site. Members requested further detail on the proposed layout with regard to the integration of buses into a shared space with cyclists. Removal of on-street parking was noted as a significant safety enhancement and attention drawn to the common sharing of road space on busier Cambridge streets.

Other members concluded that Cambourne Village College will benefit from this scheme and Cambourne needs a better transport service.

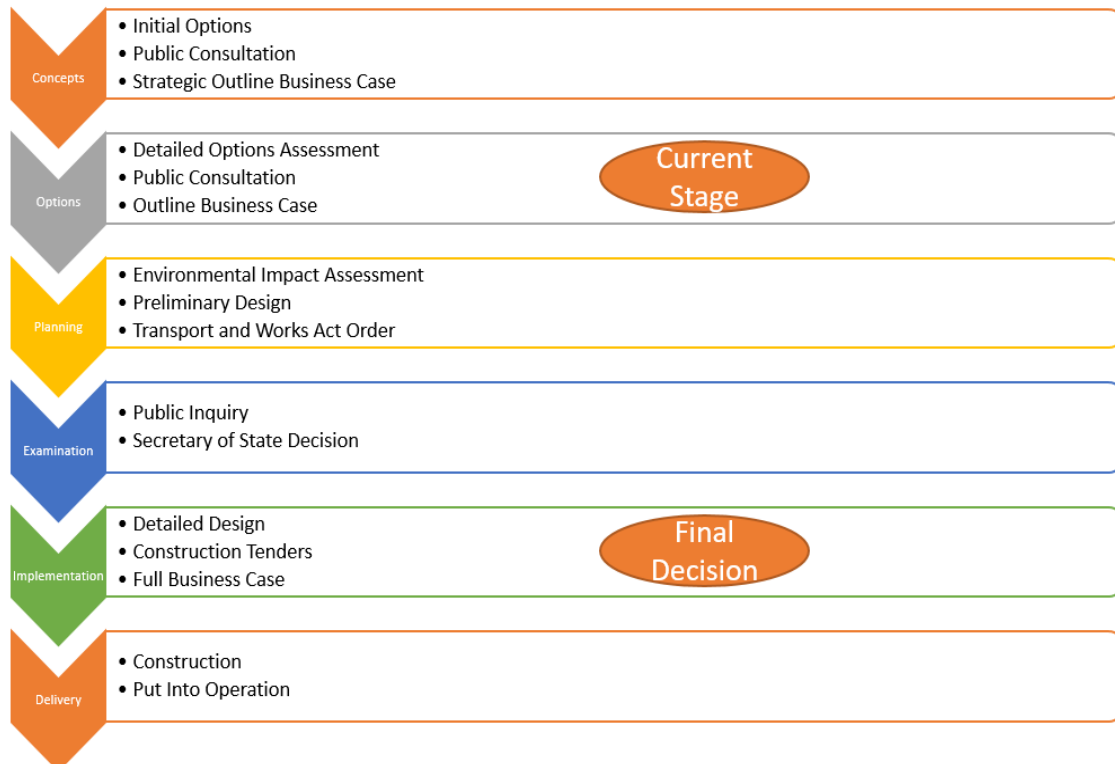
- 3.3 The second Joint Assembly meeting (June 2020) focused on the LTP Sub-Strategy. The views of Joint Assembly members on the proposed scheme were mixed, although there was general support for the proposed change in route, replacing the Adams Route option with the Rifle Range route. Members hoped that the planned improvements to Adams Road, including removing parking, would be implemented despite it no longer being part of the proposed route.
- 3.4 A number of members expressed support for the proposals, recognising there was a major and unavoidable strategic need for this scheme. Other members held an opposing view and were of the opinion that the scheme should not continue until further information on a number of factors was available. This included uncertainty about detail of the East West Rail (EWR) and Cambourne Station proposals; uncertainty about the longer term impact of Covid-19 on public transport; concerns about the process and potential legal challenge; and a lack of detail about how it was planned to address environmental concerns.
- 3.5 The importance of City Access to resolve bus transit through the City Centre, and of assessing the impact on patronage of Covid-19 were both noted.
- 3.6 Whilst the scheme was not formally presented at the Joint Assembly preceding the December 2020 Executive Board meeting it was debated in the context of the Quarterly Progress Report for GCP, and the Assembly agreed that further delay should be avoided and the scheme should be considered by the Executive Board.

4. Issues for Discussion

4.1 The C2C corridor has been identified by the GCP's Executive Board as a priority project for development in the first five years of the GCP's transport programme.

4.2 Figure 1 below outlines the current stage in the development process:

Figure 1 Scheme Development



4.3 The project is made up of three key elements: a public transport link between Cambourne and Cambridge, a new Park and Ride facility off the A428/A1303 to supplement the existing Madingley Road Park and Ride, and new cycling and walking facilities.

4.4 Project development was conducted in two phases, Phase 1 running from (and including) Madingley Mulch roundabout into the city and Phase 2 continuing the route west of Madingley Mulch roundabout on to Cambourne, with proposals for a new Park and Ride facility along the A428 being developed in parallel. The OBC is for a single scheme and both phases are expected to be constructed concurrently, with an opening date in 2024.

4.5 Since the C2C project's inception in 2014, work has progressed toward delivering the OBC. The OBC uses the five cases required by the HM Treasury Green Book for major investments – Strategic Case, Economic Case, Commercial Case, Financial Case and Management Case. See Appendix 1.

4.6 A Non-Technical Summary Report (see Appendix 2) presents an overview of the project, approach to option development and assessment and scheme delivery.

- 4.7 The OBC concludes that there is a strong strategic case to undertake a major transport infrastructure project from C2C based on current and projected transport demand along the corridor, and in line with GCP objectives to promote sustainable economic growth and reduce congestion.
- 4.8 Route options have been identified and evaluated including those that use the existing highway (on-road), new alignments (off-road) to the north or south of the existing corridor, and hybrids which use both existing and new alignments. Options have progressed through a series of assessment and refinements, including three public consultations. [Options Appraisal Report](#) (OAR 1) and [OAR 2](#) set out the options development process leading to a recommended alignment for Phase 1. OAR 3 (Appendix C to OBC) develops this further by assessing refinements to the Phase 1 proposals, and setting out the options development process for both Phase 2 and the assessment of alternative Park and Ride proposals. These reports include details of route assessment, modelling and analysis. The various OARs are important documents that sit alongside the OBC.
- 4.9 This report to the Executive Board provides a summary of work carried out on development of the OBC since presentation of the Interim Report in December 2018. The Executive Board is asked to consider the report following the amendments since publication of the CPCA's LTP CAM sub-strategy.
- 4.10 The full OBC considers a single scheme between Cambourne and Cambridge, including Phase 1, Phase 2, and the proposed new Park and Ride, in order to seek approval to progress towards applying for planning consent and powers for construction of the works.
- 4.11 In addition to the development of recommendations for Phase 2 and the location of the Park and Ride site, a number of refinements to the Phase 1 alignment, recommended in October 2018, have been proposed in response to stakeholder engagement. These are as follows:
- Revised alignment past Coton to increase distance to nearest properties and to minimise visual impact;
 - Revised alignment through West Cambridge to meet business requirements of University;
 - Selection of Adams Road rather than Rifle Range at eastern end of scheme to reflect further Green Belt review amongst other issues; and
 - Subsequent further review of Adams Road/Rifle Range and Cambourne sections of scheme to reflect draft CAM Sub-Strategy to Local Transport Plan, published in April 2020, leading to recommendation that alignment should revert to Rifle Range.
- 4.12 Further mitigation would be agreed with local communities to address issues identified during the EIA stage.

5. Strategic Case

- 5.1 The [National Infrastructure Commission's \(NIC\) report](#) on the Cambridge – Milton Keynes – Oxford Growth Corridor concluded that improvements in east-west transport connectivity along the corridor are necessary to underpin the area's long term economic success, and alleviate the area's "chronic undersupply of homes [which] could jeopardise growth, limit access to labour

and put prosperity at risk”. It estimates that infrastructure investment could support the delivery of up to 1 million new homes in a broad corridor between Oxford and Cambridge. This level of development will inevitably place additional pressure on the A428/A1303 and surrounding routes. Calling for City-scale transport infrastructure to enable growth, the NIC focuses on:

“maximising the opportunities associated with the development of EWR and the Oxford-Cambridge Expressway – integrating mass rapid transit with these schemes to enable effective first/last mile connectivity, in a way that enhances the value of these strategic infrastructure projects”.

- 5.2 The NIC has identified the Cambridge – Milton Keynes – Oxford arc as a national priority stating that its world-class research, innovation and technology can help the UK prosper in a changing global economy.
- 5.3 Through City Deal investment in transport and infrastructure, the GCP seeks to bring forward schemes to connect people to places of employment and allow communities to grow sustainably in the coming years, by creating better and greener transport networks, reducing congestion and making better use of limited road space by prioritising sustainable transport.
- 5.4 The GCP delivery programme is based on the policy framework established by the local planning and transport authorities. These include the adopted Local Plans for [Cambridge](#) City and [South Cambridgeshire](#) (2018) and emergent transport policy being established by the CPCA, in particular the compatibility of the project with the proposed Cambridgeshire Area Metro (CAM) - a mass rapid transit scheme. Local Plan policies for the strategic developments of sites along the C2C corridor require High Quality Public Transport (HQPT) to link new homes to employment and services in and around Cambridge.
- 5.5 The Transport Strategy for Cambridge and South Cambridgeshire (TSCSC) was prepared in parallel with the development of the Local Plans and was agreed in March 2014. The strategy provides a plan to manage the rising population and increasing demand on the travel network by shifting people from cars to other means of travel including public transport, walking and cycling. Policy within the TSCSC requires a range of infrastructure interventions on the St Neots and C2C corridor as a key part of the integrated land use and transport strategy responding to levels of planned growth.
- 5.6 The Transport Modelling Report 2015 supporting the Cambridge and South Cambridgeshire Local Plans and TCSC concluded:
 - Sustainable transport measures, in particular HQPT facilities, are necessary to support delivery of the plan;
 - Such public transport routes need to be able to bypass queues and congestion to offer reliable and swift journeys; and
 - The Transport Strategy will help to make the City and key destinations more accessible and should reduce the amount of car growth.
- 5.7 The CPCA was established in March 2017 and is led by an elected Mayor and Board comprising of the constituent local authorities. The key ambitions for the CPCA include:

- Doubling the size of the local economy;
 - Accelerating house building rates to meet local and UK need; and
 - Delivering outstanding and much needed connectivity in terms of transport and digital links.
- 5.8 The CPCA is responsible for transport infrastructure improvement and the Local Transport Plan. The CPCA also established the Cambridgeshire and Peterborough Independent Economic Review (CPIER). The review provides a robust and independent assessment of the Cambridgeshire and Peterborough economy and the potential for growth. One of the key conclusions of the CPIER was “A package of transport and other infrastructure projects to alleviate the growing pains of Greater Cambridge should be considered the single most important infrastructure priority facing the Combined Authority in the short to medium term”.
- 5.9 The CPCA published [a first draft Cambridgeshire and Peterborough Local Transport Plan \(CPLTP\)](#) in June 2019. Following consultation, a final version was adopted in January 2020. The CPLTP replaces the Interim Local Transport Plan which was produced in June 2017 and is based upon the pre-existing Cambridgeshire Local Transport Plan (LTP3) and the Peterborough Local Transport Plan (LTP4).
- 5.10 The goals of the CPLTP are to deliver a transport system that delivers economic growth and opportunities, provides an accessible transport system and protects and enhances the environment to tackle climate change together. There are ten objectives which have been formed to underpin the delivery of the goals relating back to the economy, environment and society.
- 5.11 In April 2020 the CPCA published a draft Sub-Strategy to the Local Transport Plan specifically dealing with CAM issues. The C2C proposals have been assessed against the policies in the Sub-Strategy and it is concluded that the scheme is compliant, although further review of the eastern end of the scheme has been undertaken and a review of the western end will be required once there is clarity with regards to proposals for EWR and a station in the Cambourne area.
- 5.12 The route along the A1303/A428 from Cambridge City centre towards Cambourne, St Neots and Bedford has been highlighted as a strategic project to help make travel by foot, bicycle and public transport more attractive than private car journeys, alleviating congestion and supporting the region's growth.
- 5.13 With a house price to earnings ratio of around 13:1 in Cambridge, reflecting shortfalls in supply, demand for housing in locations like Cambourne and St Neots continues to grow. Along the C2C corridor, around 11,500 additional homes are planned in Cambourne West, Bourn Airfield, and North West Cambridge. Development is estimated to support 13,400 additional jobs, leading to increasing pressure on the already heavily congested A1303 approaching M11 junction 13 and the city centre. A further source of pressure on the C2C corridor will come from 3,800 new homes which are planned for the St Neots East site.

- 5.14 As such, to meet this growing demand, the vision of the C2C Project as defined in the business case is:

“To connect existing and new communities along the A428/A1303 to places of employment, study and key services to enable the sustainable growth for Greater Cambridge. We will deliver this through improved, faster and more reliable HQPT services, together with high quality cycling and walking facilities serving a new Park and Ride site to the west of Cambridge.”

6. Part of the Wider Network

- 6.1 The project is part of the GCP's Transport Programme, investing devolved City Deal funding in a comprehensive package of measures to tackle congestion through the creation of a world class transport system.

CPCA - CAM

- 6.2 In October 2018, an independent review of alignment between the C2C scheme and the CPCA plans for a CAM, undertaken by consultants Arup and commissioned by the CPCA, concluded the following key findings:

- The process undertaken to date to determine the route is robust and identified the optimal solution for the corridor.
- The route should be reclassified as a CAM route.
- The vehicles operating along the route should comply with the principles of the CAM being a rubber-tyred, electrically powered vehicle.
- The route must continue to be designed to align with the overarching CAM network, providing high quality public transport on dedicated routes.
- The route is connected into a tunnelled CAM network thereby providing a high frequency, pollution free public transport option into and across Cambridge centre and the entire CAM network.

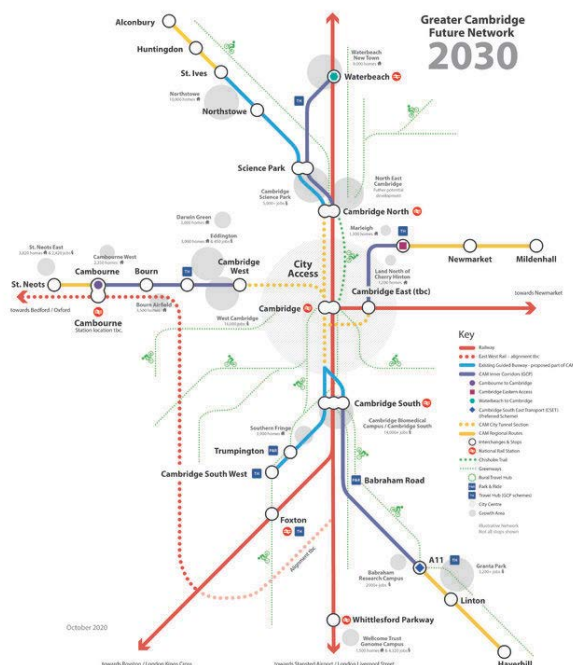
- 6.3 To align with the CAM, the scheme developed by GCP will need to deliver:

- A HQPT system using rapid transit technology on dedicated routes.
- High frequency, reliable services delivering maximum connectivity.
- Continued modal shift away from car usage to public transport.
- Capacity provided for growth, supporting transit-oriented development.
- State of the art environmental technology, with easily accessible, environmentally friendly, low emission vehicles such as electric/hybrids or similar.
- A fully integrated solution, including ticketing and linkages with the wider public transport network to maximise travel opportunities.

- 6.4 At a CPCA meeting on 31st October 2018 the CPCA Board agreed to support the recommendations of the “Arup Report” and agreed that the C2C scheme should be progressed by the GCP as an essential first phase of developing proposals for the CAM. GCP has continued to work closely with CPCA to ensure alignment of the developing proposals.

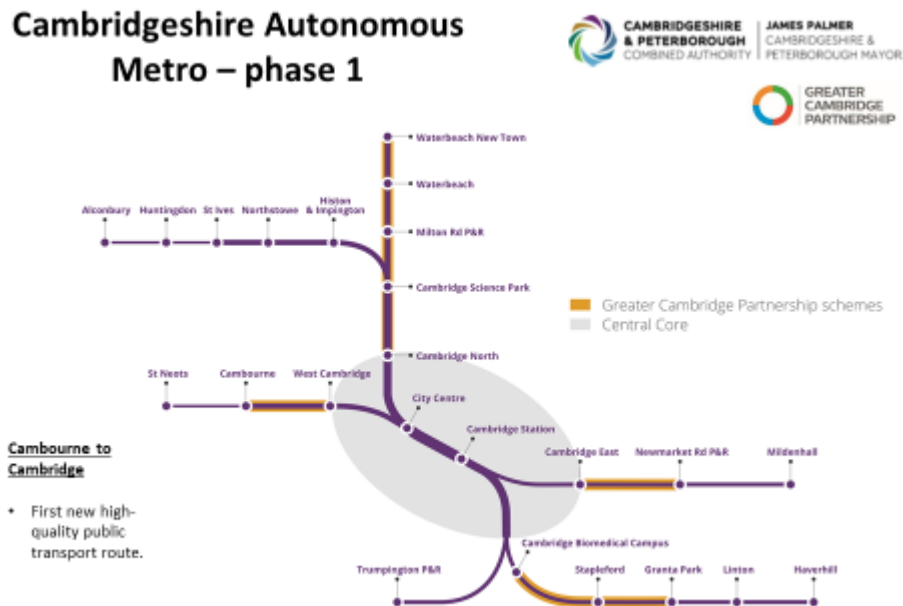
- 6.5 The CAM project proposes an expansive metro network that seamlessly connects Cambridge City Centre, key rail stations (Cambridge, Cambridge North and the future Cambridge South), major City fringe employment sites and key 'satellite' growth areas, both within Cambridge and the wider region.
- 6.6 CAM will operate entirely segregated from traffic beneath Central Cambridge through underground tunnels, ensuring fast and reliable services are unaffected by traffic congestion. Services will be provided by electric, low-floor 'trackless metro' vehicles.
- 6.7 The vision for the CAM network includes regional connections to St Neots, Haverhill, Alconbury and Mildenhall, serving locations with significant planned or potential growth. These regional connections will only be viable if they directly connect into new segregated infrastructure serving the City Centre.

Figure 1 – Cambridge Future Network



- 6.8 As set out in Figure 1, as part of the Cambridge future network, GCP's arterial routes, including C2C, will provide a step change offering a viable public transport alternative for quicker and more reliable journeys to key destinations in and around Cambridge, as well as safe and segregated cycling and pedestrian routes.
- 6.9 The GCP routes will form the first phase of the Combined Authority's CAM project. Figure 2 outlines the wider CAM network and the GCP schemes as the first phase of delivery.

Figure 2 – CAM Network (CPCA)



City Access

- 6.10 In the City Centre, GCP's City Access project is proposing measures to reduce reliance on car travel and free up the city centre's congested road space, to run better public transport services.
- 6.11 The objectives of the City Access scheme complement the C2C project by seeking to improve conditions for sustainable transport within the City Centre, thereby benefitting users of the C2C scheme either through improved journey times for public transport or better connectivity to pedestrians and cyclists. City Access will also complement C2C by providing an alternative to car journeys for trips from new developments served by the scheme.

Comberton Greenway

- 6.12 GCP is developing a network of Greenways to increase levels of cycling and walking and to benefit users, including horse-riders and those with disabilities, through identifying and improving local travel routes. Greenways are generally defined as attractive linear corridors away from traffic and suitable for cycling and walking and can be important wildlife corridors.
- 6.13 The Comberton Greenway will complement the C2C project as it develops improved pedestrian and cyclist routes with a segregated path continuing beyond the proposed bus route.

Maddingley Road Cycling Improvements

- 6.14 As part of the phase 1 public consultation for the C2C scheme, consultees suggested that there should be better walking and cycling provision along the Maddingley Road section of the route within the public highway.

- 6.15 The subsequent occupation of the Eddington site as well as potential expansion of the West Cambridge site strengthens the case for complementary cycling improvements along Madingley Road, building on those already secured via the planning process.
- 6.16 As such, in the context of adherence to policy and as a response to the public consultation, GCP initiated the development of a separate cycling project to improve cycling provision on Madingley Road. The scheme supports C2C objectives by providing better connectivity to pedestrians and cyclists travelling into the city and making cycling a more viable and attractive alternative to car use for communities to the west.

East West Rail

- 6.17 Since adoption of the South Cambridgeshire Local Plan, and as part of the Cambridge-Milton Keynes-Oxford Arc project, further development work has been undertaken on the concept of EWR to re-establish a rail link between Cambridge and Oxford, and to improve rail services between East Anglia and central and southern England, including enhanced rail connections with national mainline services. Work has progressed on the western section between Oxford, Aylesbury and Bedford.
- 6.18 Five options for the EWR route between Bedford and Cambridge were consulted on in early 2019, with a final preferred option for the corridor announced in 2020.
- 6.19 The preferred corridor is for a northern alignment between Bedford and Cambridge which includes proposals for a new rail station to serve Cambourne. This would offer another attractive mode of travel from C2C to the City Centre. The EWR scheme could therefore be considered complementary to C2C as it would offer good connections for those in Cambourne travelling to destinations easily accessible from the Cambridge stations. The current preferred corridor indicates a station to the south of Cambourne although it has been reported that EWR is still considering an option to the north. The Cambourne to Cambridge scheme has been designed to cater for both options.
- 6.20 However, any new rail station would not offer the same level of local service access to areas along the A428/A1303. Neither would it serve other housing and employment locations along the corridor such as Bourne Airfield and West Cambridge. The C2C route would also support 'last mile' journeys for commuters from surrounding villages using public transport, cycling or walking and via a Travel Hub to enable access to EWR from Bourn Airfield and the surrounding area.
- 6.21 EWR focuses substantially on longer term growth beyond the Local Plan period and not the immediate and worsening issues of congestion and lack of connectivity for expanding communities west of Cambridge. Once a preferred alignment has been agreed for EWR and clarity established with regards to the location of a Cambourne station there will be a programme to ensure

integration between EWR, C2C and the wider CAM network can be maximised.

- 6.22 The business case will also need to be reviewed to include a sensitivity test to assess the impact of EWR Rail once there is clarity with regards to the proposals. It is unlikely that EWR will have an impact of the core business case for C2C given that it is unlikely that any EWR proposals will have achieved consent during the C2C assessment period.

Oxford – Cambridge Expressway - Black Cat to Caxton Gibbet

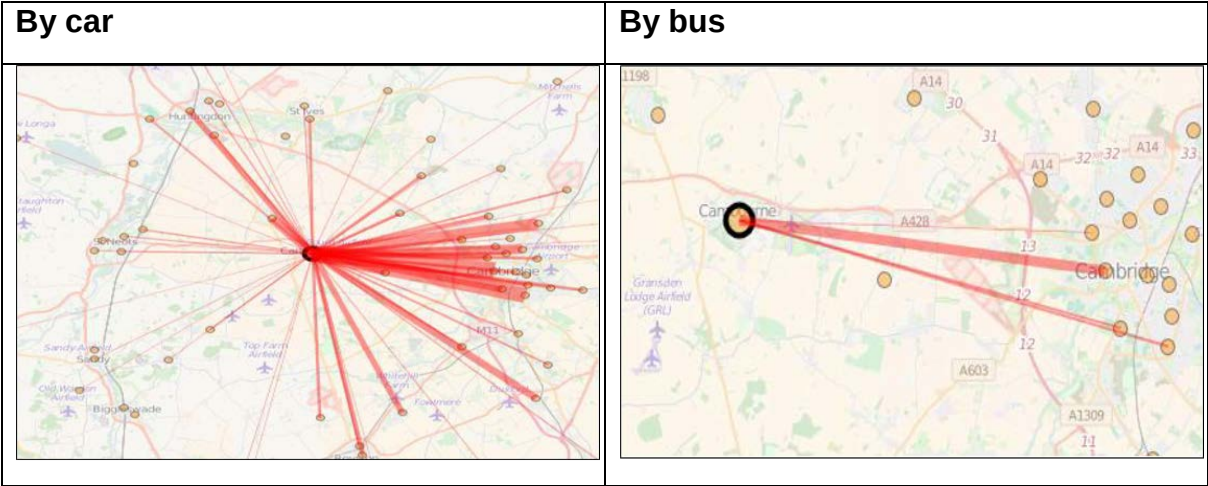
- 6.23 The A428 Black Cat to Caxton Gibbet scheme aims to cut congestion and increase capacity and journey time reliability between Milton Keynes and Cambridge, creating a 10 mile dual carriageway with new junctions, roads and bridges to improve reliability, decrease delays and significantly improve journey times. The project forms part of the proposed Oxford to Cambridge Expressway to create a high-quality east-west link between Oxford and Cambridge, via Milton Keynes and Bedford.
- 6.24 Even with delivery of the Black Cat to Caxton Gibbet section of A428 improvements, a HQPT Route is necessary linking C2C and supporting delivery of the Local plan. The C2C scheme is planned for completion in 2024 in order to connect growing communities and tackle the immediate issue of worsening congestion along the A1303.

7. Technical Work – Key Findings

Transport Constraints

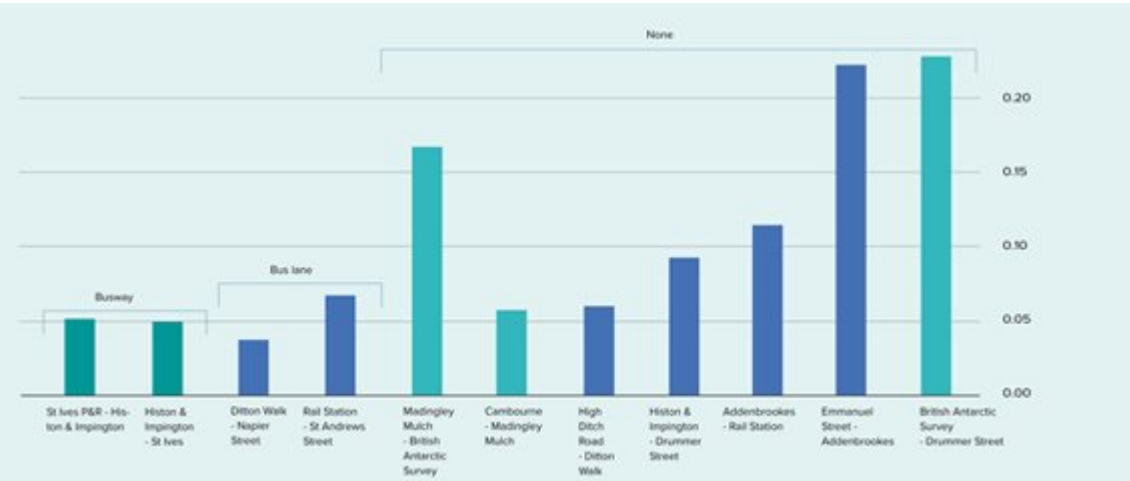
- 7.1 Existing car mode share and car ownership within the A428/A1303 corridor is high, and future growth is expected to generate additional demand for car use in this area.
- 7.2 Trafficmaster data shows that AM peak hour traffic speeds are 75% slower than night time average speeds on the route between the Madingley Mulch Roundabout and M11 Junction.
- 7.3 Considering planned growth, between 2011 and 2031, car trips along the A428/A1303 corridor eastbound are forecast to increase by 14% in the AM Peak hour, 82% in the Inter-peak period and, 37% in the PM Peak period. Without intervention this could lead to a further deterioration in traffic speeds and reliability of journey times.
- 7.4 Travel to work data for key origins along the C2C corridor also illustrate the high level of car use along the route, with the car mode share for residents of Cambourne being particularly high (65%). This suggests that, by providing an attractive and viable alternative to the car such as C2C, there is scope for a further modal shift to more sustainable options.
- 7.5 Travel to work data has also been used to identify trends in travel patterns along the corridor, including key origins/destinations and mode choice (see Figure 3). C2C presents a key opportunity for growth areas to be better connected to key employment centres and encourage future sustainable travel rather than continued reliance on the car.

Figure 3 – Travel to Work destinations from Cambourne (ONS 2011)



- 7.6 Residents of Cambourne and surrounding villages currently have limited options to use public transport due to the low level of service and current unreliability. Only the Madingley Road Park and Ride attains a ‘turn up and go’ frequency of one bus every 10 minutes.
- 7.7 In the absence of substantial bus priority in the corridor, congestion and delays mean journeys of around 10 miles can take over an hour during peak times. Buses therefore offer no competitive advantage over private cars in terms of journey times and reliability.
- 7.8 Figure 4 illustrates the reliability challenges along this corridor and how it compares to other corridors where bus priority is provided, and for the existing Cambridgeshire Guided Busway alignment. Using a Reliability Ratio, this shows that the existing Cambridgeshire Guided Busway performs better than the non-busway corridors, meaning that the infrastructure is delivering journey times that are more consistent.
- 7.9 Two sections of the C2C route, from Madingley Mulch to Drummer Street, are among the three worst performing sections from this example of reliability performance along key radial corridors in Cambridge.

Figure 4: Reliability comparison of non-segregated routes vs segregated routes



- 7.10 The existing cycling network between Cambourne and Cambridge has sections of segregated links of uneven quality but is discontinuous and does not in total provide a high quality segregated route which would cater for the potential increased modal share of cyclists along the corridor.
- 7.11 Therefore, HQPT, plus the provision of additional cycling and walking facilities, has a key role in providing an attractive and competitive alternative to car use, which would alleviate congestion, poor journey time reliability and delay. Crucially, such interventions will help to accommodate future growth planned to the west of Cambridge, improve access to housing and employment sites alike, and improve quality of life in the local communities.

Planning Constraints

- 7.12 A substantial level of housing and employment development is planned, or is already under development, along the C2C corridor include Cambourne West, Bourn Airfield, West Cambridge and North West Cambridge (Eddington).
- 7.13 Based on current plans, both those within the current Local Plan or well established through planning applications or known to be emerging, there are around 11,700 additional houses planned and around 13,400 additional jobs along the C2C corridor. Around 50% of all housing planned (c. 6,000 houses) would be directly linked to Cambridge City centre and other key employment locations via the C2C project.
- 7.14 The jobs, assuming an average GVA per worker figure of £61,800 per worker¹, would generate approximately £827.5m of GVA per annum.
- 7.15 Crucially, two significant new planned developments (Cambourne West and Bourn Airfield) are, in housing terms, judged to be fully dependent upon the C2C project given the clear policy position within the adopted Local Plan and as supported by Section 106 commitments and ongoing negotiations. The Bourn Airfield New Village Supplementary Planning Document (SPD) was adopted by South Cambridgeshire Council on 2 October 2019. The adopted SPD can be viewed [here](#). Whilst some housing development may come forward incrementally before the scheme is fully implemented, policy is clear that the scheme is needed to facilitate sustainable development along the corridor.
- 7.16 The C2C project has been recognised in the Local Plans and local transport strategy as a key project to help address these infrastructure constraints on growth by linking Cambridge to growth areas to the west. The provision of a HQPT service supporting journeys to key employment sites presents a viable alternative to car use/purchase for residents in new developments.

8. Developing the Business Case

- 8.1 Development of the C2C project commenced in 2014 with initial public consultation on high-level options undertaken in 2015. The established method of progressing major transport projects such as C2C is via a 'business case' which assesses the overall case for public investment by measuring the public benefits and costs of different options.

¹ East of England Forecasting Model (EEFM 2017, accessible at <https://cambridgeshireinsight.org.uk/eefm/>)

- 8.2 A C2C Local Liaison Forum (LLF) was formed and convened to regularly review and contribute to progress as part of the scheme development process.
- 8.3 Following presentation of the initial stage of the business case, the Strategic Outline Business Case (SOBC), the GCP Executive Board agreed in principle in October 2016 that a segregated route for C2C best meets the strategic objectives of the City Deal and the City Deal Agreement, given the wider economic benefits, and a commitment was made to undertake further work.
- 8.4 Throughout the course of the scheme's development there have been significant efforts to review and assess alternative routes as proposed by stakeholders, including the LLF. Updates were provided to the GCP Executive Board in July 2017 on the development of an LLF-conceived on-road option (Option 6) and further review of Park and Ride sites along the corridor and, in October 2017, the GCP Executive Board agreed that public consultation be undertaken as part of the further development of the business case.
- 8.5 A second public consultation on options for a Phase 1 route running between Madingley Mulch Roundabout and the city, together with an accompanying Park and Ride site, was undertaken between 13th November 2017 and 29th January 2018.
- 8.6 As part of the options assessment, alternative versions of an on-road and off-road route for Phase 1 were developed and compared. Option Appraisal Report 1 presented an assessment and analysis of option development to date, up to this point.
- 8.7 Further technical and environmental assessment, modelling, stakeholder input and consultation results contributed to Option Appraisal Report 2, informing recommendations presented to members at the December 2018 GCP Executive Board. Board members noted assessment and recommendation presenting the off-road Phase 1 route as the best performing against the project's objectives, and approved continuing work to further develop an end-to-end route on this basis. As part of this, ongoing ecological surveys have been undertaken. Baseline air quality surveys have also been undertaken at locations agreed with the local environmental health officers, and noise surveys are due to commence in January 2020. Three Technical Notes on the air quality conditions in Adams Road, Coton and Hardwick have been produced. Further ecological surveys are also planned if a preferred scheme decision is made.
- 8.8 A third consultation on options for a Phase 2 route running from Madingley Mulch roundabout and on to Cambourne was undertaken in February and March 2019.
- 8.9 Consultation findings, OARs and supporting reports are available on the C2C webpages.
- 8.10 To provide assurance of robust evaluation of route options, two technical notes were published in May 2019 in response to stakeholder requests to:

- Explore [‘quick-win’ options along Madingley Hill](#). Viable projects to avoid land take and significant environmental impact and minimising input from, or impact on, third parties, restricting options to a short section of public transport lane, extension of cycling improvements and review of signal timings.
- Provide further clarification on why a [northern alignment](#) via Girton was previously discounted. GCP has written to and met with Highways England to put the case for work to upgrade to Girton Interchange and enable movement between west and south. Papers are available on the LLF C2C section on the GCP website.

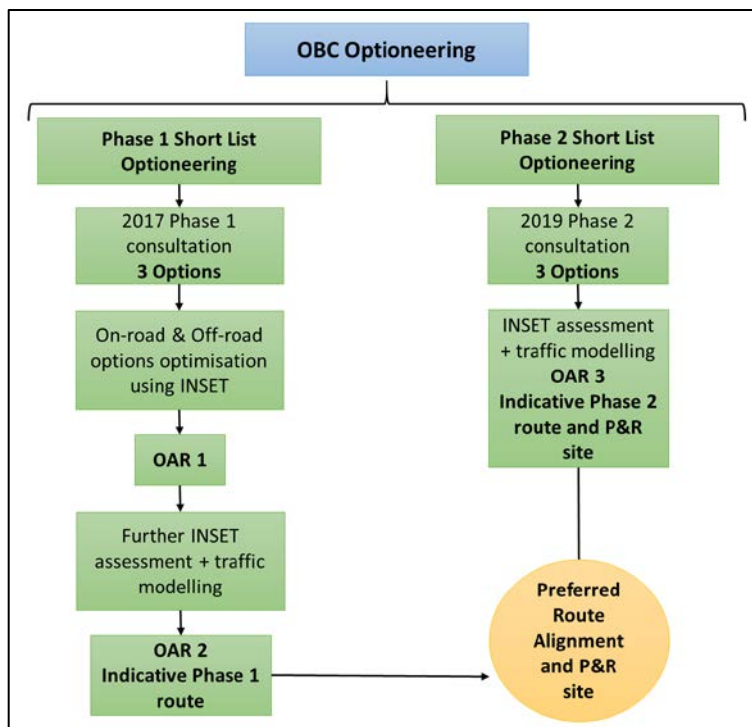
8.11 Further work has also been undertaken to review and consider a hybrid (on and off-road) option proposed by a Technical Sub-Group of the LLF. This, however, was not pursued further because its focus was on a solution which would be on-road for the most congested and most environmentally sensitive section of the corridor, constrained by limited road space, along Madingley Road past the Sites of Special Scientific Interest (SSSI) and the American Cemetery.

8.12 Ongoing assessment, modelling, stakeholder input and consultation results, presented in OAR Part 3, has contributed to the completion of the OBC presenting the recommended, end-to-end route and Park and Ride site.

9. Basis of Selecting and Refining an Option

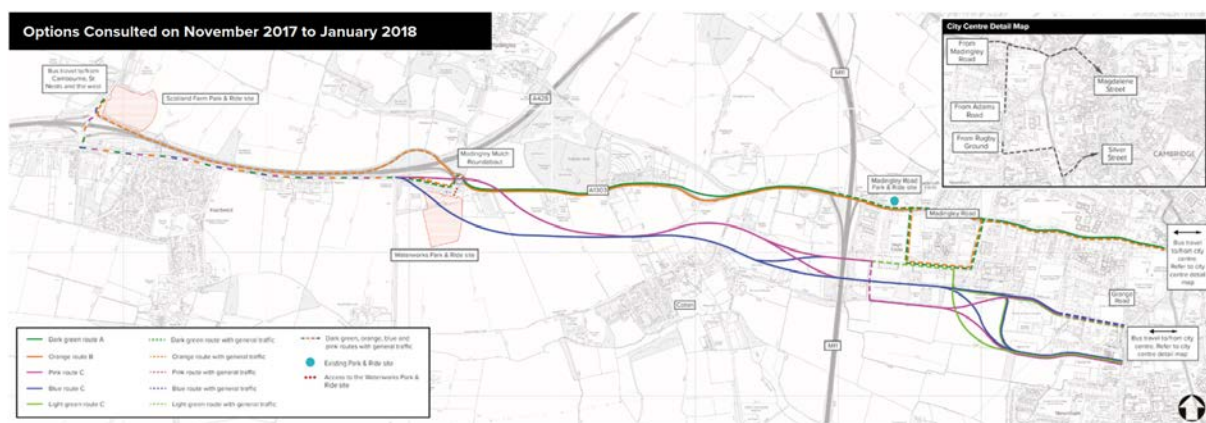
9.1 Figure 5 illustrates the optioneering process carried out in identifying a preferred option.

Figure 5: C2C OBC Optioneering Process



- 9.2 Option development and appraisal for the Phase 1 route alignment, Grange Road to Madingley Mulch roundabout, was undertaken in two stages.
- 9.3 The first stage involved consultation on three options. The definition of the three options consulted on in 2017 was as follows and as shown in Figure 6:
- Option A: An on-road option which includes the introduction of an inbound bus lane on Madingley Road between Madingley Mulch roundabout and Lady Margaret Road;
 - Option B: An on-road tidal bus lane on Madingley Road running between Madingley Mulch roundabout and the new entrance to Eddington (High Cross); and
 - Option C: An off-road public transport route running between Madingley Mulch roundabout and Grange Road, Cambridge.

Figure 6: Phase 1 Options



- 9.4 The options were also assessed against each other to generate an 'optimised' on-road option that reflected Option A and some of the Option B suggested improvements to outbound traffic, and a single specific off-road route alignment from Option C, in order to refine the number of variations within each option down.
- 9.5 Stage 2 of the options assessment process for the Phase 1 route alignment involved the assessment of these 'optimised' options, with the incorporation of each of the proposed Park and Ride sites, against both a Do Minimum scenario and an Illustrative Comparator.
- 9.6 The definitions of the options as part of Stage 2 were as follows:
- Do Minimum – Committed Schemes.
 - Low Cost a – Recommended optimised on-road Phase 1 + Park and Ride at Waterworks.
 - Low Cost b – Recommended optimised on-road Phase 1 + Park and Ride at Scotland Farm.
 - Do Something 1a – Recommended off-road Phase 1 Madingley Mulch Roundabout to Grange Road + Park and Ride at Waterworks.
 - Do Something 1b – Recommended off-road Phase 1 Madingley Mulch Roundabout to Grange Road + Park and Ride at Scotland Farm.
 - Illustrative Comparator – Recommended off-road Phase 1 and Phase 2 Cambourne to Grange Road Park and Ride at Waterworks for comparative purposes.

9.7 The options were evaluated, using INSET multi-criteria analysis, against a series of assessment criteria grouped by the following themes:

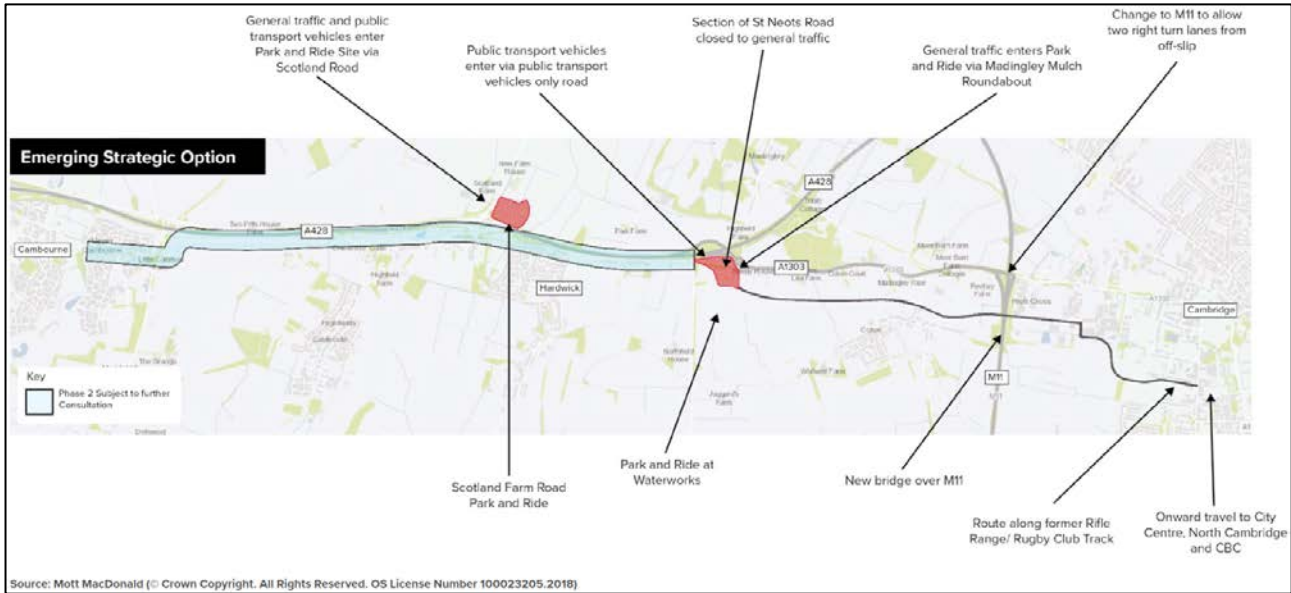
- Policy fit.
- Contribution to economic growth.
- Contribution to improved transport network.
- Contribution to quality of life.
- Scheme deliverability.
- Stakeholder support.

9.8 The results of the optioneering for Phase 1 are shown in Table 1. They show that, for Phase 1, the off-road solution with a Park and Ride site at Waterworks was the best performing, whilst the Illustrative Comparator demonstrated the merit of implementing the full scheme in order to deliver the maximum benefits and meet the scheme objectives.

Table 1: Phase 1 INSET Assessment Results

Option	INSET Scoring Summary Ranks
Do Minimum	Ranked 6th
Low Cost a	Ranked 5th
Low Cost b	Ranked 4th
Do Something 1a	Ranked 2nd
Do Something 1b	Ranked 3rd
Illustrative Comparator	Ranked 1st

Figure 7: Emerging Strategic Option – Phase 1 Route Alignment

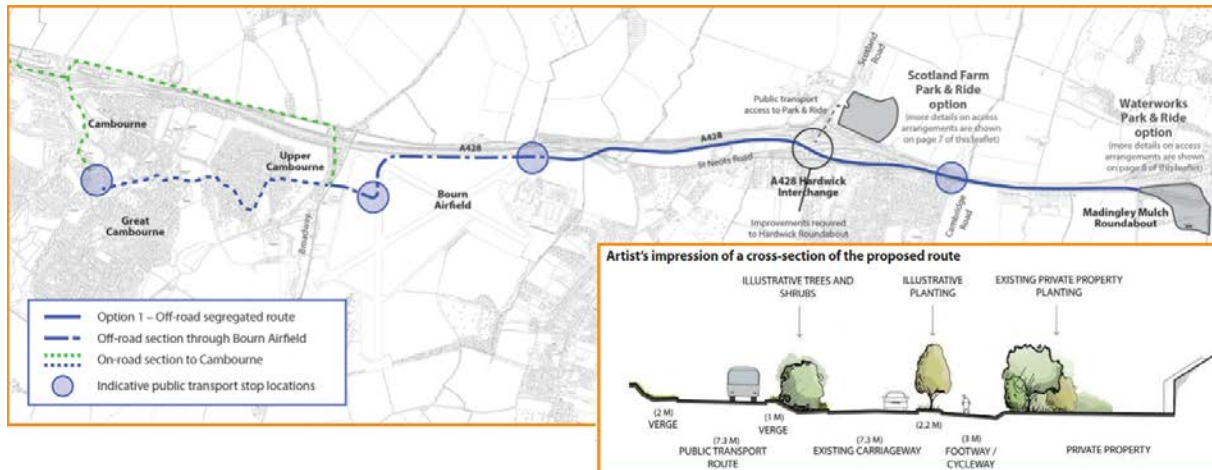


9.9 Phase 2 route alignment options, from Madingley Mulch roundabout to Cambourne, included three options, with each option including the Phase 1 preferred route alignment. The definition of the three options (each with a variation for the two Park and Ride sites) for Phase 2 is as follows and shown in Figures 8, 9 and 10:

- **Option 1 a and b:** Off-road segregated route. A new public transport route adjacent to the A428 and St Neots Road. The route would be entirely off-road with minimal interaction with general traffic, except at junctions.

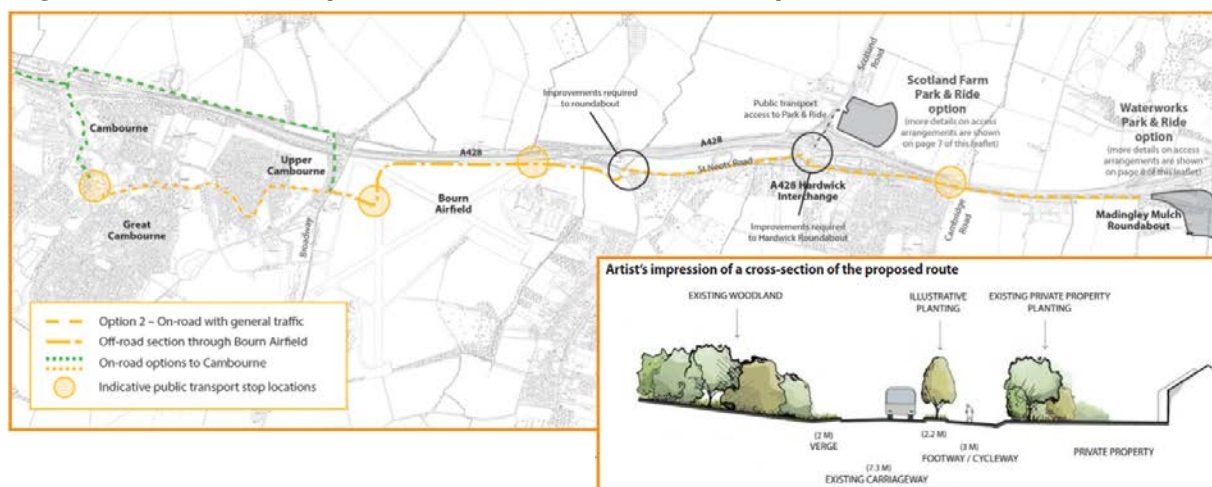
- **Option 2 a and b:** On-road with junction improvements. Public transport vehicles would run on-road along St Neots Road with general traffic east of the Bourn roundabout. There would be basic junction improvements.
- **Option 3 a and b:** On-road with public transport priority lanes. Public transport vehicles would run on-road along St Neots Road in priority lanes running in both directions.

Figure 8: Phase 2 – Option 1: Off-Road Segregated Route



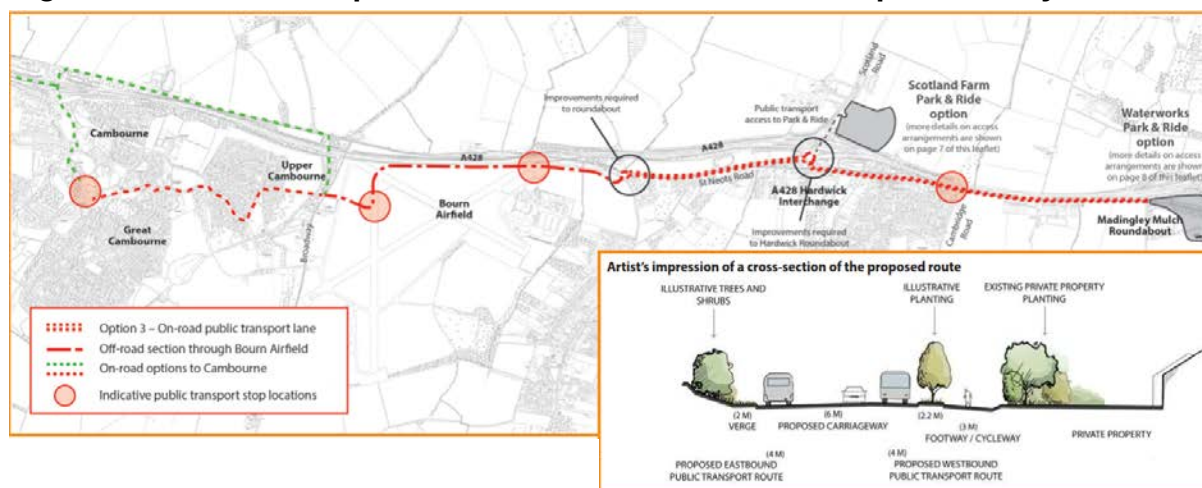
Source: February to March 2019 consultation leaflet

Figure 9: Phase 2 - Option 2: On-Road Junction Improvements



Source: February to March 2019 consultation leaflet

Figure 10: Phase 2 – Option 3: On-road with Public Transport Priority Lanes



Source: February to March 2019 consultation leaflet

9.10 These options were all assessed against the same criteria as the Phase 1 options. The results of the optioneering for Phase 2 are shown in Table 2. They illustrated that for Phase 2 the off-road solution with a Park and Ride site at Scotland Farm was the best performing.

Table 2: Phase 2 INSET assessment results

Option	INSET Scoring Summary Ranks
Option 1a	Ranked 2 nd
Option 1b	Ranked 1 st
Option 2a	Ranked 6 th
Option 2b	Ranked 5 th
Option 3a	Ranked 4 th
Option 3b	Ranked 3 rd

The Phase 1 and Phase 2 options assessment, based on the INSET assessment, concluded that the off-road option is the only solution that presents the potential of a segregated route for mass rapid transit that is close to population centres, and with potential capacity to meet the development pressures along the corridor.

Benefit to Cost Ratios/Wider Economic Impacts (WEI)

9.11 In addition to the INSET assessment of the options, an initial assessment of the value for money (VfM) of the different options was carried out using traffic modelling outputs and appraisal of the economic performance of the schemes. This resulted in a series of initial Benefit to Cost Ratios (BCRs) for each option to provide a comparison of the VfM. The adjusted BCRs for the options from Phase 2, which each included the off-road alignment from Phase 1, are presented in Table 3 below.

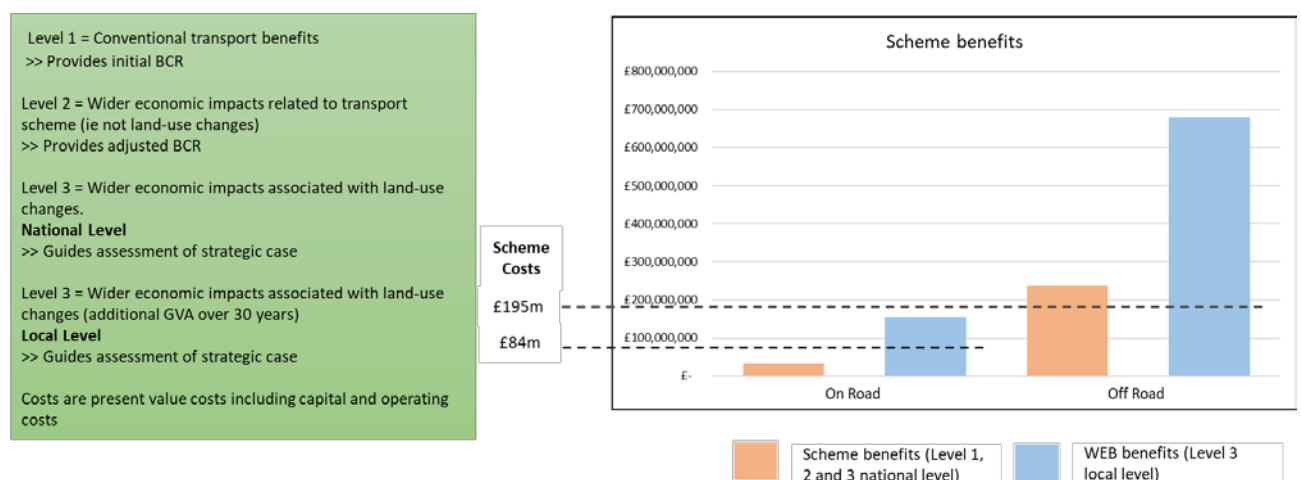
Table 3: Adjusted Benefit Cost Ratios

	Option 1a	Option 1b	Option 2a	Option 2b	Option 3a	Option 3b
Benefit Cost Ratio	0.31	0.33	0.36	0.34	0.32	0.35

Source: Mott MacDonald

- 9.12 Whilst Option 2a – On road with Scotland Farm Park and Ride, is the best performing option with regards to this initial VfM assessment, the close similarity between each option does not provide a conclusive indication of which is best performing. Therefore, the results from the INSET assessment must still be taken into account which indicate an off-road solution as the best performing.
- 9.13 Additionally, due to the strategic case and need for the scheme to support future housing developments and economic growth, the consideration of the wider economic impacts of the options must be taken into account.
- 9.14 Therefore, the on and off-road options were assessed for their impact on wider (non-transport) economic growth, expressed as Gross Value Added (GVA). GVA measures the total value of goods and services. This assessment found that a new segregated off-road alignment for public transport would bring significant wider economic benefits.
- 9.15 Figure 11 summarises the findings from the Value for Money assessment of the off road vs on road options for both Phase 1 and 2, and includes the relative benefits of the on and off-road options against the current scheme costs to demonstrate how the off-road option has a greater value for money in delivering wider economic impacts.
- 9.16 When considering the level of GVA benefit, the on-road option would have a local benefits BCR of 1.86, whilst the off road option would have a local benefits BCR of 3.48.
- 9.17 The conclusion of the options assessment, therefore, is that, taking into account all elements of assessment – INSET, initial VfM assessment and WEI assessment, an off-road route is the best performing solution that provides for delivery of the long-term transport objectives of both the GCP and the Combined Authority and is best aligned with the emerging CAM concept. For further detail on the assessment detail, refer to OAR 2 and 3.

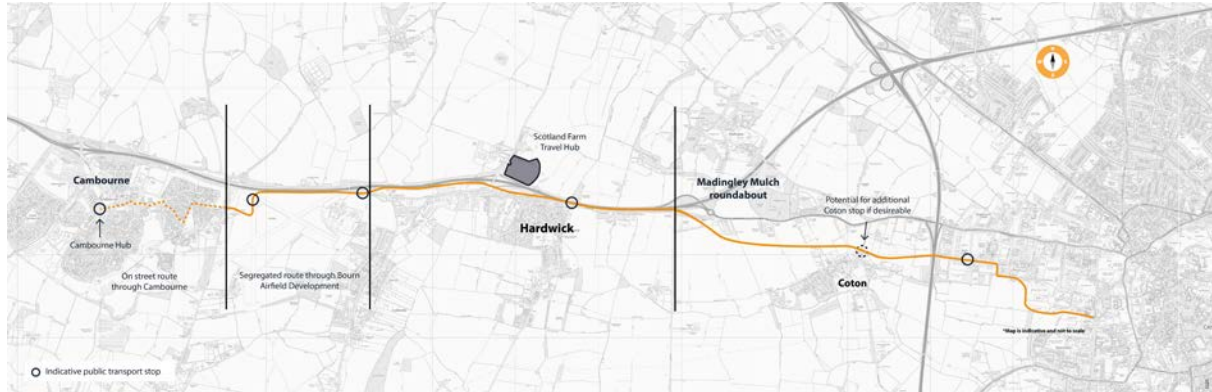
Figure 11: On-Road vs Off-Road Wider Economic Impacts



10. The Preferred Option

- 10.1 The preferred option for the C2C project is the off-road alignment for Phase 1 and Phase 2 with Scotland Farm as the preferred Park and Ride site – see Figure 12.

Figure 12 – Preferred Option



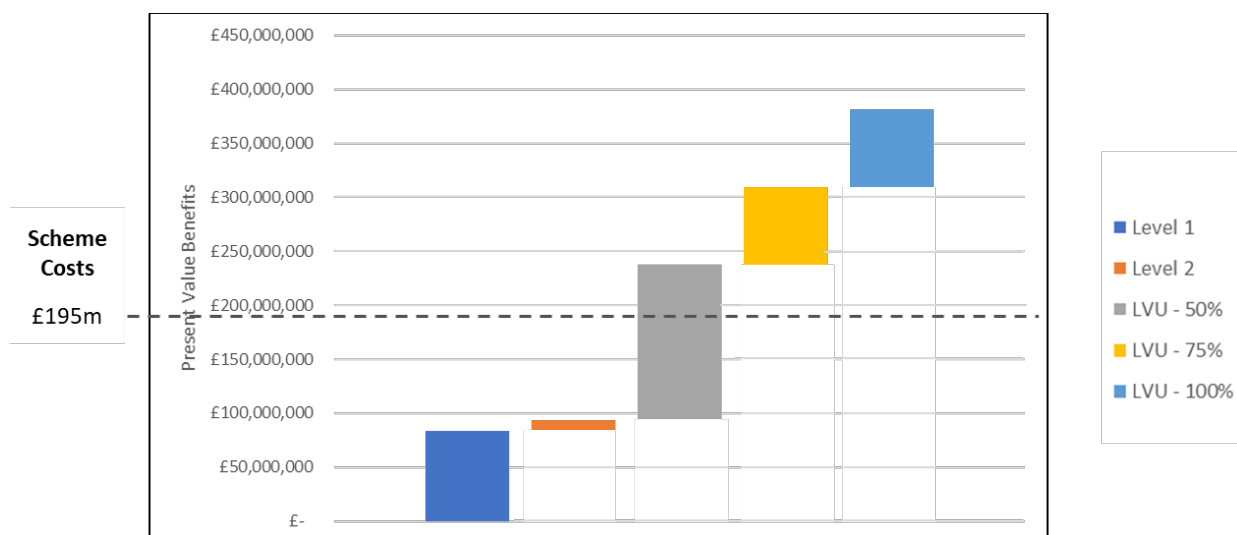
- 10.2 At the end of Phase 1 appraisal, the Waterworks site was the highest scoring Park and Ride option, but at this stage, the assessment did not fully consider Phase 2 alignments. At the end of Phase 2 appraisal, Scotland Farm has emerged as the preferred site, reflecting both technical appraisal and strong public opinion.

- 10.3 See section 9 for route alignment and scheme proposal.

Preferred Option Value for Money

- 10.4 The Value for Money of the C2C project takes into consideration all appraisal and assessment work undertaken to date to arrive at the emerging scheme that is shown to present the best VfM. This takes into account the monetised impacts vs the project costs presented as a BCR, as well as the findings from any qualitative and non-monetised assessments.
- 10.5 The role the C2C scheme plays in unlocking and supporting future housing and economic growth is a key element of the strategic rationale for the scheme. Therefore, in establishing the final VfM position of the C2C project, the role of Wider Economic Impacts (which are not part of a standard BCR) should be considered central to examining the case for investing in the scheme.
- 10.6 Whilst the scheme has an initial BCR of 0.43, and adjusted BCR of 0.48, when taking into account the additional wider economic impacts and, in particular, the land value uplift (LVU) brought about by the scheme (£458m in Land Value Uplift - see table 4), the total BCR is 1.22 when considered at a national level. This is assuming only 50% of the calculated LVU is actually achieved. If the full value is realised, then the total BCR would rise to 1.95. This additional benefit brought about by the scheme is illustrated in Figure 13.

Figure 13: C2C Benefits Build Up



10.7 Considering the C2C scheme's wider economic impacts at a local level (i.e. the benefits accruing to Greater Cambridge) further increases the VfM.

10.8 The C2C project would help to connect growing communities, whilst enabling them to evolve and access the increasing number of jobs and opportunities in the city and on its periphery. Accounting for these Greater Cambridge level benefits, the strategic economic benefits of the scheme are as follows:

- £102.8m direct GVA per annum
- £676.1m in total GVA over 30 years
- A total 'local BCR' of 3.48

Other Key Benefits

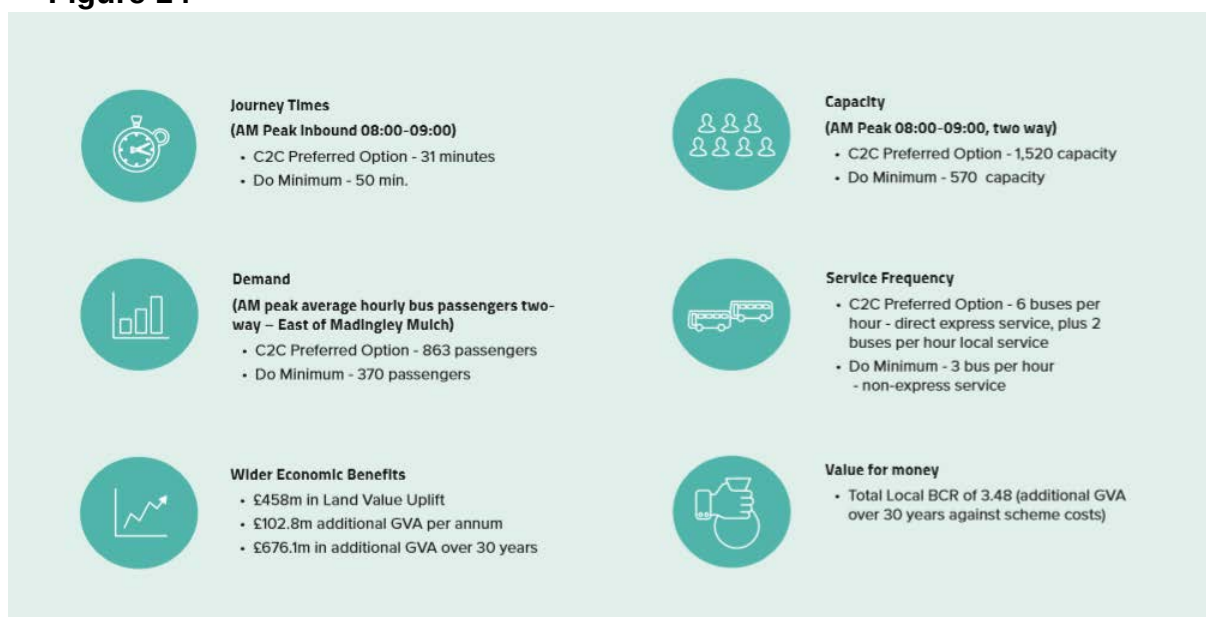
10.9 In summary, the C2C project will offer the following benefits shown in Table 4 and Figure 14 (all benefits shown for forecast year 2036):

Table 4: C2C preferred option benefits vs Do Minimum (DM)

Benefit	C2C preferred option	DM
Journey times (Cambourne to Drummer Street) (inbound)	<ul style="list-style-type: none"> • 30 mins - AM Peak (08:00-09:00) • 26 mins - Inter Peak (10:00-16:00) • 30 mins - PM Peak (17:00-18:00) 	<ul style="list-style-type: none"> • 53 mins - AM Peak (08:00-09:00) • 28 mins - Inter Peak (10:00-16:00) • 38 mins - PM Peak (17:00-18:00)
Demand (peak average hourly bus passengers two-way – East of Maddingley Mulch)	<ul style="list-style-type: none"> • 863 passengers - AM Peak • 233 passengers - Inter Peak • 320 passengers - PM Peak 	<ul style="list-style-type: none"> • 370 passengers - AM Peak • 248 passengers - Inter Peak • 231 passengers - PM Peak
Service Frequency	<ul style="list-style-type: none"> • 6 buses per hour - (10 min interval) direct express service between Cambourne High Street and central Cambridge, via the new Park and Ride site. • Local service running in parallel 2 buses per hour (30 min interval). 	<ul style="list-style-type: none"> • 3 buses per hour - (20 min interval) non-express service between Cambourne High Street and central Cambridge.
Bus passenger Capacity	<ul style="list-style-type: none"> • 1,520 capacity 	<ul style="list-style-type: none"> • 570 capacity

Benefit	C2C preferred option	DM
(AM Peak 08:00-09:00, two way)	<ul style="list-style-type: none"> Demand with the scheme is forecast to increase by 233% by 2036, with capacity increasing by 267%, therefore catering for the additional demand. 	
Journey time reliability	<ul style="list-style-type: none"> C2C estimate at delivering £536,000 (2010 prices) in additional benefit from reliability improvements. Using Reliability Ratios, the existing Cambridgeshire Guided Busway sections perform better (0.06) than the non-busway sections of the A428 (0.15), meaning that the infrastructure is delivering journey times that are more consistent. 	
Wider economic impacts	<ul style="list-style-type: none"> £102.8m direct GVA per annum £676.1m in total GVA over 30 years £458m (2019 prices) in Land Value Uplift 	<ul style="list-style-type: none"> None
Environmental	<ul style="list-style-type: none"> Reduction in levels of private vehicle use will lead to: Improved air quality in the Cambridge City Centre AQMA. Design principles to support an increase in biodiversity Leisure and Amenity enhancements with delivery of walking and cycling route Social benefit with an overall reduction in private car use. 	<ul style="list-style-type: none"> Higher levels of traffic compared to current levels, resulting in greater levels of congestion, resulting in: Poorer air quality in the Cambridge City Centre AQMA. Worsening of the setting of the SSSI and American Cemetery.

Figure 14



Journey Reliability

10.10 A key aspect of the C2C scheme is its ability to deliver reliable journey times for those using it. Results of the appraisal of the preferred off-road option show that it has the potential to deliver £536,000 in additional benefits over a 60-year period.

10.11 In addition to the economic appraisal of the reliability benefits of the C2C preferred option, a quantitative assessment of the benefits of delivering a fully segregated public transport route was undertaken by examining the reliability ratios for the existing Cambridgeshire Guided Busway and non-busway

services within Cambridge as outlined in figure 4. This data is derived from observed journey time variability in line with DfT guidance.

- 10.12 The Reliability Ratios show that the existing Cambridgeshire Guided Busway sections perform better than the non-busway sections, meaning that the infrastructure is delivering journey times that are more consistent.
- 10.13 The urban sections of services 1, 4 and B have higher reliability ratios, so journey times are more variable. Two sections of the C2C route, from Madingley Mulch to Drummer Street, are among the three worst performing sections.

Environmental Impact

- 10.14 Overall there is likely to be a minor to moderate adverse effect on the environment along the route corridor which will be mitigated by: route refinement to minimise impacts; sensitive landscape design; high value habitat creation to ensure positive biodiversity net gain is achieved; and providing mitigation for noise from existing sources along the A428. In addition, the NMU path will increase wellbeing by increasing access to the countryside and facilitating more people moving away from vehicles to cycling, walking and horse riding. These measures will reduce the impact of the scheme on the environment and will lead to some benefit in places.
- 10.15 The precise mitigation requirements will be identified through engagement with stakeholders and the project team during the Environmental Impact Assessment that would be completed on the approved scheme to support the planning approval process.
- 10.16 The impact on the Green Belt will be mitigated by landscape planting that screens the route from local communities where practical to achieve this. This will improve over time as the planting schemes mature, reducing the impact on the Green Belt.
- 10.17 Whilst it is always preferable to avoid any impacts on the Green Belt, in the case of C2C, impact is inevitable. The National Planning Policy Framework establishes that “certain other forms of development are also not inappropriate in the Green Belt provided they preserve its openness and do not conflict with the purposes of including land within it. These are:
 - (c) local transport infrastructure which can demonstrate a requirement for a Green Belt location”
- 10.18 The C2C scheme has been developed to provide linkage from new settlements located outside the Green Belt to the City of Cambridge. Given the need to connect development outside the Green Belt to the city, some degree of impact on the Green Belt is inevitable.

11. Bus Strategy

- 11.1 A bus strategy has been developed to use the C2C route for travel from Cambourne to key employment destinations in and around Cambridge (see Appendix F to OBC). This has been drawn up with reference to other GCP schemes such as the Cambridge South East Transport Scheme, and also

ongoing work on the City Centre Access Strategy, but also noting the need to be compatible with future opportunities such as CAM and any potential changes to bus operating models such as franchising. The strategy will feed into the CPCAs Bus Task Force work.

11.2 The routes are based on realistic service numbers and anticipated demand. This approach builds upon the successful approach adopted as part of the Cambridge Guided Busway scheme which has delivered a significant increase in service and patronage.

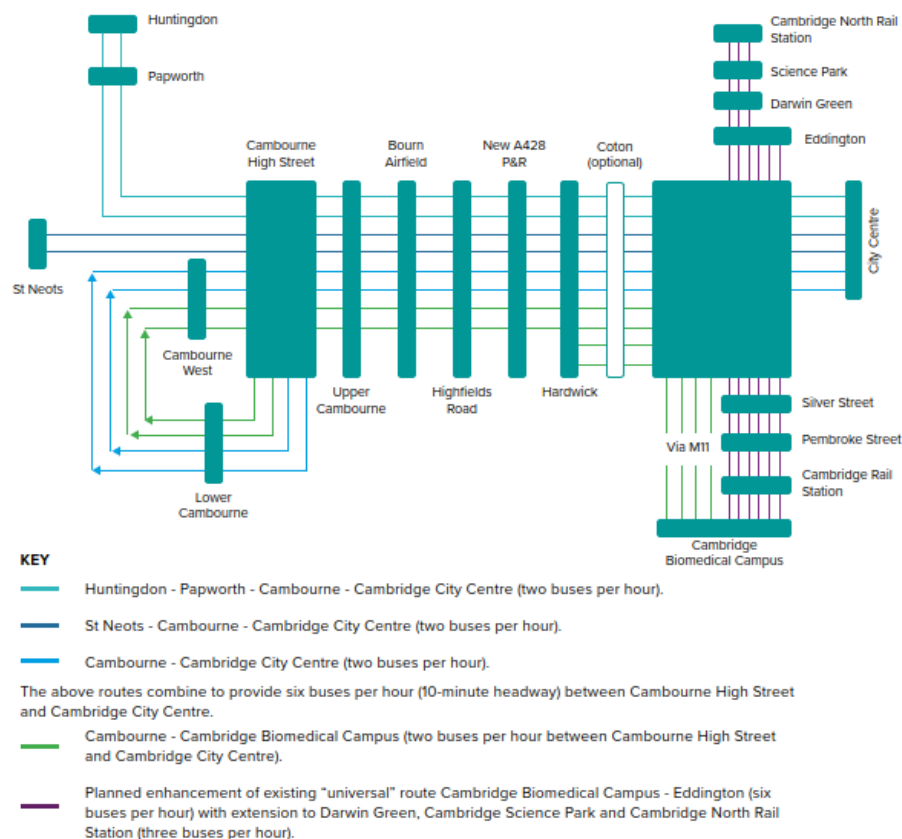
11.3 Existing bus services would have the option of using the new public transport route, providing they comply with clean vehicle standards. For example, the X5 would be likely to use the new route. The Citi 4 has been assumed to continue to serve existing stops on the A1303.

11.4 The proposed bus strategy has three direct express services:

1. C2C to City Centre at 10-minute interval service (six buses per hour).
2. Cambourne to Biomedical Campus at 30-minute interval service (two buses per hour).
3. A428 Park and Ride site to Biomedical Campus at 30-minute interval service (two buses per hour during peak periods).

11.5 The proposed bus network is shown in schematic form in Figure 15 below:

Figure 15 – Schematic Proposed Bus Network



12. Scheme Proposal

12.1 The design approach and quality of new segregated HQPT infrastructure has and will continue to be informed by principles agreed by the GCP Executive Board in October 2016 (supplemented by LHE and NMU working group principles, as above) – namely:

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

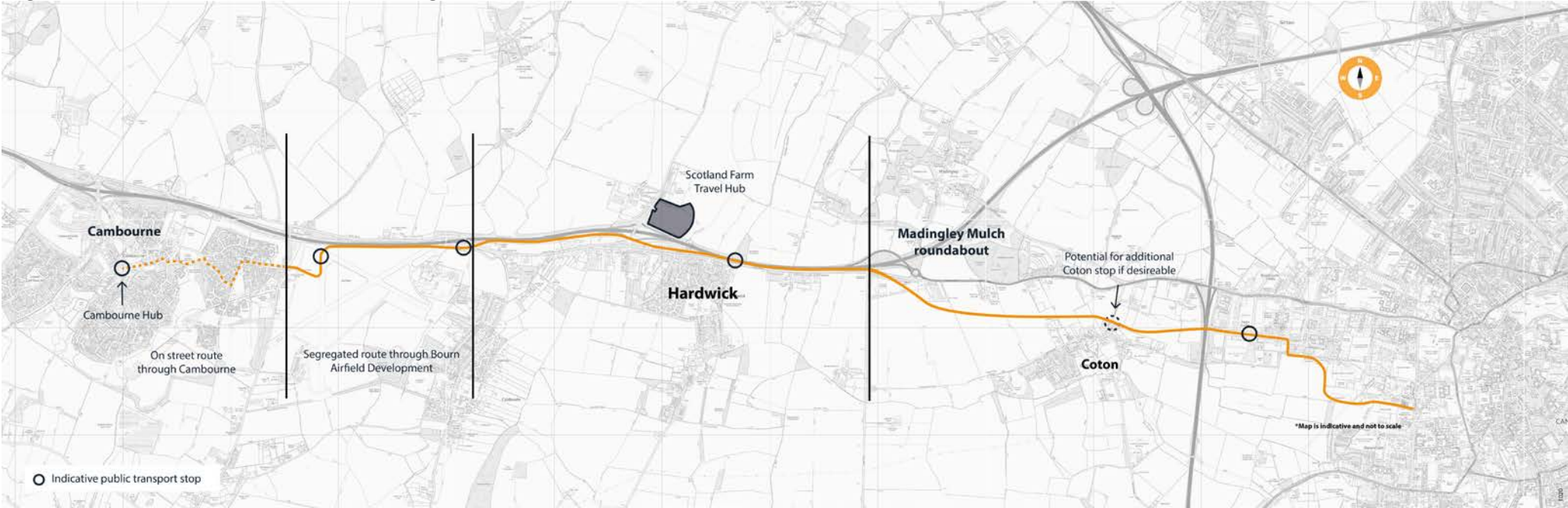
12.2 The end-to-end Recommended Route Option is illustrated at Figure 16.

12.3 The Phase 1 alignment has been modified since the report to the 2018 Executive Board to reflect the following:

- Amended line in Cambridge West to follow West Cambridge Masterplan and detailed operational issues
- Revisions to alignment around Coton (still being refined in dialogue with stakeholders)
- In addition, the Rifle Range section was reviewed twice, firstly, to reflect a review of Green Belt impacts, which suggested that Adams Road would be preferable, although the options were finely balanced. Subsequently, the section was revisited in the light of the CPCA's LTP Sub-Strategy for CAM and it is concluded that whilst the options remain balanced, the original Rifle Range option is better aligned with scheme objectives.

12.4 A final alignment will be subjected to a detailed Environmental Impact Assessment, which would definitively assess the impact and potential benefit of mitigation options.

Figure 16 – Recommended Route Alignment

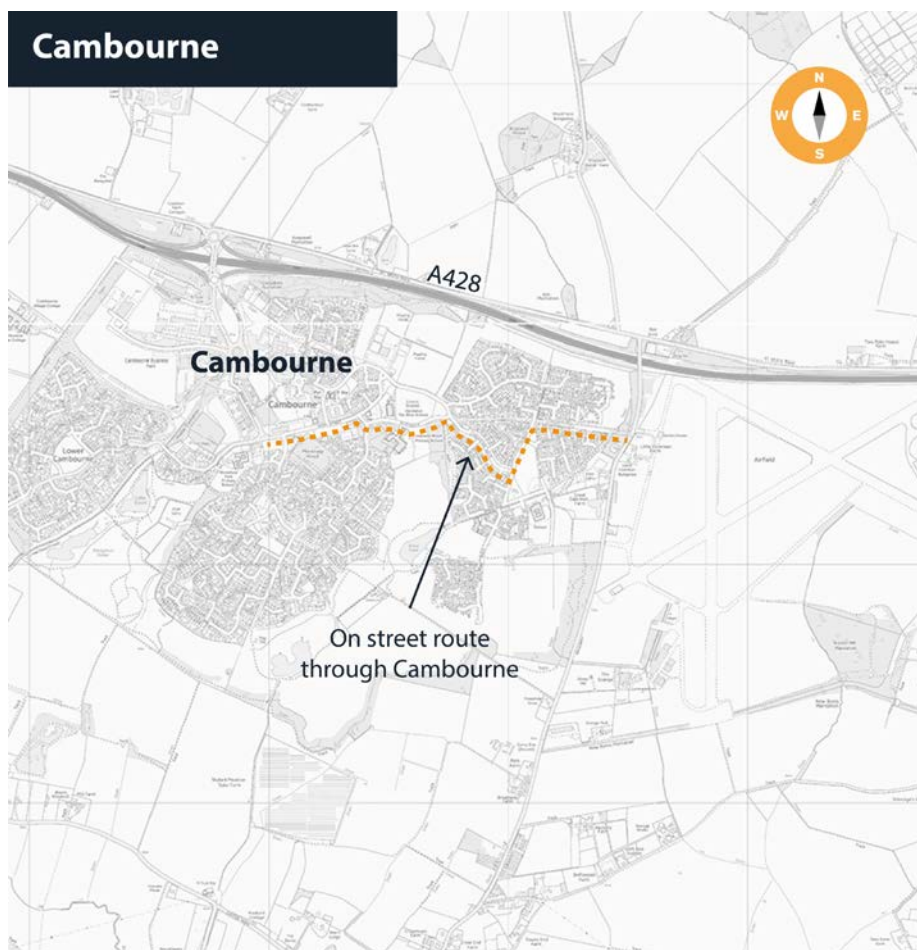


12.5 Salient features are as follows from west to east:

Cambourne

- 12.6 With the exception of a bus gate and short section of bus route west of the Broadway, the first section of the route is on-road through Cambourne. This is an interim arrangement for the route subject to changes once other factors are known as set out in 10.9, at which point a final CAM-compliant route at Cambourne can be identified.
- 12.7 Routes, including via Cambourne West, have been developed and included in the traffic modelling assessments.
- 12.8 Work is also underway, liaising with South Cambridgeshire District Council and Cambourne Town Council, to investigate potential provision of a further Travel Hub at a future date.
- 12.9 Once a location for a Cambourne Station to be provided as part of East-West Rail is confirmed then the Travel Hub might be located at the station and the C2C scheme would support last mile journeys for train commuters. This will be reviewed in due course alongside consideration of eventual CAM connectivity to St Neots.

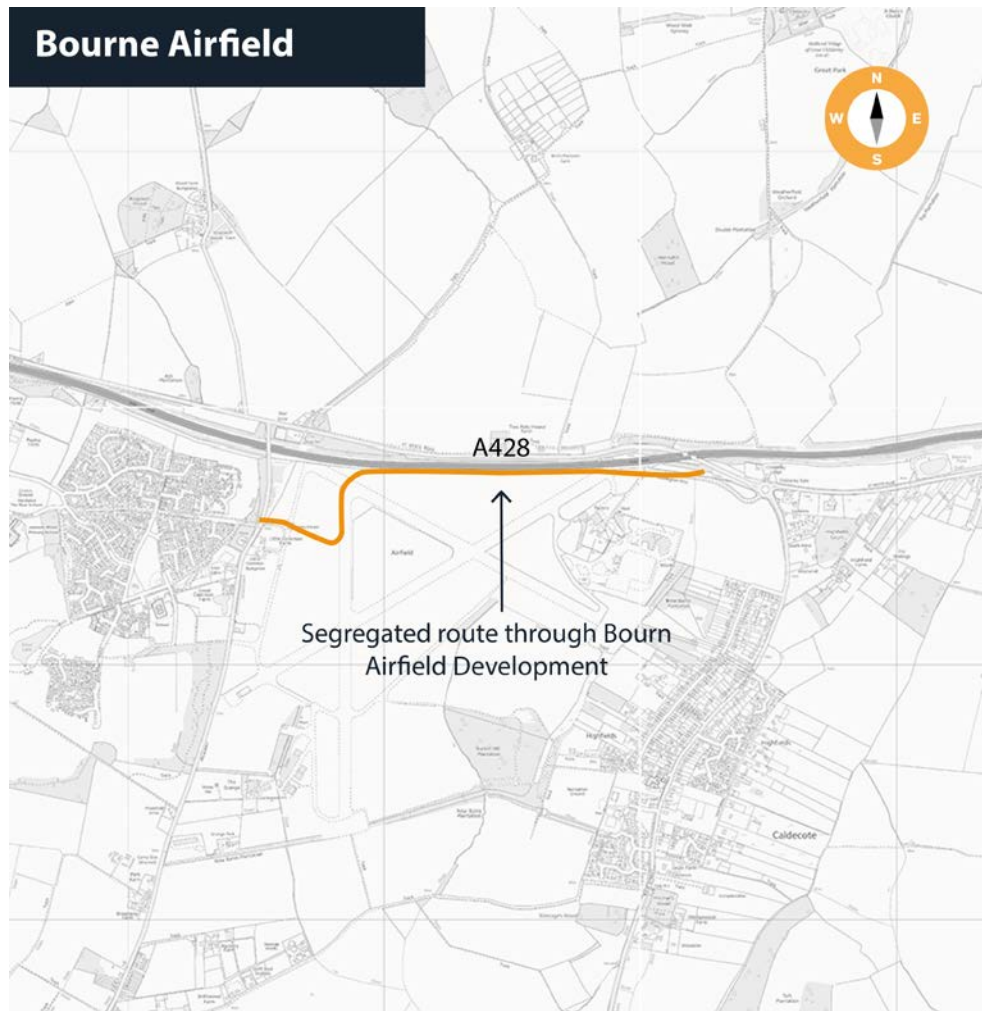
Figure 17 – Cambourne Route Section



Bourn Airfield

- 12.10 The route continues off-road passing through Bourn Airfield on a corridor defined in the [Supplementary Planning Document](#) along the A428 as far as Scotland Farm, agreed in October 2019. Two stops are proposed.

Figure 18 – Bourne Airfield Route Section



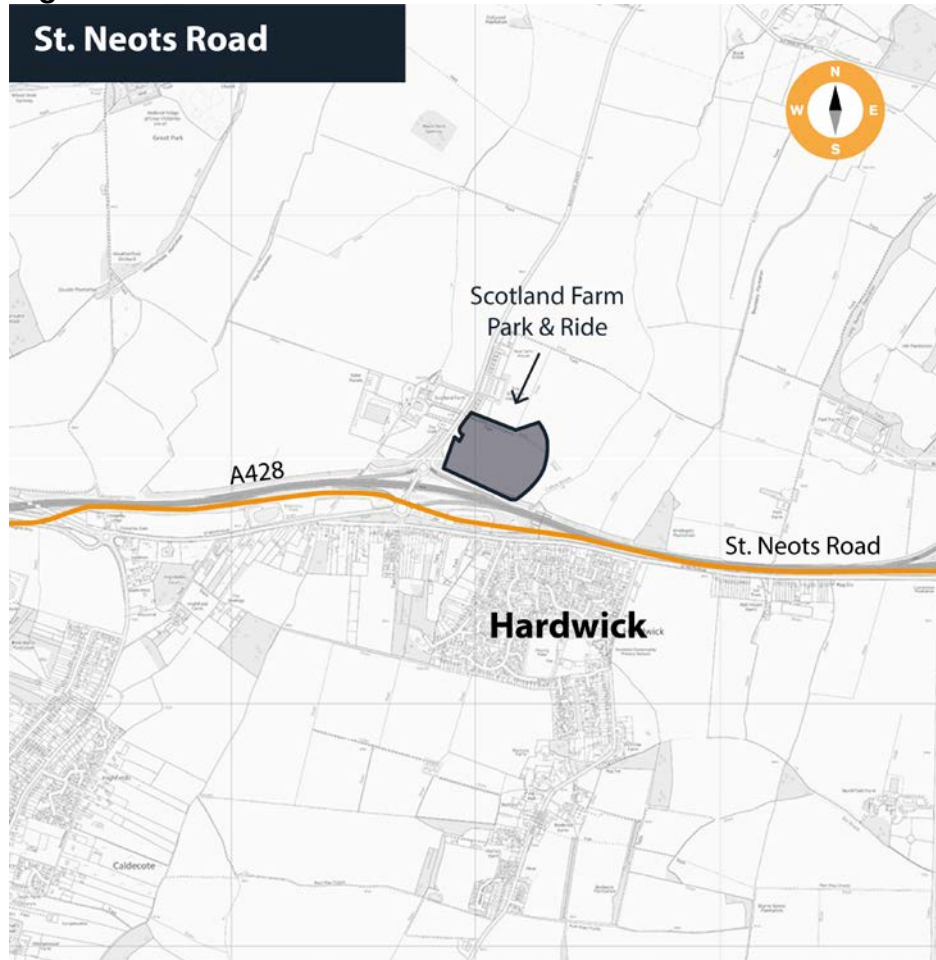
Scotland Farm

- 12.11 A Travel Hub (Park and Ride site) will be provided at Scotland Farm. Responding to input from local residents, local traffic management will be provided on Scotland Road in order to ensure access, and to deter 'rat-running' through Dry Drayton, and a new cycle and pedestrian route into Dry Drayton will be created.

St Neots Road

- 12.12 The route will continue from Scotland Road off-road but largely parallel to the St Neots Road. There will be a loss of trees and vegetation in this location but new planting will be provided to partially offset the impact.
- 12.13 Proposals would improve the current A428 noise barrier which is poorly provided and in places in a state of disrepair through provision of a well-designed noise barrier to ensure a net decrease in traffic noise.

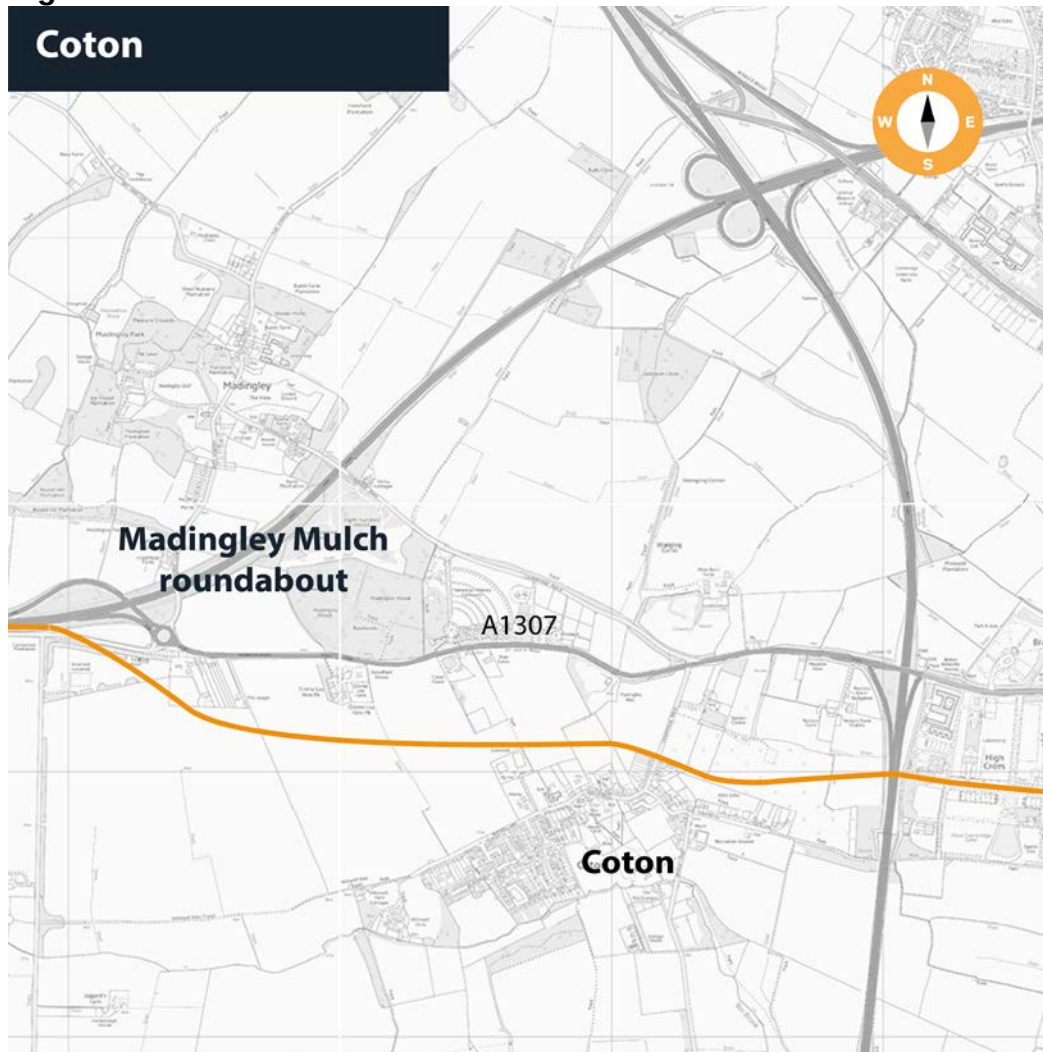
Figure 19 – St Neots Road and Scotland Farm Route Section



Coton

- 12.14 Since December 2018, work has been ongoing to further assess and refine the Phase 1 route involving key stakeholders including local residents and LHE and NMU working groups.
- 12.15 From the Water Works site near to Madingley Mulch roundabout the route then crosses to the south side of the A1303 to the north of water storage tanks on the edge of Coton where it crosses the Cambridge Road. As a result of discussions with local residents, Cambridge Past Present and Future and the National Trust, the route alignment to the north of Coton Village is proposed to move further north to a distance of 40-50 metres from the nearest houses.
- 12.16 Work will continue beyond the current stage of scheme development to refine the alignment and investigate bunding options to hide infrastructure from view. Where fields are severed there will be an opportunity to retain more suitable areas of land for future use such as the creation of new wildlife habitats as part of the commitment to a net biodiversity gain.

Figure 20 – Coton Route Section

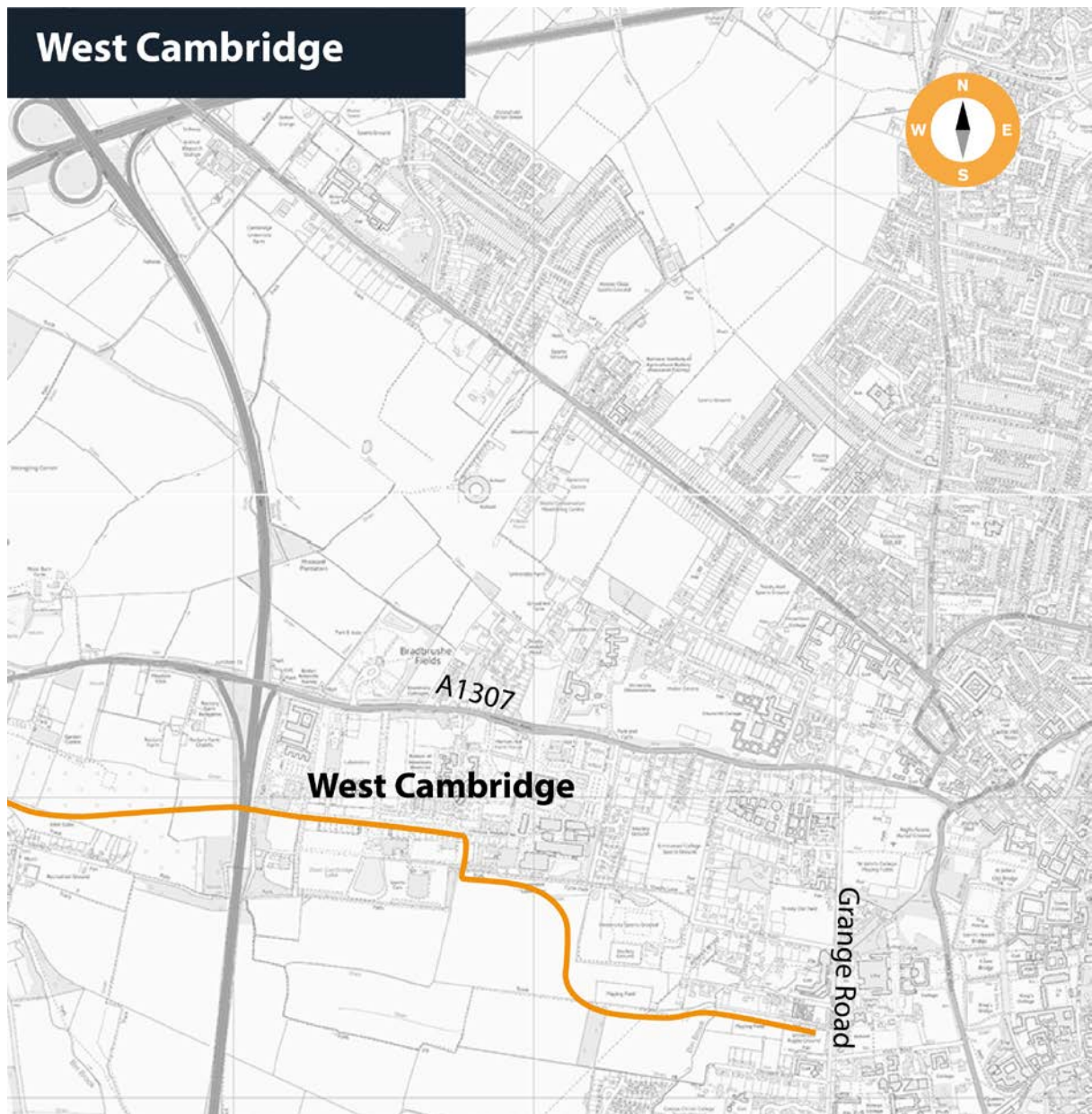


West Cambridge

- 12.17 The proposed route cuts through the Coton Orchard and crosses the M11 on a new bridge passing into the West Cambridge campus and along Charles Babbage Road before cutting through the campus to the south, and then around the edge of the West Fields before joining the old Rifle Range Track which crosses the Bin Brook on a culvert before passing between Clare Hall College and the CU Rugby Football Ground.
- 12.18 Whilst on the basis of analysis undertaken prior to the Dec 2018 Executive Board meeting, the Rifle Range Track had been the highest performing option, further concerns were raised regarding the potential impact on the green belt, reflected in research undertaken by LDA Design Consulting: see [A428 Cambourne to Cambridge Segregated Bus Route: Consideration of Green Belt Issues Report, Appendix 1LC J to the End of Stage Report](#).
- 12.19 In order to investigate the green belt issue further, GCP commissioned a second LDA assessment of the options, reflecting more detailed alignments – see [Cambourne to Cambridge Interim Planning Assessment](#). This new research has concluded that, despite amendments to the alignment through Grange Field to minimise its impact, the Rifle Range option would lead to greater harm to the green belt than the Adams Road option.

- 12.20 Further dialogue with landowners on the Rifle Range route also identified a number of access requirements which, whilst not insurmountable, would each lead to a degree of disruption to the route.
- 12.21 As a result, the preferred alignment was updated to travel down Adams Road in order to minimise land take of green belt land through the West Fields. Subsequently, however, a number of concerns were raised with regards to that option. The main concern voiced by CamCycle and Residents Groups was with regards to the potential impact on cycle usage of Adams Road including the potential growth in cycle demand as the campus grows.
- 12.22 The publication of the CAM LTP Sub-Strategy has prompted a revisiting of that section to reflect the need to ensure segregation. Having reviewed the assessment it is concluded that the options remains finely balanced.
- 12.23 In order to reach a decision between the two options they have been reviewed against the CPCA sub-strategy. Against these specifically, Rifle Range would appear to be the better fit because it offers a higher level of segregation to enable a better public transport service, and also creates better NMU linkages, especially to West Cambridge, whilst avoiding the conflict with NMUs that would occur on Adams Road. As such, whilst both Adams Road and Rifle Range have comparable advantages and disadvantages officers have concluded that Rifle Range is better aligned.

Figure 21 – West Cambridge Route Section



13. Environment considerations/commitments

- 13.1 GCP intends that electric vehicles would be deployed, aligned with the preferred mode for the CAM scheme.
- 13.2 A biodiversity net gain assessment will be completed once the preferred route is identified and there will be a requirement for GCP to deliver a minimum of 10% gain, with the objective of achieving 20% gain.
- 13.3 A significant number of environmental surveys and assessments have been undertaken and are available on the GCP website, covering wildlife habitats along the route for animals including reptiles, bats, breeding and wintering birds, badgers, barn owls, reptiles, water voles and invertebrates.
- 13.4 Further ecological surveys and baseline noise surveys will continue into 2020 to inform the emerging final scheme design, and to be used in the Environmental Impact Assessment.

- 13.5 Engagement with Natural England is being undertaken on the results of the surveys.
- 13.6 Initial air quality reports for communities and villages in closer proximity to the route (Hardwick, Adams Road and Coton) propose a negligible impact on air quality.
- 13.7 A final scheme design will be subject to a full Environmental Impact Assessment.
- 13.8 GCP will continue to work with LHE and NMU stakeholder groups to develop scheme design.
- 13.9 GCP have committed to replacing and improving the, now aged, acoustic barrier along the A428 where the route would remove a belt of trees between the A428 and St Neots Road.

14. Delivering a Scheme

Financial Case

- 14.1 Further refinement of option costs has been carried out since the SOBC and 2017 stage of project development. The current estimated capital cost of the current off-road option is £160.5m, of which £37.7m is anticipated from Section 106 contributions from other third parties such as the developers of the Bourn Airfield site and West Cambridge. The predicted costs and third-party contributions are shown in Table 5 and builds upon the estimates previously provided for the Phase 1 works.
- 14.2 It should be noted that the financial case does not include Optimism Bias (currently 44%), which is used within the economic appraisal, but does include a risk allowance of 25%.

Table 5: C2C Funding Profile – Preferred Option (£000's)

Funding source	2014-19	2020	2021	2022	2023	2024	Total
City Deal	£3,214	£8,661	£10,568	£42,977	£49,354	£7,714	£122,488
Developer Contributions (S106)				£19,000	£19,000		£38,000
TOTAL	£3,214	£8,661	£10,568	£61,977	£68,354	£7,714	£160,488

- 14.3 The estimated high level scheme costs at this stage of the project's development are based on a number of assumptions and exclusions, which are detailed within OBC Appendix Q. As would be expected there are some differences to the costs that were presented in the SOBC (£141.7m) and subsequent reports, there are multiple reasons for this which include the following:
- Level of detail of schemes – the options have been developed further enabling the costs to be further refined;
 - Option alignment work for Phase 2 (formally Option 3a) which has implications on costs;
 - Information and data – further information on utilities, land assembly has been obtained; and
 - Further indicative design work specifically related to the recommended option.

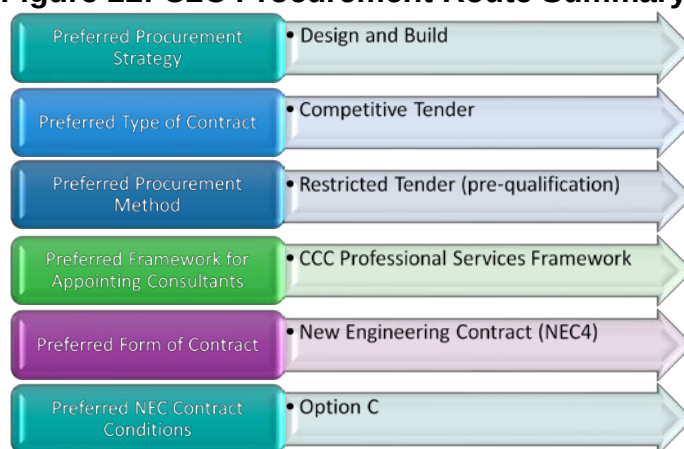
Funding

- 14.4 Funding for the project is intended to be sourced through the GCP supplemented by third party developer contributions through S106. City Deals provide a funding framework for central government and local partners to agree investment programmes, centred on the promotion of local economic growth and development. The total scheme costs for the scheme of £160.5m are deemed affordable based on successfully securing funding from the identified funding sources.
- 14.5 The estimated developer contributions shown above are dependent upon on-going assessments and negotiations and so are indicative at this stage. However, it is currently anticipated that between 20% and 25% of the scheme costs can be attributed to development and contributions secured accordingly.

Commercial Case

- 14.6 The Commercial element of the business case covers a range of commercial factors related to delivery of options. Examples are the issues associated with procurement, contractual risk etc. In the SOBC it was concluded that these commercial factors did not significantly differentiate between the options.
- 14.7 An initial procurement work stream has commenced for each option as currently defined there is a clear commercial strategy for the range of options currently under consideration. The procurement strategy will be influenced by further developments in options for example around vehicle guidance technology which would be further developed at the OBC stage in order to establish the applicable process for the application of powers and consents.
- 14.8 Operational and maintenance considerations will also form part of the final Commercial Case but at this stage do not offer a basis of differentiation between options.
- 14.9 Figure 22 sets out the emerging procurement route for the C2C scheme.

Figure 22: C2C Procurement Route Summary



Management Case

- 14.10 The Management section of the business case focuses on project delivery and management/ governance arrangements in place. The management case also considers the planning process and legal powers necessary to undertake to build a scheme. This is based on a review of previous projects delivered by GCP authorities such as Cambridgeshire County Council and lessons learnt.
- 14.11 Broadly, as stated in the SOBC, the management case does not differentiate in terms of the options under consideration.
- 14.12 The GCP includes a governance structure via the Executive Board and a standard approach to project management including a standard project control framework. A project management team exists with defined roles and responsibilities. A series of commercial contracts are in place with third party suppliers (designers, consultants, legal advisors etc.) which are managed by the project team. The GCP Joint Assembly reviews projects at the strategic level prior to recommendations being presented to the Executive Board. An Assurance Framework exists between central Government and GCP in terms of project prioritisation and delivery.
- 14.13 The management case also identifies the key risks and mitigations for the project. It also reviews the process of public consultation and engagement. Public and stakeholder consultation is essential to ensure that the various aspirations of the general public and key stakeholders are taken into account throughout development and delivery of the project and to manage the communication and flow of information relating to the project. A communication plan sets out how this process is managed, identifying key stakeholders and how engagement is managed including the facilitation of a project specific Local Liaison Forum.

15. Consultation and Engagement

- 15.1 Throughout the scheme's development, there has been significant and continuing effort to engage with stakeholders and members of the public in order to inform, consult, address concerns and, wherever possible, reflect feedback in developing plans.

Stakeholder Input

- 15.2 In addition to 3 public consultations, activities have included:
- Regular LLF meetings, including representation from Stagecoach and workshops with representatives from the Local Liaison Forum, forming a 'Technical Group' covering subjects including modelling, Wider Economic Impacts and Environmental Scoring and Mitigation.
 - Multiple and continuing representations at community meetings including local Parish Council meetings, drop-ins and area committees.
 - Meetings with local businesses and landowners.

Public Consultations

- 15.3 Three public consultations have contributed to scheme development.
- 15.4 Each consultation has taken a multi-channel approach to promote and seek feedback including through traditional and online paid-for, owned and earned media, community engagement events in key or high footfall locations along the route and through the wide-spread distribution of around 15,000 consultation leaflets. Drop-in events held across the area enabled people to have their say in person and provided the opportunity to question transport officers and consultants. Quantitative data was recorded through a formal questionnaire and information booklet.
- 15.5 An initial 2015 public consultation presented six high-level options for public transport infrastructure improvements along the C2C corridor. Of 2,193 responses, Options Area 1 Central (bus lane from Madingley Mulch Roundabout to Cambridge via Madingley Road) and Area 2 Central (Bus only route from Cambourne to Bourn Airfield) received majority support (66.8% and 58.1% respectively). Almost half (46.1%) of respondents approved of a new Park and Ride site near the Madingley Mulch roundabout. Other headline findings included 70.3% respondents agreeing in principle to better bus journeys between Cambourne and Cambridge and reliable journey times' as being key to making bus travel a better alternative to the car by over half (50.7%) of respondents.
- 15.6 Three options for the Phase 1 route and two Park and Ride sites were consulted on in 2017/18 via online and print questionnaire, events and focus groups. In total 2,049 respondents replied to the consultation. Headline results included a preference for the Scotland Farm (54%) Park and Ride location. Although there was no overall majority, route B (on-road tidal bus lane) was the most popular route option (40%). Option C, off-road, was preferred by 33% of respondents.

Phase 2 Consultation Findings

- 15.7 Between 04 February and 31 March 2019 the GCP held a third public consultation on three route options for the Phase 2 section of the route, from Madingley Mulch to Bourn Airfield and on to Cambourne and for updated proposals for Park and Ride sites (moving the Waterworks site further up the hill in response to stakeholder feedback).
- 15.8 From 968 responses, just under half of respondents (48%) indicated that 'Option 1: off-road' would be their preferred choice. 20% preferred 'Option 3: on-road with public transport priority lanes.' 19% preferred 'Option 2: on-road with junction improvements' and 9% indicated that they didn't want any of the options.
- 15.9 For the choice of Park and Ride site, the majority of respondents (63%) preferred 'Option A – Scotland Farm'
- 15.10 A large number of detailed comments were received. Of these, the issues that were highlighted most compared to previous consultation rounds for the route included:

- The impact of the proposals on residents of St Neots Road, Hardwick from increased traffic and loss of vegetation.
- The need to consider the implications of the East-West rail proposals from the EWR Company.
- The need for wider public transport network to be developed to improve accessibility for villages around the route.
- The possibility of locating a Park and Ride site closer to or within Cambourne.

15.11 Responses were also received on behalf of 35 different groups or organisations. All of the responses from these groups were made available to board members in full and published alongside the results of the public consultation survey on the GCP website - <https://www.greatercambridge.org.uk/cambourne-to-cambridge>.

15.12 See Appendix 3 - C2C Phase 2 Consultation Summary Report.

Stakeholder Working Groups

15.13 Two working groups were established in May 2019 for organisations representing Landscape, Heritage and Ecology (LHE) and Non-Motorised Users (NMU) and continue to meet regularly to contribute to scheme design. Working group members include CamCycle, the National Trust, Cambridge Past, Present and Future and the British Horse Society. As a result of representation in the Landscape, Heritage and Ecology Working Group, route refinements between Coton village and Madingley are ongoing to see if minor changes to the alignment could have benefit to the potential impacts on the landscape of that section of the scheme. This is intended to reduce the impacts on land that is covered by a Covenant to protect the landscape that is held by the National Trust.

15.14 More recently, LHE and NMU working groups have devised GCP Working Group Design principles (Appendix 4 and 5) to adopt on C2C and all GCP transport schemes. The objective of the principles is to ensure GCP projects go above and beyond minimum requirements in scheme development and delivery.

15.15 OBC Appendix H – Statement of Community Involvement provides further stakeholder engagement information and full consultation summary reports.

16. Options and Emerging Recommendations

16.1 This report provides an update on the development of the Business Case and the development of a recommended Option for the C2C project. The report summarises outcomes of stakeholder engagement and public consultations on developing options and the technical assessment work carried out in the context of the Government's '5 Cases' business case methodology.

16.2 The Business Case assessment reaffirms the findings of the previous stages, that there remains a strong strategic case to undertake a major transport infrastructure project from C2C based on both current and projected transport demand along the corridor, and given the GCP objectives to promote sustainable economic growth and reduce congestion.

- 16.3 The Strategic Case demonstrates a proposed off-road segregated alignment for HQPT will provide significant transport benefits over bus priority on the existing highway and is consistent with the CPCA's CAM proposal.
- 16.4 The C2C scheme is necessary to support the delivery of a number of residential settlements within the Greater Cambridge Local Plan and engagement on this scheme, both with Stakeholders and members of the public has been significant and far beyond the level expected for a scheme such as this.
- 16.5 The scheme is underpinned by strong environmental design principles to ensure net gain or betterment of the natural environment as part of the design process. Design principles agreed with local stakeholder groups are outlined in Appendix 4 and 5.
- 16.6 The report also sets out a recommended alignment for a rapid transit route between Cambourne and key destinations in and around the city, and, presents a bus strategy for regular services.
- 16.7 The report recommends a travel hub site location at Scotland Farm.
- 16.8 Further assessment work and refinement will continue to be aligned with the development of CAM.

17. Citizen's Assembly

- 17.1 Citizens' Assembly members developed and prioritised their vision for transport in Greater Cambridge. The range of solutions being considered for C2C directly contributes to delivery of 5 of the highest 7 scoring priorities, namely:
- Provide affordable public transport (32).
 - Provide fast and reliable public transport (32).
 - Be environmental and zero carbon (28).
 - Be people centred – prioritising pedestrians and cyclist (26).
 - Enable interconnection (e.g. north/south/east/west/urban/rural) (25).
- 17.2 In addition, C2C has the potential to complement delivery of the other highest scoring priorities:
- Restrict the city centre to only clean and electric vehicles (27).
 - Be managed as one coordinated system (e.g. Transport for Cambridge) (25).
- 17.3 The Citizens' Assembly voted on a series of measures to reduce congestion, improve air quality and public transport. Of the measures considered, Assembly members voted most strongly in favour of road closures, followed by a series of road charging options (clean air zone, pollution charge and flexible charge). These will be considered further as packages develop.

18. Financial Implications

- 18.1 This report recommends that the C2C project proceeds to the next stage. The financial implications are contained within the body of the report. The total budget allocated is £157m and once the design is refined and mitigation requirements identified the budget will either be confirmed or any changes will be requested for approval from the Executive Board.

Have the resource implications been cleared by Finance? **Yes**

Name of Financial Officer: Sarah Heywood

19 Next Steps and Milestones

- 19.1 The next steps in the development of the project include the key elements set out in Table 6 below.

Table 6: Indicative Programme

Task	Commentary	Timescale
Prepare an application for statutory consent including Environmental Impact Assessment and Environmental Statement	The power to construct the scheme is likely to come from a Transport and Works Act Order which would be determined by the Secretary of State for Transport. This process is likely to include a Public Inquiry directed by an independent Inspector. Work to be undertaken will include Environmental Impact Assessment as well as Transport Assessment, Road Safety Audit etc. This will draw on further work to be done on scheme design including mitigation measures and further stakeholder engagement.	Submit application early 2021 with a determination period estimated of around 18 months – completed in 2023
Seek authority to construct project	Following the completion of the statutory permissions stage, the Board will be presented with the Final Business Case for approval. This will trigger the construction of the project.	2023 depending on statutory powers process
Opening of the scheme to operational services	Planned opening	Planned for 2025

20. List of Appendices

(<https://greatercambs.filecamp.com/s/qPIODPJ6PFVX33L5/fo>)

Appendix 1	OBC - Strategic case, Economic case, Commercial case, Financial Case and Management Case and Appendices including Appendix C Option Appraisal Report 3 and Appendix F Bus Strategy Report - https://greatercambs.filecamp.com/s/N3Ok8LEwxGZeW18O/fo
Appendix 2	Non-Technical Summary Report - https://greatercambs.filecamp.com/s/SX3FTm0utbzFTi1V/fo
Appendix 3	C2C Phase 2 Consultation Summary Report - https://greatercambs.filecamp.com/s/93TQ8ABGnWE2xG4r/fo
Appendix 4	NMU Working Group Design Principles - https://greatercambs.filecamp.com/s/v1ZbfGCfjpiVoRuX/fo
Appendix 5	LHE Working Group Design Principles - https://greatercambs.filecamp.com/s/oBF20ODteowHCyLV/fo
Appendix 6	CPCA Transport and Infrastructure Committee 4 November Committee Papers

20. Background Papers

Option Appraisal Report 1	https://citydeal-live.storage.googleapis.com/upload/www.greatercambridge.org.uk/transport/transport-projects/Option%20Appraisal%20Report%20Part%201.pdf
Option Appraisal Report 2	https://citydeal-live.storage.googleapis.com/upload/www.greatercambridge.org.uk/transport/transport-projects/Option%20Appraisal%20Report%20Part%202.pdf
National Infrastructure Commission's (NIC) report	https://www.nic.org.uk/publications/national-infrastructure-assessment-2018/
Local Plan for Cambridge City	https://www.cambridge.gov.uk/local-plan-2018
Local Plan for South Cambridgeshire	https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/the-adopted-development-plan/south-cambridgeshire-local-plan-2018/
Transport Strategy for Cambridge and South Cambridgeshire (TSCSC)	https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/transport-plans-and-policies/cambridge-city-and-south-cambs-transport-strategy
Draft Cambridgeshire and Peterborough Local Transport Plan (CPLTP)	https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf
East of England Forecasting Model 2017	https://cambridgeshireinsight.org.uk/eefm/
Madingley Road Quick Wins Options Outline Technical Note	https://citydeal-live.storage.googleapis.com/upload/www.greatercambridge.org.uk/transport/transport-projects/C2C%20LLF%20Technical%20Note%20-%20Madingley%20Road%20Quick%20Wins%2014-05-2019.pdf
Northern route technical note	https://citydeal-live.storage.googleapis.com/upload/www.greatercambridge.org.uk/transport/transport-projects/C2C%20LLF%20Technical%20Note%20Northern%20Route%2022-05-2019.pdf
Bourne Airfield Supplementary Planning Document	https://www.scambs.gov.uk/bournairfieldSPD
Cambourne to Cambridge Segregated Bus Route: Consideration of Green Belt Issues Report	https://citydeal-live.storage.googleapis.com/upload/www.greatercambridge.org.uk/transport/transport-projects/Appendix%20L1c.pdf
<u>Cambourne to Cambridge Interim Planning Assessment</u>	https://citydeal-live.storage.googleapis.com/upload/www.greatercambridge.org.uk/transport/transport-projects/Cambourne%20to%20Cambridge%20interim%20planning%20appraisal%2010%20Sep%202019.pdf
Environmental surveys and assessments including initial air quality assessments	https://www.greatercambridge.org.uk/transport/transport-projects/cambourne-to-cambridge/cambourne-to-cambridge-background/