
The Cambourne to Cambridge Order

Transport And Works Act 1992

Transport And Works (Applications And Objections Procedure) (England And Wales) Rules 2006

Outline Business Case Addendum

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Greater Cambridge Partnership

CAMBOURNE TO CAMBRIDGE

OUTLINE BUSINESS CASE: Appendix A -
Strategic Case Addendum



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1 INTRODUCTION

1.1 OUTLINE BUSINESS CASE

- 1.1.1. The Cambourne to Cambridge Public Transport Project (CtoC) Outline Business Case (OBC) Strategic Case document was prepared in January 2020¹. The OBC was developed in line with HM Treasury and Department for Transport (DfT) guidance on the preparation of a 5-Case business case.
- 1.1.2. In August 2021, the DfT released an update to the *Transport Business Case* guidance document to reflect the 2020 HM Treasury Green Book review. The Green Book review resulted in an increased emphasis on the Strategic Case, demonstrating alignment to the national policy priorities of net zero and levelling-up.

1.2 PURPOSE OF THIS DOCUMENT

- 1.2.1. This Strategic Case Addendum provides a companion document to the existing Strategic Case, focussing on a review and update of the alignment of local, regional and national policy with carbon net zero and levelling up. It further captures the development of the proposed scheme design and provides an update on other schemes and developments related to the CtoC scheme. It also adds to the narrative to strengthen the case for the CtoC scheme by providing new evidence based on the latest information available.
- 1.2.2. The Strategic Case Addendum creates a link to the Economic Case Addendum as well. The Strategic Case Addendum introduces the framework for the Spending Objective Analysis Statement, which is presented alongside the Value for Money (VfM) statement in the Economic Case Addendum. The scheme SMART objectives are mapped to the impacts appraised in the Economic Case to ensure appropriate note is taken of the overall scheme alignment and achievement of the strategic objectives.

1.3 STRUCTURE OF THIS DOCUMENT

- 1.3.1. The structure of this document is set out below.
 - Chapter 2 provides a summary overview of the Strategic Case developed in January 2020 and sets out the areas for review and update in this addendum document
 - Chapter 3 provides the review and update of policy and the strategic fit of the scheme with changes in policy
 - Chapter 4 provides a review and update of the scheme design

¹ <https://www.greatercambridge.org.uk/asset-library/Sustainable-Transport/Public-Transport/Cambourne-to-Cambridge/CtoC-OBC-Jan-2021/CtoC-Jan-2020-App-1-Strategic-Case.pdf>

- Chapter 5 provides a review and update of the SMART spending objectives and links them to the Economic Case Addendum, as part of the Spending Objective Analysis Statement
- Chapter 7 provides a review and update of scheme interdependencies and further relevant development projects

2 STRATEGIC CASE

2.1 INTRODUCTION

2.1.1. The Strategic Case was produced in January 2020. This chapter provides an overview of the Strategic Case.

2.2 CTOC SCHEME OBJECTIVES

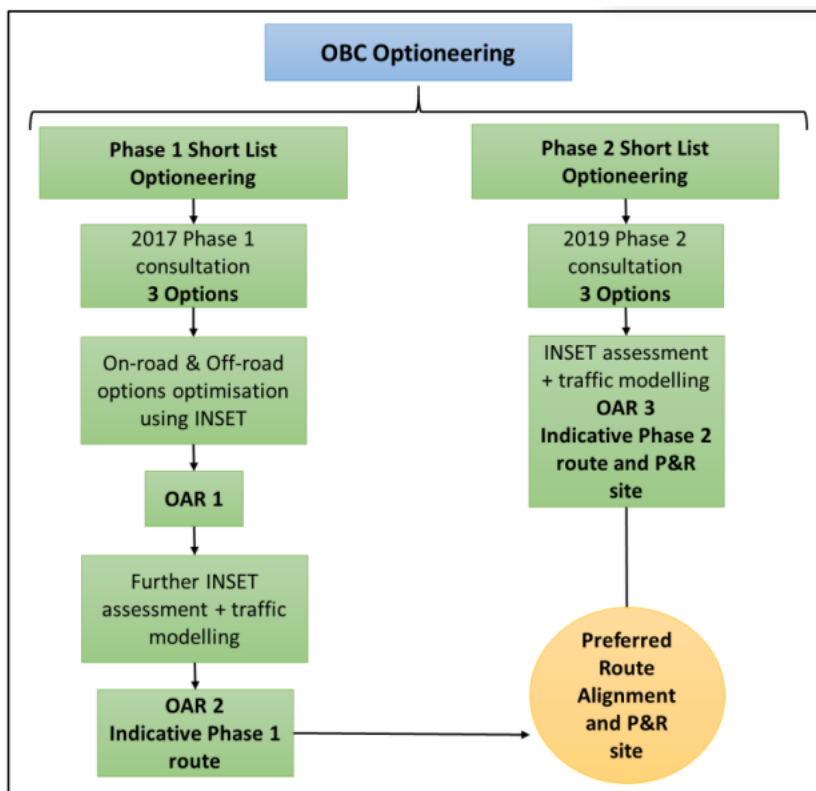
2.2.1. The objectives for the CtoC scheme are as follows:

- To achieve improved accessibility to support the economic growth of Greater Cambridge
- To deliver a sustainable transport network/system that connects areas between Cambourne and Cambridge along the A428 / A1303
- Contribute to enhanced quality of life by reducing congestion and improving air quality within the surrounding areas along the A428 / A1303 and within Cambridge city centre

2.3 OBC OPTIONEERING PROCESS

2.3.1. The OBC preferred option was developed from a shortlisting process over the period 2014 to 2016 for the Strategic Outline Business Case (SOBC) stage. Options were developed in terms of two phases to reflect the targeting of funding from the City Deal. Phase 1 is the section of route between Madingley Road roundabout and the city centre. Phase 2 is the section between Cambourne and Madingley Road roundabout. Figure 2-1 shows the approach used to select the preferred option.

Figure 2-1 – OBC Option Development



Source: CtoC Outline Business Case, Strategic Case, January 2020

- 2.3.2. The SOBC presented five options (representing combinations of Phase 1 and Phase 2 including alternative Park and Ride sites). Following approval of the SOBC, further work was undertaken to develop a preferred route alignment for Phase 1 (assessing on-road and off-road options) and Phase 2 of the scheme. The preferred Park and Ride site location was also confirmed as part of the preferred option.
- 2.3.3. As indicated in Figure 2-2 the Phase 1 route runs from the Madingley Mulch roundabout into Cambridge. The route will connect into the existing bus network on Grange Road, and onwards to other destinations such as the city centre, Cambridge Biomedical Campus, Addenbrookes Hospital and Cambridge Science Park. Phase 2 links the route further west, out to Cambourne, through the proposed development at Bourn Airfield. Phases 1 and 2 together will provide the complete end-to-end high quality public transport (HQPT) scheme between Cambourne and Cambridge and it is envisaged that both phases and the Scotland Farm Park and Ride site will be delivered in parallel. The outcome of further option development was the recommended option shown in Figure 2-3.
- 2.3.4. The strategic economic benefits of the scheme are improvements in public transport journey times along the CtoC Road corridor (A428/A1303), which in turn represent improvements in public transport connectivity and accessibility. The scheme will support new housing in the corridor and employment growth more widely across Cambridge.

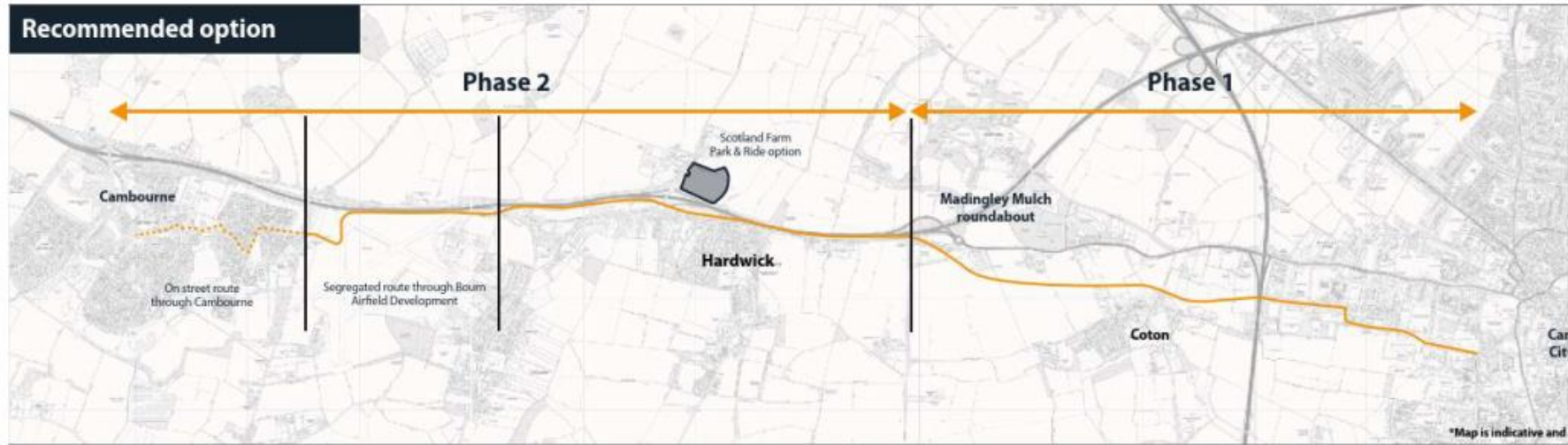
Revisions to the Preferred Route

- 2.3.5. The approach to Grange Road was assessed in 2017 at the end of the Stage Report², which compared alternatives including Adams Road and the Rifle Range access track.
- 2.3.6. When CtoC was presented to the GCP Executive Board on 6th December 2018, the recommendation was that the CtoC route would approach Grange Road via the Rifle Range track. This recommendation was set out in the Options Appraisal Report Part 1 (OAR1) of the OBC.
- 2.3.7. At the time the OBC was produced, the CtoC scheme was envisaged as part of a wider HQPT network including CAM (Cambridge Autonomous Metro). At that time, and following a review of Green Belt impacts, the emerging preferred route was modified to access Grange Road via Adams Road. This modification was made as Adams Road offered future-proofing given the potential delivery of CAM which would have rendered the section of CtoC on the Rifle Range access track between West Cambridge and Grange Road redundant.
- 2.3.8. Subsequently to the production of the OBC, but prior to approval of the preferred route, the CAM was cancelled, reversing the future-proofing argument, and the recommended alignment reverted to the Rifle Range access track in line with OAR1, and as shown in Figure 2.3. The two options were recognised to be finely balanced, but the Rifle Range access track alignment, which offers a segregated route, was considered better aligned with the scheme objectives as assessed in the OAR1.
- 2.3.9. Details of the latest scheme developments after the 2022 consultation are discussed in Chapter 4 but for the purposes of this addendum the CtoC scheme comprises the following:

² <https://www.greatercambridge.org.uk/asset-library/Sustainable-Transport/Public-Transport/Cambourne-to-Cambridge/CtoC-End-of-Stage-Report-Sept-2017-Appendix-N3.pdf>

- a two-way guided busway 13.6 kilometres in length commencing at Sterling Way, Cambourne and terminating at Grange Road, Cambridge segregated from local highways except for stretches along St Neots Road and Charles Babbage Road;
- intermediate bus stops along the route and an emergency and maintenance access track for most of the length of the guided busway with full access for pedestrians and cyclists. Most of the length of the service track will also function as a bridleway;
- a new travel hub building and Park and Ride site east of Scotland Farm with access for the buses over the existing A428 bridge
- new bridges over the M11 and at Bin Brook to provide for the two-way guided busway and adjoining emergency and maintenance track;
- access roads, temporary compounds, stopping up, diversion and creation of public rights of way, highway crossings, drainage works and attenuation and infiltration ponds

Figure 2-2 – CtoC 2020 OBC Recommended Option with Phasing



Source: <https://www.greatercambridge.org.uk/asset-library/Sustainable-Transport/Public-Transport/Cambourne-to-Cambridge/CtoC-OBC-Jan-2021/CtoC-Jan-2020-App-1-Strategic-Case.pdf>

Figure 2-3 – Preferred Route as approved following OBC



Source: <https://consultcambs.uk.engagementhq.com/CtoC-eia-2022>

2.4 CTOC USER TRANSPORT IMPACTS

2.4.1. The CtoC scheme can be summarised as having the following user transport impacts:

- A reduction in bus journey times between Cambourne West and Cambridge city centre
- An increase in bus passenger demand
- Improved journey time reliability
- Increased bus mode share

2.5 ECONOMIC IMPACTS OF THE CTOC SCHEME

2.5.1. The five strategic economic benefits of the CtoC scheme on the Cambridge economy set out in the Strategic Case of the 2020 OBC document are as follows:

- Improving labour market access and mobility
- Supporting business investment and long-term economic growth
- Supporting productivity growth through agglomeration economies
- Supporting inclusive economic growth
- Quality of Life impacts

2.5.2. To capture the wider economic benefits of the CtoC scheme in supporting development, the impact of change in land use to more productive uses was assessed through quantification of land value uplift benefits in line with HM Treasury's Green Book and DfT's Transport Analysis Guidance (TAG).

2.6 ISSUES AND OPPORTUNITIES

2.6.1. The Strategic Case reviewed key transport issues and opportunities for the CtoC scheme, as follows:

- Increasing inward commuting to Cambridge employment from the surrounding urban area is creating traffic congestion, highlighting the need for sustainable public transport connectivity between home and workplace to support economic growth.
- Providing a public transport network, which can meet the needs of commuters, not only to access the city centre, but also employment centres across Cambridge. The CtoC scheme offers an opportunity to connect residents in the A428 / A1303 corridor to a wide variety of journey destinations across Cambridge through interchange with other public transport services. This opportunity is aligned with the City Deal objectives to better connect growth areas to employment through sustainable modes of transport.
- As Cambourne has developed, the A428 / A1303 corridor has experienced high rates of growth in road traffic. These rates of traffic growth are forecast to continue and with limited road capacity, traffic congestion will extend across more of the surrounding road network. The CtoC scheme offers an opportunity to encourage mode shift from car to the HQPT services and active transport modes, providing sustainable transport services supporting further economic growth in West Cambridge.
- The proposed East West Rail shortlisted options in the West Cambridge corridor, Route B and Route E included a potential station at Cambourne. An East West Rail station at Cambourne would offer a rail service for Cambourne residents travelling to destinations readily accessible from Cambridge railway stations. CtoC would complement East West Rail as CtoC would be the key public transport mode for intermediate locations including the Bourn Airfield development between Cambourne and Cambridge city centre.

- The CtoC scheme has some local cycling links, although not an end-to-end segregated cycle route between Cambourne and the city centre. The scheme, however, will offer improved cycling infrastructure and encourage greater use of cycling where feasible to reduce the use of the car and support future economic growth. Cycling will be supported through signed on- and off-road routes, and local links connecting villages with on-road and segregated paths.

2.7 ENVIRONMENTAL ISSUES AND OPPORTUNITIES

- 2.7.1. The Strategic Case includes an environmental review highlighting the impact of increasing road traffic on exacerbating existing low air quality and increased carbon emissions. The CtoC scheme will encourage mode shift from cars reducing traffic levels and hence improve air quality and reduce greenhouse gas emissions and noise levels in Cambridge city centre. The scheme will also contribute to the maintenance of low levels of pollution along the route. There are opportunities to mitigate the scheme's environmental impact by landscaping.

2.8 OTHER SCHEMES

- 2.8.1. Schemes with an impact on travel into Cambridge in the A428 / A1303 corridor which are in progress or being considered are identified in the Strategic Case. Impacts need to be considered with respect to local traffic movements and the level of demand for Park and Ride.

- 2.8.2. Other schemes identified include:

- CAM – no longer being progressed
- City Access Programme in particular Making Connections (development of the Sustainable Travel Zone proposal has been stopped, further discussed in Section 7.2)
- Cambridge South-East Transport System
- Cambridge South-West Travel Hub
- Greenways
- East West Rail

- 2.8.3. In addition to the above presented schemes and projects, stakeholders are identified as a key interdependency for the CtoC scheme to ensure the scheme meets the stakeholder needs.

2.9 ROUTING STRATEGY

- 2.9.1. Parallel to the development of the preferred alignment option, a routeing strategy was developed for the CtoC scheme bus services. The proposed bus route strategy comprised three direct express bus services as follows:

- Cambourne to Cambridge city centre at a 10-minute interval service (6 buses per hour)
- Cambourne to the Biomedical Campus at a 30-minute interval service (2 buses per hour)
- A428 Park and Ride site to the Biomedical Campus at a 30-minute interval service (2 buses per hour during peak periods)

- 2.9.2. Additionally, interchanges were planned with the Universal route, operated by Whippet Coaches, at West Cambridge, serving Cambridge North and the Cambridge Science Park. These services would offer:

- Biomedical Campus to Eddington at a 15-minute interval service (4 buses per hour)
- Biomedical Campus to Cambridge North station and Cambridge Science Park at a 30-minute interval service (2 buses per hour)

- 2.9.3. The bus route strategy represents proposed routes and is subject to agreement with existing bus route operators. It is stated that further work will be undertaken with operators to ensure the routes set out at OBC stage represent the most appropriate scenario. It is also noted that other routes could be considered such as the route via West Cambridge, the new development at Eddington Green, and Darwin Green to the Cambridge Science Park.
- 2.9.4. The recommended preferred option will bring buses on a dedicated guided busway to the closest feasible point to central Cambridge where the scheme bus routes will join the existing city centre bus route network.
- 2.9.5. The OBC has been developed assuming standard Euro VI buses which meet the standards of Clean Air Zones. However, the Economic Case includes a sensitivity test for replacement of Euro VI buses with electric buses. A physical guidance system was assumed, although the GCP wished to consider evolving automatic guidance systems.

2.10 SCHEME CONSTRAINTS

- 2.10.1. Scheme constraints identified by the OBC were as follows:
- The Coton Conservation Area including a Grade 1 listed Church. The scheme must be reviewed in terms of the setting of these protected assets.
 - Adams Road which lies in the West Cambridge Conservation Area. The scheme must seek to minimise impact on this area.
 - Land parcels owned by Cambridge Past, Present and Future, which are protected by National Trust Covenants. Engagement with both organisations is needed to minimise the impacts.
 - Crossing the M11 motorway which creates a severance impact for vehicles, pedestrians and cyclists travelling between Cambridge and areas to the West of the city.
 - Fitting within available space in areas where the alignment passes relatively close to properties. For example, along some parts of the St Neots Road. Where necessary noise barriers will need to be explored as an option to ensure that traffic noise experienced by residents reduces.
 - Minimising the impact on the Coton Orchard and a City Wildlife Site, to the west and east of the M11 respectively which the alignment for the preferred option bisects (note - neither site has national designation, but the impact on either should be minimised).
 - Providing appropriate traffic calming and management proposals to mitigate rat-running to Park & Ride sites.
 - Any new Park & Ride service will need to be to a standard similar to that currently operating for Cambridge's Park & Ride services as set out in the current Access Agreement, which states that the Bus Operator will operate the Park & Ride Bus Services in accordance with the established minimum requirements.
 - Communities along the corridor are served by the Citi 4 Bus Service, amongst others. This is a stopping service which could provide a feeder for the busway. Whilst the decision as to future Bus Services lies with bus operators, the provision of the Busway should not prevent the provision of existing services.
 - The scheme must provide a segregated route for non-motorised users, as a minimum to include cyclists and walkers, but where appropriate equestrians, and to ensure that all pedestrian facilities are accessible for all.

2.11 STRATEGIC CASE REVIEW

2.11.1. The OBC was produced in January 2020. A review of the OBC was undertaken in August 2022 which identified some updates for the Strategic Case. These updates relate to the following sections of the Strategic Case:

- Policy Review: There have been significant updates in local, regional and national policy.
- A review and update of transport schemes which are considered complementary to the CtoC scheme; and
- A review and update on the development projects, particularly with a dependency on the CtoC scheme implementation for delivery of the development.

2.11.2. These updates are set out in the following chapters.

3 POLICY REVIEW

3.1 LOCAL

3.1.1. The following local level policies have been released since the production of the OBC:

THE CASE FOR CAMBRIDGE (DEPARTMENT FOR LEVELLING UP AND HOUSING & COMMUNITIES, 2024)³

- 3.1.2. Greater Cambridge has become one of the UK's foremost innovation centres, home to a flourishing scale-up ecosystem and range of globally significant companies. As of 2023, a total of 23 businesses born in Cambridge have reached the \$US one billion 'unicorn' status and the city is Europe's largest technology cluster, home to over 5,000 high tech firms. This explosion of innovation and entrepreneurship has been termed the 'Cambridge Phenomenon'.
- 3.1.3. The Case for Cambridge, produced by the Department for Levelling Up, Housing and Communities, outlines the economic rationale for the growth of Cambridge and its potential to enhance its position as Europe's science capital. Some of the challenges facing Greater Cambridge were found to be the following:
- **Housing affordability:** Cambridge is one of the most expensive cities in the UK for buying a home relative to local pay. Since 2014, house prices have increased by 78% and pay by only 23%. Rents are also high, often making it difficult to live close to work.
 - **Transport and mobility:** Severe road congestion in Cambridge is a feature of daily life, leading to delays, frustration for local people, poor air quality and related health consequences. Critically, pressured public transport and poor connectivity is constraining the local economy, creating delays and is inefficient for everyone.
 - **Laboratory Space:** There is a significant shortage of laboratory space in Cambridge. Larger occupiers expanding in Greater Cambridge could take years to acquire the right facilities, with the risk that they choose to locate outside of the UK entirely.
- 3.1.4. The document describes the steps to tackle these issues, highlighting the role of the Cambridge Delivery Group (CDG) which endeavours to 'kickstart' development and deliver an ambitious programme of works. The CDG is actively supporting the local area to unlock and accelerate the delivery of planned growth at key strategic sites, including the Cambridge Biomedical Campus.
- 3.1.5. The document also discusses improvements to transport in Greater Cambridge to provide better connectivity and a wider range of safe, speedy and pleasant transport options. As part of the levelling up of Cambridge, the government envisages a transport system made up of several elements which may range from improved walking and cycling routes to mass transit system options, to deliver a step-change in capacity and connectivity. To support this ambition, the government will deliver East West Rail to connect other innovation and economic centres to

³ [The Case for Cambridge \(www.gov.uk\)](https://www.gov.uk)

Cambridge, and ensure that the Cambridge Biomedical Campus, the world-leading life sciences cluster, has the right public transport links.

- 3.1.6. The CtoC scheme aims to deliver a sustainable transport network which enhances connectivity between Cambourne and Cambridge. The scheme plans to provide a new bus route, with a path for walkers, cyclists and horse riders alongside, as well as a new travel hub at Scotland Farm. This would help in addressing some of the issues and supporting the solution of some of the challenges facing Cambridge.
- 3.1.7. The shorter and more reliable journeys between Cambourne and Cambridge would create a viable option to live in more affordable housing in Cambourne and commute to Cambridge for work, supporting a better standard of living. It would also allow businesses to reach a wider range of workers and possibly more workspaces. The new routeing strategy also includes services to Cambridge Biomedical Campus.

LOCAL TRANSPORT AND CONNECTIVITY PLAN (CAMBRIDGESHIRE & PETERBOROUGH COMBINED AUTHORITY, 2023)⁴

- 3.1.8. The Local Transport and Connectivity Plan (LTCP) is the Combined Authority's long-term strategy to improve transport in Cambridgeshire and Peterborough. The LTCP aims to address big transport issues like climate change, pollution, inequality, and public health. It aims to support growth in jobs, the economy, and housing growth while also protecting and improving the environment.
- 3.1.9. The LTCP was approved on November 29th 2023 by the Combined Authority's Board. The LTCP marks a new era for transport in the region. It sets out a vision and goals for how transport supports a better future and describes the projects needed to make that new future possible. This includes things like better buses, more train services, less pollution and carbon emissions, and helping more people to cycle and walk.
- 3.1.10. The LTCP focuses on six goals. These show the outcomes for the transport network to achieve in Cambridgeshire and Peterborough. The goals are:
- **Productivity:** Giving both employers and people the means to achieve more of their potential, making them more efficient and more innovative to create more prosperity.
 - **Connectivity:** People and communities are brought closer together, giving more opportunity for work, education, leisure and pleasure.
 - **Climate:** Successfully and fairly reducing emissions to Net zero by 2050.
 - **Environment:** Protecting and improving green spaces and improving nature with a well-planned and good quality transport network.
 - **Health:** Improved health and wellbeing enabled through better connectivity, greater access to healthier journeys and lifestyles and delivering stronger, fairer, more resilient communities.
 - **Safety:** To prevent all harm by reducing risk and enabling people to use the transport system with confidence.

⁴ [Local Transport and Connectivity Plan \(2023\) | Cambridgeshire & Peterborough Combined Authority \(cambridgeshirepeterborough-ca.gov.uk\)](https://cambridgeshirepeterborough-ca.gov.uk/local-transport-and-connectivity-plan-2023/)

- 3.1.11. The LTCP sets out to reduce the amount of car journeys in Cambridgeshire and Peterborough, through cutting the number of miles driven by 15%. The LTCP instead plans for more journeys to be taken by public transport like buses and trains, and also by cycling or walking. The aim is to shift people out of cars and on to other forms of transport by making them better and easier to use.
- 3.1.12. The plan also includes a strategy for buses so that the number of passenger journeys doubles by 2030. This includes a range of improvements, from more electric buses to significant change to how services operate from the current deregulated system.
- 3.1.13. The CtoC scheme contributes towards provision of an integrated public transport network in the region with improvements also to active mode infrastructure. The objective of the CtoC scheme is to improve connectivity and job accessibility between Cambourne and Cambridge as well as the developments along the corridor. Furthermore, the scheme aims to encourage mode shift to sustainable modes of transport by making public transport more frequent and reliable. These objectives are in line with the LTCP as it addresses the challenges identified in the plan.
- 3.1.14. The local strategy for Greater Cambridge mentions the CtoC scheme to support the around 8,000 new homes planned in the area, along the A428 / A1303 corridor, highlighting the dependence of the developments on the scheme.

CAMBRIDGESHIRE'S ACTIVE TRAVEL STRATEGY (2023)⁵

- 3.1.15. Cambridgeshire's Active Travel Strategy provides a comprehensive set of policies that will enable quality provision of active travel infrastructure and initiatives in Cambridgeshire to contribute to the County Council's target to achieve Net zero carbon by 2045. By enabling and encouraging more people to travel by active travel modes, the number of journeys made by car can be reduced.
- 3.1.16. The strategy sets out to make active travel safe, pleasant and convenient in order to become the preferred travel choice for local journeys. It will have a significant role to play in addressing the following:
 - Improvements to Cambridgeshire's wider transport network by reducing the pressure of ever-increasing vehicular traffic on the roads and the significant impact this has.
 - Sustainable growth in Cambridgeshire through well-connected and integrated sustainable transport networks and supporting infrastructure.
 - Achieving a number of significant environmental targets at a local level, including for Net zero carbon, air quality and biodiversity.
 - Achieving a significant positive impact on people's health, wellbeing and quality of life by enabling more active lifestyle choices, creating pleasant spaces for people to travel along and spend time in, and provide affordable, inclusive access to key services for people of all ages and ability.
 - Ensuring that all new developments meet a common standard of infrastructure provision for inclusive walking and cycling across the county.
- 3.1.17. The Cambourne to Cambridge guided busway includes an emergency and maintenance access track offering the option of walking, cycling and along most of its length horse riding for shorter

⁵ [Cambridgeshire's Active Travel Strategy \(2023\) | Cambridgeshire County Council \(cambridgeshire.gov.uk\)](https://www.cambridgeshire.gov.uk/active-travel-strategy-2023)

journeys. It also supports the first and last mile journeys to be made via active travel. Therefore, the scheme greatly aligns with Cambridgeshire's active travel strategy, supporting the area in sustainable growth, reaching environmental targets, promoting healthier lifestyles and overall, a better quality of life.

CAMBRIDGESHIRE'S LOCAL CYCLING AND WALKING INFRASTRUCTURE PLAN (2022)⁶

- 3.1.18. Cambridgeshire's Local Cycling and Walking Infrastructure Plan (LCWIP) forms part of the government's ambition to increase walking and cycling, particularly to school, in the UK by 2025 as outlined in the Cycling and Walking Investment Strategy (CWIS, 2017 and CWIS 2, 2022). The CWIS sets out the government's aim to make walking and cycling the natural choice for all short journeys, or as a part of a longer journey.
- 3.1.19. The LCWIP forms part of a long-term vision to improve Cambridgeshire's walking and cycling networks in order to increase the number of residents travelling on foot and by cycle and thereby improve the health and well-being of all those living and working in Cambridgeshire.
- 3.1.20. The aim is to build on the already high levels of cycling in Cambridge and to spread the cycling culture out to the rest of the county whilst encouraging more walking by improving journeys in town centres and to schools and employment areas. Walking and cycling routes to transport hubs are particularly important and feature strongly in the routes proposed for improvement.
- 3.1.21. The proposed cycling and walking infrastructure along the guided busway between Cambourne and Cambridge will create the opportunity for commuters to mode shift. It will allow people to use the infrastructure as part of their longer journeys or for short-distance journeys, for example for their first and last mile travel. The high-quality infrastructure will provide a safer, healthier and more affordable alternative to personal car usage.

EMERGING GREATER CAMBRIDGE LOCAL PLAN (CAMBRIDGE CITY COUNCIL AND SOUTH CAMBRIDGESHIRE DISTRICT COUNCIL, 2022)⁷

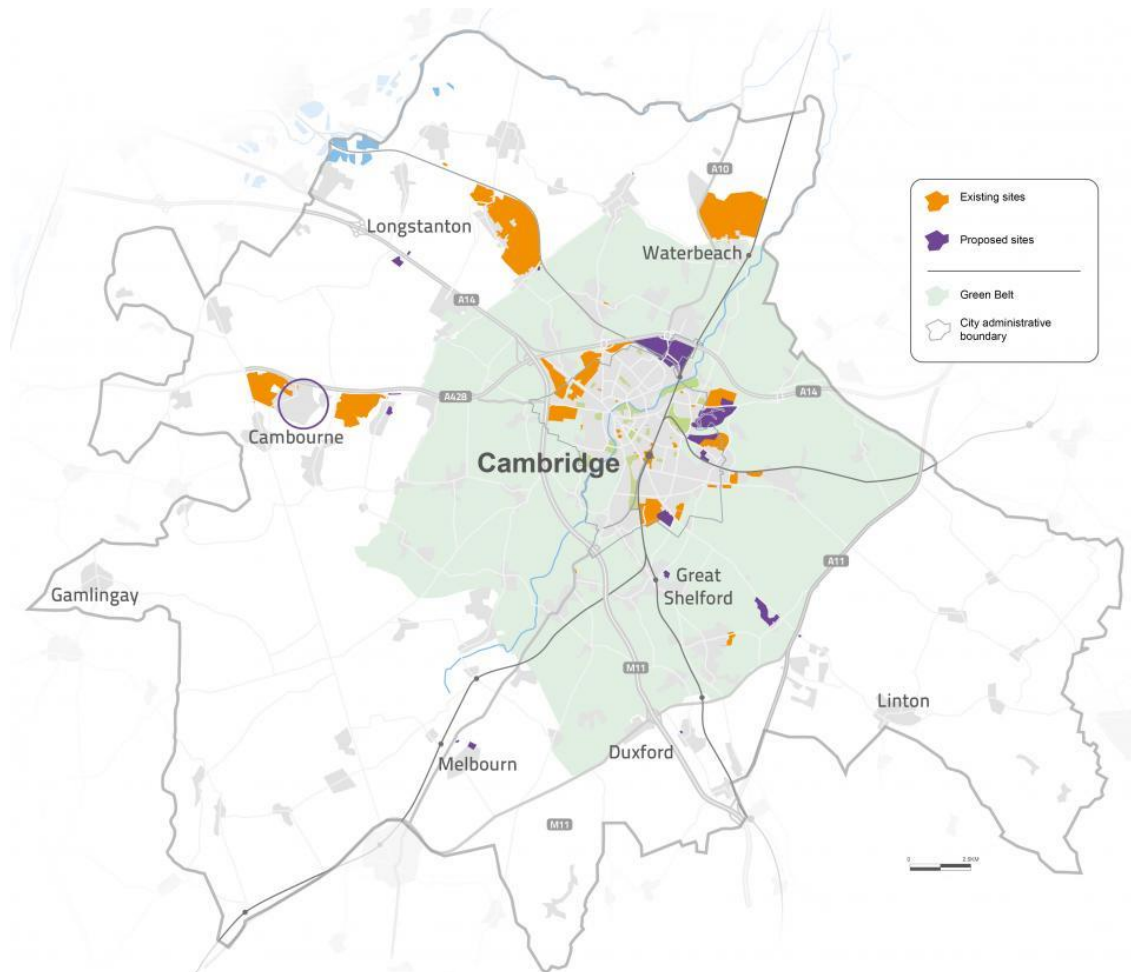
- 3.1.22. The Greater Cambridge Local Plan is a joint local plan between Cambridge City Council and South Cambridgeshire District Council. The local plan will ensure a consistent approach to planning and construction across both areas up to 2041. The consultation stage on the First Proposals has been completed.
- 3.1.23. The Greater Cambridge Local Plan has assessed a need for 44,400 new homes and 58,500 new jobs across all employment sectors in the Greater Cambridge region. These developments are targeted to be met over the plan period of 2020-2041. In terms of housing, this reflects an annual objectively assessed need for 2,111 new homes per year.

⁶ [Cambridgeshire's Local Cycling and Walking Infrastructure Plan \(2022\) | Cambridgeshire County Council \(cccandpcc.sharepoint.com\)](https://cccandpcc.sharepoint.com)

⁷ [Greater Cambridge Local Plan First Proposals \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org)

- 3.1.24. The Greater Cambridge Local Plan identifies that in addition to the current planned housing supply of 37,200 which includes adopted allocations, windfall allowance, and dwelling equivalent from communal accommodation allocated or with planning permission, there will be a need for a further 11,640 new homes to be identified to satisfy the housing need of 48,840 homes (including a 10% buffer for flexibility) for the period 2020-2041.
- 3.1.25. The First Proposal suggests 19 new sites across Greater Cambridge for additional development to meet the needs up to 2041. These development sites across Greater Cambridge are shown in Figure 3-1 which include existing sites at Cambourne West and Bourn Airfield.

Figure 3-1 – Greater Cambridge Local Plan First Proposals



Source: <https://consultations.gretercambridgeplanning.org/greater-cambridge-local-plan-first-proposals/greater-cambridge-2041/how-much-development-and-where>

- 3.1.26. As presented in Table 3-1 the following developments along the CtoC corridor are aligned to certain policies in the First Proposals for the Greater Cambridge Local Plan. The policies associated with these developments are discussed below.

- **Policy S/CB⁸ Cambourne West:** The policy identifies Cambourne as a broad location for longer term strategic scale growth with high quality public transport connectivity and responsive to the opportunity presented by the proposed East West Rail that includes a station at Cambourne. It provides guidance for the existing allocation at Cambourne West (1,200 dwellings by 2031 as per the South Cambridgeshire Local Plan⁹) that is planned to be carried forward and expanded to include the full extent of the planning permission. In 2017, following the submission of the Local Plan, the Council resolved to grant permission for a mixed-use development, including 2,350 homes on a larger site which included the land allocated in Policy SS/8 in the South Cambridgeshire Local Plan. This permission was granted for the same extent of land marked in the Emerging Local Plan but excluding the Swansley Wood Farm¹⁰. The Emerging Local Plan proposes an allocation of 2,590 homes by 2041 on the entire 159.15 hectares of land.
- Further development at Cambourne West will need to consider the relationship between Cambourne West and Bourn Airfield in terms of the planned sustainable development mix of services, employment and transport opportunities offered by the area as a whole.
- **Policy S/WC¹¹ - West Cambridge:** The policy carries forward the allocation of the West Cambridge site from the 2018 Cambridge Local Plan and is further refined to reflect the themes of the new Greater Cambridge Local Plan. The refinements include emphasis on a comprehensive approach for future development of the area that responds to the location, and the opportunities to create a thriving environment for people, as well as playing a significant role supporting the high technology economy of Cambridge. The policy focuses on the importance of providing a mix of complementary uses, high quality walking and cycling connections, and maximising opportunities provided by public transport improvements such as CtoC. In July 2024, the West Cambridge site was granted planning permission with a Section 106 agreement that safeguards the CtoC route and provides for funding of the CtoC scheme.
- **Policy BG/GI¹² – Green Infrastructure:** The policy identifies the existing green infrastructure network and the strategic initiatives intended to enhance it and addresses how development proposals should relate to green infrastructure enhancing access and connectivity. The strategic green infrastructure initiatives have been identified in the Greater Cambridge Green Infrastructure Opportunity Mapping Final Report (2021)¹³. The policy requires development proposals to provide benefits for people, wildlife and planet. The CtoC scheme offers developments an opportunity to fulfil these requirements by contributing to scheme development. CtoC particularly is aligned with the ambitions of the policy to promote healthy living by providing access to active travel infrastructure and enhancing access and connectivity.

⁸ [Policy S/CB: Cambourne | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org/policy-s-cb-cambourne)

⁹ [South Cambridgeshire Adopted Local Plan 2018 \(scambs.gov.uk\)](https://scambs.gov.uk/south-cambridgeshire-adopted-local-plan-2018)

¹⁰ [All Planning Applications for Cambourne \(2017\) | South Cambridgeshire District Council \(scambs.moderngov.co.uk\)](https://scambs.moderngov.co.uk/all-planning-applications-for-cambourne-2017)

¹¹ [Policy S/WC: West Cambridge | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org/policy-s-wc-west-cambridge)

¹² [Policy BG/GI: Green infrastructure | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org/policy-bg-gi-green-infrastructure)

¹³ [Greater Cambridge Green Infrastructure Opportunity Mapping \(2021\) | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org/greater-cambridge-green-infrastructure-opportunity-mapping-2021)

- **Policy S/RRA¹⁴** - Land to the north of St Neots Road, Dry Drayton and land at Highfields (phase 2), Caldecote. The policy focuses on allocating sites for homes or employment that support the overall development strategy within the rural area, excluding the rural southern cluster.
- **Policy S/NS¹⁵** - Bourn Airfield New Village: The policy confirms that the three new settlements of Northstowe, the new town north of Waterbeach, and Bourn Airfield new village, will continue to be developed during the period of the new Greater Cambridge Local Plan and provides context for their development. Under this policy, it is noted that the existing SPD for land north of Waterbeach and Bourn Airfield will be carried forward.

- 3.1.27. As part of the plan-making process, 900 sites were assessed for possible inclusion in the Greater Cambridge Local Plan. Out of the 900 sites, 19 new sites have been chosen and proposed in the First Proposals document. These 19 sites are thought to be suitable for additional development to meet the needs up to 2041. Table 3-1 lists the sites that were included in the 2018 Cambridge and South Cambridgeshire Local Plans and have planning permissions. Table 3-2 shows the new sites included in the First Proposals. Updates on the developments in the 2018 Cambridge Local Plan and South Cambridgeshire Local Plan are discussed in Section 7.4.
- 3.1.28. It should be noted that the new sites in First Proposals - Land to the north of St Neots Road and land at Highfields (phase 2) - will only be allocated when the new Greater Cambridge Local Plan is adopted which may not be until 2024 or 2025.
- 3.1.29. The proposed development on land north of Cambourne is one of the 900 sites which has not been shortlisted and included in the First Proposals. However, if this site was included in the further revisions of the Local Plan, it would add 10,000 homes and 40,000 sqm of employment to the CtoC corridor and significantly increase traffic flows along the CtoC corridor and potentially Park and Ride demand.

Table 3-1: Existing sites for development and Emerging Greater Cambridge Local Plan Policies

Site Name	Status	Type	Area (in hectares)	Policy
Cambourne West	Existing - in the 2018 South Cambridgeshire Local Plan.	Mixed Use (Housing Delivery 2020-41: 2,590 units)	159.15	Policy S/CB
West Cambridge (M13)	Existing - in the 2018 Cambridge Local Plan	Mixed Use (academic and commercial use)	66.90	Policy S/WC

¹⁴ [Policy S/RRA: Site allocations in rest of the rural area | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org/)

¹⁵ [Policy S/NS: Existing new settlements | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org/)

Site Name	Status	Type	Area (in hectares)	Policy
Bourn Airfield New Village	Existing - in the 2018 South Cambridgeshire Local Plan	Mixed Use (Housing Delivery 2020-41: 2,460 units, post- 2041: 1,040 units) *	171.81	Policy S/NS
North West Cambridge (Eddington)	Existing - in the 2018 Cambridge Local Plan	Mixed Use (Housing Delivery 2020-41: 3,142 units)	90.93	Policy S/NWC
West Cambridge Green Infrastructure buffer - Coton corridor	Based on Greater Cambridge Green Infrastructure Opportunity Mapping. Adapted from policies in 2018 Cambridge Local Plan	Green Infrastructure		Policy BG/GI – Green Infrastructure
Western Gateway multifunctional GI corridors	Based on Greater Cambridge Green Infrastructure Opportunity Mapping. Adapted from policies in 2018 South Cambridgeshire Local Plan	Green Infrastructure		Policy BG/GI – Green Infrastructure

Table 3-2 - New sites for development in the Emerging Greater Cambridge Local Plan

Site Name	Status	Type	Area (in hectares)	Policy
Land to the north of St Neots Road, Dry Drayton	New site proposed in the Emerging Greater Cambridge Local Plan	Housing/ Employment	4.62	Policy S/RRA
Land at Highfields (phase 2), Caldecote	New site proposed in the Emerging Greater	Housing (Housing Delivery	6.04	Policy S/RRA

	Cambridge Local Plan	2020-41: 64 units)		
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- 3.1.31. The Bourn Airfield New Village development is subject to the conditions of the S106 funding agreement. As such, the delivery of the development on this site is dependent on the new public transport link that the CtoC scheme provides. As per the SPD for Bourn Airfield New Village (2019)¹⁶, the funding contribution towards CtoC is triggered prior to occupation. However, the delivery plan phasing for the units has been amended as indicated in Table 3-3 below. Planning permission has been granted for the outline planning application (S/3440/18/OL) for the development, and a S106 agreement secured. Condition 13 of the planning permission has a limit cap on occupation until CtoC is delivered.

Table 3-3 : Bourn Airfield New Village – Phasing of Development – Greater Cambridge Local Plan

2019 Bourn Airfield New Village Adoption Document		Emerging Greater Cambridge Local Plan	
2021 – 2025	425 units	2020 – 2041	2,460 units
2025 – 2031	900 (1,325) units	Post 2041	1,040 units
2031 – Beyond plan period	2,175 (3,500) units		

- 3.1.32. The vision for Greater Cambridge includes minimising carbon emissions and reducing reliance on the private car. Furthermore, in addition to the Transport Strategy, the Climate Change and Infrastructure themes identified in the First Proposals for the Greater Cambridge Local Plan specifically note the importance of active and sustainable travel options connecting homes and jobs for reducing climate impacts and economic growth.
- 3.1.33. Cambourne is identified as one of the ‘New Settlements’ to contribute 1,950 additional homes towards the 11,640 required in the region between 2020-2041. Under the Policy S/DS: Development Strategy, Cambourne is noted as the most suitable location for strategic scale development away from Cambridge. The advantage for Cambourne is attributed to the significant connectivity benefits provided by the CtoC scheme and potentially the East West Rail project. The proposed Greater

¹⁶ <https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/bourn-airfield-spd#:~:text=The%20Bourn%20Airfield%20New%20Village%20SPD%20expands%20upon%20Local%20Plan,new%20policies%20or%20site%20allocations.>

Cambridge Transport Strategy also considers CtoC and the East West Rail project when locating growth at Cambourne.

- 3.1.34. The CtoC scheme will enable significant improvement in public transport which will in turn provide an opportunity to support economic growth, enhancing the critical mass of population and employment which can be provided in the Cambourne area.

CAMBRIDGESHIRE COUNTY COUNCIL CLIMATE CHANGE AND ENVIRONMENT STRATEGY (2022)¹⁷

- 3.1.35. CCC declared a Climate and Environment Emergency in May 2019, setting them on a pathway to securing a sustainable future for CCC and its residents. The ambition of CCC is to be Net zero by 2045. The three most important opportunities they focus on are to:
- Reduce carbon emissions.
 - Support the development of resilient economies so that they can adapt to the impacts of climate change.
 - Support nature and biodiversity to thrive.
- 3.1.36. Focusing on these areas will deliver social, economic, environmental and health benefits for people, businesses and communities in Cambridgeshire.
- 3.1.37. The CtoC scheme will provide an opportunity for mode shift from private car usage to either public transport or active modes of transport, reducing emissions and creating a more resilient transport network. Therefore, the scheme will support the three objectives the Climate Change and Environment Strategy focus on.

3.2 REGIONAL

- 3.2.1. The following regional level policies have been released since the production of the OBC:

CAMBRIDGESHIRE AND PETERBOROUGH COMBINED AUTHORITY BUS STRATEGY (2023)¹⁸

- 3.2.2. Cambridgeshire and Peterborough is an economically successful, innovative, and desirable area to live and work. However, success and recent growth have brought challenges, including pressure on the transport network, a need to tackle emissions locally, and to contribute to the wider climate challenge response. Additionally, in some parts of the area, people feel disconnected from the opportunities that exist in the wider region. Public consultations have shown that people want to see good public transport services, as these will benefit them personally and their communities.

¹⁷ [Climate Change and Environment Strategy \(2022\) | Cambridgeshire County Council \(cambridgeshire.gov.uk\)](https://www.cambridgeshire.gov.uk)

¹⁸ [Bus Strategy \(2023\) | Cambridgeshire & Peterborough Combined Authority \(cambridgeshirepeterborough-ca.gov.uk\)](https://www.cambridgeshirepeterborough-ca.gov.uk)

- 3.2.3. The strategy sets out the following Vision: *‘A comprehensive network of bus services across Cambridgeshire and Peterborough that people find convenient, easy to use, reliable and good value for money, which is inclusive and offers a viable alternative to the car.’*
- 3.2.4. The bus strategy aims to achieve the following goals:
- Attract car users to mode shift.
 - Support sustainable growth.
 - Protect and enhance the environment.
 - Support community health and wellbeing.
 - Create opportunity for all.
- 3.2.5. The CtoC scheme strongly aligns with the objectives of the Bus Strategy due to consistency between their aims. The scheme will provide a sustainable transport network that will promote the economic growth of Greater Cambridge by improving connectivity and accessibility between Cambourne and Cambridge. It will provide a viable alternative to private car use, and the active travel routes offered also support health and wellbeing for people.

ENGLAND’S ECONOMIC HEARTLAND REGIONAL BUS STRATEGY (2022)¹⁹

- 3.2.6. EEH’s Regional Bus Strategy, published in July 2022, provides a consistent regional vision and approach to support the provision of high-quality services throughout the region as well as giving a better user experience and user confidence in what public transport has to offer. It acts as a framework for further place-specific work by local transport authorities and partners.
- 3.2.7. The Regional Bus Strategy recognises the forecast population and economic growth across the region and the need to decarbonise transport and reduce reliance on private car. These all provide an opportunity to enhance the public transport system to meet travel needs.
- 3.2.8. The Regional Bus Strategy has six key objectives that have been aligned with key policies of the EEH Transport Strategy. The objectives are outlined below.
- Reduced journey times (including reducing the impact of congestion on buses and reducing boarding and alighting times);
 - Enhance the bus network;
 - Enhance service quality;
 - Clearer and simpler fares;
 - More awareness of the bus network and willingness to choose bus travel; and
 - Decarbonised bus services.
- 3.2.9. The sustainable bus network provided by the CtoC scheme would help in the overall goal of EEH of decarbonising bus services. The guided busway would also provide quicker journey times and more reliable services by eliminating congestion problems. This in turn will also support mode shift to

¹⁹ [Regional Bus Strategy \(2022\) | England's Economic Heartland \(englandseconomicheartland.com\)](https://englandseconomicheartland.com/regional-bus-strategy-2022/)

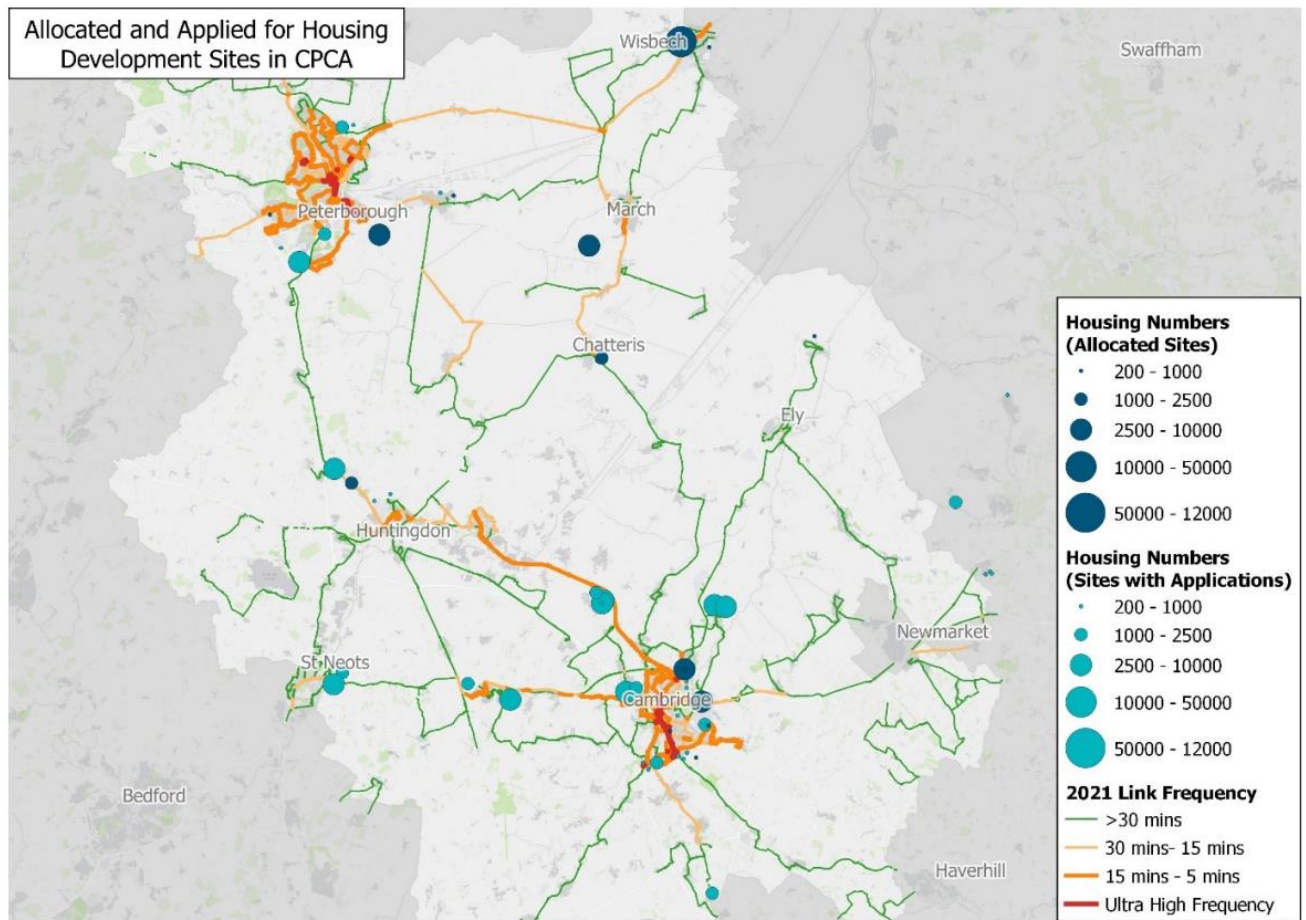
public transport, as well as active transport by providing safe and accessible active travel routes along the guided busway.

BUS SERVICE IMPROVEMENT PLAN FOR CAMBRIDGESHIRE AND PETERBOROUGH (CAMBRIDGESHIRE & PETERBOROUGH COMBINED AUTHORITY, 2021)²⁰

- 3.2.10. Since the CtoC OBC was published in January 2020 the National Bus Strategy has been produced by the DfT. A requirement of the National Bus Strategy is that each Local Transport Authority is required to produce a Bus Service Improvement Plan.
- 3.2.11. The Bus Service Improvement Plan (BSIP) for Cambridgeshire and Peterborough established a vision for bus in 2020 of “*Everyone should have the opportunity to travel; their chances in life should not be constrained by the lack of travel facilities open to them*”. This was based on extensive stakeholder and public engagement and market research.
- 3.2.12. The key elements of the vision for the BSIP are:
- Best-in-class road-based public transport services;
 - Sustainable growth through a bus network that supports economic and housing growth by connecting people with places and services;
 - Opportunity for all public transport travellers provided by a bus network that allows convenient access to jobs, facilities and services for people of all ages, incomes, abilities, locations and access to cars.
- 3.2.13. The five main objectives established in the BSIP include:
- The bus is an attractive mode of travel that competes with the car;
 - The bus network supports sustainable growth;
 - The bus helps to protect and enhance the environment;
 - The bus network supports the health and wellbeing of the population;
 - The bus provides opportunity for all.
- 3.2.14. As discussed in sections 2.2 and 2.5, the objectives and the impacts of the CtoC scheme are in line with the objectives of the BSIP.

²⁰ [Bus Service Improvement Plan for Cambridgeshire and Peterborough \(2021\) | Cambridgeshire & Peterborough Combined Authority \(cambridgeshirepeterborough-ca.gov.uk\)](https://cambridgeshirepeterborough-ca.gov.uk/bus-service-improvement-plan-2021)

Figure 3-2: Potential new housing growth in relation to the current bus network provided in BSIP



Source: Cambridgeshire and Peterborough BSIP

- 3.2.15. Figure 3-2 shows areas identified by the BSIP as opportunities for growth in bus patronage. This includes currently unserved markets with the aim to better serve new developments from the outset by bus to deliver more sustainable growth. The Cambridge – St. Neots corridor and Cambridge – Ely corridor are noted as opportunities for growing the bus market where increasing service frequencies would enable new housing locations to be better served. The BSIP states that the CtoC scheme is one of four high quality public transport schemes which will provide segregated bus infrastructure in the city (the others being the Cambridge South-East Transport Scheme, Waterbeach to Cambridge and Cambridge Eastern Access).
- 3.2.16. The BSIP identifies reliability of service and low frequency as the most important barriers to bus usage and growth based on consumer research undertaken by Cambridgeshire and Peterborough Combined Authority (CPCA). Other concerns noted by non-bus users are the need for quicker journey times, more services connecting places, greater integration and affordable fares. A survey launched by East Cambridgeshire District Council in 2020, showed that bus users particularly wanted to see more frequent services with buses running into the evening and on Sunday. It also noted that people wanted more direct routes and regular clockface timetables.

- 3.2.17. The BSIP is aligned with the GCP's sustainable transport programme, and the overall public transport strategy set out in the 2030 Greater Cambridge Future Network, which includes the CtoC scheme as a key component of the overall strategy. CtoC will provide regular and frequent services with planned interchanges with connecting orbital routes minimising overall bus trip journey times. The off-road CtoC guided busway will provide a more direct link between Cambourne and new developments, particularly at Bourn Airfield and the city centre reducing bus passengers' journey times.
- 3.2.18. The BSIP highlights that the existing road congestion will worsen as a result of the economic growth expected in the next two decades in Cambridgeshire unless there is a significant mode shift to public transport and active travel. The BSIP references economic analysis published in the Cambridgeshire & Peterborough Independent Economic Review (CPIER) which suggests that increased congestion would threaten the ability to deliver the planned growth in Greater Cambridge. A shift to public transport is also recognised as vital to tackling climate change and reducing carbon emissions produced by the transport sector. The BSIP states that there is a need for transformational improvements in the quality and provision of public transport to better serve employment and residential areas. The CtoC scheme will contribute to this objective by providing major improvements to the public transport level of service in terms of journey time reduction and improved reliability as well as supporting improvements to cycling and walking infrastructure along the growth corridor. The CtoC scheme public transport improvements will encourage modal shift and in turn contribute to the easing of congestion in the A428 / A1303 corridor.
- 3.2.19. The BSIP sets out actions and measures including the development of the four HQPT corridors to achieve more reliable bus services, faster journey times by bus, more passengers using buses and greater satisfaction with services amongst passengers. The CtoC scheme contributes to increased reliability by providing a segregated route for public transport that will result in reduced journey time and improved reliability for bus services.

ENGLAND'S ECONOMIC HEARTLAND TRANSPORT STRATEGY (ENGLAND'S ECONOMIC HEARTLAND, 2021)²¹

- 3.2.20. The 'Transport Strategy: Connecting People, Transforming Journeys' has been developed by England's Economic Heartland's (EEH) Strategic Transport Forum of political and business leaders, and provides the region and government with an evidence-based, vision-led framework focused on enabling economic growth in a way that delivers a net zero transport system by as early as 2040. The strategy covers the whole of the Oxford – Cambridge Arc, a national economic priority for the future economic growth of the UK. The Transport Strategy includes an Integrated Sustainability Appraisal and was shaped by two rounds of public engagement with its partners, stakeholders, residents and businesses, ensuring it represents the priorities of the region.
- 3.2.21. The strategy sets out a five-point plan of action to address the challenges that the transport system already faces and enable economic growth that is sustainable. It sets out that the region will:

²¹ [Transport strategy \(2021\) | England's Economic Heartland \(englandseconomicheartland.com\)](https://englandseconomicheartland.com/transport-strategy-2021)

- Focus on decarbonising the transport system by harnessing innovation and supporting solutions which in themselves create green economic opportunities
- Promote investment in digital infrastructure as a means of improving connectivity
- Use the delivery of strategic public transport schemes – such as East West Rail and Milton Keynes Mass Rapid Transit – as the catalyst for a shift towards lower carbon modes of travel
- Champion increased investment in active travel and shared transport to improve local connectivity to ensure that everyone can realise their potential
- Continue to ensure the needs of the freight and logistics sector are met whilst lowering its environmental impact

3.2.22. The Transport Strategy provides the framework to enable the development of green growth delivering a net zero transport system. The strategy identifies Cambourne as a Strategy Economic Asset defined as areas with Enterprise Zones, science parks, research and technology zones, and other key economic assets that are located outside of Regionally Significant Hubs (in this case Cambridge).

3.2.23. The CtoC scheme delivers a low emission vehicle HQPT system and improvements to cycle network infrastructure that will encourage a shift towards lower carbon modes of transport which is in line with the action plan set out by the transport strategy, serving key development areas such as Bourn Airfield and West Cambourne. The CtoC scheme is a solution to the increasing environmental impact of road traffic which is unsustainable in the west Cambridge transport corridor by offering a greener, lower emission alternative to the car.

FAIRNESS, NATURE AND COMMUNITIES: ADDRESSING CLIMATE CHANGE IN CAMBRIDGESHIRE AND PETERBOROUGH (CAMBRIDGESHIRE & PETERBOROUGH INDEPENDENT COMMISSION ON CLIMATE, 2021)

3.2.24. In October 2021, the Cambridgeshire and Peterborough Independent Commission on Climate published recommendations, outlining the approach that must be taken in order to reduce greenhouse gas emissions and tackle climate change.²² The report on climate identifies the risks to the UK from climate change as being acute. It is recognised that the region must act to contribute to the call for a national reduction in emissions.

3.2.25. The report focuses on fair and inclusive transition to a low carbon future for individuals and communities. It includes strategies and recommendations for the following:

- Transport
- Buildings
- Business and Industry
- Adaptation to climate change, Nature and Water
- Energy
- Peat

²² <https://cambridgeshirepeterborough-ca.gov.uk/news/climate-commission-calls-for-fairness-and-equity-in-tackling-the-impacts-of-climate-change/>

- Waste

3.2.26. Priority actions recognised for the transport sector include:

- The rollout of electric vehicle charging infrastructure, which provides a 'right to charge' for residents, workers and visitors to the region. This should start with bringing those districts with low provision up towards the levels of the best;
- A transition towards zero emission bus and taxi fleets by 2030;
- Measures to reduce car miles driven, including improvements to public transport, trials of on-demand electric buses and infrastructure for walking and cycling;
- Exclusion of diesel vans and trucks from urban centres by 2030.

3.2.27. The report outlines that by acting in the right way, associated sustainable opportunities may be realised such as providing new jobs in low carbon industries, safer and more comfortable homes and workplaces with lower energy bills, better air quality and more greenspace and access to nature, and improving health and wellbeing.

3.2.28. The CtoC scheme is aligned with the priority actions recognised in the report and contributes towards reduction in emissions given the scheme's ambition of operating a low emission electric vehicle based HQPT system. Additionally, CtoC's supporting cycle network infrastructure will encourage a shift towards lower carbon modes of transport and contribute towards reducing car miles driven.

3.3 NATIONAL

3.3.1. The following national level policies have been released since the production of the OBC:

NATIONAL PLANNING POLICY FRAMEWORK (MINISTRY OF HOUSING, COMMUNITIES AND LOCAL GOVERNMENT, UPDATED 2023)

3.3.2. The National Planning Policy Framework (NPPF), published by the Ministry of Housing, Communities and Local Government in February 2019 and updated in December 2023, contains the government's planning policies for England and how these are expected to be applied. It should be noted that in July 2024 a consultation draft is out to consultation and the current adopted version remains policy until the consultation version is adopted.

3.3.3. The NPPF, updated in 2023, advises that planning policies and decisions should play an active role in guiding development towards sustainable solutions and recognises three interlinked dimensions in achieving this: economic, social and environmental. The policies within the framework seek to improve health, social and cultural wellbeing for all, deliver adequate community and cultural facilities, provide services to meet the demand of local people, and create a good standard of amenity for all existing and future occupants of land and buildings.

3.3.4. The NPPF sustainable development objectives are:

- **Economic** – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure
- **Social** – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by

fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being

- **Environmental** – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy

3.3.5. Chapter 9 of the NPPF sets out policies to promote sustainable transport, including the expectation that the environmental impacts of traffic and transport infrastructure are identified, assessed, and taken into account, and that appropriate opportunities are taken for avoiding and mitigating adverse effects and achieving net environmental gains. The CtoC scheme will help to further the sustainable development goals of the NPPF and align with its key principles by:

- Promoting the use of sustainable modes of transport by the provision of an active travel network
- Encouraging the use of non-car modes to minimise air quality effects of car travel
- Creating a well-designed, beautiful and safe environment for pedestrians and cyclists

TRANSPORT DECARBONISATION PLAN (DFT, 2021)

3.3.6. The Transport Decarbonisation Plan, 'Decarbonising Transport: A Better, Greener Britain', sets out government's commitments and the actions needed to decarbonise the entire transport system in the UK.

3.3.7. This plan identifies accelerating modal shift to public and active transport as a strategic priority for achieving the net zero goals by 2050. The plan aims to make public transport and active travel the natural first choice for daily activities. Better quality infrastructure through high quality road design, dedicated routes, and networks, and enabling people to access cycles are noted to make people feel safer and more confident walking and cycling for short journeys. A cohesive, integrated and affordable net zero public transport network designed for the needs of the passengers is recognised to empower users to make sustainable end to end journeys and enable inclusive mobility.

3.3.8. The plan notes that efforts must be made to increase the share of journeys taken by public transport as buses and coaches play a crucial role in transport achieving net zero and driving green transformation. In addition to mode shift, the plan recognises the need for a zero-emission bus fleet, which is expected to achieve long term operating cost savings, which can be reinvested in improved service frequencies, lower fares and other improvements for bus users.

3.3.9. The CtoC objectives of encouraging modal shift through provision of reliable public transport with improved journey times and frequencies is aligned with the aims of the Transport Decarbonisation Plan. The active transport infrastructure improvement element of the scheme will encourage walking and cycling by enhancing safety for users, while the CtoC scheme OBC to date has been developed assuming initial operation using standard Euro VI buses.

BUILD BACK BETTER: OUR PLAN FOR GROWTH (HM TREASURY, 2021)

- 3.3.10. The 'Build Back Better: Our Plan for Growth'²³ establishes the government's plans to support growth through significant investment in infrastructure, skills and innovation, and to pursue growth that levels up every part of the UK, enables the transition to net zero, and supports the vision for Global Britain.
- 3.3.11. Within the core pillar of infrastructure, it is noted that well developed transport networks allow businesses to grow and expand, allowing them to extend supply chains, deepen labour and product markets, collaborate, innovate and attract inward investment.
- 3.3.12. One of the key places for the infrastructure investment is the Oxford-Cambridge Arc. The Oxford-Cambridge Arc establishes a long-term, holistic strategy for infrastructure investment to support jobs, unlock clean growth, and achieve net zero alongside environmental sustainability; cultivating the Arc's potential to become a global innovation powerhouse. The CtoC scheme offers a high-quality public transport network supporting growth in western Cambridge and offering potential for future integration of services with East West Rail in Cambourne enhancing further the sustainable transport options for travel between Cambourne and Cambridge city centre.

BUS BACK BETTER: NATIONAL BUS STRATEGY FOR ENGLAND (DfT, 2021)

- 3.3.13. The DfT published Bus Back Better, the National Bus Strategy for England in March 2021. The national strategy aims to transform bus services across the country ensuring buses are more frequent, more reliable, easier to understand and use, better co-ordinated, cheaper and more environmentally friendly. The Bus Back Better document sets out how the DfT intends to disburse the £3bn of new funding announced in 2020 for levelling up of buses across England; and its focus on building back bus use from the significant shift to private car from public transport caused by the COVID-19 pandemic. After the pre-COVID-19 passenger levels are achieved, the strategy intends to further exceed the previous passenger demand levels by providing guidance on making buses a practical and attractive alternative to the car for more people.
- 3.3.14. The Bus Back Better document highlights the importance of buses as part of the transport system. In 2019/2020, bus journeys were more than double those made by rail. The document outlines ways of improving bus services throughout the UK, creating sustainable offerings for all passengers and increasing the usage of buses whilst also improving economic sustainability of bus routes.
- 3.3.15. Through the guidance, Local Transport Authorities are required to commit to establishing Enhanced Partnerships, or bus franchising by the end of June 2021. The partnerships must then be delivered by April 2022. The Government also required Local Transport Authorities to publish a Bus Service Improvement Plan (BSIP) by the end of October 2021, detailing how they proposed to improve services.
- 3.3.16. The measures recommended for bus improvements in the Bus Back Better document are:
 - More frequent buses

²³ <https://www.gov.uk/government/publications/build-back-better-our-plan-for-growth>

- Faster and more reliable buses
- Cheaper buses
- More comprehensive network
- Easier to understand network
- Easier to use network
- Buses that are better to ride in
- Buses that are better integrated with other modes and each other
- Buses that are greener
- Buses that are accessible and inclusive
- Operators that are innovative
- Seen as a safe mode of transport

3.3.17. The CtoC scheme is aligned with all these recommendations. CtoC will offer passengers a high frequency, fast and reliable public transport service integrated with active modes. The scheme is expected to be implemented as a partnership between the Local Transport Agencies / Councils and the operators and will be key to achieving the desired mode-share shift.

NATIONAL INFRASTRUCTURE STRATEGY (HM TREASURY, 2020)

- 3.3.18. The National Infrastructure Strategy²⁴ sets out the government's plan to transform the UK's infrastructure networks. The three central objectives of the strategy are: economic recovery, levelling up and strengthening the Union; and meeting the UK's net zero emissions target by 2050.
- 3.3.19. The strategy notes that decarbonisation of the UK's power, heat and transport networks – which together account for over one-third of UK emissions is a necessary step to put the UK on a path to meeting its net zero emissions target by 2050. Furthermore, the strategy aims to make bus and rail networks in cities and regions comparable to Greater London.
- 3.3.20. Under the levelling up objective, the strategy recognises the £5 billion planned investment during this parliament to transform bus services and cycling infrastructure as key to leaving no community or business behind. The strategy notes that increasing cycling and walking can help tackle some of the most challenging issues facing UK society including improving air quality, combatting climate change, improving health and wellbeing, addressing inequalities and tackling congestion on the roads.
- 3.3.21. The CtoC scheme's impact on connecting housing to employment centres through a reliable and high frequency bus network is aligned with the National Infrastructure Strategy objectives of economic recovery and growth. The resulting modal shift to public transport and active transport as well as CtoC's commitment to Euro VI or possibly electric vehicles is in line with the strategy's goals for meeting net zero emissions target by 2050.

²⁴ <https://www.gov.uk/government/publications/national-infrastructure-strategy>

TEN POINT PLAN FOR A GREEN INDUSTRIAL REVOLUTION (HM GOVERNMENT, 2020)

- 3.3.22. The government's Ten Point Plan for a Green Industrial Revolution aims to turn the UK into the world's number one centre for green technology and finance, laying the foundations for decades of economic growth by delivering net zero emissions in a way that creates jobs and allows people to carry on living their lives. The ten points deal with:
- Advancing offshore wind
 - Driving the growth of low-carbon hydrogen
 - Delivering new and advanced nuclear power
 - Accelerating the shift to zero-emission vehicles
 - Green public transport, cycling and walking
 - Jet zero and green ships
 - Greener buildings
 - Investing in carbon capture, usage and storage
 - Protecting our natural environment
 - Green finance and innovation
- 3.3.23. The CtoC scheme encourages mode shift from car to the HQPT and active transport modes. As such, the CtoC scheme will directly contribute to the strategic goals of the Ten Point Plan by encouraging greener public transport and reducing emissions through the provision of an improved bus network and active travel infrastructure, which in turn will protect the natural environment.

GEAR CHANGE / LTN 1/20 (DFT, 2020)

- 3.3.24. Gear Change outlines the vision of central government to make England a great walking and cycling nation. It sets out the actions required at all levels of government to make this a reality, and follows the following themes:
- Better streets for cycling and people
 - Cycling and walking at the heart of decision-making
 - Empowering and encouraging local authorities
 - Enabling people to cycle and protecting them when they do
- 3.3.25. The Local Transport Note (LTN) provides guidance and good practice for the design of cycle infrastructure, in support of the Cycling and Walking Investment Strategy and Gear Change. It supports the delivery of high-quality cycle infrastructure and reflects current good practice, standards and legal requirements. Inclusive cycling is the underlying theme so that people of all ages and abilities are considered.
- 3.3.26. Delivery of the CtoC scheme aligns with the vision of Gear Change for providing a safer and more accessible cycling network in the west of Cambridge. An emergency access and maintenance track is proposed to run alongside the CtoC bus route, which would also provide an active travel path for pedestrians, cyclists and horse riders. This active travel path adds to the growing rural walking and cycling network as it integrates with new and existing routes such as the planned Comberton Greenway and Madingley Road scheme.
- 3.3.27. The CtoC scheme also includes cycle parking, shed and shelters at the Park and Ride site and at stops along the route. Crossing points along the route to ensure safe pedestrian and cycle journeys are also provided in the scheme. The improvements to cycling infrastructure provided under the



CtoC scheme will enable residents and cycle user groups to use the cycle network as a form of active travel, supporting the strategic goals of Gear Change to be met.

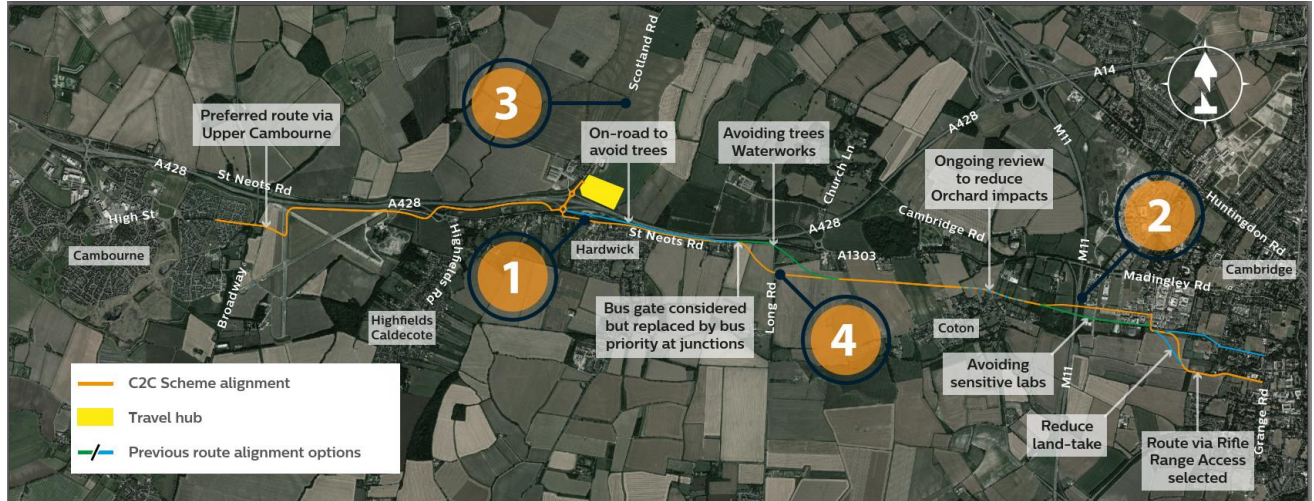
4 SCHEME DESIGN DEVELOPMENT

- 4.1.1. In the summer of 2022, the fourth public consultation was undertaken on the CtoC scheme proposals as part of the Environmental Impact Assessment (EIA). The focus was how to best manage and mitigate the impacts of the scheme.
- 4.1.2. The proposals for the scheme addressed by the consultation included:
- a two-way guided busway, 13.6 kilometres in length, commencing at Sterling Way, Cambourne and terminating at Grange Road, Cambridge segregated from local highways except for stretches along St Neots Road and Charles Babbage Road;
 - intermediate bus stops along the route and an emergency and maintenance access track running alongside the two-way guided busway for most of the length of the guided busway with full access for pedestrians and cyclists (the Service Track). Most of the length of the Service Track will function as a bridleway;
 - a new travel hub building and Park and Ride site east of Scotland Farm with access for the buses over the existing A428 bridge;
 - new bridges over the M11 and at Bin Brook to provide for the two-way guided busway and adjoining emergency and maintenance track;
 - access roads, temporary compounds, stopping up, diversion and creation of public rights of way, highway crossings, drainage works and attenuation and infiltration ponds.
- 4.1.3. Public consultation on the preferred route and its potential environmental impact is essential to inform the EIA. Public consultations allow all those with an interest in the proposals including local people and organisations, as well as statutory bodies, to give their views about the scheme, identifying issues and opportunities which are, wherever feasible, taken into account in the further development of the scheme.
- 4.1.4. Informed by the feedback from the public consultation the GCP Executive Board decided on the preferred route at their meeting on 22 September 2022.
- 4.1.5. As a result of the decision from the GCP Executive Board and further technical work, the following amendments were made to the scheme, as illustrated in Figure 4-1:
1. Buses will travel on-road along St Neots Road through Hardwick to retain the trees along the A428. Junctions will be amended to provide bus priority but the bus gate to the east of Hardwick, which would have restricted access for cars, is no longer proposed.
 2. Bridleway 39/30 runs along the Cambridge side of the M11 where CtoC will cross. The bridleway will be diverted to join the new active travel route (and Coton Path).
 3. Working with Dry Drayton Parish Council an alternative solution to the active travel path along Scotland Road to the village will be developed. This path will now be designed as a separate scheme and not as part of CtoC.
 4. The route has also been moved to avoid the Waterworks site and Comberton Plantation near Madingley Mulch roundabout.
- 4.1.6. Figure 4-1 details the preferred route and the changes compared to previously proposed routes. The Service Track, adjoining the guided busway will also act as a new active travel path for pedestrians

and cyclists and, for most of the route, for equestrian use and includes the developer designed sections at West Cambridge, Bourn Airfield and Cambourne West.

4.1.7. The scheme is scheduled for opening in 2027.

Figure 4-1 - The preferred route after the EIA consultation



5 UPDATED SCHEME CONSTRAINTS

5.1.1. This section provides an update on the OBC scheme constraints, as follows:

- The section of the scheme through Bourn Airfield must comply with the Supplementary Planning Document (SPD) and complement the development masterplan;
- The scheme needs to achieve a net 10% biodiversity gain is required to discharge the scheme deemed planning conditions;
- The section of the scheme through West Cambridge must complement the development's masterplan;
- Bus emissions must meet Euro VI standards and be wheelchair accessible and designed to enable eventual integration with CAM (subsequently paused).

6 SPENDING OBJECTIVE ANALYSIS STATEMENT

6.1 BACKGROUND

- 6.1.1. The DfT TAG (November 2023) recommends that the economic dimension of the business case should be informed by the spending objectives identified in the strategic case. This builds on the findings of the Green Book Review in 2020 and helps ensure that economic analysis engages with the strategic context of the appraised scheme.
- 6.1.2. The aim of the Spending Objective Analysis Statement (SOAS) is to ensure consistency between the strategic and the economic cases by connecting the scheme's SMART objectives to the measures by which the scheme options are assessed. This helps to understand whether an option reaches the objectives it set out to.

6.2 ANALYSIS OF OBJECTIVES

- 6.2.1. Table 6-1 sets out the spending objectives and the corresponding measurements by which the performance of scheme options against them can be assessed. The spending objectives are scheme objectives, and the measurements are identified based on the analysis presented in the Economic Case.
- 6.2.2. The Economic Case Addendum presents the appraisal results for each of the measurements against the spending objectives, demonstrating the performance of the scheme in delivering the objectives set for it.

Table 6-1 – Spending Objective and Relating TAG Impacts

Objectives	Objective 1: Improved accessibility to support economic growth			Objective 2: Sustainable transport network providing connectivity along the corridor	Objective 3: Enhanced quality of life by reducing congestion and improving air quality			
Measurement	<ul style="list-style-type: none"> ▪ Dependent development (and land value uplift) quantifying the impact of the transport improvement for unlocking land for further investment; ▪ Business users & transport providers capturing the impact on time and money saved on business travel, increasing productivity; ▪ Access to services representing the impact on the journeys people need to make to access services they require. 			<ul style="list-style-type: none"> ▪ Total journey time savings capturing the value of travel time saved due to the scheme. 	<ul style="list-style-type: none"> ▪ Air quality quantifying the impact on health through the change in air pollutants, affecting quality of life; ▪ Journey quality measuring the impact on real and perceived physical and social environment while travelling, affecting quality of life; ▪ Physical activity estimating the impact on health due to the uptake of active travel, affecting quality of life; ▪ Congestion / journey time benefit capturing the impact on time saved travelling by reducing congestion, affecting quality of life. 			
TAG Impact relating to the measurement	Monetised TAG Dependent Development impact	Monetised TAG Business Users & Transport Providers impact	TAG seven-point scale for Access to Services impact	Monetised TAG Journey Time Savings	Monetised TAG Air Quality impact	Monetised TAG Journey Quality impact	Monetised TAG Physical Activity	Monetised TAG Journey Time Savings

7 UPDATE ON OTHER SCHEMES AND DEVELOPMENTS

7.1 INTRODUCTION

- 7.1.1. The following section presents a review and update on key schemes and development projects since the development of the OBC in 2020 that have a potential impact on the CtoC scheme.
- 7.1.2. Updates are provided as follows:
- Transport schemes with a strategic fit with respect to the wider regional context (Making Connections and East West Rail)
 - Transport schemes in a local context (Waterbeach to Cambridge Transport Study, Cambridge Eastern Access Scheme, Madingley Road Project)
 - Development projects (Bourn Airfield, Cambourne West, West Cambridge and North-West Cambridge)

7.2 REVIEW OF STRATEGIC FIT PROJECTS

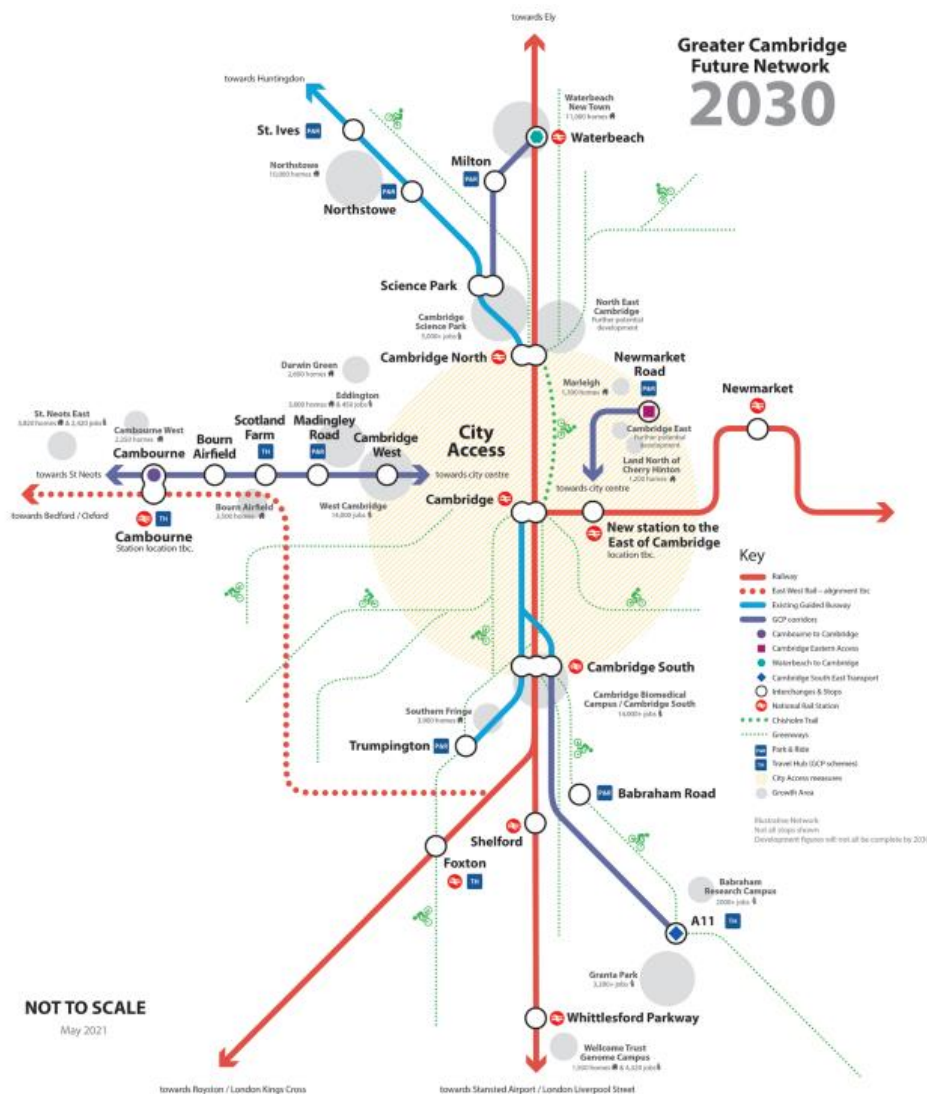
CITY ACCESS/‘MAKING CONNECTIONS’²⁵

- 7.2.1. The City Access project is developing a package of measures to deliver a commitment to reduce traffic in Cambridge by 10-15% on 2011 levels by 2030. Making Connections was a key part of the City Access project and it would have been complementary to CtoC through its proposals to:
- **Transform the bus network:** It was proposed that the Making Connections proposals would transform the bus network through the introduction of new routes, additional services, cheaper fares, and longer operating hours. The network would focus on travel hubs for better interchange between services and different modes.
 - **Invest in sustainable travel schemes:** Proposed investment in new sustainable travel schemes, such as better walking and cycling links.
 - **Create a Sustainable Travel Zone (STZ):** Under this proposal, vehicles would be charged for driving within the STZ between 7am and 7pm on weekdays; the charges would fund long-term improvement and create road space. The STZ would be gradually introduced in 2025 after the bus improvements were implemented and would be fully operational in 2027/28.
- 7.2.2. In September 2023, the GCP Executive Board took the decision to stop further development of the Making Connections main STZ proposal. They collectively decided that while the aims of Making Connections to make travelling in and around Cambridge simpler and faster by saving time and money, would have eased congestion, and offered better, fairer, and greener travel choices, the STZ was not able to progress to Full Business Case due to a lack of political consensus.
- 7.2.3. As illustrated in Figure 7-1, CtoC forms an integral part of the Greater Cambridge Future Network 2030 proposed in the Making Connections consultation report.

²⁵ [Making Connections \(greatercambridge.org.uk\)](https://greatercambridge.org.uk/making-connections)

- 7.2.4. Even though the development of the Making Connections STZ proposal has stopped, the proposed CtoC services have been recognised as essential for providing the connectivity and accessibility to and from Cambridge in the western corridor. In addition to connecting Cambourne with Cambridge West by high frequency bus service, CtoC services will also provide intermediate connections to Bourn Airfield, Scotland Farm and Maddingley Road. Furthermore, CtoC contributes to the wider context improvements to the bus network in the region by improving public transport by increasing frequency, journey time and reliability of buses.
- 7.2.5. The March 2024 GCP Executive Board agreed that any revised proposals for City Access would be developed through the Greater Cambridge Transport Strategy led by Cambridgeshire County Council.

Figure 7-1 : Greater Cambridge Future Network 2030 from Making Connections Consultation Document



- 7.2.6. CtoC contributes to the wider context improvements to the bus network in the region by improving public transport by increasing frequency, journey time and reliability of buses. These improvements

in turn aid in reducing traffic and congestion by encouraging mode shift along the A428/A1303 corridor.

EAST WEST RAIL²⁶

- 7.2.7. The proposed East West Rail project will provide a new direct rail link between Oxford and Cambridge and join-up key towns and cities across the region. The project aims to connect people to jobs and growth by providing public transport alternatives to the car with faster journey times and lower transport costs. The scheme could also support additional homes in Cambourne, which has been identified as a growth location. The new station in Cambourne is anticipated to bring economic growth to the community, creating more jobs and prosperity.
- 7.2.8. The central section of the East West Rail scheme is intended to deliver a new railway between Bedford and Cambridge, forming an important part of the Oxford-Cambridge Arc. It will enable new direct services between Oxford and Cambridge and other places in between such as St. Neots and Cambourne.
- 7.2.9. A public consultation was held in early 2019 to ask for views on five of the route options. Following which in January 2020, the preferred route option (route E) was identified. The preferred route travels from Bedford to Cambridge via Sandy/St Neots and Cambourne with new stations proposed at both locations.
- 7.2.10. In early 2021, five route alignment options were identified within the preferred route and published for public consultation. Of the proposed alignments the route along the A428 (Alignment 1 and 9) with a station in Cambourne North was identified²⁷ as the emerging preference.
- 7.2.11. The first stage of Statutory Consultation on the Central section of East West Rail was planned for summer 2024 but was paused until after the General Election. The consultation is intended to inform application for a Development Consent Order.
- 7.2.12. East West Rail and CtoC schemes are mutually complementary. The East West Rail station at Cambourne will provide direct connection for Cambourne residents to opportunities in Cambridge city centre. The CtoC scheme connects new developments along the full length on the A428/A1303 corridor, including Bourn Airfield and West Cambridge and could also provide first/last mile connectivity to the Cambourne station which would be likely to be located the other side of the A428 from Cambourne itself.

7.3 LOCAL TRANSPORT SCHEMES UPDATES

WATERBEACH TO CAMBRIDGE TRANSPORT STUDY²⁸

- 7.3.1. In September 2023, the OBC for the Waterbeach to Cambridge Scheme was approved by the GCP Executive Board. The scheme includes a new high-quality public transport route between

²⁶ [East West Rail \(eastwestrail.co.uk\)](https://eastwestrail.co.uk)

²⁷ [East West Rail – 2021 Consultation Document](#)

²⁸ <https://www.greatercambridge.org.uk/sustainable-transport-programme/public-transport-schemes/waterbeach-to-cambridge>

Waterbeach and Cambridge that will improve access to Cambridge from the North via the A10 Corridor for journeys by public transport, cycling and walking. The CtoC and Waterbeach to Cambridge schemes both provide better sustainable transport connectivity to Cambridge city centre from the growing communities in the west and north respectively, contributing to the sustainable growth of the Greater Cambridge region.

CAMBRIDGE SOUTH EASTERN TRANSPORT PROJECT

The Cambridge South East Transport project (CSET) provides enhanced and safer bus, cycling and walking routes in the A1307 and A1301 areas.

CSET comprises two phases:

- Phase 1 improvements include road safety, walking, cycling and bus priority on the A1307 between Haverhill and Cambridge.
- Phase 2 is a new, dedicated guided busway from a new A11 travel hub near the A11/A1307 junction to the Cambridge Biomedical Campus via Sawston, Stapleford and Great Shelford with an adjacent new path for walkers, cyclists and horse riders.

7.3.2. The Phase 1 scheme element for a continuous shared-use path for pedestrians, cyclists and horse riders from Cambridge to Linton is under construction and will form part of the Linton Greenway. Also, implementation is underway of road safety, junction, walking, cycling and horse-riding improvements on the A1307.

7.3.3. In March 2024, the Government announced £7.2 million funding for the GCP to deliver the next stage of Phase 2.

7.3.4. CtoC is closely aligned with CSET as this project will also provide high-quality public transport and active mode networks. CSET is included in the GCP's vision for a future Bus Strategy and is one of the four public transport corridors including active mode improvements identified as essential to link growing communities across Cambridge. As such, CSET is complementary to CtoC in supporting the growth of the Cambridge economy.

CAMBRIDGE EASTERN ACCESS²⁹

7.3.5. In December 2021, the GCP Executive Board approved the SOBC for the Cambridge Eastern Access Programme (CEA). The project includes improvements to public transport, cycling and walking on Newmarket Road as well as potential relocation of the Newmarket Road Park and Ride in the short term, followed by a new busway providing connectivity towards the city via the Cambridge Airport site. The most recent consultation took place in the beginning of 2023 which presented a preliminary scheme design for Newmarket Road. The results of the engagement will be reviewed by the Joint Assembly and Executive Board who will advise on the way forward for the project.

7.3.6. CEA, CtoC, Waterbeach to Cambridge, and Cambridge South East corridor schemes form an integral part of GCP's vision for a future Bus Strategy. These GCP public transport schemes offer

²⁹ [Cambridge Eastern Access | Greater Cambridge Partnership \(greatercambridge.org.uk\)](https://www.greatercambridge.org.uk/cambridge-eastern-access)

better public transport and active travel routes along the four public transport corridors identified as essential to link growing communities to the north, south east, east and west of Cambridge.

MADINGLEY ROAD PROJECT³⁰

- 7.3.7. The Maddingley Road Project focuses on walking and cycling improvements along the Maddingley Road. Following pre-consultation engagement and consultation, the GCP Executive Board took the decision to move forward with Option 2 in June 2020. A design review of the scheme was then undertaken by GCP. Following this review, Option 1 was retained as the preferred option which includes a one-way directional on road segregated cycle lanes on the south and northside of Maddingley Road. The scheme is currently at the next stage of design.
- 7.3.8. The Maddingley Road scheme is a key complementary scheme as it provides an alternative route to Northampton Street roundabout for cyclists. The existing cycleway/footway retained by the CtoC scheme through the West Cambridge site and between West Cambridge and the Adams Road/ Wilberforce Road junction allows cyclists access through and to south-western Cambridge. The two schemes complement each other and provide a comprehensive cycle network between West Cambridge and Northampton Street.

7.4 UPDATE ON DEVELOPMENT PROJECTS

BOURN AIRFIELD ³¹

- 7.4.1. Bourn Airfield was allocated in the 2018 South Cambridgeshire Local Plan for the development of a new village of approximately 3,500 homes and is a long-term development opportunity, which will take place over the plan period, and beyond. The Emerging Greater Cambridgeshire Local Plan proposes to carry forward the existing SPD for the site.
- 7.4.2. Sustainable transport connections to Cambridge and St Neots along the A428 corridor is a key strategic objective within the SPD, making CtoC an essential scheme for the overall success of the development. The SPD³² also stated that the developer would make a contribution towards the CtoC scheme within the Infrastructure Delivery Plan. A contribution towards the scheme was negotiated through a Section 106 agreement which has now been agreed as follows:

‘The Section 106 agreement, dated 29 July 2024, provides for a £20m Cambourne to Cambridge Busway Contribution towards the delivery of the CtoC Scheme (or an equivalent scheduled rapid mass transit passenger carrier service as is notified by CCC) this is to be paid in five equal 20% payments with the first being triggered prior to the Occupation of more than 501 Dwellings. Outline planning permission granted under reference S/3440/18/OL on 30 July 2024 includes provision for the CtoC Scheme with an internal route within the site.’

³⁰ [Maddingley Road | Greater Cambridge Partnership \(greatercambridge.org.uk\)](https://greatercambridge.org.uk)

³¹ [Policy S/NS: Existing new settlements | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org)

³² [Bourn Airfield | Greater Cambridge Shared Planning \(scamb.gov.uk\)](https://scamb.gov.uk)

CAMBOURNE WEST³³

- 7.4.3. In 2018, the South Cambridgeshire District Council (SCDC) Local Plan allocated the site as a new sustainable village that would accommodate 1,200 dwellings by 2031.
- 7.4.4. The Emerging Greater Cambridgeshire Local Plan carries forward the existing allocation and proposes to further expand the site to plan for delivery of 2,590 homes over the 2020-41 time period.
- 7.4.5. Additionally, under the new allocation the future development at Cambourne will need to consider:
- Integrating with and maximising the opportunity provided by East West Rail.
 - The relationship with Cambourne and Bourn Airfield, and how to make the area more sustainable, through the mix of services, employment and transport opportunities offered by the area as a whole.
 - Making effective connections within the new development and with Cambourne for public transport and active travel, as well as connections to surrounding villages so they can also benefit.
- 7.4.6. The allocation for homes at the site will contribute to the travel demand along the CtoC corridor as well as for the Park and Ride. Additionally, the Section 106 agreement for Cambourne West includes funding for the CtoC scheme of “the sum of £8.7m to be used to fund improvements for highway infrastructure so as to improve links by bus between Cambourne and the City Centre of Cambridge.”

WEST CAMBRIDGE³⁴

- 7.4.7. The University of Cambridge through the recent resolution to grant planning permission has ambitions for the West Cambridge Area to become an “innovation district.” The proposed allocation in the Emerging Greater Cambridgeshire Local Plan will carry forward the allocation of the West Cambridge site from the 2018 Cambridge Local Plan.
- 7.4.8. The Emerging Greater Cambridgeshire Local Plan proposes refining the policy to emphasise that future development of the site should seek a comprehensive approach to the area. The proposed Local Plan notes that the developments should include provision of high-quality walking and cycling connections, and development should maximise the opportunity provided by public transport improvements such as CtoC.
- 7.4.9. The existing planning application was for the overall site, which covers 66.5 hectares, seeking outline planning permission for up to 383,300m² of development including 370,000m² of academic floorspace (Class D1 space) and commercial/research institute floorspace (Class B1b and sui generis research uses), of which not more than 170,000m² will be commercial floorspace (Class B1b). In July 2024, planning permission was granted and the Section 106 agreement secured which safeguards a route through the site..

³³ [Policy S/CB: Cambourne | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org/policy-s/cb-cambourne)

³⁴ [Policy S/WC: West Cambridge | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org/policy-s/wc-west-cambridge)

NORTH-WEST CAMBRIDGE ³⁵

- 7.4.10. The 150-hectare North-West Cambridge development was granted outline planning consent in 2013 for 1,500 homes for Cambridge University and College key workers, 1,500 homes for sale, accommodation for 2,000 post-graduate students, 100,000m² of research facilities (including 40,000m² for research institutes and private research facilities linked to the University), and a wide range of community facilities. At the development, now known as Eddington, by March 2020 858 dwellings were complete (including 686 affordable dwellings), along with 325 student rooms.
- 7.4.11. The proposed Emerging Greater Cambridgeshire Local Plan will enable the development of additional dwellings on the site beyond the current plans. This will be achieved by changes to the dwelling mix and appropriate intensification of development areas still to be built. Following a detailed review of the site wide masterplan, an addition of 1,000 to 1,500 homes is anticipated.
- 7.4.12. The further increase in homes will create additional travel demand along the CtoC corridor. Given the dwelling units are affordable and include significant accommodation aimed at students, many of the future residents are likely to be public transport and active travel users.

³⁵ [Policy S/NWC: North West Cambridge | Greater Cambridge Shared Planning \(greatercambridgeplanning.org\)](https://greatercambridgeplanning.org)



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CAMBOURNE TO CAMBRIDGE BETTER PUBLIC TRANSPORT PROJECT

Appendix B - Economic Case Addendum



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TAG WORKSHEET FOR WATER ENVIRONMENT

1 INTRODUCTION

1.1 OUTLINE BUSINESS CASE

- 1.1.1. The Cambourne to Cambridge Public Transport Project (CtoC) Outline Business Case (OBC) Economic Case document was prepared in January 2020¹. The OBC was developed in line with HM Treasury and Department for Transport (DfT) guidance on the preparation of a 5-Case business case model.
- 1.1.2. In August 2021, the DfT released an update to the *Transport Business Case* guidance document to reflect the 2020 HM Treasury Green Book review. A further TAG update was produced in November 2023 on the inclusion of Spending Objective Analysis in the business case.

1.2 PURPOSE OF THIS DOCUMENT

- 1.2.1. This Economic Case Addendum provides a companion document to the existing OBC Economic Case.

1.3 STRUCTURE OF THIS DOCUMENT

- 1.3.1. The structure of this document is set out below.
- Chapter 1 sets out the purpose and structure of this document;
 - Chapter 2 provides a summary of the Economic Case developed in January 2020;
 - Chapter 3 sets out the areas of the Economic Case for review and update in this addendum document; and
 - Chapter 4 provides the Economic Case update.

¹ <https://www.greatercambridge.org.uk/asset-library/Sustainable-Transport/Public-Transport/Cambourne-to-Cambridge/C2C-OBC-Jan-2021/C2C-Jan-2020-App-1-Economic-Case.pdf>

2 ECONOMIC CASE

2.1 BACKGROUND

- 2.1.1. The Economic Case for the CtoC scheme, which was published in January 2020, focuses on the monetised impacts of the scheme and included the following:
- Economic, environmental, social and distribution impacts of the scheme;
 - Transport user benefits, safety, air quality, noise, and greenhouse gases captured using the marginal external cost method (TAG Unit A5-4);
 - Active mode impacts assessment using AMAT (TAG Unit A5-1);
 - Value for Money assessment using outputs from the Cambridge Sub-regional Model 2 (CSRM) as well as the monetisation of other scheme benefits proportional to their impact and latest scheme costs.

2.2 SCHEME BENEFITS

- 2.2.1. The Economic Case forecast that the CtoC project will produce the following user benefits (in forecast year 2036):
- The scheme will reduce journey times from Cambourne into Cambridge by 20 minutes in the AM peak hour
 - Bus passenger demand east of Maddingley Mulch is forecast to more than double to over 850 passengers in the AM peak hour
 - An increase in bus travel mode share from 2% to 4%
- 2.2.2. The CtoC scheme was also estimated to produce wider economic benefits (WEIs):
- £636m in increased GVA over 30 years
 - £458m from Land Value Uplift benefits
- 2.2.3. The CtoC scheme will produce environmental benefits as a result of the reduction in the use of private vehicles with a resultant improvement in air quality in the Cambridge City Centre Air Quality Management Area (AQMA).
- 2.2.4. The economic appraisal was carried using the DfT's May 2018 guidance, identifying three levels of economic impact:
- Level 1 impacts – user and non-user benefits, the established monetary economic impacts of a transport investment.
 - Level 2 impacts – productivity benefits, assessed for fixed land use scenarios where changes in economic scale and density produce productivity benefits for companies and workers.
 - Level 3 impacts – investment and employment effects which occur in a dynamic situation where a transport investment can change patterns of private sector investment and employment.
- 2.2.5. These three levels of economic benefits were assessed with reference to the following:
- Level 1 benefits were assessed with reference to the TAG Unit 5-1 and TAG Unit 5-4 guidance focusing on the monetised transport user and non-user benefits.
 - Level 2 benefits were assessed in accordance with TAG Unit A2-1.
 - Level 3 benefits assessment was based on a Land Value Uplift (LVU) approach (TAG Unit A2-1).

- 2.2.6. The Strategic Economic Narrative and Economic Impact Report (2020) provide details on the calculation of the Land Value Uplift (LVU) impacts with the emphasis on the assessment of the LVU of dependent developments.

2.3 FORECAST PLANNING ASSUMPTIONS

- 2.3.1. The CSRM D-Series transport model provided the transport network impacts for the economic appraisal. A standalone public transport model was developed using CUBE. A Foundation Case was developed incorporating local assumptions on housing, employment and other developments and all committed transport schemes. As development schemes dependent on the CtoC scheme, Bourn Airfield and Cambourne West were excluded from the economic appraisal.

2.4 APPRAISAL OUTCOMES

- 2.4.1. The Level 1 benefits of the CtoC scheme were £82m in 2010 prices discounted to 2010 over 60 years. Congestion relief benefits accounted for £63m of the total. Costs were £195.5m PV resulting in an initial BCR of 0.4:1.
- 2.4.2. Level 2 benefits for the 60-year appraisal period were £9.6m PV with agglomeration benefits accounting for £8.8m PV. Combining the Level 1 and Level 2 benefits produced an adjusted BCR of 0.5:1.
- 2.4.3. A switching test was undertaken which showed that the Present Value of Benefits would need to increase by £101.8m to achieve a BCR in the 'Low' VfM category. Level 3 benefits related to LVU amounted to £287.8m PV over 60 years. Applying these Level 3 benefits as a switching value improves the case with the CtoC scheme becoming 'Medium' value for money.
- 2.4.4. Sensitivity tests were carried out for optimism bias, risk, electric vehicle operation and an alternative high growth scenario. The results for these were not materially different from the core scenario.

3 SCOPE OF UPDATE

3.1 INTRODUCTION

3.1.1. The areas of the Economic Case reviewed in this Addendum, are as follows:

- Transport modelling framework
- Economic impacts
- Social impacts
- Environmental impacts (water)
- Social cost-benefit analysis
- Distributional analysis
- Impact on public accounts
- Sensitivity tests
- Value for money

3.2 TRANSPORT MODELLING FRAMEWORK

3.2.1. The OBC Economic Case used the CSRM D-Series model run to produce transport modelling outputs for use in the development of the appraisal. Since the OBC was reported in January 2020, the CSRM transport modelling suite has been updated twice with the development of E- and F-Series model runs. The economic appraisal results reported in this OBC Update Addendum are based on the CSRM F-Series model.

3.2.2. The Do Minimum scenario includes the following transport schemes:

- A14 Cambridge to Huntingdon scheme
- A428 Dualling Black Cat to Caxton Gibbet
- Cambridge South Station
- Waterbeach Station relocation
- GCP Corridor Schemes (CSET, CEA, W2C)
- M11 improvements
- A10 dualling

3.2.3. The Do Something scenario includes the addition of the CtoC scheme.

3.2.4. Given the dependency of the developments at Cambourne West and Bourn Airfield on the CtoC scheme, they are not included in either the Do Minimum or Do Something scenarios.

3.2.5. Forecasts were produced for each of these scenarios for the CSRM forecast year of 2041.

3.3 ECONOMIC IMPACTS

3.3.1. For the economic impacts of the CtoC scheme the values of input assumptions were reviewed and updated as follows:

- Appraisal parameters updated using the values in the November 2023 TAG Databook.
- Use of the latest optimism bias rates and reduced discount rates for health impacts.
- Use of updated cost of carbon values within the Data Book to give more weight to the value of changes in carbon emissions (BEIS carbon values).

SOCIAL IMPACTS

- 3.3.2. The social impacts of the CtoC scheme were updated to take account of the updated transport modelling and demand forecasts, covering impact areas such as accidents, and physical activity, which are valued using the Active Mode Appraisal Toolkit (AMAT). The social impacts assessed qualitatively have been reviewed.

ENVIRONMENTAL IMPACTS

- 3.3.3. The environmental impact inputs to the Economic Case for the OBC update relate to the Water Impact only. The approach for the Water Impact assessment is set out below.
- 3.3.4. The study area encompasses surface water and groundwater features up to 0.5 km from the scheme. The assessment of potential effects to flood risk and the water environment was qualitative covering the following:
- A review of readily available desk-based sources of information and data received from the consultation process.
 - A qualitative assessment of the potential impacts of climate change on mapped flood risk.
 - A qualitative assessment of potential impacts of the scheme on flood risk and water quality.

SOCIAL COST-BENEFIT ANALYSIS

- 3.3.5. The social cost-benefit analysis was updated drawing together updated economic, social and environmental (water) impacts. Assumptions driving the LVU benefits were reviewed and updated to reflect the latest situation for the Cambourne West and Bourn Airfield CtoC dependent development sites.

DISTRIBUTIONAL ANALYSIS

- 3.3.6. The range of impacts are unlikely to change materially with respect to the proportion of the population in age groups and ethnicity groups, proportion of households with disabilities and proportion of households without access to a car ownership. However, a high-level review of the assessment of each of the distributional impacts was undertaken.

IMPACT ON PUBLIC ACCOUNTS

- 3.3.7. The Public Accounts section was updated to reflect the revised capital cost estimates for the preferred route.

SENSITIVITY TESTS

- 3.3.8. A range of sensitivity tests was undertaken to understand the sensitivity of the appraisal to key assumptions.

VALUE FOR MONEY

- 3.3.9. An updated Value for Money Statement was produced based on revisiting the value for money of the scheme based on the changes in benefits and costs. As well as using the latest capital costs, operating and maintenance costs were also reviewed. An updated initial BCR was produced based on Level 1 transport user benefits. The Appraisal Summary Table and DfT Tables were updated. Wider economic impacts were also assessed.

4 ECONOMIC CASE UPDATE

4.1 APPRAISAL METHODOLOGY AND ASSUMPTIONS

- 4.1.1. The Economic Case has been developed following the principles of HM Treasury Green Book and the DfT's Transport Analysis Guidance (TAG). The economic appraisal refers to, and follows the guidance of, the following TAG Units:
- TAG Unit A1-1: Cost-Benefit Analysis (November 2023);
 - TAG Unit A1-2: Scheme Costs (November 2023);
 - TAG Unit A1-3: User and Provider Impacts (May 2022);
 - TAG Unit A4-1: Social Impacts (November 2022);
 - TAG Unit A4-2: Distributional Impacts (May 2023);
 - TAG Unit A5-4: Marginal External Costs (May 2023); and
 - TAG Unit A5-1: Active Mode Appraisal (November 2022).
- 4.1.2. In line with TAG, all costs and benefits in the appraisal have been presented in 2010 present values (market prices). The appraisal period is 60-years reflecting the asset life of the main components of the scheme.

Table 4-1 – Economic Appraisal Assumptions

Criteria	Assumption	Source
Opening year	2028	End of construction period
Appraisal period	60 years	Green Book
Discount rate	<i>Standard discounting:</i> 0 – 30 years: 3.50% 31 – 75 years: 3.00% <i>Health discounting:</i> 0 – 30 years: 1.50% 31 – 75 years: 1.29%	November 2023 TAG Data Book (A1 1.1)
Scheme induced cycle demand	Active Travel Fund uplift tool	Active Travel Fund (ATF) 4 uplifts tool
Journey purpose split – used for change in highway kilometres and MECs calculations	Business: 14.8% Commuting: 31.2% Other: 53.9%	November 2023 TAG Data Book (A1.3.4, percentage of distance travelled by vehicles, average weekday)
Journey purpose split – used for journey time benefits	<i>AM period (07:00 – 10:00)</i> Business: 2.1% Commuting: 25.6% Other: 72.3% <i>IP period (10:00 – 16:00)</i> Business: 1.7% Commuting: 7.2% Other: 91.1% <i>PM period (16:00 – 19:00)</i> Business: 2.6% Commuting: 33.5% Other: 64.0%	November 2023 TAG Data Book (A1.3.4, percentage of person trips, weekday periods)
Values of time per hour	Commuting: £9.95 (2010) Other: £4.54 (2010) Business: mode specific	November 2023 TAG Databook (A1.3.2)
Market price adjustment factor	1.19	November 2023 TAG Databook (A1.3.1)

Methodology for user benefits

- 4.1.3. CSRM F-Series modelling has been used for the inputs for the economic appraisal. Public transport patronage in the Cambourne to Cambridge corridor was provided by Atkins. Highways impacts were extracted from the F-series SATURN model and the impacts were monetised using TUBA.

- 4.1.4. TUBA has been run for a single year 2041, and then to estimate the benefits over the 60-year appraisal period, the following steps have been applied within the appraisal model:
- A demand ramp-up of 25% to 75% in the first three years (2028 to 2030) of scheme opening and 100% afterwards.
 - Background demand growth has been assumed from base to 2041 to calculate the benefit profile from 2028 to 2041, and then population growth has been applied from TAG post-2041 until the horizon year.
 - For time benefits, Value of Time growth has been applied post-2041.

Bus Journey Time Savings

- 4.1.5. The journey times were taken from the SATURN highway assignments for the length of the busway for the Do Something (with the scheme), and the on-road equivalent in the Do Minimum. The busway journey time includes the journey time for accessing the Scotland Farm P&R. A two-minute bus dwell time was assumed at the P&R site.
- 4.1.6. The CSRM model provided forecasts of two-way total passenger numbers by bus service for the Cambourne to Cambridge corridor for each modelled peak period. These bus passenger forecasts were split by direction of travel and by the percentage of bus passengers travelling the whole length of the corridor and part of the corridor only (which was assumed to be to/from the P&R to the city centre). These bus passenger forecasts were from CSRM E-series runs as this was the most recent available information.
- 4.1.7. The bus journey time savings were assumed to apply only to passengers using bus services that use the new busway. Existing passengers transferring from other services, or on services that themselves transfer to the busway were assumed to receive the whole journey time saving. New passengers were assumed to receive 50% of the journey time saving (rule-of-a-half).
- 4.1.8. Bus journey time savings in person seconds per hour were annualised using the TUBA factors and monetised using standard values of time.

Methodology for AMAT

- 4.1.9. Given that the scheme will also provide facilities for cyclists and pedestrians, the DfT's Active Mode Appraisal Toolkit (AMAT) and TAG Unit A5.1 guidance have been used to quantify the impacts of it on walking and cycling demand and benefits. The proposed improved active travel facilities consist of an emergency and maintenance access track adjoining the busway that will also act as a new active travel path for pedestrians and cyclists and, for the majority of the route, for equestrian use and includes the developer designed sections at West Cambridge, Bourn Airfield and Cambourne West.
- 4.1.10. AMAT enables the following benefits to be quantified:
- User benefits - journey ambience;
 - Business benefits - reduction in absenteeism;
 - Health benefits - economic benefits of preventing early mortality through cycle exercise; and,
 - Marginal external cost savings – reduction in highway kilometres driven by cars due to mode switch to cycling.

4.2 SCHEME COSTS

4.2.1. The following cost lines have been considered within the economic appraisal:

- Capital expenditure; and
- Operating, maintenance and renewal costs.

Capital Expenditure

4.2.2. The Financial Case Addendum, Section 3.2, sets out the capital cost estimate of £192.3m (nominal). The base cost for appraisal is £109.06m excluding sunk costs. The breakdown of capital costs is shown in Table 4-2. A Quantified Cost Risk Assessment was carried out in February 2024 which provides a P80 value for risk (31% of base cost). The inflation estimate reflects the impact the Covid-19 pandemic has had on the economy since the original OBC submission with additional inflation contingency of 3% per annum.

4.2.3. It has been assumed that CtoC will be delivered as an optical guidance system.

Table 4-2 – Breakdown of Capital Costs

Cost Line	£m
Base Cost (2023 prices)	109.06
Risk	37.94
Inflation	24.33
Land	7.47
Total	178.80

4.2.4. The cost profile is presented in Table 4-3 and assumes a construction start date in Q1 2026 with scheme construction completed in Q4 2027. Sunk costs totalling £13.48m that have already been incurred in the years 2014 to 2024² and are not included within the appraisal.

Table 4-3 – Cost Profile

Cost Profile	2024	2025	2026	2027
Cost Profile	2%	11%	38%	49%

4.2.5. It should be noted that for the economic appraisal the base cost was deflated and discounted to 2010 prices and values and adjusted to market prices in line with guidance.

² £0.4m assumed as sunk cost in 2024.

- 4.2.6. An update to TAG Unit A1.2 since the original submission advises that estimates for both risk and optimism bias adjusted costs should be calculated to provide insights to the overall picture of scheme costs. In the appraisal, either the risk or optimism bias adjusted costs can be considered.
- 4.2.7. At this stage, the recommended optimism bias levels are 23% for roads and 33% for rail including guided bus. As these percentages are similar or lower than the risk estimate, the risk value of 31% has been applied.

Operating, Maintenance and Renewal Costs

- 4.2.8. Operating costs have been assumed to remain the same as for the OBC submission. Whole life operating costs over a 60-year period were produced which equate to approximately £3.4m (2019 prices) per annum. Consistent with the original 2020 OBC no bus revenue has been considered at this stage.
- 4.2.9. Maintenance and renewals costs have been revisited by WSP and are estimated to be approximately £128,000 per annum (2022 prices). These have been appraised over a 60-year period within the model.
- 4.2.10. Optimism bias has not been applied to operating costs as consistent with the original submission. Within the appraisal model, the operating costs have been deflated and discounted, and adjusted to market prices.

4.3 KEY MODELLING RESULTS

Public Transport Journey Times

- 4.3.1. Modelled public transport journey times for the forecast year of 2041 for the Do Minimum and Preferred Option are shown in Table 4-4.
- 4.3.2. The journey times shown are by time period and represent average journey times by bus from Cambourne to Grange Road (the Cambridge City Centre end of the new busway) and includes the journey time for accessing the Scotland Farm P&R. A two-minute bus dwell time was assumed at the P&R site. In 2041, the CtoC services will offer a step change in travel time in the AM peak hour with the average journey time reducing from around 33 minutes to 17 minutes.

Table 4-4 – Cambourne to Cambridge Inbound Journey Times (Minutes, 2041)

Option	AM Peak Hour	Inter-Peak Hour	PM Peak Hour
Do Minimum	33:11	25:16	26:36
Preferred Option	17:02	16:40	16:50
Change in Journey Time	19:54	5:00	9:26

Source: WSP analysis of the CSRM Core Minus Scenario

Public Transport Demand Forecast

- 4.3.3. The daily forecast passenger demand for bus services using the CtoC busway is 10,300 bus trips over a 12-hour period. Of this total, 8,800 trips are new bus trips.

4.4 ECONOMIC APPRAISAL

Journey Time Benefits

- 4.4.1. The scheme seeks to improve bus connectivity and reduce congestion issues along the A428 and A1303 by providing quicker, more reliable journeys for users travelling via the proposed bus infrastructure improvements. Highway users will also experience journey time benefits due to decongestion as a result of modal shift from private car to public transport. Total journey time benefits as a result of the scheme are presented in Table 4-5. These benefits represent a total of £45.59m PV. It should be noted that the 2020 OBC used the D-Series CSRM which did not produce user (PT) journey time benefits.

Table 4-5 – Journey Time Benefits

Journey Time Benefits (£m, 2010 PV)	
Journey Time Benefits (PT)	29.86
Journey Time Benefits (Highway)	15.73
Total	45.59

Vehicle Operating Costs

- 4.4.2. The scheme results in reduced road traffic and hence produces decongestion benefits. There is a forecast mode shift from private car to public transport along the A428 and A1303 as a result of providing a competitive public transport alternative based on providing quicker, more reliable public transport journeys. Total VOC savings of £2.70m PV as a result of the scheme are presented in Table 4-6.

Table 4-6 – Vehicle Operating Costs Savings

Vehicle Operating Costs Savings (£m, 2010 PV)	
Vehicle Operating Costs (Fuel)	0.81
Vehicle Operating Costs (Non-Fuel)	1.89
Total	2.70

Active Travel

- 4.4.3. Table 4-7 below shows the benefits associated with improving active travel through provision of better-quality bus infrastructure along the CtoC corridor. These impacts have been calculated using the DfT's AMAT. This table shows the active travel benefits associated with improved active travel journeys that are mainly generated through the health benefits of cycling and walking including reduced risk of premature death and reduction in absenteeism from work. The impact on journey ambience is also significant as enhanced provision of cycling infrastructure improves the quality of journey experienced by cyclists.
- 4.4.4. There are decongestion benefits associated with mode shift from private car, improving journey times for other highway users. Associated with this, there is a reduction in

indirect tax revenues where fuel usage reduces, but this is negligible. Mode shift from private car to active travel mode also produces benefits in terms of reduced accidents and greenhouse gas emissions. Total active travel benefits are £21.3m PV.

Table 4-7 – Active Travel Benefits

Active Travel Benefits (£m, 2010 PV)	
Congestion	0.45
Infrastructure	negligible
Accident	0.07
Local Air Quality	negligible
Noise	negligible
Greenhouse Gases	0.03
Reduced risk of premature death	4.88
Absenteeism	0.57
Journey Ambience	15.33
Indirect Taxation	0.01
Total	21.34

Marginal External Costs

- 4.4.5. In line with TAG Unit A5.4, the DfT's Marginal External Costs (MECs) approach has been used for estimating the benefits for trips which continue to use the local highway network in terms of congestion, infrastructure, accidents, local air quality, noise, greenhouse gases, and indirect tax impacts. The MECs approach is based on the change in external costs arising from an additional or removed vehicle (in terms of forecast change in modelled vehicle-kms) on the network.
- 4.4.6. Table 4-8 below shows the scheme benefits due to changes in vehicle kms compared with the Do Minimum. Congestion, greenhouse gases, and indirect tax benefits have been excluded to avoid double counting with TUBA. As the CSRM model forecasts an increase in highway kms in the Inter Peak time period, especially to/from model Park & Ride zones, there is an overall increase in vehicle kms. This results in total MECs benefits of -£2.23m PV.

Table 4-8 – Marginal External Costs Benefits

Marginal External Costs Benefits (£m, 2010 PV)	
Congestion	not assessed
Infrastructure	-0.02
Accident	-2.02

Local Air Quality	-0.06
Noise	-0.13
Greenhouse Gases	not assessed
Indirect Taxation	not assessed
Total	-2.23

Costs

- 4.4.7. The Present Value of costs over the appraisal period is shown in Table 4-9.

Table 4-9 – Costs Over Appraisal Period

Costs (£m, 2010 PV over appraisal period)	
Capital	82.29
Operating, Maintenance and Renewals	55.67
Total	137.96

INITIAL BCR

- 4.4.8. The above costs and benefits have been combined to form the Present Value of Costs (PVC), Present Value of Benefits (PVB), Net Present Value (NPV) and the initial Benefit Cost Ratio (BCR). The results are presented in Table 4-10 indicating an initial BCR of 0.5:1.
- 4.4.9. The DfT tables (TEE, PA and AMCB tables) are included in Appendix A, whilst the Appraisal Summary Table is included in Appendix B.

Table 4-10 – Preferred Option Initial BCR

Analysis of Monetised Costs and Benefits (£m, 2010 PV)	
Noise	-0.13
Local Air Quality	-0.05
Greenhouse Gases	1.22
Journey Quality	15.33
Physical Activity	5.45
Accidents	-1.94
Economic Efficiency: Consumer Users (Commuting)	21.66
Economic Efficiency: Consumer Users (Other)	22.29
Economic Efficiency: Business Users and Providers	4.79
Wider Public Finances (Indirect Taxation Revenues)	-0.93

Present Value of Benefits (PVB)	67.67
Broad Transport Budget	137.96
Present Value of Costs (PVC)	137.96
Net Present Value (NPV)	-70.29
Benefit to Cost Ratio (BCR)	0.5:1

ADJUSTED BCR

Wider Impacts

4.4.10. Transport investments such as the CtoC scheme are likely to affect the wider economy beyond the direct impacts on transport users and individuals living close to it. A scheme such as CtoC could potentially deliver the following wider economic impacts:

- **Agglomeration** - productivity benefits of businesses being clustered together.
- **Labour supply impacts** - those who are economically inactive due to high perceived transport costs or lack of transport links may now have better access to employment opportunities.
- **Output change in imperfectly competitive markets** - reducing businesses travel costs such that they can increase output, reduce prices and increase productivity.

4.4.11. In line with OBC stage, a proportionate approach has been undertaken to quantify and monetise the impacts associated with agglomeration, labour supply and output change. This involved applying a percentage uplift to the transport user benefits delivered by the scheme.

4.4.12. The DfT's Value for Money Framework (2017) identifies agglomeration, labour supply impacts and output change in imperfectly competitive markets as 'evolving monetised impacts', meaning they can be included within an Adjusted BCR and should be considered under a fixed land use assumption. The impacts have been estimated by comparing the transport user benefits of scenarios in Do Minimum (P) and Do Something (S) and in line with the 2020 OBC an uplift was applied to users benefits, as follows:

- 14% of total user benefits to account for agglomeration and labour market impacts.
- 10% of business user benefits for 'Output change in imperfectly competitive markets', as per TAG Unit A2.1.

4.4.13. The wider impacts for the preferred option are set out in Table 4-11.

Table 4-11 – Wider Impacts- Preferred option

Impacts	(£m, 2010 PV)
Agglomeration	2.58
Tax revenues arising from labour market impacts	
Output change in imperfectly competitive market	0.37
Total	2.95

Adjusted BCR

- 4.4.14. The adjusted BCR includes all monetised benefits associated with the initial BCR and the wider impacts. The adjusted BCR is set out in Table 4-12.

Table 4-12 – Adjusted Benefit to Cost Ratio- Preferred option

Analysis of Monetised Costs and Benefits (£m, 2010 PV)	
Initial PVB	67.67
Wider impacts	2.95
Adjusted Present Value of Benefits (PVB)	70.62
Present Value of Costs (PVC)	137.96
Net Present Value (NPV)	-67.34
Adjusted BCR	0.5:1

- 4.4.15. Based on the AMCB results, the total monetised benefits are still less than costs by nearly £67.3m NPV. The adjusted BCR of the scheme remains 0.5:1.

SENSITIVITY ANALYSIS

- 4.4.16. Recognising the uncertainty around the appraisal assumptions and inputs, sensitivity analysis has been undertaken to assess the robustness of the appraisal results.
- 4.4.17. The sensitivity tests are as follows:
- Test 1: Replacement of the 40% optimism bias uplift based on the identified risk allowance with a 28% uplift based on the mid-point for the road and rail levels identified in TAG
 - Test 2: CtoC plus Making Connections (City Access) sensitivity test. Whilst Making Connections is not being taken forward, the scenario provides an assessment of an illustrative package of traffic management and public transport enhancement interventions on the economic performance of the CtoC scheme. It was assumed there would be no change in active mode benefits compared to the core scenario.
 - Test 3: Application of a 20% reduction to the core scenario scheme benefits to calculate a low growth scenario.
 - Test 4: Application of a 20% increase to the core scenario scheme benefits to calculate a high growth scenario.
- 4.4.18. Table 4-13 presents the sensitivity test results.

Table 4-13 – Sensitivity test results

Sensitivity Test	PVB (£m 2010 PV)	PVC (£m 2010 PV)	NPV (£m 2010 PV)	Initial BCR	Adjusted BCR
CtoC Preferred Scheme	67.67	137.96	-70.29	0.5:1	0.5:1

Test 1: Optimism Bias decreased	67.67	138.69	-71.02	0.5:1	0.5:1
Test 2: CtoC and City Access	78.23	137.88	-59.65	0.6:1	0.6:1
Test 3: Low growth	54.14	137.96	-83.82	0.4:1	0.4:1
Test 4: High growth	81.21	137.97	-56.76	0.6:1	0.6:1

LAND VALUE UPLIFT ASSESSMENT

4.4.19. As described in the Strategic Case Addendum, the proposed developments at Cambourne West and Bourn Airfield are dependent on the introduction of the CtoC scheme. TAG Unit A2-2 sets out the approach to valuing the welfare effects associated with the transport scheme and dependent development. Estimating the costs and benefits of the transport scheme under assumptions of land-use change requires the consideration of four elements:

- Land Value Uplift (LVU) – the change in land value as a result of conversion of land to a more productive use. This is a private benefit that accrues to the landowner/developer rather than wider society.
- Transport External Costs (TECs) – the impact of the development on existing transport users.
- Non-Transport Complementary Interventions (NTCI) – costs associated with community or education facilities or any other facility.
- Land Amenity Value (LAV) – The change in amenity value associated with different land-use types e.g., conversion of land from agricultural land to housing, recreational or forested land.
- Other impacts – this usually includes environmental, social and distributional impacts that are termed externalities from the dependent development.

4.4.20. The method used to value the total benefits of dependent development incorporates all private and societal benefits and costs associated with the scheme and the development unlocked or attributable to the transport scheme.

$$Total\ benefits = LVU_D + Other - TEC - LAV - NTCI$$

Where:

LVU_D = Land Value Uplift for that proportion of housing dependent on the transport scheme.

$Other$ = Environmental, social and distributional impacts outlined in TAG Unit A3 and A4.

TEC = Transport External Costs.

LAV = Land Amenity Value, based on changing land-use.

$NTCI$ = Non-Transport Complementary Interventions, with the benefits of these NTCIs.

Land Value Uplift

4.4.21. The LVU has been calculated according to the methodology set out in TAG Unit 2-2 Appendix D and the DLUHC Appraisal Guide (March 2023). New development linked

to the scheme creates economic value which is reflected in the uplift in the value of land. For the economic appraisal, the difference between this new value – once all the costs of changing land use have been factored in – and its previous value is the LUV and represents the net private benefit of the development which accrues to the landowner/developer.

Deadweight and Dependent Development

- 4.4.22. In the CtoC scheme corridor, a total of 2,000 homes (Cambourne West 1,500 and Bourn Airfield 500) can be delivered without the scheme. This is defined as the ‘deadweight’ housing and represents the number of homes that can be delivered, whilst still maintaining a reasonable level of service on the existing transport network. This means that 3,850 (Cambourne West 850 and Bourn Airfield 3,000) homes are dependent on the scheme, so called ‘dependent development’, which represents the full housing quantum (5,850 homes) minus the deadweight housing.

Housing Delivery and Profile

- 4.4.23. The housing delivery profile is based on the housing trajectory for Cambourne West and Bourn Airfield sites. It is assumed that the 2,000-deadweight housing will be delivered first, and then the dependent development would come forward.

Displacement

- 4.4.24. As well as the potential deadweight, the development may result in a decrease in housing demand in adjoining areas or elsewhere in the target area. As such, the appraisal seeks to capture the gross impact of the intervention (measured by land value uplift) and deduct any reduction in the economic activity displaced from elsewhere. As such, the level of displacement is combined with the assessment of deadweight to provide the net change in land value or overall additionality that is attributable to the scheme.
- 4.4.25. The level of displacement has been calculated in line with DLUHC Appraisal Guidance. This guidance sets out the process and recommended thresholds for the calculation of displacement. The level of displacement depends on the proportion of social / affordable rented housing, the level of affordability, the level of development and the number of units built.
- 4.4.26. Combining values with the recommended thresholds contained in the DLUHC guidance document provides a level of displacement for Cambourne West and Bourn Airfield of 23% and 20% respectively.

Additionality

- 4.4.27. To estimate additionality the following formula has been used.

$$\text{Additionality} = (1 - \text{deadweight}) \times (1 - \text{displacement})$$

- 4.4.28. Approximately, 64% (Cambourne West) and 14% (Bourn Airfield) of the total housing quantum is anticipated to be deadweight housing. Using the method and process outlined for the calculation of displacement, approximately 23% of the development at Cambourne West and 20% of the development at Bourn Airfield is expected to be displaced from adjoining areas or elsewhere in the target area.

4.4.29. The total additionality value of the development is calculated at 28% for Cambourne West and 69% for Bourn Airfield, equivalent to 3,850 homes. Table 4-14 shows the calculation of additionality and the component data sources used in the calculation of the deadweight and displacement.

Table 4-14 – Additionality Value of the Development

Ref	Item	Cambourne West	Bourn Airfield	Criteria/Calculation	Source
a	Total no. of units	2,350	3,500	-	Greater Cambridge Council
b	Deadweight no. of units	1,500	500	-	Economic Impact Report
c	Deadweight % of total (b/a)	64%	14%	-	Calculation
d	Proportion of social/affordable rent of total	30%	40%	-	Economic Impact Report
e	Affordability Ratio	10.46	10.46	-	South Cambridgeshire, Local Authority Housing Affordability, 2022
f	Work-place based affordability ratio (Low)	60%	60%	<ul style="list-style-type: none"> 60% if local authority affordability ratio of equal to or over 10 (low), 80% between 7 and 100 (medium) and 100% if equal to or below 7 (high). 	DLUHC Appraisal Guide
g	Net additions to stock over the past 10 years	12.4%	12.4%	Change from 2013 to 2022	South Cambridgeshire, DLUHC housing stock statistics, 2022
h	Development activity (High)	55%	55%	<ul style="list-style-type: none"> 45% if net additions to housing stock over the past 10 years is less than or equal to 5%, (low) 50% if net additions to the housing stock over the past 10 years is between 5% and 7% (medium) and 55% if net additions to the 	DLUHC Appraisal Guide

Ref	Item	Cambourne West	Bourn Airfield	Criteria/Calculation	Source
				housing stock over the past 10 years is greater than 7% of the housing stock (high)	
i	No. of units being delivered	100%	100%	<ul style="list-style-type: none"> 40% if 100 total units or fewer, 60% between 101-250 total units, 70% between 251-500 units; and 100% if over 500 total units 	DLUHC Appraisal Guide
j	Displacement (1-d)*f*h*i	23%	20%	$= (1-0.30) \times 0.60 \times 0.55 \times 1.00$ $= (1-0.40) \times 0.60 \times 0.55 \times 1.00$	Calculation
k	Additionality (1-c)*(1-j)	28%	69%	$= (1-0.64) \times (1-0.23)$ $= (1-0.14) \times (1-0.20)$	Calculation

Gross Development Value

- 4.4.30. The Gross Development Value (GDV) is the estimated total revenue a developer could obtain from the land, in the context of housing this is calculated by multiplying the number of dwellings in the development area by the assumed house price per dwelling.

$$GDV = \text{House prices} \times \text{number of dwellings in the development area}$$

- 4.4.31. The Viability Assessment by Aspinall Verdi³ estimated an average value of residential land of £4,761 per m² (2024 prices)⁴. Based on the mix of housing sizes proposed for the site, the average property size is 106m². This results in an average house price on the development sites of £506,051 (2024 prices)⁵. The Land Registry dataset shows a house price increase in the district, with house prices rising on average by 2.2% in real terms over the last 10 years.
- 4.4.32. Real house price growth at 2.2% has been applied every year from 2024 to 2049 and is combined with the housing delivery profile to provide an estimate of the GDV or total housing value for the development in 2024 prices. Adjusting to 2010 market prices and discounting to 2010 values, for the purposes of economic appraisal, gives a GDV estimate of £672.07m for both the sites.

³ First Proposals Viability Report, Greater Cambridge Local Plan, August 2021

⁴ 2021 prices changed to current year 2024 with GDP deflator.

⁵ 2021 prices changed to current year 2024 with GDP deflator.

Build Costs

- 4.4.33. Table 4-15 shows the values and sources of developer cost components as well as professional fees and developer profits associated with the development for both the sites.

Table 4-15 – Development Cost Components

Parameter	Value	Source
Average house size	106 sqm	Weighted average of build sizes based on mix house sizes in South Cambridgeshire
Build costs	£1,419/sq. mt. (2024 prices) ⁶	Viability Assessment
External cost	15.0% of build costs	Viability Assessment
Professional Fees	10.0% of build costs	Viability Assessment
Developer Profit	20.0% of GDV	Viability Assessment
Sales Agent and Legal Fees	2.0% of GDV	Viability Assessment
Marketing	1.5% of GDV	Viability Assessment
Finance Costs	7.5% of GDV	Viability Assessment
Contingency	5% of build costs	Viability Assessment
Growth in build costs	<ul style="list-style-type: none"> ■ 2024: 2.6% ■ 2025: 2.6% ■ 2026: 4.0% ■ 2027: 3.6% ■ 2028: 4.0% ■ 2028 onwards: average of 2024 to 2028 	BCIS All in Tender Price Index (TPI) forecast at January 2024
Dwellings/acre	16	Economic Impact Report

- 4.4.34. Over the development horizon, the developer costs are estimated to be £369.64m (2010 prices and values), or £439.87m once adjusted to market prices for both the sites.

Current Land Value

- 4.4.35. Currently the sites identified for development are agricultural land (intensive). Based on the Economic Impact Report, it has been assumed that 16 dwellings can be developed in one acre of the site extent. For the 3,850 additional homes at Cambourne West and Bourn Airfield that are dependent on the scheme, the area allocated for development would be approximately 189 acres or 76 hectares. Based on the Viability Assessment, a value for the land in its current agricultural usage at £11,500 per acre (or £28,420 per hectare), in 2024 prices⁷. It has been assumed that this valuation would grow in line with the real house price growth assumption which underpins the GDV calculation.

⁶ 2021 prices changed to current year 2024 with GDP deflator.

⁷ 2021 prices changed to current year 2024 with GDP deflator.

Multiplying this by the number of acres of housing development in each year, converting to 2010 prices and discounting to 2010 gives a current land value of £0.79m, or £0.94m once also adjusted to market prices for both the sites.

Non-Transport Complementary Interventions (NTCI)

- 4.4.36. The developments will also include non-transport complementary interventions such as the provision of schools, green infrastructure, and community facilities. TAG Unit A2-2 requires that the cost of NTCIs should be included in the valuation of dependent development as they are intrinsically linked to the uplift in land values i.e., the benefits are assumed to be captured by the land value uplift.
- 4.4.37. The total cost of NTCIs in 2024 prices⁸ is estimated to be £29.33m for both Cambourne West and Bourn Airfield sites.
- 4.4.38. In the appraisal, these costs have been adjusted for real growth in line with BCIS TPI inflation forecasts, converted to 2010 prices and discounted to 2010. The resultant cost is £7.56m (2010 prices and values), or £8.99m once adjusted to market prices for both the sites.

Transport External Costs

- 4.4.39. Transport External Costs (TECs) capture the effect of additional transport demand imposed by dependent transport users on all other users, such as increased levels of congestion and/or overcrowding. These costs arise as a result of those trips generated by the new development which are dependent on the scheme.
- 4.4.40. The assessment of TECs associated with dependent development has been assessed in line with TAG Unit A2.2 using the scenarios below to capture the additional costs to existing transport users with and without the dependent development:
- Scenario S: without the dependent development but with the transport scheme
 - Scenario R: with the dependent development and with the transport scheme
- 4.4.41. CSRM model outputs for the two scenarios have been extracted and processed in TUBA, using the same assumptions used for the calculation of the transport user benefits. The impact on journey times, vehicle operating costs and indirect tax were calculated using the approach set out in section 4.1.4. In line with guidance in TAG Unit A2-2, the Scenario S demand matrix is used in TUBA for both scenarios (Do Minimum and Do Something) as the TECs represent the impact of development traffic on existing users. Table 4-16 shows the estimate of the TECs over the appraisal period.

Table 4-16 – Transport External Costs

	£m (2010 prices and values)
Journey time impact	-35.99

⁸ 2021 prices changed to current year 2024 with GDP deflator.

VOC (Fuel and Non-Fuel) impact	-2.77
Indirect tax impact	0.74
Overall TECs impact	-38.02

- 4.4.42. The journey time impact of the dependent development is estimated at -£35.99m (2010 prices and values, market prices) over the appraisal period. The VOC fuel and non-fuel impacts of the development are estimated at -£2.77m for all transport users. There is a small indirect tax impact of £0.74m. The total transport external costs imposed by dependent transport users on all other users is estimated at -£38.02m (2010 prices and values, market prices) for Cambourne West and Bourn Airfield developments.

Land Amenity Value

- 4.4.43. Land Amenity Value (LAV) is estimated based on the change in land amenity expected from the new developments. The sites allocated for housing development are currently greenfield land, the majority of which is used for agricultural purposes.
- 4.4.44. The housing scheme, as well as addressing housing needs in the area, delivers a range of other significant amenity benefits such as open space, active transport (cycleways and footpaths) and other recreational use facilities and land-types that will serve and benefit existing residents in the wider area.
- 4.4.45. The change in amenity value has been valued using estimates of external benefits of undeveloped land contained in the TAG Valuing Dependent Development Workbook⁹.
- 4.4.46. Based on planning assumptions of 16 dwellings per acre and the profile of housing completions over the development horizon to 2049, the estimated land take for housing is calculated at approximately 189 acres for both the sites.
- 4.4.47. In line with TAG Unit A2-2, this development area is assumed to have zero amenity value. As such, the loss of amenity value from the change in land use associated with the residential development is estimated at -£0.16m (2010 prices and values) for both Cambourne West and Bourn Airfield sites.

Health Impacts

- 4.4.48. The formula for estimating the external health impacts from additional rented affordable housing is set out in Annex G of the DLUHC Appraisal Guidance. There are both external impacts and private impacts associated with health improvements. The private health benefits from additional rented affordable housing are already accounted for in the land value uplift calculations. The external benefits to society from a reduction in rough sleeping and/or the probability of a new tenant that had been living in a poor

⁹ DfT (2021) TAG: economic impacts worksheets, Valuing Dependent Development Workbook, externality values, <https://www.gov.uk/government/publications/tag-economic-impacts-worksheets>

condition or overcrowded property moving into a new property as part of the development brought about by the scheme has been calculated.

- 4.4.49. The affordable housing component of the new development assumption is 30% for Cambourne West and 40% for Bourn Airfield in line with the Local Plan (as shown in Table 4-14). This amounts to approximately 2,105 affordable homes spread over the development horizon from 2028 to 2049, or 1,158 affordable homes once deadweight and displacement are accounted for.
- 4.4.50. The external health impact of an additional affordable housing unit is £206 per year (2010 prices), or £3,900 in present value terms over 30 years. This is calculated in line with DLUHC Appraisal Guidance and is a function of the annual health care cost (£4,900) multiplied by the probability that someone is a former rough sleeper (1.5%) plus the probability of a new rented affordable housing unit reducing overcrowding (88.5%) multiplied by the annual impact of reduced overcrowding at £149 per unit annual saving.
- 4.4.51. The total health impacts from additional affordable housing delivered by the housing development is £0.09m (2010 prices and values) for both the sites.

Summary

- 4.4.52. The LVU, TECs, NTCIs, LAV and health benefits of affordable housing as set out above provides a total benefit for the dependent development of £184.18m (2010 prices and values, market prices). Table 4-17 shows the estimation of total benefits by element. All benefits are expressed in 2010 prices and values and in the market price unit of account.
- 4.4.53. The economic appraisal shows that over the delivery period to 2049, the dependent developments at Cambourne West and Bourn Airfield generates significant benefits.

Table 4-17 – Valuing the Benefits of the Dependent Development

Element	£m (2010 prices and values)
GDV	672.07
Build costs (excluding NTCI costs)	-439.87
Current land value	-0.94
NTCI costs	-8.99
Land Value Uplift	222.26
TECs	-38.02
LAVs	-0.16
Health impacts of affordable housing units	0.09
Total benefits (2010 prices and values, market prices)	184.18

Sensitivity

- 4.4.54. A sensitivity test has been carried out to assess the effect of an additional 2,000 homes in the Cambourne West area to provide further support of longer-term strategic growth, as identified in the latest Emerging Local Plan (assuming build out from 2031 to 2049, 40 homes/hectare and an annual build out rate as per Bourn Airfield and Cambourne

West). The additional homes add £115.79m (2010 prices and values, market prices) to the total dependent development benefits. The increased total dependent development benefits of £299.97m are presented in Table 4-18.

Table 4-18 – Valuing the Benefits of the Dependent Development with additional 2,000 homes

Element	£m (2010 prices and values)
GDV	1,000.55
Build costs (excluding NTCl costs)	-652.06
Current land value	-1.40
NTCl costs	-8.99
Land Value Uplift	338.10
TECs¹⁰	-38.02
LAVs	-0.23
Health impacts of affordable housing units	0.13
Total benefits (2010 prices and values, market prices)	299.97

No Displacement

- 4.4.55. The dependent development impact assessment described above used a calculation of the displacement effect based on the latest DLUHC Appraisal Guide. An alternative scenario has also been tested assuming no displacement reflecting the broad consensus that 150,000-250,000 new homes are needed in Cambridge and therefore displacement is unlikely to be an issue. To test this scenario, we have assumed that there is no displacement in the core scenario and additional housing assessments. The respective results are £241.59m and £392.16m (2010 prices and values, market prices) for both scenarios, as presented in Table 4-19 and Table 4-20.

Table 4-19 – Valuing the Benefits of the Dependent Development with No displacement

Element	£m (2010 prices and values)
GDV	845.94
Build costs (excluding NTCl costs)	-553.74
Current land value	-1.19
NTCl costs	-11.32
Land Value Uplift	279.69
TECs	-38.02
LAVs	-0.20

¹⁰ The TECs assessment does not take account of the additional traffic from the additional 2,000 dwellings which would require more modelling.

Health impacts of affordable housing units	0.12
Total benefits (2010 prices and values, market prices)	241.59

Table 4-20 – Valuing the Benefits of the Dependent Development with additional 2,000 homes and No Displacement

Element	£m (2010 prices and values)
GDV	1,273.09
Build costs (excluding NTCl costs)	-829.66
Current land value	-1.79
NTCl costs	-11.32
Land Value Uplift	430.32
TECs¹¹	-38.02
LAVs	-0.30
Health impacts of affordable housing units	0.16
Total benefits (2010 prices and values, market prices)	392.16

- 4.4.56. In line with guidance in the Value for Money Framework, induced investment impacts are considered within the *Indicative Monetised Impacts*. Therefore, these Level 3 impacts are not considered within the Initial or Adjusted Benefit Cost Ratio (BCR) for the scheme but are used to determine a 'switching value' of the VfM category.

Switching value analysis

- 4.4.57. The adjusted BCR presented in Table 4-12 implies the scheme delivers Poor value for money. The switching value analysis considers the quantum of benefit and percentage of LVU required to change the value for money category.
- 4.4.58. Table 4-21 sets out the additional PVB and percentage of LVU benefits required to switch the VfM category for the core scenario and the sensitivity tests. If at least 37% of the LVU benefits are realised, the scheme will achieve Low value for money, and with over 74% of LVU benefits, it would be categorised as Medium value for money in the core scenario. In the additional 2,000 homes scenario, the scheme will achieve High VfM category by capturing 68% of LVU benefits. In the no displacement scenario with an additional 2,000 homes, the scheme will achieve Low, Medium and High VfM categories by capturing 17%, 35%, and 52% of LVU benefits respectively.

¹¹ The TECs assessment does not take account of the additional traffic from the additional 2,000 dwellings which would require more modelling.

Table 4-21 – PVB and LVU percentage switching value required to change VfM category

Scenario	Switching value to reach	Low	Medium	High	Very High
Core	PVB (£m 2010 PV)	67.3	136.3	205.3	481.2
	% of LVU	37%	74%	111%	261%
Core with additional 2,000 homes	PVB (£m 2010 PV)	67.3	136.3	205.3	481.2
	% of LVU	22%	45%	68%	160%
Core with no displacement	PVB (£m 2010 PV)	67.3	136.3	205.3	481.2
	% of LVU	28%	56%	85%	199%
Core with additional 2,000 homes and no displacement	PVB (£m 2010 PV)	67.3	136.3	205.3	481.2
	% of LVU	17%	35%	52%	123%

4.4.59. Table 4-22 below shows how the different levels of LVU impacts on the VfM category.

Table 4-22 – Switching value impact on VfM category

Scenario	% of LVU	100%	75%	50%
Core	LVU value (£m 2010 PV and market prices)	184.18	138.13	92.09
	VfM Category	Medium	Medium	Low
Core with additional 2,000 homes	LVU value (£m 2010 PV and market prices)	299.97	224.98	149.98
	VfM Category	High	High	Medium
Core with no displacement	LVU value (£m 2010 PV and market prices)	241.59	181.19	120.79
	VfM Category	High	Medium	Low
Core with additional 2,000 homes and no displacement	LVU value (£m 2010 PV and market prices)	392.16	294.12	196.08
	VfM Category	High	High	Medium

ENVIRONMENTAL IMPACTS

Introduction

4.4.60. The environmental impact inputs to the Economic Case for the OBC update relate to the Water Environment.

Water Environment

- 4.4.61. The Bin Brook is the only river that is classified as a main river by the Environment Agency within 1km of the scheme area. The proposed scheme crosses the Bin Brook towards the eastern end of the scheme, adjacent to Heschel Road. Small areas of the scheme are located within the Flood Zone 3 related to the Bin Brook, land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%). However, the majority of the site is within Flood Zone 1, land assessed as having a 1 in 1,000 or less annual probability of river flooding (<0.1%).
- 4.4.62. The proposed scheme crosses multiple areas which are at high risk to surface water flooding. However, these areas predominantly have modelled depths below 150mm.
- 4.4.63. The risk of flooding will most likely increase over the lifetime of the scheme as a result of climate change. However, the scheme will be designed to ensure that it is not at risk of flooding for its lifetime without adverse impacts elsewhere.
- 4.4.64. A water environment appraisal of the proposed scheme has been carried out following the guidance in TAG Unit A3 section 10.
- 4.4.65. Applying this methodology, the scheme is anticipated to have a **neutral-slight adverse impact** on the water environment.
- 4.4.66. The TAG Worksheet for Water Environment is included in Appendix C.

SOCIAL IMPACTS

Introduction

- 4.4.67. The Social Impact appraisal covers the user and non-user experience of the transport project and its impact on social factors. Guidance is provided in TAG Unit 4.1.

Results

- 4.4.68. A review was undertaken of the 2020 OBC Social Impact assessment which affirmed that the scheme will deliver a broadly positive benefit across impact areas. The assessment scores for the OBC Social Impact assessment are set out in Table 4-23.

Table 4-23 - Social impacts Assessment

Impact Area	Score	Assessment Comments
Accidents	Slight adverse	The scheme will result in some increase in accidents due to the increased travel on the highway network to access the Park and Ride site.
Physical Activity	Moderate beneficial	The AMAT,(TAG Unit A5-1) assessment shows monetised benefits of over £4.88m over 60 years for the reduced risk of premature death and almost £0.6m of benefits from reduction in absenteeism.
Security	Neutral	Negative impacts in terms of encouraging users to leave vehicles are offset by security features provided by the Park and Ride facility. Overlaps with Journey Quality are assessed within Journey Quality section.

Severance	Slight beneficial	The scheme will provide improvements to pedestrian movement through segregated paths alongside the bus route. The proposed route will cut across some footways introducing additional complexity through signals and crossings as a result of the busway, which may result in some minor hindrance to movement, however the benefits to pedestrian flow are on balance likely to be greater.
Journey Quality	Slight beneficial	Traveller care impacts are expected to be beneficial due to the new facilities and services. Frustration due to congestion and parking is likely to be improved with the scheme. A conservative slight beneficial assessment has been made in the absence of demand data.
Option values and non-use values	Large beneficial	The number of households benefitting from the existence of the service is higher than the threshold of 1,000 required for a large beneficial impact assessment.
Accessibility	Slight beneficial	Residents along the route will benefit from wider public transport provision with better private car and public transport access to Cambridge where many services and activities are based. Difficulties would still exist for more remote residents not close to the route who do not have access to a private car. Those from the wider area with access to a private car will be most likely to realise the benefits of the scheme.
Personal Affordability	Neutral	There may be slight beneficial impacts that arise from the free parking compared to costly parking in the city centre, and the reduction of miles travelled therefore a reduction in fuel consumption, though this may be offset by the cost of the bus service however this is expected to be in line with costs across the Cambridge network.

Source: Mott MacDonald (2020) Appendix K – Social Impact and Distributional Impact Appraisal Report

- 4.4.69. The Social Impacts of the CtoC scheme have been updated to take into account the updated transport modelling and demand forecasts, covering impact areas such as accidents and physical activity, which was valued using the AMAT. The other social impacts assessed qualitatively have been reviewed and updated.
- 4.4.70. The scheme design changes since the development of the OBC were also reviewed with respect to the effect on the social impact assessment. These changes are summarised below:
- Change in the alignment to avoid the Waterworks site
 - Change in the alignment through Hardwick to an on-road solution between St Neots Road and the A428

- Diversion of the Bridleway east of the M11, to provide improved connectivity with the Comberton Greenway
- The NMU connection proposed between the Scotland Farm Park and Ride site and Dry Drayton is to be reviewed for inclusion in a future programme.

Accidents

- 4.4.71. The collisions data for the A428/A1303/M11 area shows that there have been multiple accidents of varying severity in the areas surrounding the A11/A1307 junction and the route into Cambridge. Whilst the preferred option will reduce traffic on this route due to mode shift to the busway, there is an overall disbenefit of -£1.94m PV over the appraisal period. This arises due to the impact on MECs accident estimation of an increase in vehicle kilometres associated with access/egress to the Park and Ride site.

Physical Activity

- 4.4.72. The preferred off-road option for the scheme will provide segregated continuous cycling and walking facilities along the route which will make non-motorised travel more attractive and accessible. Also, the scheme includes cycle parking, sheds and shelters at the Park and Ride site and at stops along the route. This is likely to encourage higher levels of physical activity. The AMAT assessment shows monetised benefits of over £4.88m PV over 60 years for the reduced risk of premature death and almost £0.57m PV of benefits from a reduction in absenteeism. Physical activity impacts have been scored as moderate beneficial. The level of monetised benefits is similar to the OBC so there is no change in the scoring of the impact.

Security

- 4.4.73. The scheme aims to encourage mode shift from car to public transport and active modes by means of Park and Ride and a new off-road bus and non-motorised user route. There is a potential negative security impact in encouraging users to leave their vehicles, however using the Park and Ride (which has CCTV and lighting) will help to prevent car users parking in potentially less secure locations closer to the centre. It is not intended to light the bus route, which may create negative impacts for cyclists and pedestrians using the route during off-peak and darker periods. Further there is a potential for overlap with journey quality impacts; to avoid double counting some indicators (which reflect perception of security and journey quality) have only been considered in the journey quality impact assessment. Security impacts have been scored as neutral. The scheme impact is therefore considered unchanged.

Severance

- 4.4.74. It is important that appropriate crossing points are provided to ensure pedestrian and cycle journeys can still be made following the introduction of the scheme. While cycle and pedestrian movements would still take place, with little to no deviation from the desired route, there could be a small amount of hindrance to movement resulting in slightly longer journey times. However, the provision of better connections and footpaths for pedestrians along the route into Cambridge is likely to outweigh any slight journey lengthening due to new crossing points, therefore this impact is judged at slight beneficial. Given the scheme design and crossing points are very similar to that assessed in 2020, the severance impact score of 'slight beneficial' is unchanged.

Journey Quality

- 4.4.75. Traveller journey quality impacts are expected to be beneficial, with travellers benefitting from the clean surroundings, good facilities and information and an improved travelling environment typically provided by modern Park and Ride facilities. Traveller stress would be expected to reduce because of the scheme. The scheme would encourage travellers to leave their vehicles at the Park and Ride, reducing the number of vehicles in Cambridge City Centre and associated congestion and frustration. Wait times for services and stress associated with finding a parking space will be reduced. Traveller views are not expected to be impacted significantly. The OBC assessment of journey quality on the CtoC infrastructure and services resulted in a score of 'slight beneficial'. This score was considered conservative. The scale of impact is considered to be unchanged.
- 4.4.76. With respect to the cycling and walking elements of the scheme, the AMAT assessment shows monetised benefits of over £15.33m PV over 60 years due to improvement in journey ambience. Additionally, a qualitative review of the impacts using TAG 4.1 journey quality impacts worksheet was conducted and determined that there will be a moderate beneficial impact on journey quality following improvements through the scheme. The improvements in cycling infrastructure result in enhanced journey ambience which is scored as moderate beneficial.

Option values and non-use values

- 4.4.77. The estimated number of households in the CtoC corridor that could benefit from the option of using the transport scheme is more than 40,000, past the threshold of 1,000 households that signifies a large impact. Future development sites should also be taken into consideration as there is significant potential development in the area. These include sites at Hardwick, Cambourne and Bourn Airfield totalling more than 6,000 dwellings. The residents at these sites will all benefit from the option of having the scheme's services to access quality public transport services, particularly where a car is not available i.e., the car is being used by another household member or it is off the road for a period. Consequently, the Option Values impact is considered to have a large beneficial impact given the number of households with the option of using CtoC services.

Accessibility

- 4.4.78. The assessment of accessibility impact produces slight beneficial impacts. This is due to the scheme providing better access to public transport and access to services and activities via the new route. Accessibility will be improved particularly for residents in the wider corridor with access to a car who can use the Park and Ride. Accessibility was scored as slight beneficial. This impact is not considered to have changed.

DISTRIBUTIONAL IMPACTS

Introduction

- 4.4.79. The assessment of distributional impacts indicates that the range of impacts are unlikely to change with respect to the proportion of population in age groups and ethnicity groups, proportion of households with disabilities and proportion of households without access to a car. A review of the OBC assessment of each of the distributional impacts has been carried out which has concluded that there is no requirement for an update at this stage of business case development.

4.4.80. The Distributional Impact (DI) appraisal presented in the OBC has been carried out in line with TAG Unit A4.2, proportionate to the size of the scheme and the level of quantitative data available at this stage of the business case development. A DI appraisal considers the variance of transport intervention impacts across different social groups, seeking to identify those social groups that would be adversely or beneficially disproportionately impacted by the intervention(s). A DI appraisal is comprised of three stages: an initial screening stage, assessment of impacts and appraisal of the impacts. The eight distributional impacts assessed for the scheme are, as follows:

- User benefits
- Noise
- Air quality
- Accidents
- Security
- Severance
- Accessibility
- Affordability

User Benefits

4.4.81. The DI analysis of user benefits assesses the impact of the scheme benefits on income groups. A proxy study area of the Cambridge and South Cambridgeshire local authority areas was used for user benefits. The income distribution in Cambridge was produced using the 2015 Index of Multiple Deprivation in Cambridge and South Cambridgeshire. This showed that levels of deprivation were low with 48% within the least deprived quintile of deprivation. User benefits would therefore reflect the income distribution with a significant proportion accruing to the least deprived residents. The user benefit distribution is not considered to have changed materially.

Noise, Air Quality and Security

4.4.82. The OBC assessed the noise, air quality and security impacts as neutral impacts. This assessment is not considered to have changed.

Accidents

4.4.83. The distributional analysis of accidents in the OBC is based on a study area of 1km around the scheme. The OBC noted that if detailed accident modelling data is provided at FBC stage for the preferred option, this approach will be revised to include any links on the network that trigger the appraisal output criteria. As per TAG Unit 4.1 guidance, the OBC assessed the distribution of children (under 16), young people (16-25) and older people, as evidence suggests these groups have a greater risk of being involved in a traffic collision. The population of children locally is close to the national average, whilst the proportion of young people is greater than the national average. The distribution of children and young people with a greater propensity for involvement in accidents is unlikely to have changed and hence there is no update to this assessment.

Severance

4.4.84. The severance impact assessment was carried out with respect to vulnerable social groups (including older residents, residents with disabilities, children, residents without access to a car). The proportion of residents in each group was assessed. The key

outcome of the assessment of severance impacts was a slight beneficial severance for children due to the scheme providing pedestrian infrastructure and pedestrian crossings of roads to reduce severance effects. The scheme would also reduce severance effects in terms of access to amenities which are trip attractors for these vulnerable social groups, increasing mobility and opportunities to access education, sporting facilities and health centres. This resulted in a slight beneficial assessment for older residents and those without a car. The scheme design changes are unlikely to change the outcomes of this assessment.

Accessibility

- 4.4.85. As CtoC provides a new public transport route and service, the OBC appraised the distributional impact of the potential changes to accessibility on different social groups. The scheme was assessed as providing beneficial accessibility impacts due to wider public transport provision to amenities. Some residents will still experience barriers to accessibility living further away from the CtoC corridor and being without access to a car. The distributional analysis showed that income levels are high compared to national levels and the costs of accessing transport services was not a significant barrier. As the proportion of young adults and BAME groups is relatively high these groups will benefit more from the improved accessibility offered by CtoC. These groups were considered to experience a large beneficial impact. The outcomes of this appraisal of the distributional analysis of the scheme impacts on accessibility is unlikely to have changed given that the income distribution and social group composition is unlikely to have changed.

Personal Affordability

- 4.4.86. The distributional analysis of Personal Affordability was assessed as a neutral impact. This was due to reduced parking charges and potential reduced car fuel costs being offset by bus fare charges. This impact was therefore scoped out of the distributional impact appraisal. This outcome is unlikely to have changed.

VALUE FOR MONEY STATEMENT

- 4.4.87. The initial BCR indicates that the preferred option will produce Poor Value for Money with a BCR of 0.5:1. The NPV (2010 prices over 60 years) is -£70.29m. The main source of benefit contributing to the PVB is journey time benefits for existing and new users of public transport and highway users. Additionally, there are benefits related to active travel improvements, particularly improved journey quality for cyclists, and an increase in physical activity, which in turn leads to health benefits including reduced risk of premature death. The preferred option PVB is £67.67m.
- 4.4.88. The construction costs of the scheme include the busway infrastructure and the emergency access track which also provides an active travel facility. Costs also include scheme operating, maintenance and renewal costs. The PVC is £137.96m which includes a risk allowance of approximately 31%.
- 4.4.89. Under a range of sensitivity scenarios the implied case for the scheme remains as Poor Value for Money. However, as stated in the 2020 OBC Value for Money Statement, schemes assessed within the City Deal Assurance Framework with a BCR of less than 2:1 (Medium Value for Money) are still to be considered for funding if a compelling case for investment can be made with respect to delivery of City Deal objectives. The

preferred option for CtoC meets the City Deal objectives for the A428/A303 corridor by improving accessibility to transport, supporting economic growth, providing a sustainable transport network/system, provision of enhanced connectivity between Cambourne and Cambridge, and finally, contributing to enhanced quality of life by reducing highway congestion and improving air quality.

- 4.4.90. Economic growth in Cambridge is supported by the proposed new housing at the sites at Bourn Airfield and Cambourne West. In turn, the construction of these housing developments is dependent on the CtoC scheme being in place for full delivery of the planned housing.
- 4.4.91. The LVU assessment shows that the development of this land for housing produces for the dependent development an increase in land value of £184.18m PV. However, in the economic appraisal this benefit is excluded from the BCR as DfT guidance (TAG Unit A2.1 - Wider Economics Impacts Appraisal) states these benefits are indicative monetised benefits in recognition of the uncertainty around the magnitude of the impacts as they represent feedback effects between land use and the transport market due to the CtoC scheme.
- 4.4.92. The estimated change in land value because of the CtoC scheme provides an indicative monetary valuation of the user benefits which has been considered for a switching value test.
- 4.4.93. The switching value test for the CtoC scheme indicates that if 37% of the LVU benefits are realised the scheme will achieve Low Value for Money (namely, above 1:1), and with 74% of LVU it would be categorised as Medium Value for Money (namely, above 1.5:1). If the additional 2,000 homes in Cambourne West are delivered, High Value for Money would be achieved, with around 68% of the estimated LVU benefits meeting the City Deal Assurance Framework investment threshold. In the no displacement test with an additional 2,000 homes, High Value for Money would be achieved with around 52% of the estimates of LVU.

SPENDING OBJECTIVE ANALYSIS STATEMENT

- 4.4.94. The aim of the spending objective analysis is to ensure the preferred option aligns with the SMART objectives originally set for the scheme. Through comparing relevant appraisal results with the scheme benefit assertions, the spending objective analysis statement (SOAS) connects the Strategic Case Addendum with the Economic Case Addendum.
- 4.4.95. During the optioneering process, as discussed in section 2.3 of the Strategic Case Addendum, a preferred option has been developed. Economic analysis has been undertaken for the preferred option only, therefore, the SOAS analyses the absolute performance of this option. More information about the relative performance of all shortlisted options can be found in the Strategic Case of the 2020 OBC document¹² produced by Mott MacDonald.
- 4.4.96. Section 5 of the Strategic Case Addendum sets out which measurements need to be appraised, and why, to best value the performance of the preferred option against each of the objectives. Several measurements have been chosen, since the objectives cover a number of aims to be achieved.

Performance of the Preferred Option

- 4.4.97. Table 4-24 presents the performance of the preferred option against the three scheme objectives.

Objective 1: Improved accessibility to support economic growth

- 4.4.98. As set out in the Strategic Case Addendum, the three measurements used to assess the performance for this objective are dependent development, business users and transport providers benefit and access to services impacts.
- 4.4.99. Development of the CtoC guided busway and active travel infrastructure will have an impact by unlocking opportunities for dependent developments. A detailed explanation of calculations can be found under the section on Land Value Uplift Assessment above. Furthermore, the developments provide an improvement in productivity through agglomeration benefits and better labour market access. The monetised benefit of the dependent development is approximately £184.18m PV, greatly supporting economic growth.
- 4.4.100. Benefit for business users and transport providers is valued at £4.79m PV. This aligns with the aim of increased accessibility and connectivity for business travel, leading to higher productivity due to more efficient travel and, therefore, economic growth.
- 4.4.101. The access to services impact is assessed to be Slight Beneficial, demonstrating the benefit from wider public transport provision with better public transport access to Cambridge where many services and activities are based.

¹² [2020 OBC Strategic Case | Greater Cambridgeshire Partnership \(greatercambridge.org.uk\)](https://www.greatercambridge.org.uk/2020-OBC-Strategic-Case)

Objective 2: Sustainable transport network providing connectivity along the corridor

- 4.4.102. The performance against this objective is captured by the impact on total public transport journey times, which is valued at £29.86m PV. Benefits are realised from improved bus connectivity and reduced congestion issues along the A428 and A1303 by providing faster, more reliable journeys for users travelling via the proposed bus infrastructure improvements.

Objective 3: Enhanced quality of life by reducing congestion and improving air quality

- 4.4.103. Reduced congestion can be measured through the experienced journey time benefits, valued at £29.86m. Benefits due to decongestion will be experienced by public transport users as a result of developing the bus-only route.
- 4.4.104. The scheme impact on air quality was valued to be negligible at -£0.05m.
- 4.4.105. Journey quality impact is appraised to be £15.33m showing the value of benefits created by the scheme improvements due to the new facilities and services developed. The physical activity impact is valued at £5.45m due to mode shift to active travel.

Table 4-24 - Spending Objectives, Relating TAG Impacts and Option Performance

Objectives	Objective 1: Improved accessibility to support economic growth			Objective 2: Sustainable transport network providing connectivity along the corridor	Objective 3: Enhanced quality of life by reducing congestion and improving air quality			
Measurement	<ul style="list-style-type: none"> Dependent Development (Land Value Uplift) Business Users & Transport Providers Access to Services 			<ul style="list-style-type: none"> Total Journey Time Benefits 	<ul style="list-style-type: none"> Air Quality Journey Quality Physical Activity Congestion / Journey Time Benefit 			
TAG Impact relating to the measurement	Monetised TAG Dependent Development impact (£m)	Monetised TAG Business Users & Transport Providers impact (£m)	TAG seven-point scale for Access to Services impact	Monetised TAG Journey Time Benefits (£m)	Monetised TAG Air Quality impact (£m)	Monetised TAG Journey Quality impact (£m)	Monetised TAG Physical Activity (£m)	Monetised TAG Journey Time Benefits (£m)
Summary of benefits referenced in the Strategic Case Addendum	Asserts a positive impact on the economy by supporting productivity growth through agglomeration economies and a change of land use, since some development is dependent on the scheme.	Asserts a positive impact for business users & transport providers by reducing journey times and congestion, resulting in more time used for productive activities.	Asserts a positive impact by improving labour market access and mobility.	Asserts a positive impact through a reduction in bus passenger journey times between Cambourne West and Cambridge city centre.	Asserts a positive impact through encouraging mode shift from cars, therefore, reducing traffic levels during peak times in Cambridge city centre.	Asserts improved journey times and reliability through an HQPT system and provides an alternative to car travel.	Asserts a positive impact through encouraging the uptake of active travel.	Asserts positive impact through delivering the segregated busway and the HQPT system.
Preferred Option performance	184.18	4.79	Slight Beneficial	29.86	-0.05	15.33	5.45	29.86

Key Uncertainties

4.4.106. Sensitivity analysis has been undertaken to assess the robustness of the appraisal results, recognising the uncertainties around the appraisal assumptions and inputs. The sensitivity analysis is discussed in more detail under Sensitivity Tests in section 4.4.

4.4.107. The sensitivity tests to assess the key uncertainties are:

- Test 1: Replacement of the 40% optimism bias uplift based on the identified risk allowance with a 28% uplift.
- Test 2: CtoC plus Making Connections (City Access) sensitivity test
- Test 3: Application of a 20% reduction in scheme benefits from core scenario to calculate the low growth scenario.
- Test 4: Application of a 20% increase in scheme benefits from core scenario to calculate the high growth scenario.

4.4.108. The relevant values for the SOAS from the sensitivity tests are shown in Table 4-25. All impacts are similar to the ones in the core scenario, with the exception of the 'Making Connections' sensitivity test. This is due to the type of scheme measures that were planned as part of the 'Making Connections' scheme, e.g. traffic management and public transport enhancements. Since the difference is more beneficial relative to the core scenario in supporting the objectives, it is apparent that in any of the tested scenarios, the overall support of the objectives still holds true.

Spending Objective Impact

4.4.109. The performance of the preferred option, based on the chosen measures in the Strategic Case Addendum, shows significant support for the objectives with all values other than one contributing a beneficial impact. The uncertainties discovered at this stage of the business case have been assessed as part of the sensitivity tests, which also show that the overall level of support for the objectives is unlikely to change.

Table 4-25 – Preferred option performance under the core and sensitivity scenarios

Objectives	Objective 1: Improved accessibility to support economic growth			Objective 2: Sustainable transport network providing connectivity along the corridor	Objective 3: Enhanced quality of life by reducing congestion and improving air quality			
TAG Impact relating to the measurement	Monetised TAG Dependent Development impact (£m)	Monetised TAG Business Users & Transport Providers impact (£m)	TAG seven-point scale for Access to Services impact	Monetised TAG Journey Time Benefits (£m)	Monetised TAG Air Quality impact (£m)	Monetised TAG Journey Quality impact (£m)	Monetised TAG Physical Activity (£m)	Monetised TAG Journey Time Benefits (£m)
Core Minus	184.18	4.79	Slight Beneficial	29.86	-0.05	15.33	5.45	29.86
Risk/Optimism Bias	184.18	4.79	Slight Beneficial	29.86	-0.05	15.33	5.45	29.86
Making Connections	193.73	4.19	Slight Beneficial	35.84	0.14	15.33	5.45	35.84
Low growth	184.18	3.83	Slight Beneficial	23.89	-0.04	12.26	4.36	23.89
High growth	184.18	5.75	Slight Beneficial	35.83	-0.07	18.39	6.54	35.83

Annex A

DFT TABLES



the columns within which benefits and costs sit needs to be considered for each project

All entries are discounted present values, in 2010 prices and values

Note - costs are currently attributed to the road infra column but this should be considered on a project by project basis. Private sector costs are assumed to be netted against local government funding

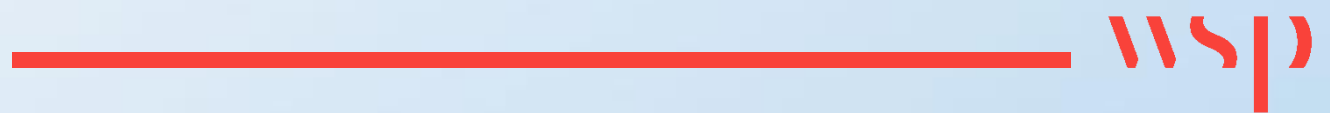
All entries are discounted present values in 2010 prices and values.

Analysis of Monetised Costs and Benefits (£000s)		
Noise	-	130 (F2)
Local Air Quality	-	55 (F3)
Greenhouse Gases		
Journey Quality		1,217 (F4)
Physical Activity		15,326 (F5)
		5,454 (F6)
Accidents	-	1,943 (F7)
Economic Efficiency: Consumer Users (Commutoi		21,659 (F8)
		22,382 (F9)
Economic Efficiency: Consumer Users (Other)		
		4,762 (F9)
Economic Efficiency: Business Users and Providers		
Wider Public Finances (Indirect Taxation Revenues)	-	931 (F11): sign changed from P to B due to P4 table represents costs and benefits
		67,674 (F9B) = (F2) + (F3) + (F4) + (F5) + (F6) + (F7) + (F8) + (F9) + (F10) + (F11)
Present Value of Benefits (see notes) (PVB)		
Broad Transport Budget		137,962 (F10)
Present Value of Costs (see notes) (PVC)		137,962 (PVC) = (F10)
OVERALL IMPACTS		
Net Present Value (NPV)	-	79,288 NPV= PVB-PVC
Benefit to Cost Ratio (BCR)		0.49 BCR= PVB/PVC

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the main basis for decisions.

Annex B

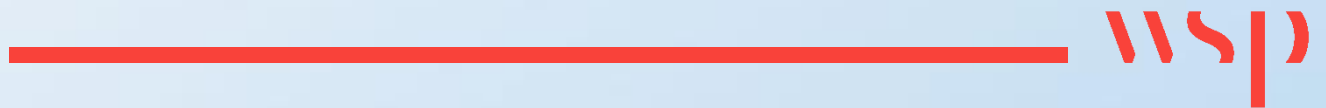
APPRAISAL SUMMARY TABLE



Appraisal Summary Table			Date produced:		1282024		Contact:	
Name of scheme:		Cambourne to Cambridge Better Public Transport Scheme					Name	
Description of scheme:		The Greater Cambridge Partnership (GCP) is promoting a transport scheme to improve connectivity between the town of Cambourne and Cambridge City Centre along the A428/A1303, creating a vital link to ease congestion, offer sustainable travel choices, connect communities and support growth. An OBC was submitted in 2020, and has now been reviewed by WSP. This AST draws on the AST previously submitted, with any differences noted and monetary values updated.					Organisation	WSP
							Role	Advisor
Impacts		Summary of key impacts		Assessment				
				Quantitative		Qualitative	Monetary	Distributional
							£(NPV)	7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Impacts of the scheme on business users and transport providers have been estimated using TUBA. It is expected that the scheme will improve connectivity from Cambourne to the economic centres in Cambridge.	Value of journey time changes(£)			N/A	4,791,689	
	Net journey time changes (£)							
	0 to 2min	2 to 5min	> 5min					
	Reliability impact on Business users	Not assessed at this stage	N/A			N/A	N/A	
	Regeneration	Not assessed at this stage	N/A			N/A	N/A	
Wider Impacts	Proposed developments at Cambourne West and Bourn Airfield will result in land value uplift and other wider economic impacts such as agglomeration.	N/A			N/A	187,121,151		
Environmental	Noise	The scheme is expected to encourage modal shift from private car to public transport or active travel thereby reducing the amount of vehicle movements, and as a result noise, along the A428 and A1303.	N/A			Neutral	-129,515	
	Air Quality	The impact on air quality is expected to be neutral.	N/A			Neutral	-54,909	
	Greenhouse gases	The reduction in highway kilometres as a result of modal shift will lead to a net decrease in user greenhouse gas emissions.	Change in non-traded carbon over 60y (CO2e)			Neutral	1,217,015	
			Change in traded carbon over 60y (CO2e)					
	Landscape	Not assessed at this stage	N/A			N/A	N/A	
	Townscape	Not assessed at this stage	N/A			N/A	N/A	
	Historic Environment	Not assessed at this stage	N/A			N/A	N/A	
	Biodiversity	Not assessed at this stage	N/A			N/A	N/A	
	Water Environment	The Bin Brook is the only river that is classified as a main river by the EA within 1km of the scheme area. The proposed scheme crosses the Bin Brook towards the schemes east, adjacent to Heschel Road. Small areas of the scheme are located within the Flood Zone 3 related to the Bin Brook, land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%). However, the majority of the site is within Flood Zone 1, land assessed as having a 1 in 1000 or less annual probability of river flooding (<0.1%). The proposed scheme crosses multiple areas which are at high risk to surface water flooding. However, these areas predominantly have modelled depths below 150mm. The risk of flooding will most likely increase over the lifetime of the scheme as a result of climate change. However, the scheme will be designed to ensure that it is not at risk of flooding for its lifetime without adverse impacts elsewhere.	N/A			Neutral - Slight Adverse	Not quantified at this stage	
Social	Commuting and Other users	Impacts of the scheme on business users and transport providers have been estimated using TUBA. It is expected that the scheme will improve connectivity from residential areas in Cambourne to employment centres in Cambridge.	Value of journey time changes(£)			-	43,944,064	
	Net journey time changes (£)							
	0 to 2min	2 to 5min	> 5min					
	Reliability impact on Commuting and Other users	Not assessed at this stage	N/A			N/A	N/A	
	Physical activity	The introduction of a new off-road segregated cycle track will result in physical activity benefits. The Active Mode Appraisal Toolkit (AMAT) has been used to assess these benefits and show monetised benefits of £4.88m for the reduced risk of premature death and £0.57m benefits from reduction in absenteeism.	N/A			Moderate Beneficial	5,454,050	
	Journey quality	Users will benefit from an improved travelling environment provided by modern Park and Ride facilities, cleaner surroundings and improved journey information. Wait times are also expected to be reduced and the improvement in journey times will benefit user's journey perception. For car users there may be minor disbenefit from the introduction of the bus gate west of Long Road. Active travel users will benefit from new facilities replacing the previous on-road non-segregated lane.	N/A			Moderate Beneficial	15,325,968	
	Accidents	A reduction in accidents for active travel users is captured within the AMAT. It is expected the reduction in private car traffic will also reduce accidents.	N/A			Slight Beneficial	-1,942,731	
	Security	The new Park and Ride facilities include CCTV and lighting which will help to improve security for users. The scheme is not intended to light the bus route, which may create negative impacts for cyclists and pedestrians using the route during darker periods.	N/A			Neutral	N/A	
	Access to services	The scheme will provide better access to public transport and therefore access to services and activities via the new route.	N/A			Slight Beneficial	N/A	
	Affordability	Not assessed at this stage	N/A			N/A	N/A	
Public Account	Severance	The provision of improved connections and footpaths for pedestrians along the route into Cambridge are likely to outweigh any slight journey lengthening due to new crossing points.	N/A			Slight Beneficial	N/A	
	Option and non-use values	Residents along the route and in the proposed developments will benefit from the option of having the scheme's services to access quality public transport services, particularly where a car is not available.	N/A			Large Beneficial	N/A	
	Cost to Broad Transport Budget	The Broad Transport Budget which captures the public sector cost of the scheme has been estimated in line with TAG	N/A			N/A	137,962,267	
	Indirect Tax Revenues	The scheme will result in increased direct tax revenues as a result of greater spending on public transport fares and fuel spends.	N/A			N/A	-931,224	

Annex C

TAG WORKSHEET FOR WATER ENVIRONMENT



TAG Water Environment Impacts Worksheet

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study area: Surface water and groundwater features located within c.1km of the Site and/or hydraulically connected to the Site have been considered.	Bin Brook and tributaries	Water supply	Main river. 'Moderate' WFD status. Likely to support local water supplies.	Local	Low	Limited potential for substitution	Medium	Negligible	Insignificant
Potential Impacts: •Increase to surface water flood risk due to increased impermeable surface area. •Increase to fluvial flood risk due to decrease in flood plain storage from water features such as the installation of culverts and bridges. •Permanent impact that may affect the hydromorphological quality of water features associated with works within or in close proximity to water features such as the installation of culverts and bridges. •Increased pollution risk to surface water features.		Transport and dilution of waste products	Main river. 'Moderate' WFD status.	Local	Low	Cannot be substituted	Medium	Negligible - Increased runoff into watercourse but no significant loss in quality and can be mitigated through the use of SuDS.	Insignificant
		Biodiversity	Moderate' ecological WFD status. No known fish species or designations.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Aesthetics	Low - heavily modified within study area.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Cultural Heritage	No known cultural assets.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Recreation	No known recreation uses.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Value to economy	No known commercial uses.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Conveyance of flow and material	Flows through multiple culverts north of site area.	Local	Low	Limited potential for substitution	Medium	Negligible to slight adverse - Proposed scheme crosses the Bin Brook but on pre-existing crossing, hydraulic modelling shows that the new bridge has potential to have a minor impact conveyance and flow but can be mitigated in design.	Insignificant
	Land Drains and Ditches	Water supply	Ordinary watercourses, unlikely to be part of local water supplies.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Transport and dilution of waste products	Ordinary watercourses.	Local	Low	Limited potential for substitution	Low	Negligible - Increased runoff into watercourse but no significant loss in quality and can be mitigated through the use of SuDS.	Insignificant
		Biodiversity	Small watercourses, not monitored by WFD. No known fish species or designations.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Aesthetics	Straightened watercourses.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Cultural Heritage	No known cultural assets.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Recreation	No known recreation uses.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Value to economy	No known commercial uses.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
		Conveyance of flow and material	Flows in predominantly rural areas.	Local	Low	Limited potential for substitution	Low	Negligible	Insignificant
• Potential decrease in flood plain storage	Floodplain	Conveyance of flood flows	Located in Flood Zone 3, flood risk associated with the Bin Brook. Areas at High risk of flooding from surface water sources along the route from overland flow paths. Site specific hydraulic modelling (Bin Brook Model) indicates that there will be no increased fluvial flood risk to any third party land.	Regional	Low	Limited potential for substitution	High	Negligible to Slight Adverse - Proposed scheme crosses the Bin Brook but on pre-existing crossing, hydraulic modelling shows that the new bridge has potential to have a minor impact floodplain but can be mitigated in design.	Insignificant
		Biodiversity	Located within a 'Moderate' ecological WFD status. No known fish species or designations.	Local	Low	Limited potential for substitution	Low	Slight Beneficial - Proposed watercourse crossings have potential to impact feature, but will be mitigated by BNG enhancement.	Insignificant
		Aesthetics	Site is mostly located in a rural area.	Local	Low	Limited potential for substitution	Medium	Negligible	Insignificant
• Increased pollution risk to groundwater.	Groundwater	Water supply	Located approximately 500m away from a source protection zone 3, south of the western most point of the site. Good WFD status. High groundwater vulnerability zones are located in small areas in the east of the site, the majority of the site is low risk, with areas over the principal aquifers of the West Marly Chalk and Woburn Sands Formation being medium risk. The West Marly Chalk aquifer is approximately less than 6.5m in thickness and so unlikely to be significantly utilised for water supply due to its thickness. The Woburn Sands aquifer is identified as being in poor chemical condition and good quantity condition and may possibly used for abstractions.	Local	Low	Limited potential for substitution	Medium	Negligible - Increased runoff from the scheme but no significant loss in quality and can be mitigated through the use of SuDS.	Insignificant
		Transport and dilution of pollutants	No known discharge points.	Local	Low	Cannot be substituted	Low	Negligible	Insignificant
		Groundwater flow	Groundwater flow to rivers.	Local	Low	Cannot be substituted	Medium	Negligible	Insignificant
		Value to economy	No known commercial uses.	Local	Low	Cannot be substituted	Low	Negligible	Insignificant
		Biodiversity	Provides baseflow to rivers.	Local	Medium	Cannot be substituted	High	Negligible	Insignificant

Reference Sources

OS Mapping, MAGIC GIS Portal, British Geological Survey, Environment Agency's online maps for flood risk and Environment Agency's Catchment Data Explorer, site specific hydraulic modelling (Bin Brook Model).

Summary Assessment Score

Neutral - Slight Adverse

Qualitative Comments

Review of the EA's Flood Map for Planning (Rivers and Sea) indicates that sections of the site is located in Flood Zone 3. The fluvial flood risk is associated with the Bourn Brook. Review of the EA's Flood Risk from Surface Water map indicates that areas along the route are at High risk of flooding from surface water sources. The Bin Brook is classified as main rivers.



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Greater Cambridge Partnership

CAMBOURNE TO CAMBRIDGE

Outline Business Case Appendix C - Financial
Case Addendum



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1 INTRODUCTION

1.1 OUTLINE BUSINESS CASE

- 1.1.1. The Cambourne to Cambridge Public Transport Project (CtoC) Outline Business Case (OBC) Financial Case document was prepared in January 2020¹. The OBC was developed in line with the HM Treasury and Department for Transport (DfT) guidance on the preparation of a 5-Case business case model.

1.2 PURPOSE OF THIS DOCUMENT

- 1.2.1. This Financial Case Addendum provides a companion document to the existing OBC Financial Case.

1.3 STRUCTURE OF THIS DOCUMENT

- 1.3.1. The structure of this document is set out below.
- Chapter 2 provides a summary of the Financial Case developed in January 2020 and sets out the areas for review and update in this addendum document; and
 - Chapter 3 sets out the areas of the Financial Case updated in this addendum document which reports on scheme costs, funding arrangements and accounting implications in April 2024.

¹ <https://www.greatercambridge.org.uk/asset-library/Sustainable-Transport/Public-Transport/Cambourne-to-Cambridge/C2C-OBC-Jan-2021/C2C-Jan-2020-App-1-Financial-Case.pdf>

2 FINANCIAL CASE

2.1 INTRODUCTION

- 2.1.1. The Financial Case for the OBC was published in January 2020. This section provides a summary of the scheme costs, funding arrangements and accounting implications.

2.2 SCHEME COSTS

- 2.2.1. The scheme costs for the preferred option were produced for a physically guided system (kerb guided system representing a 'worst case' assumption). Land cost estimates were prepared separately. The scheme costs developed are proportionate and affordable to the scale of issues identified in the Strategic Case and the predicted benefits assessed in the Economic Case.
- 2.2.2. In January 2020, the total (nominal) cost of the scheme at OBC stage was £127.6m, exclusive of risk allowance. At the Full Business Case stage, it was noted that the design would be at a greater level of maturity with unspecified uncertainties reduced to a minimum. A P80 value of 25% was applied to the base cost.
- 2.2.3. A summary of the cost for the preferred option is shown in Table 2-1.

Table 2-1 – Scheme Capital Costs

To be updated for Item	Cost £millions
Construction	82.481
Design	13.197
Project Management	9.707
Environment	1.394
Statutory Undertakings	1.100
Land Costs	7.951
Base Cost (4Q2018 prices)	115.830
Inflation (3% per annum until 2024)	11.777
Risk allowance	32.881
Total	160.488

Source: Outline Business Case, Financial Case, January 2020

- 2.2.4. The capital cost of the preferred option adjusted for a P80 risk level is £160.5m (nominal). A spend profile for capital costs was produced for 2020 to 2024. This profile is shown in Table 2-2.
- 2.2.5. Given the uncertainty in cost estimation due to the level of design undertaken P50 and P90 risk contingency allowances were estimated. This produced a cost range of £153.4million for P50 Risk and £165.2 million for P90.

Table 2-2 – Spend Profile Preferred Option, £millions

Cost Item	Costs 2014-19	2020	2021	2022	2023	2024
Annual Costs	3.214	8.661	10.568	61.977	68.354	7.714
Cumulative total	3.214	11.875	22.443	84.420	152.774	160.488

Note: Scheme costs 2014-19 are costs in developing the scheme up to OBC submission

- 2.2.6. Maintenance costs for the scheme were calculated from 2024 to 2084 with a total whole life cycle budget of £66.0 million. This is equivalent to £1.1 million per annum. The maintenance costs also included the operating costs for the Scotland Farm Park and Ride site. It was noted that maintenance costs would be subject to negotiation with potential providers.
- 2.2.7. The Financial Case stated that greater clarity on maintenance costs would be available at the next stage of business case development.
- 2.2.8. It should be noted that costs will potentially be incurred for the purchase and operation of new vehicles for CtoC. This will be available at the next stage of business case development. The OBC stated that these costs do not form a part of the current funding request.
- 2.2.9. It was noted that Value Engineering at the next stage of business case development would offer a means of reducing cost whilst achieving the aims of the scheme.

2.3 FUNDING ARRANGEMENTS

- 2.3.1. Funding for CtoC will be through the City Deal, the funding partnership between central government and local partners. The City Deal funding aims to enable Greater Cambridge to promote economic growth and development. However, the GCP is looking to secure an appropriate proportion of the costs from local developer contributions through the planning process. The working assumption of the OBC is that £37m will be secured from developers, including the developers at Cambourne West, Bourn Airfield, and the University of Cambridge West.
- 2.3.2. A S106 grant funding profile was developed up to 2024 based on the timescales current at the time the OBC was prepared. If the S106 funding is not available during the construction period, then funding will be secured through the City Deal. S106 funds will be returned to the City Deal once these funds become available. An 'in principle' £8.7m was secured through a S106 agreement with Cambourne West. Other S106 negotiations were ongoing at the time the OBC was prepared with the University of Cambridge West Cambridge development and the Bourn Airfield development.
- 2.3.3. A funding profile was estimated for the OBC which is shown in Table 2-3.

Table 2-3 – Preferred Option Funding Profile, £millions

	2014-19	2020	2021	2022	2023	2024	Total
City Deal	3.214	8.661	10.568	43.127	49.504	7.714	122.788
S106 contributions				18.850	18.850		37.700
Total	3.214	8.661	10.568	61.977	68.354	7.714	160.488

Source: GCP

2.4 ACCOUNTING IMPLICATIONS

- 2.4.1. The scheme was considered affordable based on City Deal funding of £122.8 million and £37.7 million of S106 funding. The OBC noted that £8.7 million is secured in principle through a S106 agreement with the Cambourne West developer.
- 2.4.2. In the event of cost increases or reduced S106 funding, the GCP will look to the Future Investment Strategy to underwrite these costs. Additional City Deal funding or other third-party funding opportunities would be considered to meet the full costs of the scheme. A value engineering cost review may also offer opportunities to reduce the scheme costs whilst minimising the impact on the delivery of the scheme objectives.
- 2.4.3. A preferred option for an operating maintenance strategy will be developed at FBC stage and include in the Financial Case. It is not expected that operating costs will be funded directly by the GCP.
- 2.4.4. The CtoC scheme is not anticipated to have any state aid implications. As the scheme promoter, the GCP will be funding the scheme under the organisation's statutory function requirement to provide public infrastructure. The OBC notes that the scheme will benefit multiple housing and employment sites along the corridor and not a sole organisation and therefore will not have state aid implications. Nevertheless, it is stated that a full state aid check will be carried out at FBC stage.

3 FINANCIAL CASE ADDENDUM

- 3.1.1. This Financial Case Addendum provides an update on the following sections of the Financial Case:
- Capital cost estimates (change in inflation assumptions, etc);
 - Funding arrangements; and
 - Accounting Implications

3.2 SCHEME COSTS

CAPITAL COSTS

- 3.2.1. The preferred option scheme costs were updated for this addendum following a review of the latest scheme design which included an optical guided busway specification (August 2022) and delivery plan. The inflation forecast assumed that construction was due to start in 1Q2025 with construction completed in 4Q2026. Inflation was applied to the total costs. An allowance of 3% inflation contingency per annum was included to account for current market conditions. The current scheme programme indicates a construction start of 1Q2026 with completion scheduled for 4Q2027. This movement in the programme was contemplated in the risk register and allowance has been made accordingly in the risk/contingency figures below. The updated costs based on these assumptions are shown in Table 3-1.
- 3.2.2. The updated scheme cost estimate is £192.3 million (nominal). The spend profile for the construction period is shown in Table 3-2.
- 3.2.3. The detailed breakdown of the capital cost estimate is provided in the CtoC-8-00 Estimate of Costs document.

Table 3-1 – Updated Preferred Option Scheme Costs, £millions

Item	Cost £millions
Base Direct / Indirect Construction Costs	97.881
Base In-Direct Non-Construction Costs	24.659
Risk/Contingency	37.941
Total	160.481
Inflation forecast	13.321
Inflation risk @3%	11.012
Land take cost	7.471
Total	192.285

Source: WSP

Table 3-2 – Spend Profile Preferred Option, £millions

	2014-2024	2024/25	2025/26	2026/27	2027/28	Total
Total	13.482	4.237	23.977	83.891	66.697	192.285

Source: WSP

LIFE CYCLE COSTS

- 3.2.4. Since the OBC a review has been undertaken of the life cycle costs for cyclical structures inspection and routine maintenance and highways maintenance. Over the 60-year appraisal period this is £7.685 million (4Q2022 prices).

OPERATING COSTS

- 3.2.5. The estimated operating cost was produced for the 2020 OBC. Its assumptions have been retained and the whole life operating costs of £205.29 million over a 60-year period equate to approximately £3.4m (2019 prices) per annum.

3.3 FUNDING ARRANGEMENTS

- 3.3.1. The scheme will be funded through the Greater Cambridge City Deal, along with third party Section 106 contributions, which are detailed below.

GCP has allocated sufficient funds from the City Deal to meet the balance of the remaining anticipated costs of the CtoC scheme following the receipt of developer contributions. These contributions are anticipated to amount to £37.7 million. They include:

- Cambourne West: £8.7 million secured funding plus direct delivery of the Broadway Link (£400,000) and the internal route within the site
- Bourn Airfield: £20 million – planning permission has been granted and the Section 106 agreement is in place, plus direct delivery of the internal route within the site
- West Cambridge: £9 million - planning permission has been granted and the Section 106 agreement is in place

- 3.3.2. The allocation of City Deal funds to the GCP's overall programme will be regularly monitored by the GCP Executive Board to ensure that as projects progress to full business case, the required funds are in place for each approved investment.

3.4 ACCOUNTING IMPLICATIONS

- 3.4.1. The expected impact on the GCP's balance sheet is not anticipated to have changed since the January 2020 Financial Case submission. The scheme is considered affordable based on City Deal funding and S106 funding.



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CAMBOURNE TO CAMBRIDGE

Outline Business Case - Appendix D -
Management Case Addendum



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1 INTRODUCTION

1.1 OUTLINE BUSINESS CASE

- 1.1.1. The Cambourne to Cambridge Public Transport Project (CtoC) Outline Business Case (OBC) Management Case document was prepared in January 2020¹. The OBC was developed in line with HM Treasury and Department for Transport (DfT) guidance on the preparation of a 5-Case business case.
- 1.1.2. In August 2021, the DfT released an update to the *Transport Business Case* guidance document to reflect the 2020 HM Treasury Green Book review.
- 1.1.3. The overall concept for developing business cases across three investment stages and utilising the five-case model remained unchanged within the update to the *Transport Business Case* guidance, but the specific contents, and their level of development, within each of the five cases was revisited.

1.2 PURPOSE OF THIS DOCUMENT

- 1.2.1. This Management Case Addendum provides a companion document to the existing OBC Management Case, focussing on a review and update of the scheme dependencies and the project delivery programme.

1.3 STRUCTURE OF THIS DOCUMENT

- 1.3.1. The structure of this document is set out below.
 - Chapter 2 provides a summary overview of the Management Case developed in January 2020 and sets out the areas for review and update in this addendum document; and
 - Chapter 3 provides a review and update of the Management Case Project Dependencies and Project Delivery programme

¹ <https://www.greatercambridge.org.uk/asset-library/Sustainable-Transport/Public-Transport/Cambourne-to-Cambridge/C2C-OBC-Jan-2021/C2C-Jan-2020-App-1-Management-Case.pdf>

2 MANAGEMENT CASE

2.1 INTRODUCTION

- 2.1.1. The OBC Management Case was published in January 2020. The Management Case sets out Project Dependencies and the Project Plan.

2.2 PROJECT DEPENDENCIES

- 2.2.1. Project dependencies identified by the 2020 OBC were as follows:
- Delivery of housing and employment sites set out in the South Cambridgeshire Local Plan. A key driver of the CtoC scheme is the new housing developments, particularly at Cambourne West and Bourn Airfield.
 - Emerging Cambridgeshire and Peterborough Combined Authority (CPCA) policy. The CtoC scheme, the OBC stated, needed to be reviewed against the draft Local Transport Plan and future Cambridge transport systems proposals to ensure the scheme's alignment with current policy;
 - Cambridge Autonomous Metro (CAM). The OBC identified a need to monitor the development of CAM as the CtoC scheme formed part of Phase 1 of the infrastructure for CAM;
 - City Access Strategy. The OBC stated that the City Access Strategy by addressing congestion in the city centre and facilitating travel in and out of the city centre through improved bus journey times would be a key factor in encouraging people to use the CtoC Park and Ride.
 - Oxford-Cambridge Arc: Both the Oxford-Cambridge expressway and East-West Rail projects were identified as having an impact on travel in the corridor and although CtoC is not directly dependent on these schemes it was stated that these schemes may have a significant impact on CtoC;
 - Emerging technologies. The final specification of CtoC will be led by technology advances and solutions available at the time of procurement.

2.3 PROJECT PLAN

- 2.3.1. The project scope and execution was assessed by the full project team and with the support of key stakeholders. GCP developed its own work and reporting stages using key decision points based on the DfT business case process. The detailed programme approved by the Project Board was set out in Appendix J of the January 2020 Management Case. The reporting process for raising risks to programme delivery was through a Status Report to the Project Board. A formal requirement to change the programme would be reported to the GCP Executive Board for approval with recommendations provided for the decision-makers.
- 2.3.2. The Management Case set out the key milestones for the CtoC delivery programme shown in Table 2-1. .

Table 2-1 – CtoC Delivery Programme (January 2020) – Key Milestones

Phase	Task	Target Completion Date
Phase 1: Establish Project	Agree the scope of the project	2014
	GCP Executive Board Approval	2014
Phase 2: Identify Outline Concepts	Options Generation & Initial Sifting	2Q2014
	Further Options Assessment	2Q2015
	Stakeholder Consultation on Options	1Q2016
	SOBC	3Q2016
	GCP Executive Board Approval	3Q2016
Phase 3: Identification of Preferred Option	Further Option Assessment	3Q2017
	Further Stakeholder Consultation	1Q2018
	Business Case Update Preferred Option	2Q2018
	GCP Executive Board Approval	4Q2018
	Develop Design	1Q2019
	Stakeholder Consultation	1Q2019
	OBC	4Q2019
	GCP Executive Board Approval	4Q2019
Phase 4: FBC & Statutory Approvals	TWAO Application	3Q2020
	Objection Management	1Q2021
	Public Inquiry (if required)	1Q2021
	Secretary of State Decision	4Q2021
	Procurement	1Q2022
	FBC	1Q2022

	GCP Executive Board Approval	2Q2022
Phase 5: Final Design Scheme for Approval	Final Designs	1Q2022
	GCP Executive Board Approval	2Q2022
Phase 6: Construction & Final Operator Handover	Scheme Construction	2Q2022
	Handover	2Q2024
	Scheme Opening	2Q2024

3 MANAGEMENT CASE REVIEW AND UPDATE

- 3.1.1. The Management Case Review and Update is presented in this chapter. Table 3-1 shows the actions undertaken for this OBC update, namely a review, and if appropriate an update of project dependencies and the project plan. A risk management update is also provided for project risks.

Table 3-1 – Sections of Management Case Updated

Section	Comments	Action
Introduction and objectives	This section would need to be revisited to ensure it reflects any updates to the Management Case	Addressed at FBC
Evidence of similar projects	Chapter 2 of the Management Case includes evidence of similar projects. This section could be updated if there are further relevant projects delivered since production of the OBC	Addressed at FBC
Governance, organisational structure and roles	This section would need to be revisited to ensure it reflects the release of the Value Toolkit	Addressed at FBC
Assurance	There are no changes anticipated to this section of the Management Case	No action for OBC Addendum, reconsider at FBC stage
Programme or project reporting	There are no changes anticipated to this section of the Management Case	No action for OBC Addendum, reconsider at FBC stage
Programme or project scope, dependencies and constraints	Chapter 3 of the Management Case sets out the project dependencies. These need to be revisited to reflect their latest position	Addressed in OBC Addendum
Project implementation	There are no changes anticipated to this section of the Management Case	No action for OBC Addendum, reconsider at FBC stage
Programme or project plan	The project programme will need to be revisited to ensure it reflects the latest position	Addressed in OBC Addendum

Stakeholder engagement and communications	This section should be updated to reflect the latest position and any additional stakeholder engagement activities since the production of the current OBC	Addressed at FBC
Risks and issues management	This section should be updated to reflect any changes in the risk register	Addressed at FBC
Lessons management	This section was added as part of the August 2021 update to the DfT's Transport Business Case guidance	Addressed at FBC
Benefits management	This section would need to be revisited to ensure it reflects the release of the Value Toolkit	Addressed at FBC
Data information security	This section was added as part of the August 2021 update to the DfT's Transport Business Case guidance	Addressed at FBC
Benefits management and evaluation	This section would need to be revisited to ensure it reflects the release of the Value Toolkit	Addressed at FBC
Project closure	This section was added as part of the August 2021 update to the DfT's Transport Business Case guidance	Addressed at FBC

3.2 PROJECT DEPENDENCIES

- 3.2.1. Chapter 2 of this document has set out the project dependencies identified in the OBC. In this chapter these project dependencies have been revisited to reflect their latest position.
- 3.2.2. The review of the project dependencies is shown in Table 3-2 below: It should be noted that the housing developments along the CtoC corridor are dependencies requiring the CtoC to be implemented to be developed. The other potential impacts shown in Table 3-2 are considered complementary impacts rather than dependencies.

Table 3-2 – Project Dependencies

	Impact on the Development of the Scheme
Delivery of housing and employment sites set out in the South Cambridgeshire Local Plan and Emerging Greater Cambridge Local Plan.	A key driver identified in the 2020 OBC for the CtoC scheme is the new housing development at the Bourn Airfield and Cambourne West sites. The 2018 South Cambridgeshire Local Plan provided for 3,500 new homes at Bourn Airfield and 2,350 new homes at Cambourne West. In the Emerging Greater Cambridge Local Plan, the housing units increase to 2,850 homes at Cambourne West. There are also 2,000 additional homes to be built in Cambourne, as identified in the latest Emerging Local Plan. Delivery of much of this housing development is dependent on the CtoC scheme.

City Access Strategy	The CtoC scheme will deliver a sustainable transport network which would derive additional benefit from complementary initiatives such as the City Access Strategy, which seeks to reduce the attractiveness of the car as a mode for accessing the city centre but would provide additional benefits for alternative modes including the CtoC scheme. Making Connections, a part of the City Access programme, proposed a Sustainable Travel Zone (including a road-user charging scheme) discouraging car use in the city centre. The proposed STZ is not being taken forward, but the March 2024 GCP Executive Board agreed that any revised proposals for City Access would be developed through the Greater Cambridge Transport Strategy led by the Cambridgeshire County Council.
Cambridge South East Transport project (CSET)	The Cambridge South East Transport project (CSET) provides enhanced and safer bus, cycling and walking routes in the A1307 and A1301 areas. CSET is included in the GCP's vision for a future Bus Strategy and is one of the four public transport corridors including active mode improvements identified as essential to link growing communities across Cambridge. As such CSET is complementary to CtoC in supporting the growth of the Cambridge economy.
Cambridge Autonomous Metro (CAM)	The CtoC scheme is part of a wider high quality public transport network (HQPT). This included CAM (Cambridge Autonomous Metro), which is no longer being pursued. However, whilst the CAM offered additional network synergy, the CtoC scheme was never dependent on the CAM scheme.
Greater Cambridge Greenways	The Greenways network of improvements to cycling and pedestrian connectivity provides scope for enhanced connectivity for users of the CtoC cycling and walking infrastructure. The Greenways in general, and in particular the Comberton Greenway, will provide additional connectivity benefits for active modes using the CtoC Non-Motorised Users (NMU) infrastructure.
East-West Rail	<p>East-West Rail (EWR) will provide improved rail connectivity along the Oxford-Cambridge Arc.</p> <p>In 2024, the EWR section connecting Bicester with Bletchley and Milton Keynes is scheduled for completion.</p> <p>The section of EWR connecting Milton Keynes with Cambridge is in the planning stage. In 2021, the consultation document identified the route along the A428 with a station in Cambourne North as the emerging preference for the EWR alignment.</p> <p>EWR will have an impact on travel in the CtoC corridor. However, the impact on CtoC is not likely to be significant as EWR will serve longer distance travel whilst CtoC will serve shorter distance travel between Cambourne West / Bourn Airfield and Cambridge. .</p>

Oxford-Cambridge Expressway	In 2020, there were plans for an expressway, the Oxford-Cambridge Expressway, however this scheme is no longer being pursued, so there is no likely medium-term impact for CtoC.
National Highways M11 Improvements	National Highways regularly reviews its network to identify improvements to be included in its Route Improvement Strategy (RIS). Currently, the opportunity to improve either Junctions 13 or 14 has been discussed but there are no current plans for either to be delivered in the RIS.
Emerging technologies.	Emerging technologies were identified in the OBC as a project dependency. Utilisation of emerging technologies remains a consideration for the final specification of CtoC, which will reflect the latest technologies and solutions available at the time of procurement. GCP is currently preparing to trial the solutions developed for the CAVForth scheme, which operates buses on motorways in mixed traffic. As such this provides a significant basis upon which CtoC can build.

3.3 PROJECT PLAN

- 3.3.1. The project plan has been revisited to reflect the latest position and is shown in Table 3-3 below. It should be noted that this is subject to further refinement as the project progresses.

Table 3-3 – Updated Project Delivery Plan

Phase	Task	Target Completion Date, OBC Update
Phase 1: Establish Project	Agree the scope of the project	2014
	GCP Executive Board Approval	2014
Phase 2: Identify Outline Concepts	Options Generation & Initial Sifting	2Q2014
	Further Options Assessment	2Q2015
	Stakeholder Consultation on Options	1Q2016
	SOBC	3Q2016
	GCP Executive Board Approval	3Q2016
Phase 3: Identification of Preferred Option	Further Option Assessment	3Q2017
	Further Stakeholder Consultation	1Q2018
	Business Case Update Preferred Option	2Q2018
	GCP Executive Board Approval	4Q2018

	Develop Design	1Q2019
	Stakeholder Consultation	1Q2019
	OBC	4Q2019
	GCP Executive Board Approval	4Q2019
Phase 4: FBC & Statutory Approvals	TWAO Application	3Q2024
	Objection Management	4Q2024
	Public Inquiry (if required)	2Q2025
	Secretary of State Decision	4Q2025
	Procurement	4Q2025
	FBC	4Q2025
	GCP Executive Board Approval	4Q2025
Phase 5: Final Design Scheme for Approval	Final Designs	4Q2025
	GCP Executive Board Approval	4Q2025
Phase 6: Construction & Final Operator Handover	Scheme Construction	1Q2026
	Handover	4Q2027
	Scheme Opening	1Q2028

3.4 RISK MANAGEMENT

- 3.4.1. The approach to risk management and development of a risk management strategy is set out in the 2020 OBC Management Case. The risk register has since been updated to capture the progress of the scheme and assist in programme management.
- 3.4.2. The current key quantified project risks at OBC stage are a result of a QCRA carried out in February 2024. An assessment score has been produced for each risk. These scores are set out in Table 3-4, along with a summary of impacts, mitigation measures and mitigation progress for each risk.

Table 3-4 – Risk Register - Key Project Risks

Risk/Opportunity	Risk Category	Project Stage	Project Risk Description (If)	Potential Impact (Then)	Pre-Mitigation Likelihood	Pre-Mitigation Impact	Pre-Mitigation Score	Risk Mitigation / Realisation Measures	Post-Mitigation Likelihood	Post-Mitigation Impact	Post Mitigation Score
Risk	External Stakeholders	DS3 - Preliminary Design	The agreements with the developers take longer to negotiate than planned, due to the concerns of the Environment Agency around the capacity of water infrastructure to accommodate additional housing. This is delaying the TWAO submission and could put the overall project at risk.	Since the TWAO application is not being submitted until the signed agreements are in place, this could result in the programme being delayed with associated cost increases including inflationary pressures.	5	5	25	Continued negotiation and schedule of regular meetings with landowners' agents to reach conclusion. Capture tasks in project programme.	5	5	25
Risk	Construction	DS5 - Delivery	Utility diversions may not be complete in time, cost more and take longer. Key interfaces are Cadent Gas, UKPN overhead electricity at the proposed park & ride site and communications apparatus at various locations.	Prolongation and associated costs including cost of mitigation.	4	4	16	Advanced works contract to undertake the utility diversions and additional GPR surveys. Agreement of the protective provisions with the utility providers.	4	4	16
Risk	Statutory Process	DS3 - Preliminary Design	The TWAO submission is not authorised by the Secretary of State (SoS) because of concerns with adherence to Statutory Process, for example: - Consultation Process (separate risk created)	If the process or documents does not adhere to the TWAO requirements, then there will be grounds for the scheme to be delayed/ rejected.	3	5	15	Legal advice should mitigate risk sufficiently and implement strategies for Consultation etc. Produce documents and	2	5	10

			<ul style="list-style-type: none"> - Non-adherence of deadlines/ time constraints in TWAO - Documents do not meet requirements 	Cost impact includes programme delay and resubmission of the TWAO.				processes as advised by legal advisors			
Estimating Uncertainty	Project Funding	DS5 - Delivery	Construction inflation may exceed cost plan provision due to shortage in supply chain capacity and demand outstripping supply.	<p>The latest update to the Cost Estimate (V1.9) included an allowance for inflation and inflation contingency of £24.3 million. This estimating uncertainty captures the possibility that the project has over or under provided for inflation.</p> <p>The estimating uncertainty has been modelled with a pessimistic skew as construction cost inflation is consistently tracking above the general rate of inflation.</p> <p>Min - 5% reduction in inflation cost</p> <p>MI = no substantive variation from inflation costs built into the cost estimate.</p> <p>Max -20% increase in inflation costs.</p>	5	4	20	Manage through best practice commercial and procurement management	5	4	20
Risk	Supply Chain	DS5 - Delivery	Market interest /competing projects. Competition for resources with Sizewell C, Black Cat to Caxton Gibbet, and other major projects will drive up resource cost. The construction programme is also challenging (2 years).	<p>If local contractors are not available, then may need to source contractors from further afield resulting in delay to procurement and driving up costs.</p> <p>Inflationary impact over and above cost plan</p>	4	4	16	<p>Consideration of procurement routes to make the project attractive to potential tenderers.</p> <p>Pre-market engagement.</p>	3	4	12

				provision expected to be covered within our cost plan allowance for inflation. Main cost impact is prolongation of the project team and delayed start of project, possibly up to 6 months delay (resulting in 2.5% inflation)							
Risk	Statutory Process	DS3 - Preliminary Design	Statutory stakeholders object to scheme e.g. risks associated with landowners, utilities diversion works etc	If the risk to Stakeholders statutory assets was high enough to warrant an objection, then the scheme could be halted.	3	5	15	Consultation strategy for early engagement with stakeholders. Work jointly with land and legal advisors. Ensure collaborative interfaces and workstreams to ensure focus on TWAO requirements.	3	4	12
Risk	Design	DS3 - Preliminary Design	Risk that alignment of circa 200m route along Rifle Range Track could have an adverse impact on trees that are protected by TPOs	Potential need to design alternative alignment or localised measures to safeguard tree roots.	5	4	20	WSP has undertaken a radar survey of roots and prepared an indicative engineering solution set out in a Technical Note. Engage with LA Tree Protection Officers to confirm proposed methodology and solution.	5	3	15

Risk	Project Scope	DS3 - Preliminary Design	Developments do not proceed as planned	If the developments do not proceed as planned, then the scheme will receive less S106 funding and there is likely to be lower demand for the CtoC scheme bus services which are connected to future growth.	4	4	16	Close consultation with CCC is required to affirm that developments will proceed as planned in the scheme corridor and assumed build out timescales.	4	3	12
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WSP QCRA, February 2024



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