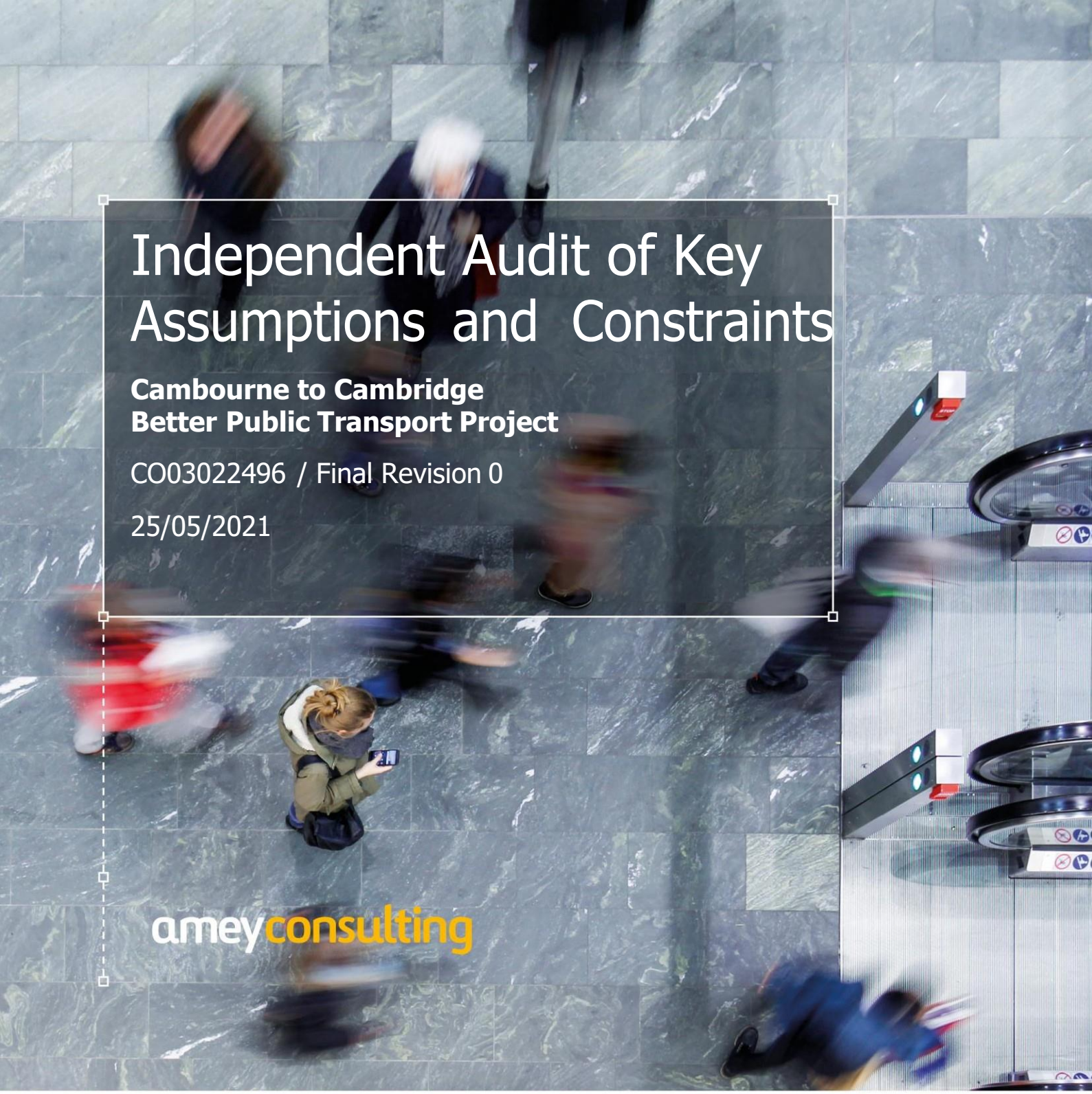

Independent Audit of Key Assumptions and Constraints

Cambourne to Cambridge
Better Public Transport Project

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Executive Summary

This Independent Audit has been prepared in response to a dispute over the alignment for the Cambourne to Cambridge (C2C) busway scheme. The preferred route option was chosen following the evaluation of a range of route options during the Outline Business Case process. The GCP considers the scheme to have a strong strategic case and is required to deliver the Better Public Transport strategy in the growth corridor along the A428/A1303. The process has included extensive consultations with stakeholders and affected parties. The preferred option has taken these views into account and proposed mitigation measures where negative impacts are identified.

Despite this, there are many objections to the scheme and its impact on the communities affected, which range from questions over the need for a segregated busway to objections to specific elements of the project including its route alignment. Alternative options have been put forward, some of which have been assessed in the Business Case. The former Mayor of the Cambridgeshire and Peterborough Combined Authority, James Palmer, proposed a 'northern route' alignment to fit-in with the planned CAM network of which the C2C scheme was part, and formed the central section between the western fringe of the City and Cambourne. The CAM network emerged since the Better Public Transport policy was adopted by the GCP. Following the publication of the Combined Authority Local Transport Plan in 2019 the two authorities agreed to work together to integrate the C2C and CAM projects. In May the newly elected Mayor Nik Johnson indicated that he does not intend to proceed with CAM. The establishment of the Combined Authority is the most significant change since the C2C scheme was initiated but it is not the only factor that changes the context of the scheme. Other factors include the development of the East West Railway with a station planned at Cambourne, amendments in 2019 to the Climate Change Act 2008, the impact of the COVID-19 pandemic on travel behaviour and the government's Bus Services Act 2017 and the Bus Back Better National Bus Strategy for England 2021.

There are clearly challenges in how to respond to travel demands in a post-COVID world. Some trends point in the direction of less travel or changes in travel behaviour that is more local and accessible by active modes. At the same time there is evidence that traffic is returning to pre-pandemic levels but perhaps spread out more across the day. If so, traffic congestion will remain a key constraint on growth that still requires alternative solutions. In this context the strategic case for schemes like C2C remain valid but the assumptions regarding passenger demand may need revisiting as will potentially the need for on-going support to bus services. These effects apply to CAM as much as the C2C busway, and possibly more so to EWR. The pandemic has heightened the risks for these schemes. The government at least sees buses as being an important part of the post-COVID landscape and in this respect the C2C poses less of a risk than either CAM or EWR.

The conclusion of this audit is that there is no reason why the Executive Board of the GCP should not proceed to the next stage in the development of the C2C scheme.

The audit has concluded thatthe scheme is in alignment with national, regional and local policies on the economy and transport. Stakeholder engagement has been carried out in a robust manner and the business case development followed the HMT Treasury Green Bookand the Department for Transport's TAG methodology. The appraisal has been carried outin a robust manner and the economic analysis and financial case remain valid

The environmental impact of the scheme is mixed and the validity of some of the assumptions will need to be investigated further as part of an Environmental Impact Assessment which would form part of the next stages.

A number of alternative route options have been put forward and have been examined in this audit. It is important to stress, however, that the business case must balance local concerns with the wider strategic goals. The GCP has followed the national guidance on appraisals such as this.

Overall, the audit has confirmed that the key constraints and assumptions on which the C2C business case is based remains valid. There have, however, been some significant changes in the wider context, including the impact of Covid-19, the increasing importance of climate change, the government's new bus policy, East-West Rail and the CAM scheme. These factors will have to be taken into account in the next stages of developing the C2C scheme.

It has been argued that progress with the C2C scheme should be delayed, to consider the CAM and East-West Railprojects. This audit has concluded that the case for delay is not strong and has been significantly weakened as a result of the increasing uncertainty about CAM in the light of statements by the incoming Mayor.

The key findings of the audit are as follows:

1. The C2C scheme is in alignment with national, regional, and local policies on the economy and transport strategy as evident in the various studies at the time of its inception and adopted in Local Plans and the Local Transport Plan, 2014 – 2018. The evidence validates that Greater Cambridge has been growing rapidly and will continue to do so in the future. Consequently, Cambridge's transport infrastructure is under pressure, with high levels of congestion in the city centre and on key corridors into and out of the city. The C2C project has been recognised in the Local Plans and local transport strategy as a key project to help address these infrastructure constraints on growth by linking Cambridge to growth areas to the west.
2. These assumptions and constraints are confirmed in the Combined Authorities Local Transport Plan which recognises the need for a high-quality public transport scheme in the Cambourne to Cambridge corridor. The objectives of the scheme therefore remain valid.
3. The strategic context of the scheme, however, has changed especially with the proposed CAM network (which may not now proceed) as well as the next stage of the EWR consultation on the preferred route options and station location. The transport strategy of which CAM is a central part looks set to be revised as the incoming Mayor, Nik Johnson, has indicated that he wants to prioritise bus services including consideration of a franchising model. There is an opportunity to reset the assumptions for the Better Public Transport project to match the new Mayor's priorities and take advantage of the government's Bus Back Better national bus strategy initiative which includes support for innovative bus projects like the C2C as well as other bus priority measures. The C2C mayno longer be constrained by the CAM project.
4. The C2C focus is primarily on the A428/A1303 corridor and while acknowledging the constraints on bus accessibility through the city centre it offers no solution apart from the City Access program of soft measures to restrict on-street parking and reallocate road space to active travel. The assumption is that these measures will be enough to enhance bus speeds and provide more reliable journey times across the city. However, no detailed modelling of the likely impact has been conducted so it remains uncertain whether bus accessibility will improve.

5. The C2C scheme objectives include increasing bus mode share along the corridor, and local transport policy aims to reduce traffic in Cambridge City Centre and on radials like the A1303. It is not clear from the analyses how much these will be achieved, and it is therefore difficult to comment on the validity of these assumptions and constraints.
6. East West Railway: the C2C business case assumes it would connect into the EWR station, so the assumptions regarding the routing through Cambourne are still valid. The issues around potential impacts on demand should be subjected to further analysis. This could be done through more detailed modelling of passenger demands or through sensitivity analysis of projected demands for the C2C under different scenarios. It would benefit the planning and operations of the C2C busway to have a better understanding of the potential demands at the time of the EWR likely opening. The assumptions therefore need updating. In the intervening period, the transport and housing constraints that underpin the scheme remain valid.
7. The uncertainty over the future of the CAM project weakens the case for any pause in the C2C scheme development and consequently does not alter the assumptions and constraints for the scheme which remain valid in the corridor. The C2C HQPT remains the only means of increasing capacity on the A1303/A428 corridor and addressing the public transport travel needs of the growing population. The EWR does not provide an alternative to travel along the corridor to West Cambridge and the City Centre. The two schemes serve different travel markets and should be planned as complementary services. The housing developments in Cambourne West and Bourn Airfield require the C2C project to be opened by 2025, otherwise the planned growth will be put at risk.
8. The C2C scheme objectives are a valid response to the constraints identified along the corridor with some ambitious assumptions to deliver a HQPT that can compete with car travel. There are a couple of caveats. Firstly, while accepting that these objectives relate to the scheme once open, the phasing of the housing and employment development along the corridor is a constraint that is not analysed in the Business Case. This omission should be addressed in further modelling of incremental growth scenarios. Secondly, there is no objective to integrate with other public transport services including EWR or to integrated ticketing/fares that would incentivise bus use. Thirdly, the only environment objective is to improve air quality – a valid objective – but omits any other goals related to climate change or impact on the environment. There seems to a 'strategy' gap between the policy related objectives and the scheme specific objectives.
9. So while the three components of the scheme – HQPT route, new Park & Ride facilities, and active travel facilities - are complementary features and consistent with the scheme objectives, it is not clear how the scheme fits into the broader transport strategy to address the growth constraints. This vacuum was filled by the previous Mayor's CAM network project that was central to the Local Transport Plan strategy for the area. At the time of writing there is uncertainty over the future of CAM and what may be required to replace it. If it is to be the Better Public Transport program and schemes like the C2C, then the objectives need updating and widening to fill the gaps in transport strategy.
10. The business case development has broadly followed the guidelines and procedures laid out in the HM Treasury Green Book and DfT's TAG methodology. These documents provide the guiding principles within which projects should be appraised but allow some leeway for scheme proposers to employ different methods and techniques where appropriate. It is accepted that in scheme appraisal there will be a need for judgement alongside quantitative assessment so long as there is a robust evidence base to support the decisions made.

11. It appears that the appraisal has been conducted in a robust manner. The process has included consultation with stakeholders at each phase and in addition a Local Liaison Forum has been established to represent stakeholder interests. These have been given ample opportunity to present their evidence and opinions on the C2C route options and in response the GCP has amended some features of the scheme.
12. Generally, the appraisal covers the required elements for the business case and appraises the options against the assumptions and constraints specified in the scheme objectives. The only question is whether the objectives remain valid in light of developments with CAM (the future of which is uncertain) and EWR, as well as changes in transport policy and strategy evident in the CPCA's Local Transport Plan? The appraisal took place while these projects were at an early planning stage and could not reasonably incorporate them into the appraisal given that they were not committed schemes. The recent statements by the new Mayor which question the CAM project validates this approach but the EWR has since taken a step forward and should be brought into the appraisal framework.
13. The appraisal of wider economic impacts is a problematic area in welfare economics, especially surrounding the assumptions over dependency versus displacement in estimating Gross Value Added (GVA) associated with jobs and land value uplift from housing. The dependency assumptions are key to the economic justification for the scheme and its overall value-for-money. The methods employed in the analysis appear to follow the appraisal guidelines, and in that respect remain valid.
14. The environmental impact of the scheme is mixed. The Business Case emphasises the benefits in terms of improving air quality, biodiversity and its compatibility with national policies on climate change and greenhouse gas emissions, and assumes these will outweigh any negative impacts of the scheme on the green belt, landscape character and heritage assets. The validity of these assumptions will need further investigation as part of the Environmental Impact Assessment that has yet to be conducted for the scheme.
15. Alternative route options have been put forward by opponents of the preferred route, who object to the scheme's impact on the local environment and suggest that better alignments are feasible and more in keeping with the scheme objectives as well as being compatible with other developments such as the CAM and EWR projects.
    a. An in-highway proposal for a HQPT along the A1303 are essentially short-term measures that are consistent with the C2C scheme objectives. However, this does not invalidate the assumptions and constraints for the preferred option as a long-term solution to meet the growth in travel demand along the corridor. The short-term measures are boosted by recent government announcements in the national bus strategy that the GCP and CPCA may wish to take advantage of and use as a catalyst for attracting ridership to public transport for when the preferred route opens.
    b. The alternative 'northern route' options and have been reviewed at various stages in the scheme options development process. The CAM route alignment proposed by the previous Mayor appears unsuitable for the busway, not least because of the higher cost compared with the preferred route and would run into considerable opposition from affected parties such as the American Cemetery and residents in Madingley. The Girton Interchange option is ambitious and expensive and would take longer to deliver especially as it is reliant on Highways England committing to upgrade the junction. It looks like a high risk compared to the preferred option. The hybrid A428 Co-alignment scheme is a compromise between the other two that incorporates some of their features but avoids the riskier elements. In this sense it is

more viable and closer aligned to the scheme objectives than the others. Nevertheless, it is likely to perform less well on cost and other performance metrics while potentially scoring higher on environmental and social impact.

The alternative route options are created to overcome the local impacts constraints identified in the Business Case. The Business Case needs to address a wide range of constraints as well as local concerns and balance these through a rational appraisal process. Objectors may feel that this process is biased in favour of strategic goals, yet it is incumbent on the GCP to adhere to an appraisal process that complies with the methods laid down in the guidelines. The C2C scheme assumptions and constraints are not invalidated by the alternative options. It is not the role of this audit to adjudicate between different options. Opponents of the preferred option will have the opportunity to present their alternative route options to the Public Inquiry and cross-examine the GCP and its consultants on the options development and preferred scheme appraisal.

Recommendations

It is recommended that the assumptions and constraints in the following areas needs updating in the Business Case to incorporate the latest developments in transport policies and strategies that influence the C2C scheme:

- CAM network. The uncertainty over the CAM project affects the context for the C2C scheme in particular and the Better Public Transport project in general. The initial public statements by the new Mayor suggest a significant change in local transport strategy that will need to be reflected in the Business Case. The implications should become clearer as the incoming Mayor develops his transport strategy, but it presents an opportunity to reset the C2C scheme.
- City Centre access remains a constraint on achieving the ambitions of the C2C scheme and needs further examination, perhaps as part of a more ambitious bus strategy for Cambridge.
- National bus strategy. The assumptions in the OBC need updating and in some cases adding to, to incorporate changes in government policy. There is little said in the OBC, for instance, on ticketing and fares which probably reflected the bus de-regulation policy in place at the time of the Better Public Transport policy but should be included as a central plank of the delivery strategy.
- Similarly, the move to implement Enhanced Partnership or franchising models for bus operations is a significant shift in government policy, which has implications (mainly positive?) for schemes like C2C.
- The environmental impact of the scheme is mixed. The Business Case emphasises the benefits in terms of improving air quality, biodiversity and its compatibility with national policies on climate change and greenhouse gas emissions, and assumes these will outweigh any negative impacts of the scheme on the green belt, landscape character and heritage assets. The validity of these assumptions will need further investigation as part of the Environmental Impact Assessment that has yet to be conducted for the scheme.
- The GCP should continue to consult with stakeholders as the preferred option progresses and implement any recommendations that may arise from the Environmental Impact Assessment.
- EWR: the issues around potential impacts on demand should be subjected to further analysis. This could be done through more detailed modelling of passenger demands or through sensitivity analysis of projected demands for the C2C under different scenarios.

- Short-term bus priority measures along the A1303 could be a catalyst for mode shift in preparation for the when the C2C busway is operational, i.e., considered as complementary measures.
- Scheme cost and benefits. A question remains over the assumptions regarding the wider economic impacts of the scheme and extent to which the scheme supports housing and jobs growth. More testing of travel demands under different scenarios would be helpful, in understanding the long-term impacts of the scheme on general traffic in the corridor as well as on bus ridership.

1 Introduction

The Greater Cambridge Partnership (GCP) has instigated an independent audit of the key assumptions and constraints underpinning the selection of the preferred route for the Cambourne to Cambridge Better Public Transport Project (C2C). The audit has been commissioned by the GCP in response to challenges over the preferred route alignment by the Mayor of the Cambridgeshire and Peterborough Combined Authority (CPCA) and other parties. The scope of the audit is to review the assumptions and constraints that underpinned the analysis that led to the selection of the preferred route and the elimination of alternative options. The objective is to test the robustness of those assumptions and constraints anddetermine whether they remain appropriate in the context of the current strategic frameworks, developments relating to Cambridgeshire Autonomous Metro (CAM) network and the East West Rail plans.

The audit has been conducted in two stages. The first stage comprised the preparation of a statement on the assumptions and constraints. The purpose was to establish a baseline understanding of the key assumptions and constraints underpinning the outline business case and selection of the preferred route. Information was gathered from documents published by the GCP along with a range of technical documents and reports prepared by its partners and other organisations such as the CPCA. Local amenity groups and individuals also submitted evidence as part of this first stage. The statement was published on the GCP web site together with an invitation to representative groups to submit further written representations on the assumptions and constraints and their application throughout the process, by 23rd April 2021. This statement is contained in Appendix A.

The continuing validity and appropriateness of the assumptions and constraints is analysed in the second part of the audit which comprises this report. The scope of the audit is to:

1. Review whether the correct procedures have been followed in developing the Business Case; and
2. Review the evidence base presented in the Outline Business Case in the light of changes in policy and other developments such as the CAM and EWR.

The audit does not evaluate the effectiveness or otherwise of any specific option.

1.1 Structure of the Audit

Following this Introduction, **Section 2** describes the background to the project as part of the City Deal agreed with central government in 2014 and the local policy context around the growth agenda. Assumptions and constraints regarding how to deliver transport improvements to enable projected increases in jobs and houses are reviewed. **Section 3** reviews specific constraints associated withthe prevailing transport conditions in the Cambridge to Cambourne corridor together with environmental constraints. **Section 4** reviews the assumptions andconstraints underpinning the development of the Business Case for the C2C scheme leading to the selection of the preferred option. **Section 5** considers the changing context for the C2C scheme with respect to proposals for the CAM network, the planned East West Railway with a station at Cambourne, amendments in 2019 to the Climate Change Act of 2008, the impact of the COVID-19 pandemic on travel behaviour, and the new powers provided by the Bus Services Act 2017 and the Bus Back Better: National Bus Strategy 2021, and whether the original assumptions and constraints underpinning the project still apply. **Section 6** summarises the submissions andrepresentations made to the audit by organisations andindividuals. A list of the representations made is recorded in

Appendix B. Finally, **Section 7** provides a summary of the audit findings and recommendations for the C2C business case.

Throughout the report summary remarks on the assumptions andconstraints reviewed are highlighted. This positions the audit comment in the specific context of the issue under review and is intended to help the reader as they work through the document.

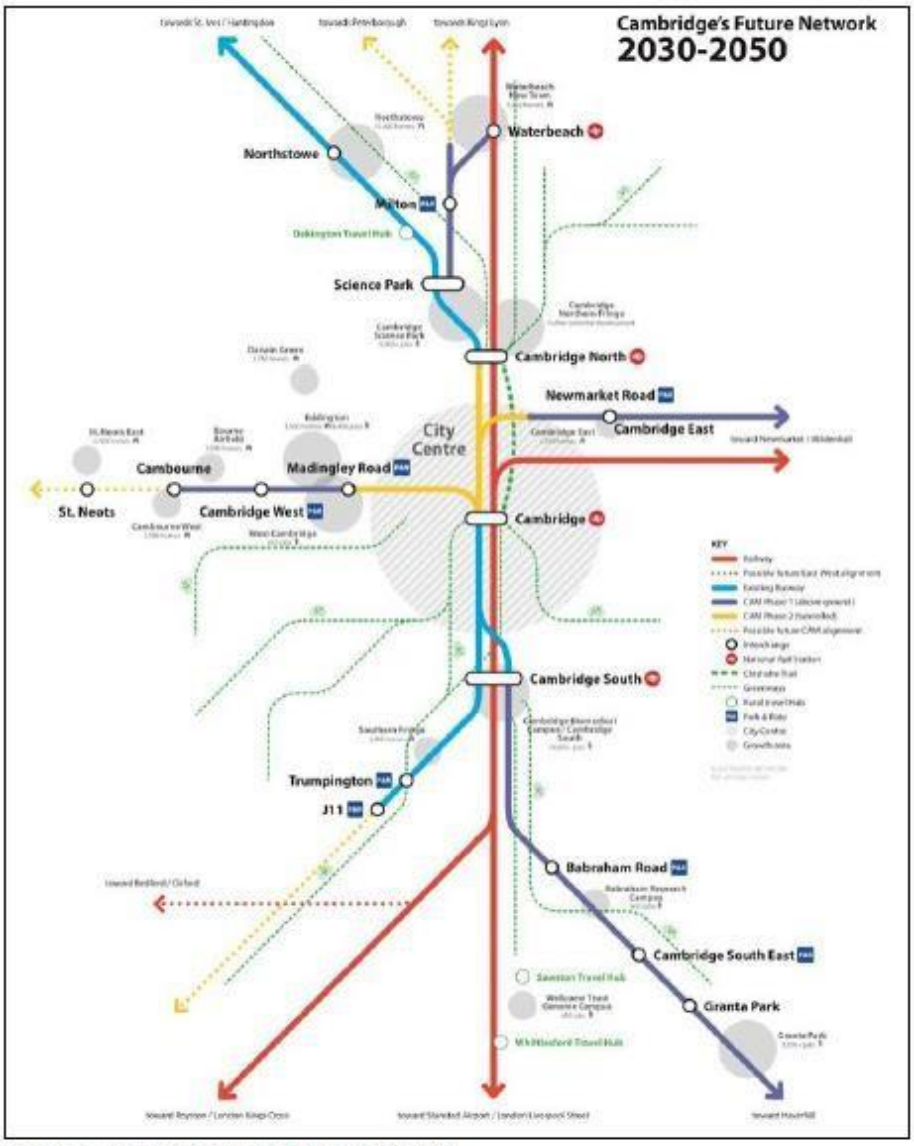
A separate Annex accompanies the Audit report containing all the submissions made in the two rounds of consultations.

2 Background to the Better Public Transport Project

The C2C is a priority scheme of the GCP and the first of four corridor projects providing better public transport and active travel routes for walking and cycling, offering better connectivity and alternatives to car use for growing communities to the north, south east, east and west of the city. The four busway schemes are depicted in Figure 1 as part of the vision for the Greater Cambridge future travel network:

- Cambridge to Cambourne (C2C)
- Cambridge to Granta Park
- City Centre to Cambridge East
- Cambridge to Waterbeach

Figure 1. Cambridge's Future Network



Source: C2C Project Update June 2019

The project was conceived as part of the City Deal agreed with central government in 2014, bringing powers and investment, worth up to £1billion over 15 years, to vital improvements in infrastructure, supporting and accelerating the creation of 44,000 new jobs and 33,500 new homes.[i] The GCP was formed to be the delivery body for the City Deal and comprises an Executive Board made up of members from Cambridge City Council, South Cambridgeshire District Council, Cambridgeshire County Council, and the University of Cambridge, and a wider Assembly. In 2016 a Local Liaison Forum was established to regularly review progress and provide input to the C2C scheme development.

2.1 Policy Context

The assumptions and constraints that underpinned the City Deal and better public transport corridors are described in policy documents and transport strategy at this time, including:

- Transport Strategy for Cambridge and South Cambridgeshire[ii] – 2014;
- Greater Cambridgeshire and Peterborough Strategic Economic Plan (SEP)[iii] produced by the Greater Cambridge Greater Peterborough Local Enterprise Partnership in 2016, which helped secure the Growth Deal that led to the formation of the Cambridge and Peterborough Combined Authority in March 2017;
- Cambridgeshire Long Term Transport Strategy – 2015;
- The emerging Local Plans for Cambridge[iv] and South Cambridgeshire[v] that confirm the housing allocations and sites for future development including employment – adopted in 2018;
- The National Infrastructure Commission identification of the Oxford – Milton Keynes – Cambridge arc as a priority area for growth including the requirement for a new Oxford – Cambridge Expressway (since replaced at the eastern end by the dualling of the A428 from the A1 at Black Cat roundabout to Caxton Gibbet roundabout) and a new east west railway.

The transport priorities at a local level are fully reflected by national transport objectives. These national objectives are set out in UK Government's statutory Transport Investment Strategy (TIS) which was published in July 2017[vi].

The TIS sets out four key objectives:

- To create a **more reliable, less congested, and better-connected transport network** that works for the users who rely on it.
- To build a **stronger, more balanced economy** by enhancing productivity and responding to local growth priorities.
- To **enhance the UK's global competitiveness** by making Britain a more attractive place to trade and invest.
- To support the **creation of new housing**.

Together these reports define the key policies and growth objectives for the Greater Cambridge area. Through the City Deal, the GCP aims to enable a new wave of innovation-led growth by investing in infrastructure, housing and skills, thereby addressing housing shortages and transport congestion bottlenecks that will facilitate its continued growth and a continuation of the "*Cambridge Phenomenon".*

The Greater Cambridge City Deal Assurance Framework establishes the key strategic objectives against which investment projects will be prioritised:

- To nurture the conditions necessary to enable the potential of Greater Cambridge to create and retain the international high-tech businesses of the future;
- To better target investment to the needs of the Greater Cambridge economy by ensuring those decisions are informed by the needs of businesses and other key stakeholders such as the universities;
- To markedly improve connectivity and networks between clusters and labour markets so that the right conditions are in place to drive further growth; and
- To attract and retain more skilled people by investing in transport and housing whilst maintaining a good quality of life, in turn allowing a long-term increase in jobs emerging from the internationally competitive clusters and more University of Cambridge (UoC) spin-offs.

The business case for the C2C project will be assessed by the GCP Executive Board to ascertain the extent to which any transport investment meets the strategic objectives of the City Deal, including:

1. How the scheme supports business investment and confidence

2. How the scheme represents targeted investment where business needs it

3. How the scheme links effectively into the key growth sites

4. How the scheme supports transport infrastructure and quality of life

Two constraints in particular feature large in the analysis of factors that underpin the policy objectives: firstly, an inadequate supply of homes including affordable housing to support the expected population growth and jobs target; secondly, insufficient capacity on the existing transport networks, principally affecting the roads and rail services. These two constraints are interrelated and to relieve pressure on the housing market, for example, requires improving transport connections to unlock new sites for development. Likewise, providing more homes and jobs creates more demand for movement and stretches the capacity of the existing transport systems.

In a compact city such as Cambridge, with its historic core and constrained road network, adding capacity by road building was always a non-starter. The focus therefore switched to meeting these additional demands by more sustainable and more efficient transport solutions using a range of public transport, cycling and walking modes. This is the background to the genesis of the better public transport program, of which the C2C scheme is the first phase, as well as the CAM network which was developed later and is discussed further below. The key assumption is that the C2C scheme will contribute to meeting the overarching policy goals along the A428/A1303 corridor and deliver the outcomes specified in the transport strategy to deliver:

- New orbital public transport routes around Cambridge that taken together provide a wider variety of direct HQPT connections than would be traditionally possible under a traditional radial City Centre "*hub and spoke*" model;
- New High-Quality Public Transport (HQPT) links into Cambridge on key routes, connecting existing and new housing developments with major employment centres;
- A comprehensive network of pedestrian and cycle routes within Cambridge; and
- The main radial routes will have high quality bus priority measures.

The C2C project is a named scheme within the City Deal and contributes to the City Deal aims and objectives by removing some of the barriers to economic growth within Greater Cambridge and improving connectivity between current and future housing and key employment sites, thus helping

to ensure there is sufficient access to a diverse labour market to contribute to continued economic growth. The project also provides additional transport capacity to allow for a growth in the number of trips from new developments along the A428/A1303 into Cambridge.

Audit Comment: A1

Overall the C2C scheme is in alignment with national, regional and local policies on the economy and transport strategy as evident in the various studies listed earlier and adopted in Local Plans and the Local Transport Plan at the time of its inception, 2014 – 2018. The evidence validates that Greater Cambridge has been growing rapidly and will continue to do so in the future. Consequently, Cambridge's transport infrastructure is under pressure, with high levels of congestion in the city centre and on key corridors into and out of the city. The C2C project has been recognised in the Local Plans and local transport strategy as a key proje ct to help address these infrastructure constraints on growth by linking Cambridge to growth areas to the west. There is a substantial level of economic growth planned with approximately 8,400 dwellings and 13,300 jobs planned on those sites directly along the C2C corridor by 2031. The assumption that a HQPT like the C2C project is necessary is justified if it can demonstrate that it will support economic growth by providing faster and reliable journey times that will improve connectivity and accessibility and thereby link housing and employment growth areas more closely.

3 Corridor Issues and Constraints

3.1 Housing and Employment Growth

One of the challenges associated with the high levels of growth is focused on housing. Housing in and around the city has become less affordable as demand outstrips supply. House prices in Cambridge are also amongst the highest in the UK. Both Cambridge and South Cambridgeshire have experienced significant growth post-recession and the house price gap continues to widen when compared to surrounding districts and national averages. This is driving the demand for housing outside Cambridge in locations such as Cambourne and St Neots, and consequentially traffic growth on the A428/A1303 route

Coupled with the city's high employment growth, Cambridge's high house prices drive the demand for housing beyond the city's boundaries and the green belt and this in turn impacts on transport infrastructure and other community facilities. Local Plans envisage that there will be 32% more in-commuters in 2031 than in 2011 under current employment growth forecasts. However, if employment growth continues at recent high rates, this could be as much as 82%. This highlights a risk to Cambridge's future growth whereby if house prices and rents increase in some areas, and heavier commuting leads to extra delays this would undermine the GCP, local authorityand CPCA policies towards employment and housing.

The sites allocated for future housing and employment in the Cambridge to Cambourne corridor are shown in Figure 2. Overall based on current plans, both those within the current Local Plan or well established through planning applications or known to be emerging, there is around 11,700 of additional housing planned and development is estimated to support 13,400 additional jobs along the Cambourne to Cambridge corridor. The key sites are:

- West Cambridge – 10,000 jobs
- North West Cambridge – 3,000 dwellings, 4,000 jobs
- Bourn Airfield – 3,500 dwellings
- Cambourne West – 2,350 dwellings

In addition, there are several smaller in-fill and village fringe housing developments planned at Hardwick and Highfield Caldecote.

Audit Comment: A2

The Local Plans for Cambridge City and South Cambridgeshire adopted in 2018 confirm the housing targets and these are currently under review as part of the Greater Cambridge Shared Planning (GCSP) agreement between the two authorities. The projected housing growth is considered a base line by the CPCA which highlights the need for more housing if current growth trends continue. The GCSP call for sites for development has identified potential sites along the corridor that provide residential and mixed-use developments. The EWR has mentioned in its consultation the possibility of unlocking land for housing development north of Cambourne if the station is in this vicinity. The A428/A1303 corridor is strategically important in contributing to the area's growth requirements and these developments in turn will generate many more travel movements. The housing constraints therefore remain valid for the C2C scheme.

Figure 2 Future Development Sites

Figure 1: Future development sites

Site numbers	Site name	Dwellings/jobs
1	Northstowe	10,000 dwellings
2	West Cambridge	10,000 jobs
3	North West Cambridge	3,000 dwellings 4,000 jobs
4	Darwin Green	2,780 dwellings
5	Cambridge Biomedical Campus (CBC) and Extension to CBC (Local Plan Proposal)[1]	14,000+ jobs
6	Bell School	347 dwellings
7	Glebe Farm	316 dwellings
8	Trumpington Meadows	1,200 dwellings
9	Clay Farm	2,300 dwellings
10	Hardwick - West of Grace Crescent	98 dwellings
11	Highfield Caldecote - Highfields Road	71 dwellings
12	Hardwick - St Neots Road	155 dwellings
13	Highfields Caldecote - Land East of Highfields Road	140 dwellings
14	Bourn Airfield (Local Plan Proposal)	3,500 dwellings
15	Cambourne West - (Resolution to grant planning Permission	2,350 dwellings

Source: Mott MacDonald (© Crown Copyright. All Rights Reserved. OS License Number 100023205.2018)

1. The SCDC and CaCC Local Plans were adopted on 27 September 2018 and 18 October .

3.2 Transport Constraints

Following the adoption of growth policies by the GCP and its partners, strategies to meet these requirements have been developed that focus on key interventions to unlock growth and add capacity. The key underlying drivers for the need for change along the A428/A1303 route and for investment in the C2C project are:

- The A428 is a nationally important route and forms part of the nationally strategically important Oxford-Cambridge Arc which was highlighted in the 2017 Budget as a priority for growth.
- Current delay on the A1303, eastbound, in the AM Peak is up to and over 75% slower than average night-time speeds. This is mirrored in the westbound PM Peak with between 50%-75% slower speeds than night-time average speeds.
- Car ownership in Cambridge is high, with 85% of households having access to a car compared to the national average of 74%.
- The demand generated by the growth in housing and employment will generate ever greater levels of demand for travel in and around Cambridge, with approximately 29% increase in trips during the AM peak, 31% increase during the PM peak and 38% increase during the interpeak period by 2036, and will thereby exacerbate current congestion issues.
- The greater levels in travel demand show that trips made by car for commuting purposes in Cambridgeshire are predicted to grow by up to 14% and 36% respectively during the AM and PM peak periods by 2036 worsening current congestion issues.
- The rail network does not serve the movements along the A428/A1303 route.
- The existing A428/A1303 is inadequate for walking and cycling as a mode of transport into Cambridge.
- Congestion on the route means that current public transport services are unable to offer an attractive alternative to private car.

With the number of developments and housing sites set to continue growing along the A428/A1303 and within and around Cambridge city centre, the number of trips generated along the route is likely to continue growing. In the absence of any high-quality public transport service, it is likely that a large proportion of these new trips will be made by car.

Audit Comment: A3

The transport constraints are based on evidence collected in traffic surveys and modelling of the transport network under different growth scenarios. Accordingly, these demonstrate the need for the intervention and a sustainable transport solution provided by the Better Public Transport Project. These constraints remain valid for the C2C scheme.

3.3 City Centre Access and Connectivity to Key Employment Sites

While the C2C will help to improve journey times and provide viable alternatives to the congested A1303, it does not provide a wholly segregated link within the City Centre. Such cross-city links are important to:

- Providing accessibility to major employment sites located on Cambridge's urban fringe; and
- Efficient movement for vehicular modes (including public transport) through the historic streetscape within the City Centre.

Cambridge is a polycentric city, with only 19% of employment located within the City Centre. Future employment growth is expected to be disproportionately concentrated on the city's "fringes", either at large employment hubs such as the Cambridge BioMedical Campus and Cambridge Science Park, or in new communities at North West Cambridge, Cambourne and Waterbeach. The city's existing public transport network is poorly configured for such future trips and commuting patterns, which are likely to be more "orbital" than "radial" in nature.

Journeys to these fringe sites usually require entering the city centre, where congestion is at its worst, changing route, and exiting from the city centre again. Consequently, many commuters are forced to rely on their car: currently 60% of trips to the Cambridge BioMedical Campus and 63% of trips to Cambridge Science Park are made by private car, compared to just 12% and 33% for the City Centre and Cambridge station area respectively

Public transport accessibility must therefore significantly improve at such sites for sustainable growth to be achieved. Without improved accessibility, traffic congestion will continue to worsen, and growth put at risk as such 'fringe' sites become increasingly difficult to access from the rest of Greater Cambridge.

One of the key causes of congestion in Cambridge is the limited capacity of its highway network, both for general traffic, bus services, and pedestrians and cyclists. This is particularly the case in the City Centre, where an historic street network, pre-dating the car, cannot accommodate modern traffic flows or provide sufficient space to fully segregate public transport services. Even if traffic volumes were to be significantly reduced, such as through adoption of an ambitious demand management or the City Access programme, many of these physical constraints would still remain.

Some of these constraints are outlined in Figure 3. Magdalene Street, which bisects the Grade I listed buildings of Magdalene College, is only wide enough for one vehicle at a time but provides the only access point into the city centre from the north-west. This route is shared by local bus services and traffic accessing the city centre, is frequently congested, and unable to support additional bus services. Hence the routeing of C2C bus services via Silver Street into the City Centre, which enables interchange with the Universal bus service at Grange Road. East-West connectivity to the city centre is limited with only two vehicular access points to the west of the city, Magdalene Bridge and the Silver Street bridge, which forms a barrier for movement for public transport services accessing the City Centre.

These limitations form a major part of the justification for the CAM network that was planned to effectively tackle these constraints, improving the transport network to support the region's growth through the provision of tunnelling to provide reliable, segregated public transport links across Cambridge.

Audit Comment: A4

The C2C OBC focus is primarily on the A428/A1303 corridor and while acknowledging the constraints on bus accessibility through the city centre it offers no solution apart from the City Access program of soft measures to restrict on-street parking and reallocate road space to active travel. The assumption is that these measures will be enough to enhance bus speeds and provide more reliable journey times across the city. However, no detailed modelling of the likely impact has been conducted so it remains uncertain whether bus accessibility will improve.

The OBC recognises the need to access the fringe employment site at the Science Park and Cambridge BioMedical Campus and proposes a pattern of orbital bus services to serve these sites

from the Park and Ride sites at Madingley Road and Scotland Farm via the M11 and A428 as well as connections in the City Centre.

These constraints remain valid for the C2C scheme and only weak remedies are proffered at this stage.

Figure 3. Connectivity Challenges in Cambridge City Centre

Source: CAM OBC, Steer 2019

3.3 Environmental Policies and Constraints

Alongside the policies on economic growth and investment in transport infrastructure, there are a range of environmental policies in the Cambridge City and South Cambridgeshire Local Plans that constrain developments in the area and in some cases conflict with the growth agenda, including:

- Air Quality - the centre of Cambridge has had an Air Quality Management Area (AQMA) since 2004 due to poor air quality (mainly due to high nitrogen dioxide from traffic) that does not meet National Air Quality Objectives. To implement improvement in air quality a series of Air Quality Management Plans have been implemented and integrated into the local transport plans. The introduction of a HQPT system that encourages lower private vehicle use, which is a key contributing factor to poor air quality in the city centre, has the potential to contribute to improvements in air quality in the city, and maintain good air quality outside of the city along the A428/A1303.
- Noise - any scheme that seeks to reduce noise levels can bring benefit to human health, although changes in traffic levels would need to be significant before conspicuous improvements in ambient noise levels are noticed.
- Historic Environment – heritage assets are abundant in Cambridge city centre, Cambridge American Cemetery and Memorial, as well as conservation areas around Adams Road and Coton village
- Landscape - The design of the scheme will need to take account of the landscape character along the route, with planting and infrastructure designed to minimise any negative impacts on the landscape.
- Green Belt - The C2C project would pass through substantial areas of land that is within the Cambridge Green Belt. The National Planning Policy Framework (NPPF) allows development such as transport infrastructure in the Green Belt so long as the requirement is demonstrated.
- Biodiversity – Cambridge City Council and South Cambridgeshire District Council have adopted policies to preserve and protect biodiversity from inappropriate development and to enhance biodiversity where possible. The GCP has committed to delivering a 10% net biodiversity gain following the scheme implementation.
- Climate Change – the Climate Change Act 2008, amended in 2019, commits the government to achieving net zero greenhouse gas emissions by 2050, with the government committing to end the sale of new petrol and diesel cars by 2030 and to ensure all cars and vans will be zero emissions at the tailpipe by 2035. Public transport schemes such as the C2C project has the potential to lead to a reduction in greenhouse gas emissions by introducing a carbon efficient public transport fleet, removing traffic off the road, and reducing congestion. There is also the opportunity to deploy solar panels at the Scotland Farm transport hub/Park and Ride site.
- Water and flood risk - The NPPF requirement is that no new development (taking proper account of climate change impacts on rainfall) should increase flood risk to surrounding areas. The C2C project is judged to have a very limited impact on integrated water resources, with no likely special measures to be required to ensure the relevant policies in the Local Plans for Cambridge and South Cambridgeshire councils will be fully complied with. This will be assessed further as the scheme design progresses.

The potential environmental constraints along the preferred route are shown in Figure 4. It is worth noting that the OBC also identifies opportunities to enhance the environment along the preferred route, not just to mitigate impacts, but to increase biodiversity.

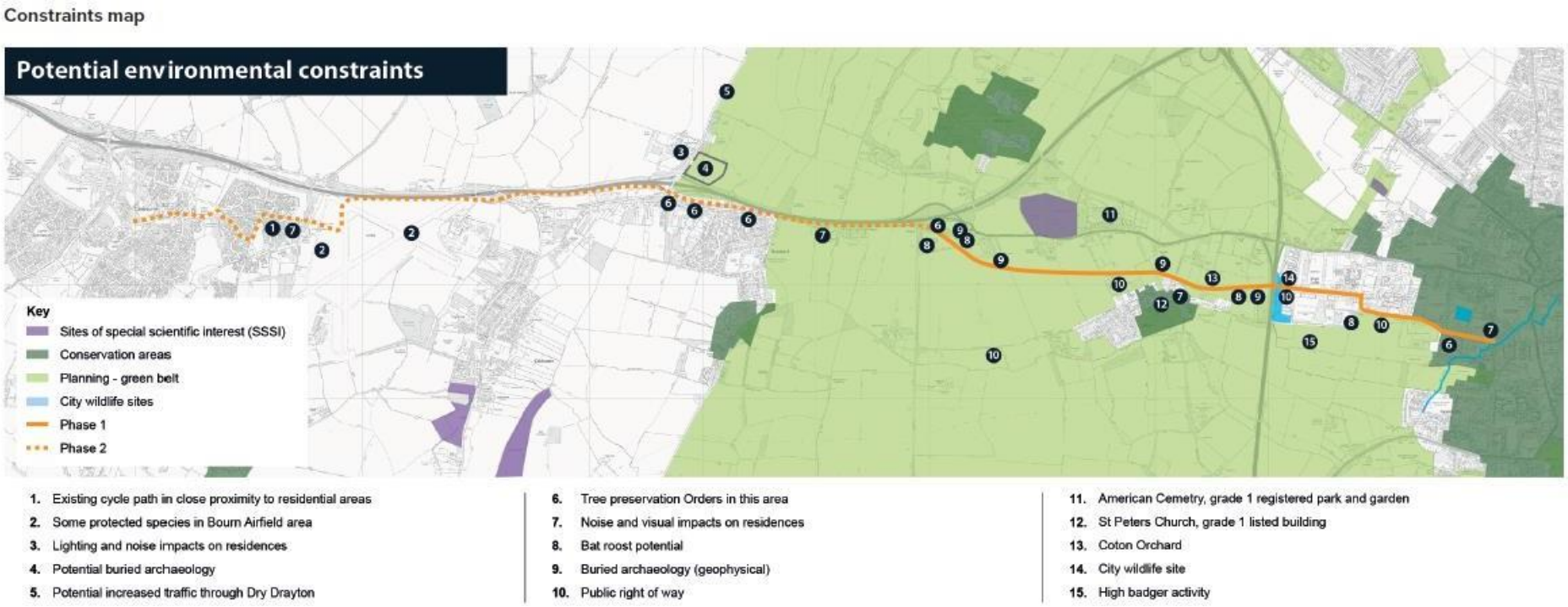
Audit Comment: A5

The environmental impact of the scheme is mixed. The Business Case emphasises the benefits in terms of improving air quality, biodiversity and its compatibility with national policies on climate

change and greenhouse gas emissions, and assumes these will outweigh any negative impacts of the scheme on the green belt, landscape character and heritage assets.

The validity of these assumptions will need further investigation as part of the Environmental Impact Assessment that has yet to be conducted for the scheme.

Figure 4. Potential Environmental Constraints



4 C2C Business Case

This section describes the business case development process for the C2C scheme. Since the project inception a large volume of documentation has been produced which is available on the GCP website[vii], culminating in the preparation of the Outline Business Case: Strategic Case[viii] in January 2021, which is the principal report reviewed in this Audit.

The background and policy context for the scheme was described in Section 2, and Section 3 reviewed the constraints – housing, transport, and environment – that underpin the rationale for the scheme and the concept design. The focus of this section is on the appraisal process and the assumptions made in reaching the preferred option and the extent to which these remain valid.

The Audit asks two critical questions:

1. Does the Business Case comply with the appraisal process prescribed by the DfT and cover all elements required for the options evaluation?
2. Is the evidence base, evaluation methods and techniques employed robust enough to support the C2C scheme assumptions and their continued validity in the light of developments since the project was conceived?

4.1. Business Case Development

Broadly, the development of the business case follows the 5-case model prescribed in the HM Treasury Green Book – Strategic, Economic, Financial, Commercial and Management cases- and the procedures set out in the Department of Transport (DfT) Transport Appraisal Guidelines (TAG). Together these processes provide a robust framework for evaluating the business case for a scheme including the strategic fit to local policies, the need for the intervention, options sifting and evaluation, the benefits and costs of the scheme, its value for money, local impacts (positive and negative), funding sources, and delivery arrangements. The focus of the OBC is on the strategic case for the scheme, in line with appraisal guidelines, and the options sifting and appraisal is conducted at this level. Once the preferred option is chosen, this is then subject to more detailed appraisal of the economic, financial, commercial and management aspects of the scheme.

The process requires the compilation of a robust evidence base on local conditions, issues, and constraints, supported by technical analyses and wide-ranging consultation with stakeholders and communities affected by the scheme. This process allows for gateway reviews at critical junctures to ensure that the business case is on track and conforms to the strategic policies and benchmarks for the scheme, in this case the policy objectives outlined in Section 2.1 earlier. The decision on whether the C2C Business Case complies with these rests with the GCP Executive Board and is ultimately subject to examination in a Public Inquiry which is the penultimate step in obtaining approval for the scheme from the Secretary of State for Transport.

4.1.1 Scheme Objectives

The specific objectives of the C2C scheme are listed in Figure 5. These aim to address the policies and constraints underpinning the scheme and comprise the critical success factors against which the scheme should be judged.

The subsequent project design comprises three elements:

- A HQPT route, between Cambourne and Cambridge, that bypasses general traffic congestion;
- A new Park & Ride site enabling traffic on the A428/A1303 access to the HQPT route, and;
- New continuous high-quality cycling and walking facilities along the route.

Figure 5. C2C Scheme Objectives

In addition, The C2C project aspires to utilise innovative future technologies where doing so would provide the solutions to its aims and objectives. This includes exploring the options of using alternative guidance technologies for the guided HQPT route and electric vehicles. As alternative technology becomes more viable, the business case would be updated to reflect the adoption of such technology.

Audit Comment: A6

The C2C scheme objectives are a valid response to the constraints identified along the corridor with some ambitions/assumptions to deliver a HQPT that can compete with car travel. There are a couple of caveats. Firstly, with respect to the specification of six buses or more in the peak hours this seems incongruous in outlining the overarching objectives. The scheduling of bus services will be determined by the level of demand that is generated as the housing and employment growth takes place, so represents more of an ambition rather than an objective. While accepting that these objectives relate to the scheme once open, the phasing of the housing and employment development along the corridor is a constraint that is not analysed in the Business Case. This omission should be addressed in further modelling of incremental growth scenarios.

Secondly, there is no objective to integrate with other public transport services including EW R or to integrated ticketing/fares that would incentivise bus use. Thirdly, the only environment objective is to improve air quality – a valid objective – but omits any other goals related to climate

change or impact on the environment. There seems to a 'strategy' gap between the policy related objectives described in Section 2 and the scheme specific objectives listed in Figure 5.

So while the three components of the scheme – HQPT route, new Park & Ride facilities, and active travel facilities - are complementary features and consistent with the scheme objectives, it is not clear how the scheme fits into the broader transport strategy to address the constraints described earlier. This vacuum was filled by the previous Mayor's CAM network project that was central to the Local Transport Plan strategy for the area. Early statements by the incoming Mayor suggest that the future of CAM is in doubt. A decision not to proceed with CAM would raise the question of what replaces it. If it is to be the Better Public Transport program and schemes like the C2C, then the objectives need updating and widening to fill the gaps in transport strategy.

4.1.2 Options Development and Appraisal

Options development and appraisal proceeded through three stages that are summarised in Figure 6. At each stage a range of options were developed that were then evaluated against the scheme objectives and local transport policies and plans. In total 34 options were considered which were sifted through a multi-criteria assessment framework (MCAF) to derive 6 options (3 phase 1 & 3 phase 2) including the P&R site options. These were then combined into 5 options for both phases. The optioneering process reviewed a wide range of options suggested by stakeholders and following consultation. The assessment criteria followed DfT appraisal guidelines and covered a broad range of issues from policy goodness-of-fit to local environmental impacts.

The MCAF criteria is a qualitative exercise that measures the performance of each option against a wide range of factors grouped into six themes:

1. Policy fit – related to 6 local policy documents and plans
2. Contribution to economic growth – 6 economic factors assessed
3. Contribution to improved transport network – 8 transport related criteria
4. Contribution to quality of life – 7 environmental factors plus safety and accessibility
5. Scheme deliverability – 7 factors assessed
6. Stakeholder support – public acceptabilityscore

This option sifting exercise is an important part of the options development process and is intended to ensure that all possible options are included in the evaluation. The outcome is a shortlist of best performing options for each phase of the project. The option scoring is justified on the available evidence but by its nature is subjective. It also takes account of feedback from the stakeholder consultation, as evidenced by the selection of Scotland Farm for the Park and Ride site rather than the Waterworks site at Madingley Mulch; and the decision to route the busway along Rifle Range in place of Adams Road which went through several iterations.

This is not unusual, and options development should be flexible enough to respond to concerns raised in the process. Objections to various elements of the scheme have been raised by stakeholders and some of these have been investigated. The latest submittals to this audit include suggestions for alternative alignments that are reviewed in Section 6.

Following the options appraisal and feedback from stakeholders, the GCP Executive Board has approved the preferred options for phase1 of the project and at its Executive Board Meeting of 18 March, noted the conclusions of the OBC presenting a preferred high quality public transport, walking and cycling route. The results indicated that the best performing option was the segregated off-road option with Park & Ride at Scotland Farm (Figure 7). The Executive Board also agreed to undertake an Environmental Impact Assessment pending the findings of the independent review.

Audit Comment: A7

The business case development has broadly followed the guidelines and procedures laid out in the HM Treasury Green Book and DfT's TAG methodology. These documents provide the guiding principles within which projects should be appraised but allow some leeway for scheme proposers to employ different methods and techniques where appropriate. It is accepted that in scheme appraisal there will be a need for judgement alongside quantitative assessment so long as there is a robust evidence base to support the decisions made.

In this case, it appears that the appraisal has been conducted in a robust manner by independent consultants with experience in business case development and familiar with the appraisal process. The process has included consultation with stakeholders at each phase and in addition a Local Liaison Forum has been established to represent stakeholder interests. These have been given ample opportunity to present their evidence and opinions on the C2C route options and in response the GCP has amended some features of the scheme.

The GCP should continue to consult with stakeholders as the preferred option progresses and implement any recommendations thatmay arise from the Environmental Impact Assessment that has yet to be conducted.

Generally, the appraisal covers the required elements for the business case and appraises the options againstthe assumptions and constraints specified in the scheme objectives. The only question is whether as indicated earlier the objectives remain valid in light of developments with CAM (the future of which is now uncertain) and EWR, as well as changes in transport policy and strategy evident in the CPCA's Local Transport Plan? The appraisal took place while these projects were at an early planning stage and could not reasonably incorporate them into the appraisal given that they were not committed schemes. The early comments by the new Mayor on the CAM project validates this approach but the EWR has since taken a step forward and should be brought into the appraisal framework. Likewise, pronouncements on government policies on climate change, Bus Back Better and the effects of the COVID-19 pandemic. These have both positive and negative implications for the C2C scheme as discussed in Section 5.

Figure 6. Options Development Process

Option development and appraisal since October 2016 has been undertaken in three stages:

Stage 1 – Stage 1 assessed the options that were presented as part of the 2017 public consultation, taking into account responses from the consultation and stakeholder engagement to arrive at the highest scored on-road route and the highest scored off-road routes.

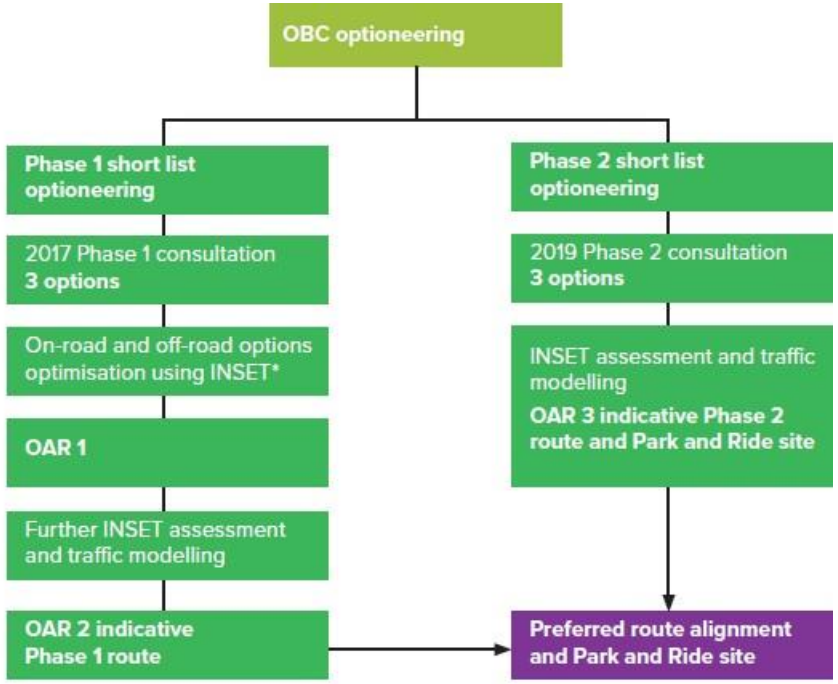
Summarised in Options Assessment Report Part 1 (OAR1)

Stage 2 – The shortlisted on-road and off-road options were appraised against each other to arrive at a recommended Phase 1 option. An illustrative comparator, which included both off-road Phase 1 and 2 options was also assessed and showed that there was benefit to implementing the full scheme from Cambourne.

Summarised in Options Assessment Report Part 2 (OAR2)

Stage 3 – The Phase 2 options and Park and Ride Locations were appraised against each other to arrive at a single route alignment (Phase 1 and 2) and a preferred Park and Ride location recommended.

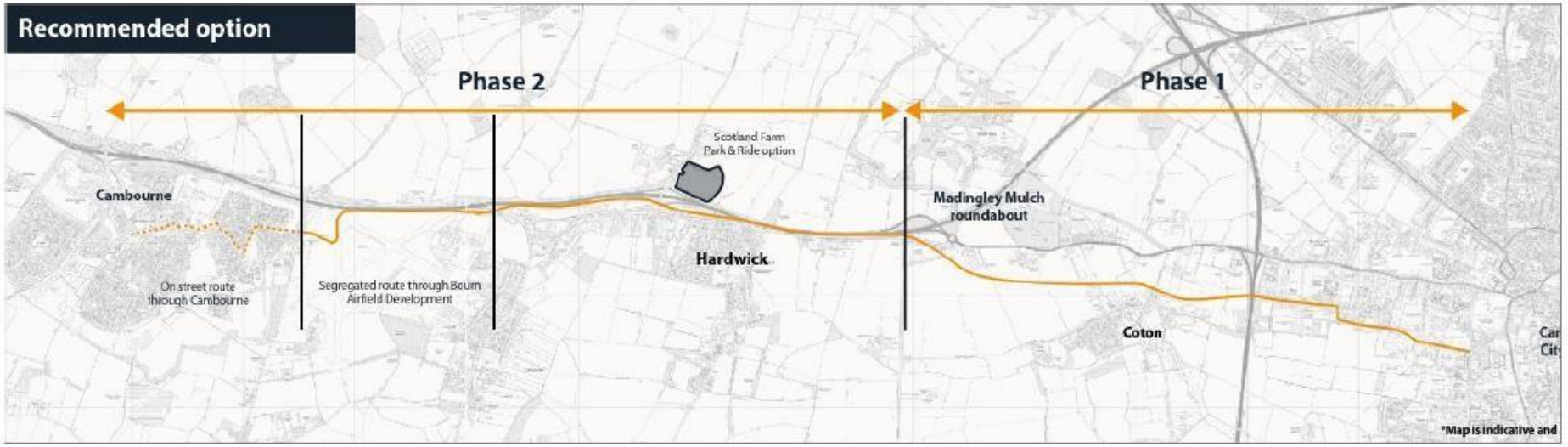
Summarised in Options Assessment Report Part 3 (OAR3)



* INSET is a multi-criteria tool used to assess and score scheme options against a range of criteria to identify the best performing option.

Source: Cambourne to Cambridge Better Public Transport Project: Non-technical summary. December 2019.

Figure 7. C2C Project Phases and Preferred Option



Source: Mott MacDonald (© Crown Copyright. All Rights Reserved. OS License Number 100023205.2018)

4.2 Preferred Option Appraisal

Having selected a preferred option, the business case appraises this in more detail on economic, financial, commercial and management criteria. The assumptions and constraints at this level are more scheme specific as listed in the table below. Where applicable, assumed alignments are cross-referenced with constraints on that particular section of the route.

C2C Preferred Option			
	Assumptions		**Constraints**
A1	The preferred route alignment starts in Cambourne, running on the existing street network before turning off Sterling Way onto a new section of segregated public transport route which crosses Broadway and into the proposed Bourn Airfield development.	C1	The section of the scheme which runs through Bourn Airfield must comply with the SPD for the site and complement the development Masterplan
A2	It then travels along the northern edge of the proposed Bourn Airfield development along a segregated corridor, crossing St Neots Road west of the roundabout on St Neots Road / Highfields Road.		
A3	From this point it continues east on a segregated route between the A428 and St Neots Road until it re-joins general traffic at the Scotland Road Junction.		
A4	From here public transport vehicles will access the Park & Ride site at Scotland Farm, located to the east of Scotland Road, just north of the A428.	C2	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.
A5	On leaving the Park & Ride, vehicles re-join a segregated route between the A428 and St Neots Road via the existing roundabouts where it travels from Hardwick to the junction with Long Road.	C3	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.
A6	Here, the route crosses to the southern side of St Neots Road and continues through existing agricultural fields to the south of the A1303, Madingley Road.	C4	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.

A7	Passing north of Coton, the route crosses Cambridge Road at a new signalised junction, which will be implemented as part of the scheme, before continuing to cross the M11 on a new bridge.	C6	Coton Conservation Area including Grade 1 listed Church. The scheme must be reviewed in terms of the setting of these protected assets. 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). 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.
A8	Entering the West Cambridge site the segregated route continues alongside Charles Babbage Road before turning south and exiting the West Cambridge site into the West Fields via the unnamed road leading to Forster Court where it immediately turns and heads east, following the line of, and to the south of, an existing cycleway / footway.	C7	The section of the scheme which runs through West Cambridge must complement the development Masterplan. Consideration must be given to vibration and EMI impacts on sensitive receptors such as the Department of Materials Science and Metallurgy
A9	Vehicles continue to the junction with Grange Road where they continue their onward journeys on the existing road network.	C8	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.
A10	Existing cycle routes are utilised through the West Cambridge site and the existing cycleway / footway is maintained between West Cambridge and the Adams Road / Wilberforce Road junction.	C9	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.
A11	A new footway-cycleway will be implemented as part of the scheme, that will follow the segregated sections of the route through Bourn Airfield up to the Scotland Road junction.		
A12	At this point the cycleway / footway moves to the southern side of St Neots Road up to the junction with Long Road where it re-joins the segregated route to West Cambridge.		
		C10	Bus emissions are improving over time and Euro VI emission standard is now required for new buses as a minimum.
		C11	All buses are now required to be accessible for all including wheelchair users

		C13	The scheme must achieve a 20% net biodiversity gain.

Assumptions and constraints in the OBC that refer to the CAM network and Adams Road Conservation Area have been removed as these are no longer impacted by the route alignment which is proceeding via Rifle Range.

In further designing the preferred option for the C2C project, scheme designs will need to consider how best to overcome, incorporate or mitigate impacts relating to the assumptions and constraints.

4.2.1 Strategic Economic Case

The economic impact assessment of the C2C project focuses on quantitatively assessing the level of benefits by examining the transport user benefits, the level of development and growth at those sites identified along the Cambourne to Cambridge corridor. The approach is described in the Option Appraisal Report (Part 3)[ix] and focuses on examining the potential jobs and GVA supported at the developments as well as the Land Value Uplift (LVU) impacts.

The two new settlements (Cambourne West and Bourn Airfield), in housing terms, are judged to be fully dependent upon the C2C project given the clear policy position within the local plan and Section 106 commitments and ongoing negotiations. While Bourn (3,500) and Cambourne West (2,350) are fully dependent upon the C2C (with financial contributions and direct works secured) the trigger points allow for delivery of dwellings before the link is completed. For Cambourne, there is a pre-occupation requirement to directly deliver the Broadway Bus Link component of the C2C. For Bourn Airfield, development cannot proceed beyond 500 dwellings until the C2C is delivered.

The planning context is set out in the adopted South Cambridgeshire Local Plan. Specifically, the development requires:

"Significant Improvements in Public Transport, including:

i. Provision of a segregated bus link from Cambourne to Bourn Airfield new village across the Broadway, and on through the development to the junction of the St Neots Road with Highfields Road;
ii. Any measures necessary to ensure that a bus journey between Caldecote / Highfields and the junction of the A428 and the A1303 is direct and unaffected by any congestion suffered by general traffic;
iii. Provision of high quality bus priority measures or busway on or parallel to the A1303 between its junction with the A428 and Queens Road, Cambridge;"

The employment dependency at new settlements is judged to be lower given it is largely in place to serve the developments and ensure they do not become dormitory towns whilst the employment site at Bourn Airfield is already established. Clearly, the C2C project will support all commercial development plans, especially those at West Cambridge, but the primary focus is to support housing development and support employment across Greater Cambridge's growth areas.

Overall, the C2C project is anticipated to support, at a gross level:

- In the region of 975 jobs; and,
- £102.8m of GVA per annum for Greater Cambridge.

This is a very significant economic impact and over a 30-year time period from 2019 the present value of benefits amounts to £1,075.9m (2019 value and 2019 prices), including £676.1m GVA plus £458m from land value uplift.

Benefits were assessed at 3 levels following Transport Appraisal Guidelines: level 1 measures the transport user benefits to bus riders and decongestion benefits for car users; level 2 estimates the wider economic benefits assumed to accrue from the scheme from agglomeration; and level 3 estimates the wider economic benefits from land use changes at national and local level, including Gross Value Added through jobs created and the land value uplift from the scheme. These level 3 additionality benefits are what justify the scheme producing a BCR of 1.47 (increased to 3.48 with Greater Cambridge additionality benefits) compared with just 0.43 for the level 1 benefits and 0.48 for the adjusted level 2 benefits.

Transport User Benefits

Level 1 transport user and non-user benefits are negligible as reflected in the poor benefit-cost ratio for the shortlisted options in phase 1 and phase 2. The preferred route option covering both phases scored highest at 0.43 but still showing poor value-for-money (VfM) on this measure.

The traffic modelling for the preferred option estimates a 167% increase in bus ridership when the scheme opens and 233% by 2036 when all the housing and employment in the corridor is assumed to be built. This amount of mode shifting, mainly from private car, is predicated on the C2C delivering significant journey time savings to users from Cambourne, Bourn village and the Scotland Farm P&R. For instance, C2C passengers from Cambourne to Cambridge city centre are predicted to have 23 minutes lower journey time in the morning peak hour compared to a do minimum on-road scenario. Alternative on-road options do not offer anywhere near this journey time saving or reliability.

Despite the forecast increase in bus ridership, there will still be a lot of traffic generated by the developments in the corridor so traffic congestion will remain a problem, hence the poorer performance of an on-road solution even with bus priority measures. The predicted mode shift only increases the bus mode share east of the Scotland Farm P&R site from 4% to 6% of travel demand. Off peak C2C journey times are slightly longer due to the diversion from the busway to the Scotland Farm P&R site.

Overall, the scheme is assumed to benefit a range of social areas: reduced accidents due to lower private vehicle use; providing access to services, which are affordable is also assumed; and creating a more secure and easy to use bus service will attract a broader cohort of users.

Audit Comment: A8

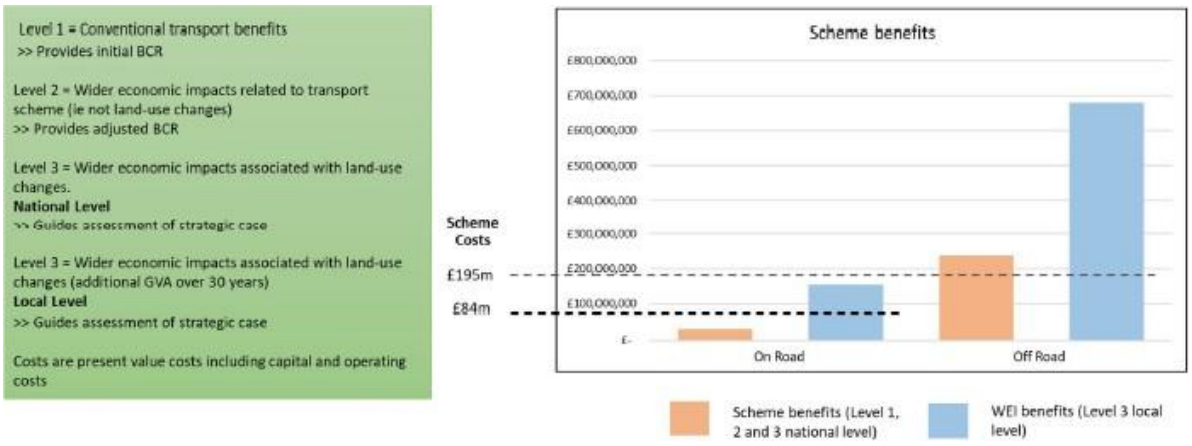
The projected demands for the C2C scheme indicate that mode shifting from private cars to buses will be moderate and growth along the corridor is likely to bring more traffic. The OBC does not present any forecasts of traffic growth after the scheme opens or when the housing is fully built out, although it is understood with and without development scenarios have been modelled using the D Series Cambridge Sub Regional Model 2 for 2026 and 2036. It would be helpful to compare the model outputson general traffic as well as ridership on the C2C to understand better the impacts of the developments as well as the C2C scheme. The C2C scheme objectives include increasing bus mode share along the corridor, and local transport policy aims to reduce traffic in Cambridge City Centre and on radialss like the A1303. It is not clear from the analyses how much these will be achieved, and it is therefore difficult to comment on the validity of these assumptions and constraints.

Wider Economic Impacts

The assessment compared an off-road (do something) to on-road (do minimum) option. Figure 8 illustrates how an off-road option compares to an on-road option in delivering wider economic impacts (WEI) at both a national and local level. The economic appraisal estimates that there are substantial benefits to an off-road segregated route.

The assumptions and calculations around the WEI are set out in the Strategic Economic Narrative and Economic Impacts Report, January 2020[x]. The estimate of jobs and housing (and land value uplift) dependent on the scheme is based on the findings of a 2016 study of the strategic economic appraisal of the C2C scheme, updated by a qualitative assessment of the key transport benefits and how these differ between the segregated and on-highway options and using the modelling outputs which were available for the 2016 study in conjunction with the latest land value update analysis.

Figure 8. C2C on-road vs off-road economic appraisal comparison



The 2016 study examined the key transport benefits for the three options put forward at the time (on highway, hybrid and offline) in terms of how they addressed congestion and capacity issues (assessed against connectivity, reliability, sustainable transport and quality). At a fine level of spatial detail this analysis looked at journey times and costs between locations by mode of travel, journey purpose and time period. To produce aggregate results the analysis demand weighted the Generalised Cost (GC) from all individual segments to show the relative reductions in GC for the three Do Something (DS) options compared to the Do Minimum (DM).

The on-highway option that is assumed is the "optimised" solution for Option 1 in Phase 1 and Option 2 for Phase 2. Significantly, there is no new assessment of the transport benefits for this on-highway solution as the latest transport modelling, given the stage of the project, assumes that all options are offline east of the M11 (Phase 1). While the appraisal uses the same methodology for appraising the off-line and on-line options the latter may be skewed by the assumptions made for the section east of the M11 motorway.

This analysis provided a set of transport multipliers that set out the differences across the options and the scale of differences across these multipliers, which were used in the economic appraisal. As outlined above, the appraisal did not update the analysis of the transport benefits for the on-highway option. However, applying the previous multipliers to the on-highway and segregated options results in the following land value update estimates that were used in the economic appraisal:

Land Value Uplift – results, PVB (2010 values and 2010 prices, 60-year time period)

Impact, £m	
Preferred Segregated Option	£287.8
On-Highway Solution	£62.1

Appendix C: Options Comparison, of the Strategic Economic Narrative and Economic Impacts Report concludes:

"*It should be noted that this is a very high level assessment, based on the anticipated differences in transport impacts between the two options, and not a detailed appraisal of the options (like the 2016 study) and their likely impacts on the dependent development. To produce a complete update would require a comprehensive refresh of the proposals for a wholly on-highway option in order to bring it up to a comparable level of design detail and then reproduce the associated modelling outputs." P.92.*

Two questions arise from the options analysis:

1. Has the comparison between the on-road and off-road options been a fair one given the on-road option was incomplete? and
2. If another, more complete, on-road option was used for the analysis would it have made any difference given the magnitude of the estimated variance between them?

The strategic economic appraisal suggests that the differences in WEI between the preferred off-road and on-road options is so wide that no on-road option would deliver the benefits of an off-road segregated busway.

This assumption is challenged in some of the submissions made to the audit and reviewed further in Section 6.

Audit Comment: A9

The technical appraisal of wider economic impacts is a problematic area in welfare economics, especially surrounding the assumptions over dependency versus displacementin estimating GVA associated with jobs and land value uplift from housing. The dependency assumptions are key to the economic justification for the scheme and its overall value-for-money.

A series of sensitivity test were performed to assess the robustness of the scheme against varying levels of growth. This supports the economic case for the scheme in that where costs may increase the VfM of the scheme remain unchanged, and that if a greater level of growth does materialise then the VfM of the scheme will increase. Overall, the preferred option is judged to have medium VfM but is sensitive to changes in land value uplift and GVA generated by additional jobs. If these are less than expected, then the VfM would be poor.

The question remains over the extent to which the scheme supports housing and jobs growth and economic growth. It is not for the audit to answer this question, but the evidence will be examined in the Public Inquiry for the scheme.

The methods employed in the analysis appear to follow the appraisal guidelines, and in that respect remain valid.

4.2.2 Financial Case

The current estimated capital cost of the off-road option is £160.5m, of which £37.7m is anticipated from Section 106 contributions from other third parties such as the developers of the Bourn Airfield site and West Cambridge. Developer contributions so far include:

- Cambourne West: £8.7 million secured plus direct delivery of Broadway link (£400k) and internal route within the site.
- Bourn Airfield: £20 million (approved Heads of Terms – subject to S106) plus direct delivery of internal route within site.
- West Cambridge: Not yet determined though £9 million is the working assumption if approved.

It is currently anticipated that between 20% and 25% of the scheme costs can be attributed to development and contributions secured accordingly. Any lower contributions would increase the financial risk of the scheme to the GCP.

The estimated high-level scheme costs at this stage of the project's development are based on a range of assumptions and exclusions, which are detailed within OBC Appendix Q. These will be revisited and updated in the Full Business Case stage.

There are several options for the Busway maintenance which will be reviewed further at Full Business Case. This will depend to an extent on the arrangement used for the operation of the bus service, which is yet to be determined, and will be influenced by new Mayor's preference for the bus operating model as discussed below.

Audit Comment: A10

The assumptions and constraints underpinning the Financial Case remain valid. However, the financial case does not include Optimism Bias (currently 44%), which is used within the economic appraisal, but does include a risk allowance of 25%. Applying the optimism bias would increase the potential scheme cost to £195m.

4.2.3 Commercial Case

Procurement Strategy

As part of the current stage of scheme development and the OBC, a design and build procurement has been selected as the preferred procurement strategy. However, this is subject to further review as part of the next stage of work in developing the scheme and informing the Full Business Case. The design and build model will provide GCP with more opportunity to drive value for money and more opportunity to transfer delay risk and interface risks to the contractor. However, adopting a design and build approach puts the responsibility for design, including integration, with the contractor and it would be the responsibility of GCP to define its requirements.

Preferred Routing Strategy

The OBC assumes that the operation of the current bus services along the C2C corridor is largely on a commercial basis. With regard to the new HQPT services which are expected to operate along the C2C infrastructure, the assumption is that the GCP will not be directly involved in their procurement and control as that is not within GCP's powers.

These assumptions need updating following the Bus Services Act 2017 and the Bus Back Better: national bus strategy statement from the government in March 2021. These constrain the potential public transport operating models to:

- Enhanced partnership; or

- Franchising

The CPCA is the local transport authority for public transport. While the GCP is the lead authority for the C2C scheme it will need to work with the CPCA on implementing these arrangements which cover routes, schedules, fares, and ticketing as part of an integrated better public transport strategy for Greater Cambridge. The budget implications of delivering clean, high-quality transport such as high frequency services operated by high quality electric vehicles will need agreeing with the CPCA and the new Mayor.

The assumed C2C bus network is based around three direct express services as follows:

- Cambourne to Cambridge City Centre at 10-minute interval service (6 buses per hour)
- Cambourne to BioMedical Campus at 30-minute interval service (2 buses per hour)
- A428 Park and Ride site to BioMedical Campus at 30-minute interval service (2 buses per hour during peak periods)

In addition, passengers from Cambourne to Cambridge corridor services would also be able to interchange with the Universal service at West Cambridge which would serve Cambridge North Station and the Cambridge Science Park. [1]

- BioMedical Campus to Eddington at 15-minute interval service (4 buses per hour)
- BioMedical Campus to Cambridge North Station & Cambridge Science Park 30-minute interval service (2 buses per hour)

There are some constraints on the proposed routing strategy:

- routes and schedule are based on anticipated demand and are proposed routes only and have not been agreed with the existing route operators or with the GCPA under an enhanced partnership regime (the default bus operating model pending a review of future franchising option).
- Any new Park & Ride service will need to be to a standard similar to that currently operating for Cambridge's Park & Ride 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.
- All buses are now required to be accessible for all including wheelchair users.
- It had been envisaged that the scheme must be capable of eventual upgrade to form part of the CAM network.

The former CPCA Mayor's Strategic Bus Review concluded that further work was required including procurement and completion of a business case to assess different delivery model options. Following completion of this latter piece of work, the CPCA Mayor was expected to decide on the future preferred option for delivering bus services in early 2021. This has been superseded by the election of a new Mayor and by the Bus Back Better announcement from the government.

[1] From the end of August 2020, the CPCA commissioned two bus services between Cambourne and Cambridge to serve Cambridge Regional College and the Cambridge Science Park (service 905 running every 30 minutes Monday to Friday) and the BioMedical Campus via Cambridge Station (X3 hourlyservice 7 days per week).

Audit Comment: A11

The assumptions and constraints need updating to reflect shifts in government policy announced in the Bus Back Better: national bus strategy for England and the Bus Services Act 2017, as well as the bus strategy to be adopted by the new Mayor. There are opportunities presented by these through the enhanced partnership or franchising arrangements. Generally, these are allpositive changes that support ambitious schemes like the C2C.

Assumptions and constraints related to the CAM may need to be amended or removed in the light of decisions taken following the election of a new Mayor.

4.2.4 Management Case

The management case identifies the key risks and mitigations for the project. The management case does not differentiate in terms of the options under consideration.

Risk Assessment

The success and financial viability of the C2C project will be dependent on several factors. Scheme design and delivery will therefore need to consider the following dependencies outlined in the OBC:

- Delivery of housing and employment sites allocated within the South Cambridgeshire Local Plan.
- Emerging CPCA Policy specified in the Local Transport Plan and the new Mayor's transport agenda. Also need to consider Cambridgeshire Transport Delivery Plan (TDP) for transport capital schemes on the local network to be delivered on a three year time frame and the Transport Investment Plan (TIP) that includes the C2C scheme, developed alongside the TDP to identify schemes to support growth.
- It had been envisaged that there would be a need to monitor how development of CAM progresses as the C2C project aimed to deliver the first phase of infrastructure for the larger CAM network.
- City Access Strategy which aims to improve congestion on routes into the City Centre which will be key to reducing the journey times for buses and therefore making the Park & Ride attractive and successful.
- Oxford-Cambridge Arc. Both the dualling of the A428 between the A1 and Caxton roundabout and EW Railway will impact on the C2C route and whilst the scheme is not dependent directly upon these proposals, they may have a significant influence.
- Emerging Technologies. The final specification of C2C will be driven by technology advances and the range of solutions available at the procurement stage.

Audit Comment: A12

These assumptions and constraints remain valid apart, potentially, from those pertaining to the CAM network. The interdependencies should be updated to reflect recent developments in national and local transport priorities.

Consultation

Public and stakeholder consultation is essential to ensure that the various aspirations of the general public and key stakeholders are taken into account throughout development and delivery of the project and to manage the communication and flow of information relating to the project. A communication plan sets out how this process is managed, identifying key stakeholders and how engagement is managed including the facilitation of a project specific Local Liaison Forum.

Audit Comment: A13

These assumptions and constraints remain valid and should be continued through the remainder of the project. Submissions to the audit have queried the consultation process and whether the GCP has adequately considered concerns raised by various parties. This is commented upon further in Section 6. It is important for stakeholders and the wider community to have confidence in the consultation process and be given the opportunity to comment on plans and be involved in the scheme development.

5 Policy and Transport Strategy Developments, 2018-present

In March 2017, a Mayor was elected to lead the newly formed Cambridgeshire and Peterborough Combined Authority (CPCA). The CPCA was given responsibility and powers for economic development, skills training, preparing the Local Transport Plan, supporting bus services, and developing a transport strategy for Greater Cambridge and beyond around a Cambridge Autonomous Metro (CAM) scheme. This is the most significant change to affect transport planning in the GCP area – with implications for the Better Public Transport project – but not the only one. Other changes include the developing plans for the East West Railway (EWR), the impacts of the pandemic on travel behaviour, the government's Bus Services Act 2017 and the Bus Back Better: national bus strategy for England 2021, and the 2019 Amendment to the Climate Change Act 2008. This section discusses the potential impacts on the assumptions and constraints for the C2C scheme.

5.1 Cambridge Autonomous Metro

The CAM project sharedmany of the goals of the Better Public Transport program but is more ambitious in its size and scope, including building a tunnel under the centre of Cambridge as part of a regional metro-style network of high quality public transport vehicles that will connect communities across Cambridgeshire, ultimately replacing the GCP busways. In the C2C corridor, for example, the long-term aim is to extend the CAM to St Neots via the EWR station at Cambourne (assuming this goes ahead) and serving the planned transport hub at Scotland Farm Park & Ride site.

The CAM is part of the CPCA growth agenda for the area which is examined in the Cambridgeshire and Peterborough Independent Economic Review (CPIER)[xi]. Published in 2018, the review provides a robust and independent assessment of the Cambridgeshire and Peterborough economy and the potential for long-term growth, which is predicted to exceed the current projections. Nevertheless, the CPIER confirmed the growth targets established in the City Deal, albeit as the base case, and the need for a package of transport and other infrastructure projects to alleviate the growing pains of Greater Cambridge including HQPT scheme from Cambridge to Cambourne.

The CPIER sets out four scenarios for the future of the area to inform recommendations about how development will be carried out and what infrastructure is likely to be needed to position the area well into the future. This includes examining the options for densification, fringe growth, dispersal, and transport corridors. The CPIER recommended that the CPCA should adopt a 'blended spatial strategy' comprising densification, fringe growth, and transport corridors, which provides flexibility to ensure development meets the needs of residents, business, and the environment.

The Mayor published an Interim Transport Strategy Statement in May 2018 that clarified its transport priorities. The Strategy provides direction for existing projects, and ensures they align with the strategic framework within the new LTP. This interim strategyset out the guiding principles of the new LTP, that include:

- Economic growth and opportunity by connecting dynamic workforce with a growing number of jobs.
- Equity to ensure that all areas of the Combined Authority can prosper.
- Environmental responsiveness by encouraging active and sustainable travel choices.

The interim strategy includedthe CAM network across the wider city region as a strategic transport project.

5.1.1 Integrating C2C and CAM as part of the CPCA Transport Plan and Strategy

Following the Interim Strategy Statement, the CPCA commissioned Arup to undertake a high-level review of the alignment between the C2C and CAM route options which concluded that:

- The process undertaken to date to determine the C2C route is robust and the optimal solution for the corridor is confirmed;
- The route is reclassified as a CAM route to serve the wider network, and not an independent guided busway corridor;
- The vehicle operating along the A428 corridor will comply with the principles of the CAM being a rubber-tyred, electrically powered vehicle;
- The route will continue to be designed to align and integrate with the overarching CAM network, comprising one of the phases of the CAM network; and
- Options for mitigating the impact of the scheme at West Fields and Coton will be incorporated into scheme design for the SOBC.

On 31st October 2018 the CPCA Board agreed that the C2C scheme should be progressed by the GCP as an essential first phase of developing proposals for the CAM. They accepted findings of the independent review of alignment between the C2C scheme and the CPCA plans for a CAM.

CAM formed a key element of the previous Mayor's transport vision for Greater Cambridge. As set out in the CAM Strategic Outline Business Case (SOBC)[xii] February 2019, the vision for CAM was an expansive metro network which seamlessly connects central Cambridge, its current and future rail stations, major employment sites on the city's fringe and key 'satellite' growth areas in Cambridge and across the wider sub-region. The SOBC for CAM illustratedhow up to 100,000 jobs and 60,000 new homes could result from the scheme by 2051.

Proposals for CAM were heavily reliant on the success of other schemes in and around Cambridge, some of which are already in place and others planned, which form the 'building blocks' of the CAM network. It was envisaged that the C2C project, although an independent scheme, would form the 'first phase' of CPCA's planned scheme, should CAM be consented. The SOBC does not specify the route or the location of the portal and assumes that these will be in alignment with the GCP Cambourne to Cambridge bus corridor with a station in West Cambridge.

The CPIER provides the evidence base for the CPCA's policies and informed the first draft of the Cambridgeshire and Peterborough Local Transport Plan (CPLTP) in June 2019. Following consultation, a final version was adopted in January 2020. The CPLTP replaced the Interim Local Transport Plan which was produced in June 2017 and is based upon the Cambridgeshire Local Transport Plan (LTP3) and the Peterborough Local Transport Plan (LTP4).

The goals of the CPLTP are to provide an accessible transport system that delivers economic growth and opportunities and protects and enhances the environment to tackle climate change together. There are ten objectives which have been formed to underpin the delivery of the goals relating back to the economy, environment, and society.

The route along the A428 from Cambridge city centre towards Cambourne, St Neots and Bedford has been highlighted as a strategic project to help travel by foot, bicycle, and public transport become more attractive than private car journeys, alleviating congestion and supporting the region's growth. In particular, the CPLTP supports the delivery of a segregated public transport corridor from Cambourne to West Cambridge and other key employment sites and destinations. It is emphasised that this would provide the first phase of CAM.

5.1.2 CAM Sub-Strategy and Route Options in the A428/A1303 Corridor

In April 2020 the CPCA published a draft Sub-Strategy to the Local Transport Plan specifically dealing with CAM issues. The C2C proposals have been assessed against the policies in the Sub-Strategy in a report by Jacobs in June 2020 which concluded that C2C currently does not fully meet 12 of the CAM Sub-Objectives, and in turn does not support the four main objectives: namely, to promote economic growth and opportunity, support the acceleration of housing delivery, promote equity, and promote sustainable growth and development.

In order for C2C to meet the objectives, it would need to commit to:

- electric / zero emission vehicles
- connect to the East West Rail Station, preferably via a segregated route around Cambourne
- be future proofed for CAM central tunnels vehicles
- provide a Metro-style service and
- minimise potential environmental impacts, particularly around Coton and Westfields.

In response, the GCP maintains that the scheme is compliant, and that the issues raised in the Jacobs report would be addressed as the scheme progressed including a review of the western end once there is clarity with regards to proposals for EWR and a station in the Cambourne area.

The former Mayor proposed a 'northern route' alignment to address concerns over the impact of the busway on the villages of Coton and Hardwick as well as the green belt, and on 6th January 2021, the CPCA's Transport & Infrastructure Committee voted to approve a recommendation to present an alternative route corridor north of the A428 to the GCP, before the GCP made its decision on a preferred C2C route. It was envisaged that pending the outcome of this independent audit, the former Mayor would decide whether to bring this recommendation to the GCP Executive Board. In response to the Mayor's proposal and the concerns raised by various parties the GCP Executive Board agreed at its meeting on 10th December 2020 to undertake an Independent Audit Review of the Cambourne to Cambridge scheme to validate the key assumptions and constraints and to determine whether they remain appropriate.

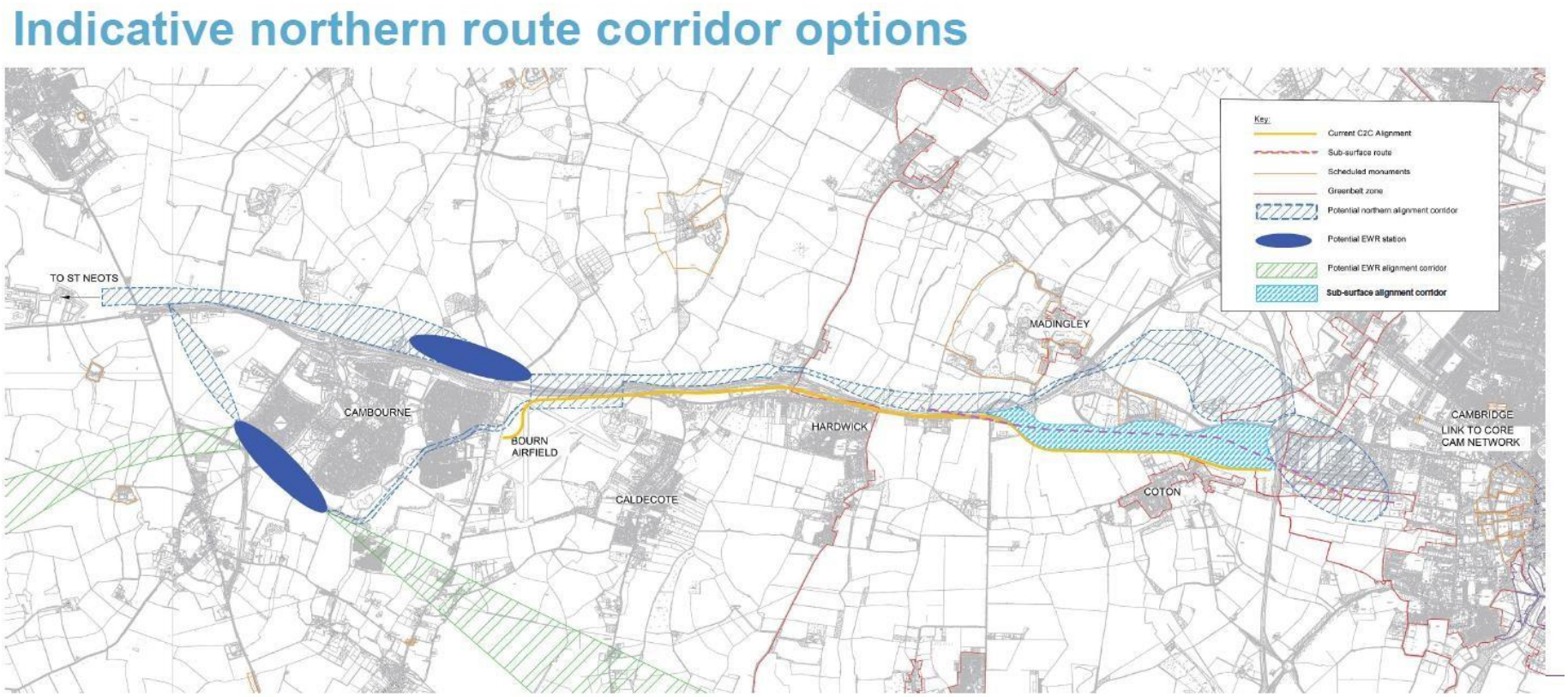
A high-level review of C2C alternative northern route alignments was undertaken by Jacobs in October 2020. Two route options were evaluated within an indicative northern route corridor as shown in Figure 9. The two potential alignments were reviewed in a joint assessment workshop involving officers from the CPCA and GCP; one route is fully on the surface and one involving an extension of the CAM central tunnel section were compared to the C2C route. The workshop concluded that the northern routes would alleviate concerns expressed by stakeholders in Coton and Hardwick and would introduce a number of new stakeholders who would be likely to have similar concerns. The northern route alignment would impact on sensitive areas around the American Cemetery, 800 Wood, Madingley Village, and White Pits Plantation. The northern route options generally perform less well than the C2C preferred option. A very high-level cost estimate indicates that the northern surface route is 35% more expensive than the current C2C route and the sub-surface route considerably more expensive than that. If the CPCA remains committed to CAM It is suggested that further combined work is undertaken to review the costs of all options in more detail and to understand the potential effects on the identified stakeholders. This may form part of the programme business case that the CPCA has commissioned for the CAM network starting in April

2021. It is also worth noting that a separate company, One Cam Ltd, was established as the delivery vehicle for the project. [2]

The CPCA Transport and Infrastructure (T&I) Committee on 4 November considered the alternative northern route corridor. A recommendation was proposed at the meeting that sought the T&I Committee's approval to request GCP to replace its recommended preferred route with the new CPCA alignment. This was not approved at this meeting, but the motion was subsequently passed at the T&I Committee on 6th January 2021.

[2] The future of the programme business case and One Cam Ltd would appear to be in jeopardy now that the CAM project is being put on hold by the new Mayor.

Figure 9. CAM Alternative Route Options

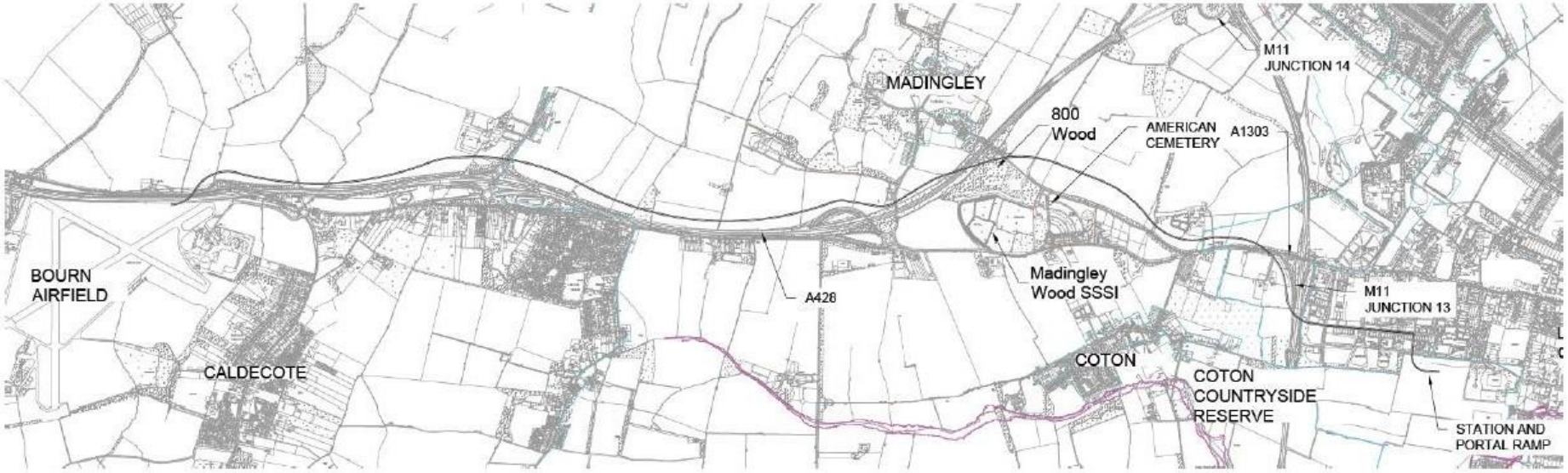


Source: Cambridgeshire and Peterborough Combined Authority

2.2 Northern Option 1

From the proposed CAM western portal at the south-eastern corner of the University of Cambridge campus, the surface route cuts north into the campus and bears east onto Charles Babbage Way. At the eastern end of Charles Babbage Way, the road is extended over the M11 crossing on a bridge on a curved alignment to Rectory Farm. It will continue on an embankment / retaining wall north alongside the northbound off slip from junction 13 of the M11 to a bridge over the A1303 Cambridge Road.

From here, the alignment follows the A1303 / Cambridge Road, passing the American Cemetery in a landscaped cutting at a distance of approximately 200m, before turning east through the top corner of 800 Wood and crossing the A428 on a bridge. It then follows the north side of the A428, connecting to the Scotland Farm before crossing on a bridge south into the Bourn Airfield development immediately west of the turn off to Childerley Lodge.

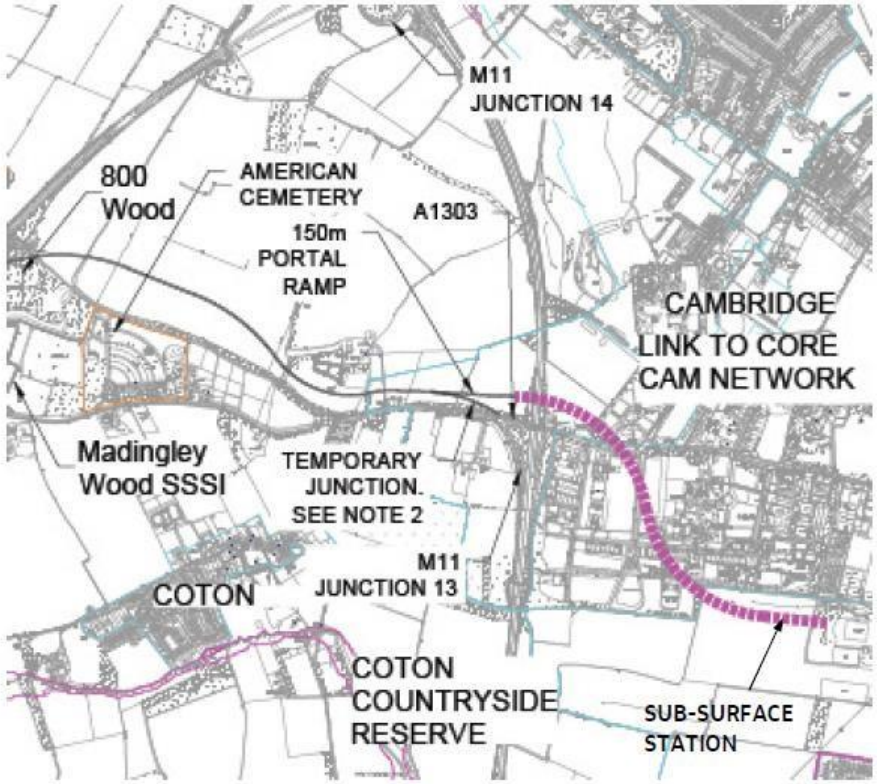


Source: Jacobs 2020 - Alignment of Option E- northern route with surface sectionthrough University of Cambridge campus

2.3 Northern Option 2

Option 2 is a sub-option to Option 1 and from the A1303 to Bourn Airfield it shares the same alignment. It consists of an extension of the CAM tunnel north west from the current western portal location – which will become a sub-surface station. The tunnel would now break ground to the west of the M11 just north of the A1303, an extension of 1.5km. From this new portal location, the alignment follows the A1303 / Cambridge Road, passing the American Cemetery in a landscaped cutting at a distance of approximately 200m, before turning east through the top corner of 800 Wood and crossing the A428 on a bridge. It then follows the north side of the A428, connecting to the Scotland Farm before crossing on a bridge south into the Bourn Airfield development immediately west of the turn off to Childerley Lodge.

There will be a programme discrepancy between the completion of the C2C works and the expected later completion of the CAM Central Tunnel Section. Therefore, a temporary connection is made at the end of the route to the A1303 to allow for the C2C route to access the wider road network until the tunnels are completed. This will also subsequently allow non-tunnel compliant vehicles to leave the segregated route when the full network is in operation.



Source: Jacobs 2020 - Alignment of Option 2 – northern route with extension to the CAMCentral Tunnel Section

Since then Jacobs has carried out further investigations into potential tunnel portal locations in west Cambridge (Figure 10)[xiii].

Figure 10. Overview of Potential CAM Portal Locations in West Cambridge

Their investigations conclude that due to its direct connection with the CAM C2C scheme and ability to directly serve the UoC West Campus site, whilst minimising impacts on existing roads, residents, the UoC campus and businesses, the preferred location for the western portal is W1.

W7 remains as a second-choice option because there is potential for the portal works to be integrated into the existing redevelopment plans of the vicinity and avoid the loss of greenfield land entailed by W1 and W3. For this option to be progressed requires coordination with the West Cambridge masterplan.

W6 is also included as an alternative choice. The main benefit of this site is the ability to connect to the GCP western branch and the ease of construction in an otherwise undeveloped area.

W1 is the assumed location for the CAM portal in the C2C OBC and the CAM SOBC also indicates the portal in this area (W1 or W7 location).

Audit Comment: A14

It was agreed that the GCP routes would form the first phase of the Combined Authority's CAM project and the GCP has continued to work closely with CPCA to ensure alignment of the developing proposals. There was a disagreement, however, over some aspects of the C2C scheme design and the route alignment. Exploratory studies by the CPCA into alternative northern route options did not demonstrate the feasibility of these and a high-level assessment comparing the northern route with the preferred route showed the latter performing better on several criteria.

Following the recent election, a new Mayor, Nik Johnson, has been elected to lead the Combined Authority. While no specific statement on the C2C scheme has been issued the new Mayor has said that the CAM network is not a priority project in his first term. In early statements to the media he said his priority was to improve bus services including the franchising of bus operations as allowed under the Bus Services Act 2017 and the government's Bus Back Better: national bus strategy for England 2021. The CPCA has previously explored bus policies and a strategy for the area and opted for enhanced partnership arrangements with bus operators . Either of these operating models would benefit passengers and bus services; and give the CPCA more influence in an enhanced partnership, or control under a franchising regime, to determine levels of bus services, fares, and ticketing arrangements. This is consistent with the GCP Better Public Transport program and potentially removes a constraint that would apply under current bus regulations regarding operator support for the program.

5.2 East West Railway

The East West Railway (EWR) company was set up in 2017 by the government to oversee improvements to the railway between Oxford, Bedford and Milton Keynes, and develop a new section between Bedford and Cambridge, thus allowing services to operate between Cambridge and Oxford with connections beyond at each end. This will reduce the current journey time by train via London from around 2.5 hours to 95 minutes via the directly connected service, and Bedford will be reachable from Cambridge in about 35 minutes.

The project has proceeded in three stages:

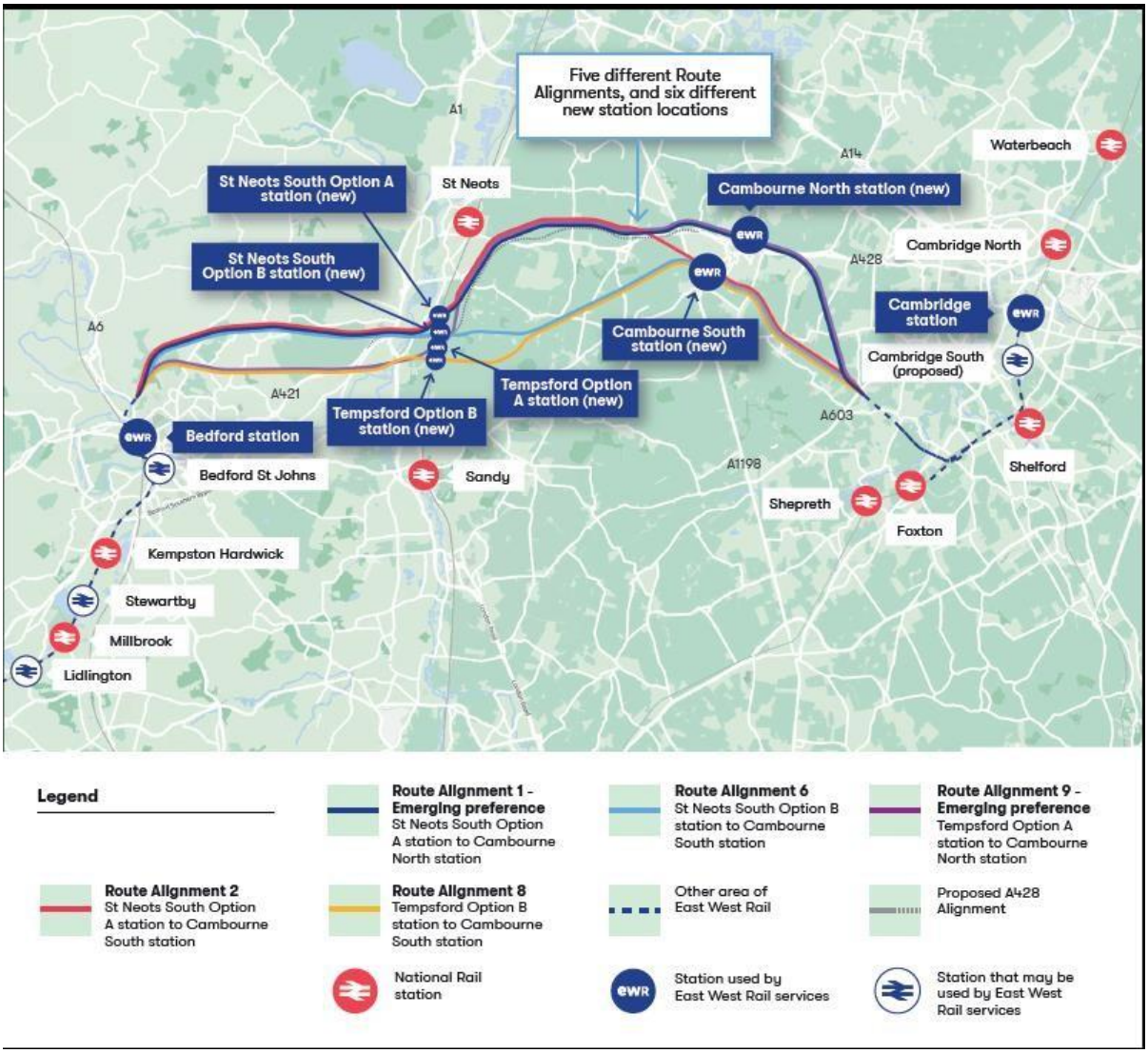
1. Oxford to Bicester was completed in 2016 with onward services to London opened in 2017
2. Bicester to Milton Keynes and Bedford is in the planning stage with construction due to begin later this year pending a final investment decision by the government.
3. Bedford to Cambridge via Cambourne is still in the planning stage. Following earlier consultation on 5 route options in 2019, EWR have now selected the Preferred Route Option, and are currently consulting on choosing the best alignment for this section (Figure 11).

Once the preferred route alignment is agreed, development consents will be sought to purchase land, etc, as well as undertake the detailed design for the scheme and environmental impact assessment, with construction scheduled to start in 2025 if the process proceeds smoothly. The aim is to have the line open later this decade.

The dark blue and purple alignments (Alignment 1 and Alignment 9 in Figure 11) have been identified as emerging preferences for a number of reasons that are explained in the Making Meaningful Connections: Consultation Document, March 2021[xiv]. In summary, the preferred alignments provide:

- Joined up infrastructure – they benefit from a shared 'travel corridor' with the proposed A428 Black Cat to Caxton Gibbet Improvement Scheme.
- New housing and communities – there are more potential for new homes and communities in the area (particularly for Cambourne North compared to Cambourne South).
- Economic growth – alongside the development of new housing, a new station could bring economic growth to the community, creating more jobs and prosperity.
- Value for money – they are expected to be less costly to deliver than other alignments connecting to the same station pairings.

Figure 11. EWR Shortlisted Route Alignments for the Bedford to Cambridge Section



Source: Making Meaningful Connections: Consultation Document, EWR March 2021

The two preferred alignments include a station to the north of Cambourne, rather than one to the south that was assumed in earlier consultations and led to the selection of the route corridor via Cambourne. Even so, the Consultation document emphasises that all options remain open as to the specific route alignment as well as the station location at Cambourne.

The C2C scheme, and CAM network, are being designed to connect with the EWR station at Cambourne. For both schemes, a station to the north makes access easier from Bourn Airfield village and probably less costly for the CAM. The C2C would connect to a station in the south via existing roads through Cambourne while the CAM would access the station by a segregated route around the east of Cambourne.

The development of an EWR station at Cambourne poses two questions regarding assumptions for the C2C scheme (and the CAM):

1. How much of the potential demand for public transport will be abstracted for people travelling to work and other purposes to South Cambridge (Cambridge BioMedical Campus,

Addenbrookes Hospital), Cambridge Station and North Cambridge (Cambridge Science Park), where the EWR would offer a faster and more reliable journey time? and

2. Will the EWR station provide car parking and if so, how will this impact the Park and Ride site at Scotland Farm (potentially intercepting drivers coming from St. Neots and other locations along the A428 corridor)?

At this stage it is difficult to answer these questions because the final plans for the EWR and station location are still under review and a final preferred option will not be chosen until later this year at the earliest and more likely sometime next year, followed by a further round of consultations and a Public Inquiry.

Audit Comment: A15

The C2C business case assumes it would connect into the EWR station, so the assumptions regarding the routeing through Cambourne are still valid. The issues around potential impacts on demand should be subjected to further analysis. This could be done through more detailed modelling of passenger demands or through sensitivity analysis of projected demands for the C2C under different scenarios. It would benefit the planning and operations of the C2C busway to have a better understanding of the potential demands at the time of the EWR likely opening. In the intervening period, the transport and housing constraints that underpin the scheme remain valid.

5.3 Climate Change

The 2008 Climate Change Act, amended in 2019, accelerates action on reducing carbon emissions and greenhouse gases. It mandates that no new cars and vans will be sold with internal combustion engines from 2030 and phases out all these by 2035. The Act promotes new clean energy solutions for buses using electric, hybrid and hydrogen propulsion and the C2C scheme is compatible with these constraints. However, assumptions regarding C2C buses adopting these cleaner technologies should be more forceful in the OBC as well as embracing other advances in vehicle technology, such as optical guidance.

5.4 Bus Back Better: national bus strategy for England

The recently announced Bus Back Better: national bus strategy for England builds on the Bus Services Act 2017 and enhances the powers of Local Transport Authorities (in this area the CPCA) to implement enhanced partnerships or franchising of bus services with additional funding from the government. This new transport strategy is in part a response to the coronavirus pandemic and the need to re-build bus services post-COVID but also a recognition that buses play an important role in local transport and support the government's 'levelling up' agenda. As the Bus Back Better strategy states:

"*There can simply be no return to the situation, seen in too many parts of England, where services were planned on a purely commercial basis with little or no engagement with, or support from, Local Transport Authorities*".

This represents a significant change in the governments transport policy that includes a range of measures that are consistent with the C2C scheme objectives, namely:

- Integrated ticketing and more easily accessible information on services and fares.
- From 1 July 2021, COVID-19 Bus Services Support Grant (CBSSG) and any successor funding to it - potentially £3bn - including possible reform to the Bus Service Operators Grant, will be available to LTAs outside of London, who have committed to entering into Enhanced

Partnerships or started the statutory process of franchising services, and to operators who co-operate with the process.

- Bus Service Improvement Plans, such as traffic management on Key Route Networkto prioritise bus services.
- The development of Superbus network with bus rapid transit (BRT) features such as the Cambridgeshire Guided Busway and deploying metro style bus systems like the Belfast Glider.

Audit Comment: A16

The changes in bus strategy by central government are positive in their potential impacts on the Better Public Transport program and the C2C scheme. The assumptions in the OBC need updating and in some cases adding to, to incorporate these changes. There is little said in the OBC, for instance, on ticketing and fares which probably reflected the bus de-regulation policy in place at the time ofthe Better Public Transport policy but should be included as a central plank of the delivery strategy.

The national bus strategy and the funding that comes with it allows LTA's to be more ambitious in developing bus services for their area. The C2C scheme assumptions remain valid in this context but should be updated to take accountof the opportunities, including closer working between the CPCA and GCP, on bus strategy in the Greater Cambridge area.

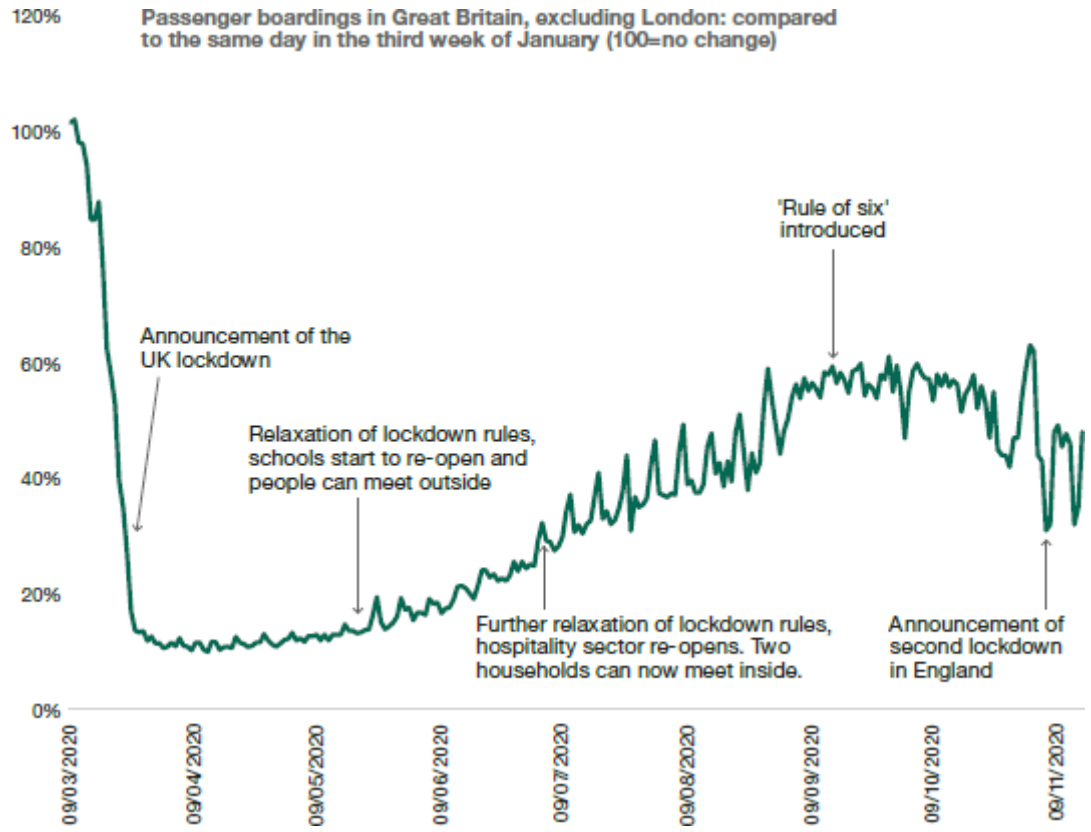
Similarly, the strategy promotes bus priority schemes to overcome network constraints as a means of improving the performance and attraction of bus services: for example, in Cambridge city centre and along the A1303. This latter option was rejected in favour of a segregated busway paralleling the A1303/A482, but perhaps the two are not incompatible and short -term bus priority measures could be a catalyst for mode shift in preparation for the when the C2C busway is operational?

5.5 COVID-19 Pandemic

The long-term impact of the coronavirus on travel behaviour is difficult to gauge. It's one of those 'known unknowns' that is bound to have some impact but there is uncertainty as to what this will be. There are already some trends that have been accelerated by the lockdown enforced by the pandemic such as the move towards flexible working arrangements with more people working from home rather than commuting into offices, more use of on-line shopping for goods and services, and less travel to work and other activities. The extent to which these may recover and the impact on public transport is considered in this section.

The COVID-19 pandemic has had a huge impact on bus use in 2020. During the first lockdown passenger boardings fell to approximately 10% of those on the same day in the third week of January 2020. As restrictions were eased passenger boardings increased as depicted in Figure 12, from data collected by the Department for Transport (DfT).

Figure 12. Passenger Boardings in Great Britain outside London during the pandemic



Source: Transport use during the coronavirus (COVID-19) pandemic, *Transport use by mode: Great Britain, since 1 March 2020*. Available online at: https:// www.gov.uk/government/statistics/transport-use-during-the-coronavirus-COVID-19-pandemic

The situation on the railways is even worse which has forced the train operators to reduce service frequencies while maintaining social distancing in train carriages.

The latest statistics for the week commencing 10 May 2021 records bus loading outside of London at 61% and national rail passengers at 36% of pre-pandemic totals on 1st March 2020.[3] Car use has recovered quicker to 88% and light vans and HGV's exceed pre-pandemic levels by 108% and 109% respectively. In total, vehicle traffic is now around 93% of pre-pandemic levels. The assumption is that as lockdown eases passengers will return to buses and trains but perhaps not in the numbers as before given the trends mentioned above.

Possibly the most reliable estimates of the impact of the pandemic is provided in a report, 'At a crossroads – Travel adaptations during Covid-19 restrictions and where next?' prepared by the Centre for Research into Energy Demand Solutions (CREDS) at the University of Leeds, March 2021.

The report sets out new insights into how people's travel patterns have adapted over time and why. It draws on national data sources and a major panel survey of over 6000 people conducted in July and December 2021. It calls for a major realignment of investment and policy to ensure that we do not return to the overcrowded, congested, polluting and unhealthy transport system that people had come to accept as inevitable.

[3] Bus use in London is around 60% and underground passengers are at 35%.

Some of the key findings on the pandemic impacts are:

- 20% more people are walking regularly. Walking is the only way of getting around that more people are doing more regularly than they did before the pandemic. 56 percent of respondents are walking three times a week or more, up from 36 percent pre-pandemic. This massive shift has been hidden in plain sight because walking so often gets ignored in what gets counted.
- Cycling levels have also increased relative to last year. This is despite cycle commuters being very likely to work from home. The warm conditions of the first lockdown saw levels increase two to threefold. Even in winter levels held up remarkably well.
- People were asked to avoid using public transport if they could and to travel only where necessary. Rail use has on average been 25 percent of the previous year. Bus use outside and in London has on average been 35 and 46 percent of the previous year respectively.
- Whilst bus use recovered to around 60 percent of 2019 levels in the early Autumn, rail did not get above 43 percent at best. Some people have already come back to public transport but the picture looking ahead is very difficult. 60% of bus users are reliant on buses for some journeys.
- Public transport will require substantial transition funding for some time to come. Without it, there are risks of a negative cycle of route closures and further decline in use.
- Public transport will also need to adapt and continue the developments in real time crowding data to reassure travellers and provide more flexible ticketing if fewer people are commuting five days a week.
- Because of the potential for some journeys to be replaced by online ways of doing things, it is not inevitable that car traffic will return to pre-pandemic levels. This also applies to levels of car ownership.
- How much working from home is possible depends on the structure of the local and regional economy: London, Bristol, and Edinburgh all showed levels of home working all well above the survey average with Lancashire, Ayrshire, and Aberdeen well below. (Cambridge is assumed to belong to the higher home working group).
- The report estimates that if people who used to commute by car and who are now working from home were to continue to do so for two days a week, almost 14 percent of morning car trips would be cut. This could result in traffic reductions similar to those seen in school half terms. The prize of continuing some working from home is quite significant in congestion and carbon emission terms.

Looking ahead the report concludes that the actions taken by the UK and Scottish Governments to date have been critical in supporting public transport and boosting active travel. The authors recommend continuing these interventions to support Climate Change goals and emissions reduction by implementing measures to alter travel behaviour and reduce travel demand. Such measures include:

- Capitalising on the opportunity for greater home working.
- Re-directing investment into active travel modes, especially walking and cycling.
- Improving the resilience of communities against the next pandemic and the long-term effects of climate change through more localised travel and accessibility policies.

The report concludes that building back better needs to be building back differently.

Audit Comment: A17

There are clearly challenges in how to respond to travel demands in a post-COVID world. Some trends point in the direction of less travel or changes in travel behaviour that is more local and accessible by active modes. At the same time there is evidence that traffic is returning to pre-pandemic levels but perhaps spread out more across the day. If so, traffic congestion will remain a key constraint on growth that still requires alternative solutions. In this context the strategic case for schemes like C2C remain valid but the assumptions regarding passenger demand may need revisiting as will potentially the need for on-going support to bus services. These effects apply to CAM as much as the C2C busway, and possibly more so to EWR. The pandemic has heightened the risks for these schemes. The government at least sees buses as being an important part of the post-COVID landscape and in this respect the C2C poses less of a risk than either CAM or EWR.

6 Summary of Representations

As part of the Audit, submissions were invited from stakeholders and other interested parties in two rounds of representations. The first round occurred at the outset of the audit to inform the preparation of the Statement on Assumptions and Constraints, and a second round was conducted following this statement. Both rounds of representations have been used in preparing this report, and this section presents a precis of the principal themes raised by the representations.

Submissions were received from a wide range of organisations, including the Mayor of the CPCA, and individuals who are listed in Appendix B. The volume of submissions received is too large to include in an Appendix, so a separate Annex has been created which is available on the GCP web site.

The range of the submissions and the level of detail provided in them is emblematic of the interest and engagement that the scheme has provoked. The preferred route option is controversial among those communities and stakeholders directly affected and some of these have invested considerable time and effort in putting forward counterfactuals to the OBC analysis and proposing alternative route options to the preferred route.

6.1 Representation themes

A small number of representations were supportive of the preferred option including Whippet Coaches, some local businesses, American Cemetery, Cambourne College, Cambridge University Hospitals, and the developers of Bourn Airfield as well as a few individuals who reside in the corridor.

However, most of the submissions object to various elements of the scheme. Broadly, the objections fall into the following categories with some overlaps and duplication:

1. Outright opposition to the C2C project and the need for any HQPT, objecting to its cost and value-for-money.
2. Opposition to a segregated off-line alignment and the options appraisal process that led to its selection, considering this to be flawed, and propose on-line improvements to the A1303/A428 instead.
3. Objections to the alignment of specific sections within the preferred route such as the busway in Hardwick between St Neots Road and the A428.
4. Recognition of the need for HQPT in the corridor but opposition to the preferred option and suggesting that the scheme should be paused pending decisions on the CAM network (now uncertain) and the EWR.
5. Proposals for an alternative, less harmful route, for the busway that avoids environmentally sensitive areas.

The objections mainly relate to the segregated sections of the route that emerged from the phase 1 optioneering, from West Cambridge to Maddingly Mulch, and the phase 2 section for an off-line busway between St Neots Road and the A428 at Hardwick. The alignment from Scotland Farm Park & Ride location to Cambourne via Bourn Airfield produced only a few general comments and appears to be more acceptable.

Strong objections to the scheme were received from the Mayor of the CPCA, District Councillors and Parish Councillors in the affected areas, and stakeholders directly affected including Coton Parish

Council, Hardwick Parish Council, Barton Parish Council, Coton Busway Action Group, Hardwick Climate Action Group, Cambridge Past Present and Future, Cambridge Connect, National Trust, North Newnham Residents Association, and Local Liaison Forum for the C2C project.

The remit of this audit is not to evaluate the merits or otherwise of specific route alignments but to review whether the assumptions and constraints underpinning the scheme remain valid, which provides the context for the discussion that follows.

6.2 Need for the scheme

Objections to the scheme in its entirety, whether on-road or off-road, are raised by several individuals. Some of these are linked to the CAM and EWR projects discussed below. It is difficult to comment on the validity of these objections as they question the rationale for the scheme in the context of the growth constraints related to housing, employment, and the limitations of the transport network. The assumption seems to be that any growth can be accommodated on the existing transport infrastructure which contradicts local policies and transport strategies. There may also be some misunderstanding regarding the impact of increased travel demands in the corridor, that is, considering the as-is situation as being representative of the to-be conditions following the growth in housing and employment. Several of these submissions mention the Girton interchange (M11/A428/A14) as being a major constraint in the wider network, that if re-modelled as an all-ways junction would divert some traffic away from the A1303 and thereby solve all the transport problems in the corridor. The 'Girton option' as an alternative alignment is discussed below in Section 6.6.

As such, they do not invalidate the assumptions and constraints underpinning the scheme unless one accepts that the limitations of the transport infrastructure should not constrain the growth targeted in the corridor, which is not the position of the GCP or the CPCA and is therefore outside the remit of this audit.

6.3 On-line HQPT

Several stakeholder organisations object to the need for a segregated busway to meet the public transport needs along the corridor. They maintain that bus priority measures along the A1303/A428 could meet the Better Public Transport project objectives and provide improved journey times and reliability at a much lower cost. They consider the options that were developed for the options evaluation are sub-optimal and do not adequately consider the panoply of bus priority measures that could be deployed.

In response to these criticisms the GCP undertook a 'quick wins' review of alternate interventions along the A1303 from the Madingley Mulch Roundabout to Grange Road[xv]. The measures evaluated include:

- Madingley Mulch roundabout – potential signalisation and outbound bus lane leading up to the roundabout
- Signal timing improvements at junctions, e.g., Madingley Road Park & Ride site

Other potential enhancements such as an extended bus lane inbound and the re-configuration of the junction with the M11 through additional right turning lanes for traffic entering the motorway southbound together with signal improvements, were not considered quick wins due to the impact of the remedial measures and the time it would take to implement them.

The review concluded that:

"Due to the limited amount of space available along the corridor, there is not considered to be a significant range of available "quick win" schemes that could be implemented along this section of road without the need for the purchase of private land, negotiation of 3rd party land, or impacting on vegetation and other significant features such as the American Cemetery or the SSSI."

Further modelling of the 'quick win' measures was recommended but has not been taken further by the GCP. The conclusions regarding the potential for quick wins has been challenged by stakeholders including the Local Liaison Forum.

One of these, Cambridge Past Present and Future, has submitted a report prepared by Edward Leigh titled: 'Cambourne to Cambridge: In-Highway Proposals for High Quality Public Transport Scheme', which describes a series of measures that they claim would reduce bus journey times delays in-bound from an average of 42 minutes to less than 10 minutes in the morning peak. The proposed package includes 1,135m of bus lanes and other technical interventions, which are illustrated in the visual diagrams in Figure 13, extracted from their report. Note, the audit is not ableto judge the feasibility of the proposal and it is mentioned expresslybecause of the level of detail and analysis that is contained within it.

The report analyses in detail bus operations along Madingley Road and challenges several of the assumptions made in the OBC. Their proposal is a subset of Options 'Low Cost a/b' in the Options Appraisal Report 2, with some additions. The report recommends:

" this package of 'quick win' interventions to the Greater Cambridge Partnership and Combined Authority as an effective and low-cost interim solution while the details of longer-term infrastructure schemes, such as East West Rail, the CAM network and the Girton Interchange, are worked out."

It is worth noting that the quick win measures proposed are short-term solutions, acknowledged as such, until the CAM network is completed. If CAM does not proceed, the efficacy of an on-road HQPT to serve the new developments at Cambourne and Bourn Airfield would not be aligned with the assumptions and constraints, at least not in the longer term. Even so, the range of measures that would improve conditions along Madingley Road for bus users as well as general traffic are worth re-considering given the recent changes in the government's transport strategy and policy towards buses accompanied with additional funding. It is possible that the GCP shied away from considering any substantial improvements along the A1303 because of the cost implications and fearing that it would divert resources away from the preferred option. The two options are not mutually exclusive and could be considered compatible.

Audit Comment: A18

The in-highway proposal for a HQPT along the A1303 are short-term measures that are consistent with the C2C scheme objectives. However, this does notinvalidate the assumptions and constraints for the preferred option as a long-term solution to meet the growth in travel demand along the corridor.

Figure 13. In-Highway Proposal for HQPT along the A1303 Developed by Edward Leigh for Cambridge Past Present and Future

Figure 7a: Annotated satellite map of proposed interventions on Madingley Rd (continued east on next pages)

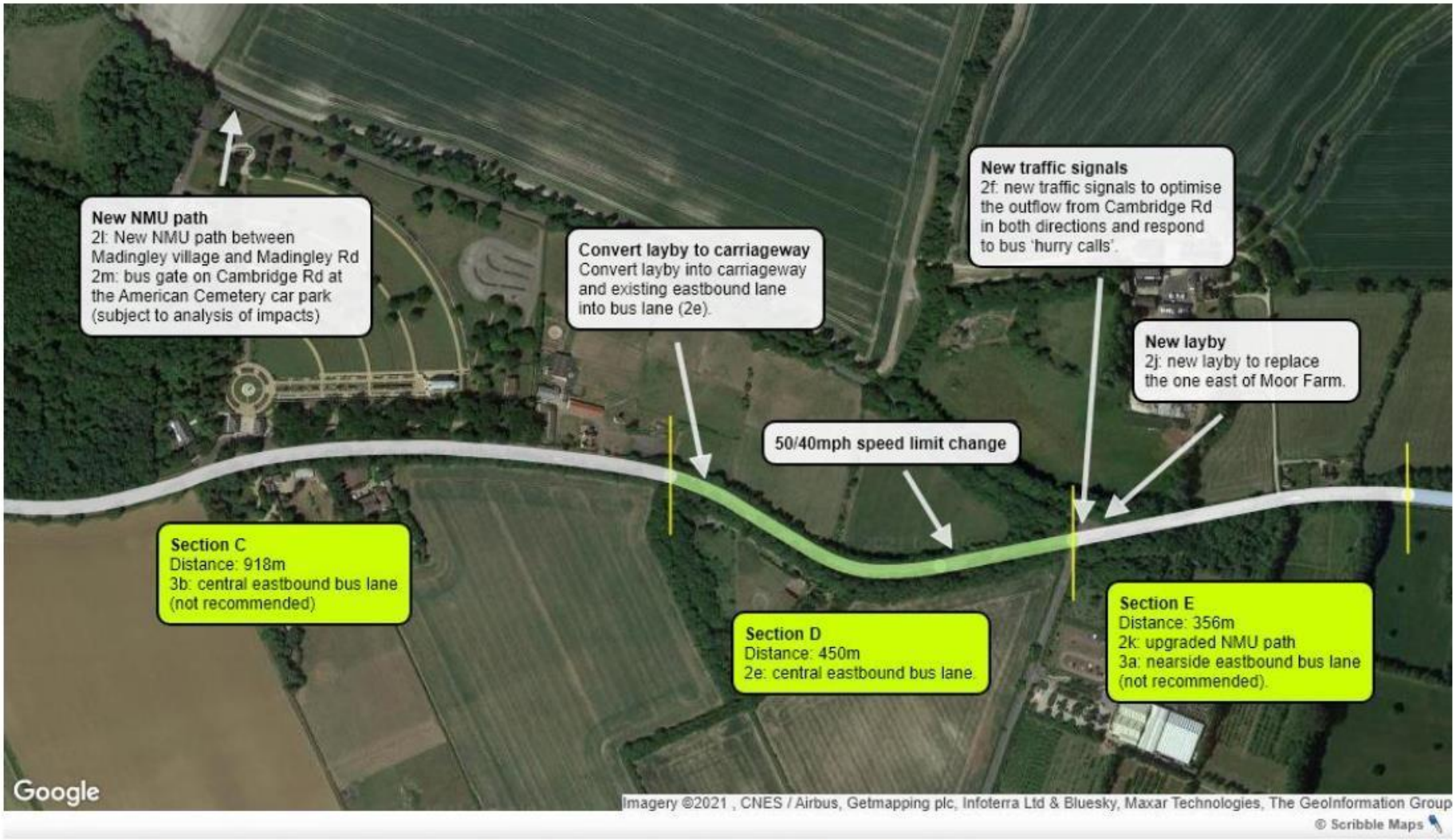


Figure 5b: Annotated satellite map of proposed interventions on Madingley Rd (continued east on next page and west on previous page)

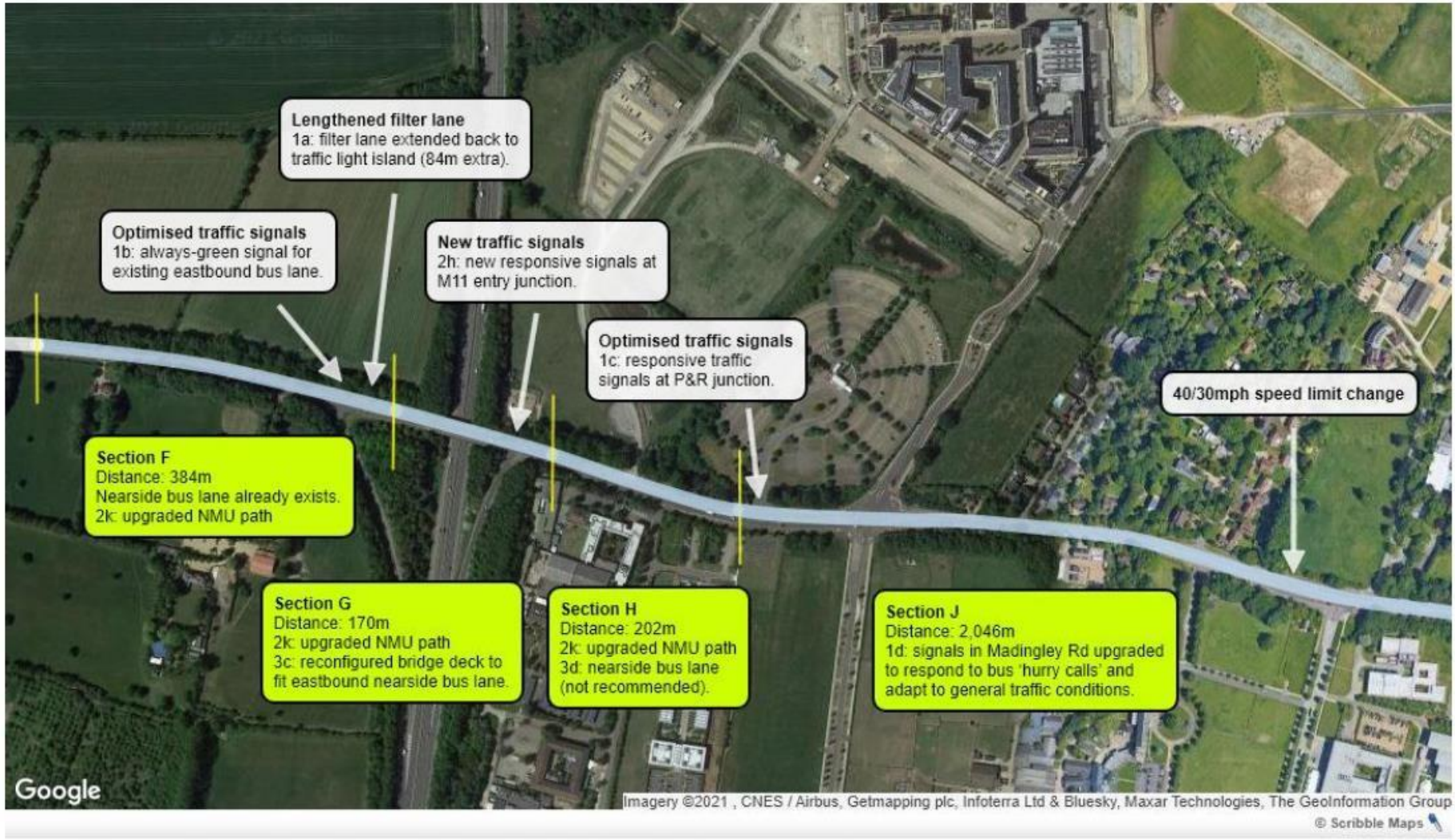


Figure 5c: Annotated satellite map of proposed interventions on Madingley Rd (continued west on previous pages)

6.4 Route Alignment Objections

Prominent among the submissions from stakeholders in Coton, Hardwick and Newnham are objections to sections of the preferred route, specifically:

- The route from Grange Road through West Cambridge and Westfields affecting the conservation area around Adams Road.
- The route affecting the setting of the Coton Conservation Area including the Grade 1 listed Church and minimising the impact on Coton Orchard and a City Wildlife Site, to the west and east of the M11 respectively.
- The visual impact of the segregated busway between St. Neots Road and the A428 at Hardwick and the loss of trees/vegetation cover this entails.

These issues are identified as constraints in the OBC, as described in Section 4.2 earlier, and it is assumed that mitigation measures will be applied to minimise the impact on local communities. Some amendments to the route alignment have already been proposed in response to the concerns raised. For example, the route from Grange Road will now use Rifle Range rather than Adams Road to access West Cambridge; and the alignment past Coton has been moved 50m north to reduce the visual and noise impacts.

Nevertheless, the objectors regard these as tokenistic gestures to appease their protestations against the scheme. Fundamentally they object to the way that the options were developed and oppose any segregated busway alignment that follows a path south of the A1303, regarding this as unnecessary to meet the objectives of the scheme, suggesting that an on-line HQPT is more appropriate, as described earlier, or if a segregated route is required that it should follow a less destructive path to the north of the A1303, which is discussed in Section 6.6 below.

The objectors are not persuaded by the assessment framework that was used in the options development, considering this to be flawed including the consultation process; nor by the proposed mitigation measures and habitat enhancements which in their view do not compensate for the loss of amenity that would result from the busway crossing valued landscapes and impacting on the setting of the village of Coton. The submissions present a detailed critique of the C2C scheme, echoing many of the points raised earlier, and in addition focus on the specific impacts on Coton and residents living on St Neots Road, Hardwick.

There is a difference of interpretation as to what the guiding assumptions and constraints for the scheme should be. For example, the OBC reflects the GCP and partners policies and transport strategy to add capacity to the transport network to overcome constraints in transport infrastructure, housing, and jobs growth. The objectives for the scheme are therefore couched in this context. Stakeholders in the affected areas, however, have a different set of priorities and see the impact of the scheme on their locale as being the major constraint that should be avoided. In simple terms, local impacts and environmental considerations should override wider infrastructure and growth concerns.

The appraisal process prescribes that the options development and evaluation should balance the economic, social, and environmental benefits and costs of the scheme in the broadest sense. The business case process is designed to explore all options from a number of dimensions: strategic, economic, financial, commercial and management. The audit is not in a position to comment on the specifics of the process or the options evaluation, but the evidence from the OBC and supporting documents indicates that the options shortlisted in Phase 1 (Grange Road to Madingley Mulch roundabout) and Phase 2 (Madingley Mulch roundabout to Cambourne including Scotland Farm

transport hub) followed a robust procedure including consultations with stakeholders, and the option for a segregated busway and the specific alignment, such as parallel to St. Neots Road, was the preferred option that performed best on the evaluation criteria. Clearly, the objectors do not agree with this interpretation and challenge the assumptions and constraints that underpin the scheme and the preferred route option.

Audit Comment: A19

The strategic assumptions and constraints that underpin the scheme and the options development remain valid. However, local constraints that emerged following the preferred route alignment need further evaluation which will be undertaken in the Environmental Impact Assessment. The preferred route may still be amended following the outcome of the EIA including any recommended mitigation measures to offset the scheme's impact.

6.5 Delay the C2C Scheme

One of the suggestions made in the representations is to pause the development of the C2C scheme until the outcomes of the designs for the CAM network and the EWR including the station location at Cambourne are confirmed. The purpose is to take stock of these transport schemes and consider their interrelations as part of the areas future transport strategy. This makes sense and the CAM and EWR are recognised in the OBC as an influence on the C2C scheme and Better Public Transport project.

As described in Section 5.1, it has been agreed that the C2C busway will provide the alignment for the CAM network, at least in the central section between West Cambridge and Cambourne. The previous CPCA Mayor objected to the preferred route alignment and proposed a 'northern route' that would take the busway (and CAM) around the north of the American Cemetery to the A428. The sub-options evaluated were more costly and performed less well than the preferred option, so the northern route remains problematic. This intervention from the Mayor introduced uncertainty into the C2C scheme and as the CAM network had yet to proceed beyond the SOBC stage, it suggested that the C2C scheme should be paused until the CAM OBC is completed and the preferred route alignment for the CAM (and the C2C busway) is determined.

Early statements on CAM by the new mayor have put the future of the scheme in doubt which significantly weakens any case for delaying the C2C scheme on this count.

The EWR poses a similar dilemma, as reviewed in Section 5.2. In this case the scheme has progressed to the next round of consultation on the preferred alignment including the station location at Cambourne. A decision on this is unlikely before the end of this year and more likely 2022, following which there will be more stages to finalise the design, purchase land and properties, hold a Public Inquiry and seek consent from the Secretary of State for Transport to build the line. Construction is not scheduled to start before 2025 and if it proceeds as planned the railway would open later this decade.

In the meantime, the delay in delivering the C2C scheme - re-scheduled to open in 2025 - would impede the delivery of housing and jobs in the corridor and undermine the growth targets across the GCP area. The transport strategy and policies adopted in Local Plans and the Local Transport Plan would need to be reset to reflect the change in circumstances.

The suggestion that the C2C scheme is not required because of the EWR is a common thread in many of the submissions but is not supported by any evidence. It is reasonable to assume that the

EWR once open would abstract some passenger travelling to South Cambridge, Cambridge Station and possibly North Cambridge, and it is recommended that the C2C Business Case is updated to include this scenario in its modelling of future travel demands. This will provide a better understanding of the impact of the EWR and its potential effect on the C2C.

Audit Comment: A20

The new Mayor's early statements indicating that he is minded not to proceed with the CAM project weakens the case for any pause in the C2C scheme development and consequently does not alter the assumptions and constraints for the scheme which remain valid in the corridor. The C2C HQPT remains the only means of increasing capacity on the A 1303/A428 corridor and addressing the public transport travel needs of the growing population. The EWR does not provide an alternative to travel along the corridor to West Cambridge and the City Centre. The two schemes serve different travel markets and should be planned as complementary services. The housing developments in Cambourne West and Bourn Airfield require the C2C project to be opened by 2025, otherwise the planned growth will be put at risk.

6.6 Alternative Route Options

This section reviews three alternative route options that have been proposed as better alignments for the C2C scheme than the current preferred route. All three route options proceed north of the A1303 and thereby avoid the contested alignments around Coton and Hardwick:

1. The 'northern route' for the CAM network proposed by the CPCA that would serve as the busway until the CAM is built. This option is reviewed in Section 5.1, so will only be considered here alongside the other route options.
2. Route via Girton interchange as part of the re-modelling to an all-ways junction with access to a Park and Ride hub in place of the proposed Scotland Farm site.
3. Co-aligned route via the A428 and looping south of the Girton interchange through the Eddington development to West Cambridge.

6.6.1 CAM Northern Route

As this is considered earlier the only additional comment to make here is that the proposed northern route options for the CAM do not go near the Girton Interchange and neither is a route via Girton considered in the CAM SOBC. The relevance of this that the options proposed by stakeholders that proceed via Girton would not be compatible with CAM or the C2C preferred route, and as such would not comply with the transport strategy for Greater Cambridge in the Local Transport Plan.

As the in-coming Mayor has cast doubt on the future of the CAM project this may be a moot point, but it is worth noting that neither the GCP nor CPCA consider an alignment via Girton to be a viable option.

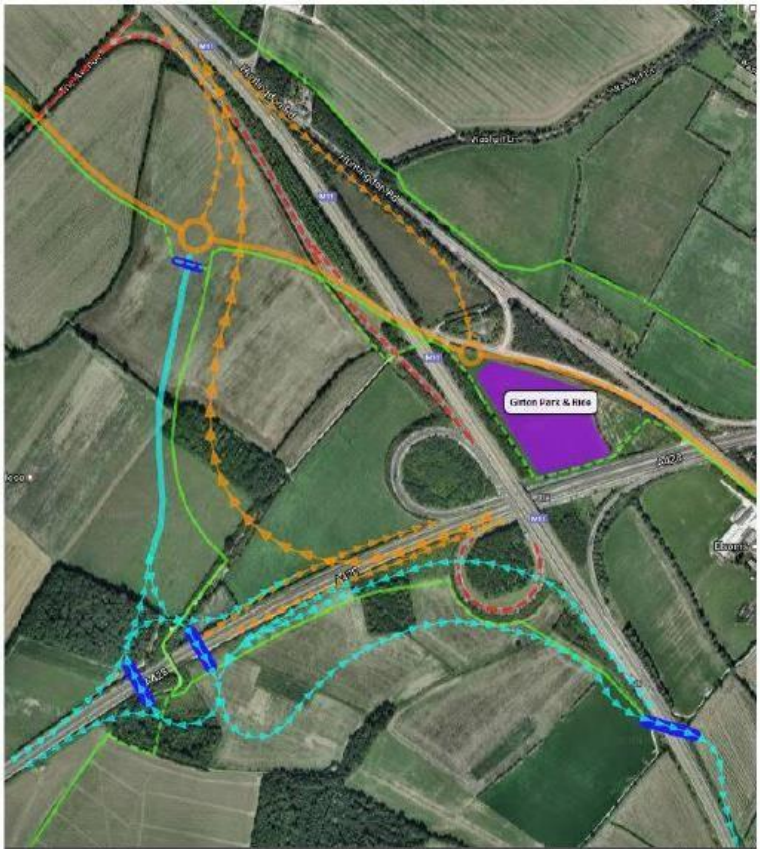
6.6.2 Girton Interchange

As mentioned earlier many of the submissions propose an alignment via Girton Interchange, and the GCP commissioned a high-level study into this option in response to requests from stakeholders.[xvi] Cambridge Past, Present and Future (CPPF), and Smarter Cambridge Transport (SCT) have both suggested options for layouts at Girton Interchange, as an alternative to the scheme currently being developed between Cambourne and Grange Road. One option suggested by both organisations is to locate a new all-ways junction at Girton Interchange to improve connections in the area, as well as

to locate a park and ride within the interchange. Two possible configurations are shown in figure 14 below.

Figure 14. Smarter Cambridge Transport Options for Park and Ride at Girton Interchange with All -Ways junction

Sketch of remodelled Girton Interchange (opening 2020) with additional connections proposed by Smarter Cambridge Transport

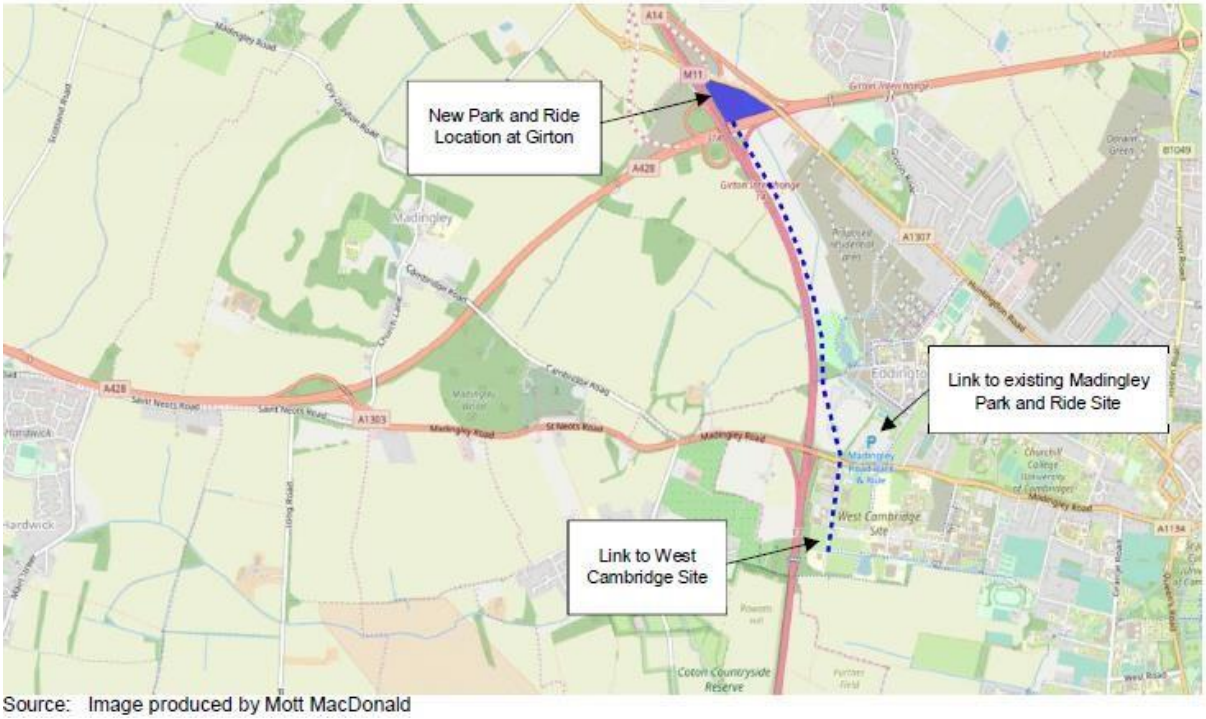


Sketch of remodelled Girton Interchange (opening 2020) with additional connections proposed by Smarter Cambridge Transport to create an all-ways junction

Both options are complex arrangements that would require substantial re-modelling of the Girton interchange.

The Local Liaison Forum Technical Group has suggested an option that utilises the Girton upgrade and P&R site alongside a new route, potentially along the eastern edge of the M11 that could access the West Cambridge Site via the existing Madingley road P&R as illustrated in Figure 15.

Figure 15. LLF suggested route via M11



Source: Image produced by Mott MacDonald

Initial consideration of this route estimated an additional length of approximately 2.2km of public transport road would be required, along with a means of crossing the A428 and M11 J13 slip roads (assuming a P&R site located along with Girton Interchange). A high-level cost estimate for the new junction at Girton, excluding the cost for the Park and Ride site, showed that the cost could be between £50M to £75M depending on which option is used. The additional route to the West Cambridge Site is likely to add in the region of £15m - £20m to the scheme, excluding land costs. This would bring the total high-level cost to between £70M to £95m.

This option was not taken forward any further in the optioneering process because:

- The cost is considerably higher than other options;
- It performs less well than other options in terms of journey times;
- the proposals for Girton provide no public transport improvements to the A428/A1303 corridor so do not offer any ability to accommodate CAM; and
- Development of a new all-ways junction or any other development at Girton Interchange would most likely need to be delivered by Highways England and therefore beyond the control of local stakeholders. While HE has agreed to investigate an all-ways junction improvement at Girton Interchange there is no commitment to enter it into their Road Investment Strategy 3 program for funding in 2025-2030. Even if it was accepted into RIS3 it is unlikely that it would be built until later this decade, at the earliest. In addition, the CPCA Local Transport Plan does not list Girton Interchange as a priority scheme as part of their highway investment strategy.

Despite these reservations and it being ruled out as a viable option for further consideration in the options development for Phase 1, it has continued to be promoted by LLF as well as other stakeholders as described in the next route option.

6.6.3 Co-aligned route via the A428

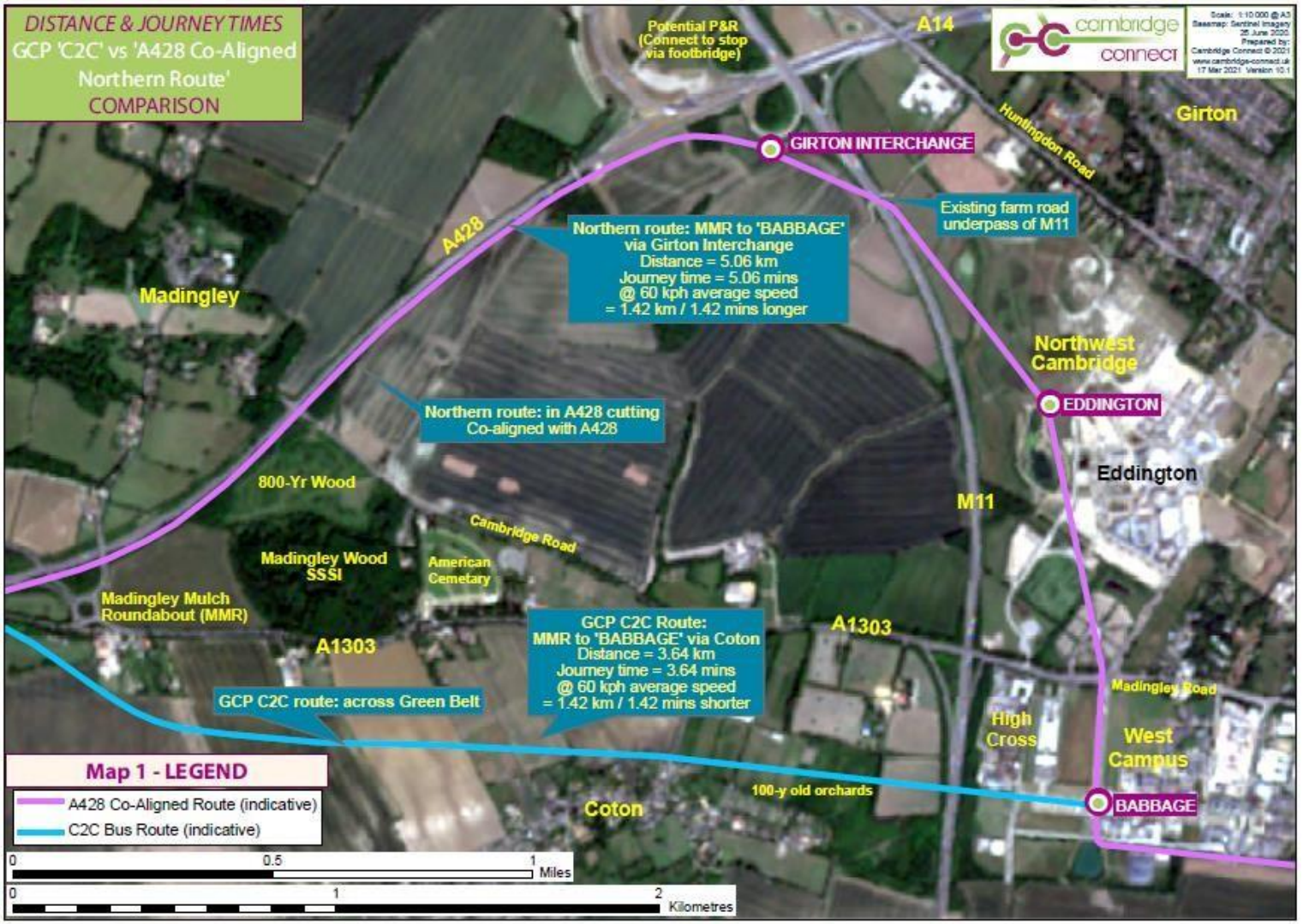
A variation on the Girton Interchange scheme has been proposed by Coton Parish Council who as part of their submission include an independent report prepared by transport consultants, i-Transport, on the Audit Statement of Assumptions and Constraints, and other potential limitations in elements of the C2C scheme development and audit process. Their report explores a modified northern route option that avoids the setting of the American Cemetery and crosses the M11 to the south of the Girton Interchange. As depicted in Figure 16, this option is not reliant on an interconnection with the Girton Interchange but provides for this in the future.

This route would be a segregated public transport route alongside the A428 extending east from the A1303 junction (Madingley Mulch roundabout) as far as the Girton Interchange with the M11, then routing south across the M11 and back towards the A1303 corridor. It would connect directly with the Madingley Road P&R. It is a slightly longer route than the preferred option but has the advantage of full segregation thus providing good journey time reliability. It would run in the A428 cutting near Madingley and hence not be visible from the American Cemetery, and the SSSI. It is a route advocated by Cambridge Connect, and is shown indicatively in pink on the image below in Figure 16, with the preferred C2C alignment in blue. The report claims that this route option has support from numerous stakeholders.

According to the report, the scheme is a viable option although no evidence is presented to support this assertion. At a strategic level when considered against the principal objectives of the C2C project it would deliver benefits in comparison to the current preferred option by connecting to the emerging Eddington community (and potential onward connection to Bar Hill and Northstowe) enabling further economic growth and providing an improved Sustainable Transport Network. It also claims to perform equally well in respect of relieving congestion, particularly on the A1303, with future potential to tie in to the Girton Interchange improvements providing the opportunity to re-assign traffic via the A428 thus relieving the A1303.

The major advantage of this scheme is that it would avoid the communities at Coton and Hardwick and appears to have less environmental impact. It could be configured with either the preferred route through West Cambridge or on-road options east of the M11 and generally takes a ‘path of least resistance’ in terms of community opposition and environmental impact. However, while it may be compatible with the quality of life objectives for the C2C scheme it is less consistent with other objectives. The report recognises that there would be engineering challenges for the route with cost implications, which are not estimated. It therefore falls short on the criteria that stymied the earlier Girton Interchange option.

Figure 16. A428 Co-aligned Route Option



Audit Comment: A21

The alternative route options comprise variations on the 'northern route' and have been reviewed at various stages in the scheme options development process. The CAM route alignment proposed by the previous Mayor appears unsuitable for the busway, notleast because of the higher cost compared with the preferred route and would run into considerable opposition from affected parties. The Girton Interchange option is ambitious and expensive and would take longer to deliver especially as it is reliant on Highways England committing to upgrade the junction. It looks like a high risk compared to the preferred option. The hybrid A428 Co-alignment scheme is a compromise between the other two that incorporates some of their features but avoids the riskier elements. In this sense it is more viable and closer aligned to the scheme objectives than the others. Nevertheless, it is likely to perform less well on cost and other performance metrics while potentially scoring higher on environmental and social impact.

The alternative route options are created to overcome the local impacts constraints discussed in Section 5 (as identified in the Business Case). The Business Case needs to address a wide range of constraints as well as local concerns and balance these through a rational appraisal process. Objectors may feel that this process is biased in favour of strategic goals, yet it is incumbent on the GCP to adhere to an appraisal process thatcomplies with the methods laid down in the guidelines. The C2C scheme assumptions and constraints are not invalidated by the alternative options, some of which can reasonably claim that they are just as valid. It is not the role of this audit to adjudicate between conflicting options. The objectors will have the opportunity to present their alternative route options to the Public Inquiry and cross-examine the GCP and its consultants on the options development and preferred scheme appraisal. There is no guarantee, for instance, that the Co-alignment scheme would perform any better if subject to a detailed appraisal than the preferred option evaluated in the business case.

7 Conclusion and Recommendations

The findings of the audit are summarised in this section. Just to re-cap the scope of the audit is to review the assumptions and constraints that underpinned the analysis that led to the selection of the preferred route and the elimination of alternative options. The objective is to test the robustness of those assumptions and constraints anddetermine whether they remain appropriate in the context of the current strategic frameworks, developments in relation to the Cambridgeshire Autonomous Metro (CAM) network and the East West Rail plans.

The assumptions and constraints are categorised into three levels pertaining to:

1. Strategic policies and objectives underpinning the Better Public Transport program and the C2C Scheme and whether these remain valid in the context of developments that have occurred during the schemes advancement.
2. The Business Case options development process and the assumptions and constraints underpinning the appraisal of the route options.
3. The assumption and constraints underpinning the preferred route alignment.

7.1 Key Findings: Strategic Policies and Objectives

7.1.2 Better Public Transport Project

As originally conceived, the Better Public Transport program is in alignment with national, regional, and local policies on the economy and transport strategy as evident in local policies such as Local Plans and the Local Transport Plans at the time of its inception. The evidence validates that Greater Cambridge has been growing rapidly and will continue to do so in the future. Consequently, Cambridge's transport infrastructure is under pressure, with high levels of congestion in the city centre and on key corridors into and out of the city. The C2C project has been recognised in the Local Plans and local transport strategy as a key project to help address these infrastructure constraints on growth by linking Cambridge to growth areas to the west.

7.1.3 Housing and Employment Growth

There is a substantial level of economic growth planned with approximately 8,400 dwellings and 13,300 jobs planned on those sites directly along the C2C corridor by 2031. The assumption that a HQPT like the C2C project is necessary is justified if it can demonstrate that it will support economic growth by providing faster and reliable journey times that will improve connectivity and accessibility and thereby link housing and employment growth areas more closely.

The Local Plans for Cambridge City and South Cambridgeshire adopted in 2018 confirm the housing targets and these are currently under review as part of the Greater Cambridge Shared Planning (GCSP) agreement between the two authorities. The projected housing growth is considered a base line by the CPCA and the CPIER highlights the need for more housing if current growth trends continue. The A428/A1303 corridor is strategically important in contributing to the area's growth requirements and these developments in turn will generate many more travel movements. The housing constraints therefore remain valid for the C2C scheme.

7.1.4 Transport Constraints

The transport constraints are based on evidence collected in traffic surveys and modelling of the transport network under different growth scenarios. Accordingly, these demonstrate the need for the intervention and a sustainable transport solution provided by the Better Public Transport Project. These constraints remain valid for the C2C scheme.

City Centre Access

The C2C scheme focus is primarily on the A428/A1303 corridor and while acknowledging the constraints on bus accessibility through the city centre it offers no solution apart from the City Access program of soft measures to restrict on-street parking and reallocate road space to active travel. The assumption is that these measures will be enough to enhance bus speeds and provide more reliable journey times across the city. However, no detailed modelling of the likely impact has been conducted so it remains uncertain whether bus accessibility will improve.

The OBC recognises the need to access the fringe employment site at the Science Park and Cambridge BioMedical Campus and proposes a pattern of orbital bus services to serve these sites from the Park and Ride sites at Madingley Road and Scotland Farm via the M11 and A428 as well as connections in the City Centre.

These constraints remain valid for the C2C scheme and only weak remedies are offered by current policies.

7.1.5 Transport Policy and Strategy Changes Since the Schemes Inception

Several changes in policies at the national and local level have occurred since the project was started, most notably the creation of the CPCA and the development of the Local Transport Plan and the strategy around the deployment of the CAM network. The developments have impacted on the C2C scheme as summarised below.

Cambridge Autonomous Metro

Following preparation of the former Mayor's transport strategy, it was agreed that the GCP routes would form the first phase of the Combined Authority's CAM project and the GCP has worked closely with CPCA to ensure alignment of the developing proposals. There was a disagreement, however, over some aspects of the C2C scheme design and the route alignment of the C2C preferred option, which the then Mayor proposed should follow a 'northern route'. Exploratory studies by the CPCA into alternative northern route options did not demonstrate the feasibility of these and a high-level assessment comparing the northern route with the preferred route showed the latter performing better on several criteria. Given the initial statements by the new Mayor the requirement for the C2C to integrate with the CAM network may no longer be applicable. Alternative route alignments including the location of the tunnel portals in West Cambridge may no longer have any continuing influence on the C2C scheme. The preferred alignment has, however, continued to draw criticism from some stakeholders who have put forward their own alternative route options which are considered below.

CPCA Mayoral Election 6th May 2021

Following the recent election, a new Mayor, Nik Johnson, has been elected to lead the Combined Authority. While no specific statement on the C2C scheme has been issued the new Mayor has said that the CAM network is not a priority project in his first term. His focus is on improving bus services including the franchising of bus operations as allowed under the Bus Services Act 2017 and the government's Bus Back Better: national bus strategy for England 2021. The CPCA has previously explored bus policies and a strategy for the area and opted for enhanced partnership arrangements with bus operators. Either of these operating models would benefit passengers and bus services and give the CPCA more influence in an enhanced partnership or control under a franchising regime, to determine levels of bus services, fares, and ticketing arrangements. This is consistent with the GCP Better Public Transport program and potentially removes a constraint that would apply under current bus regulations regarding operator support for the program.

East West Rail

The C2C business case assumes it would connect into the EWR station, so the assumptions regarding the routing through Cambourne are still valid. The issues around potential impacts on demand should be subjected to further analysis. This could be done through more detailed modelling of passenger demands or through sensitivity analysis of projected demands for the C2C under different scenarios. It would benefit the planning and operations of the C2C busway to have a better understanding of the potential demands at the time of the EWR likely opening. In the intervening period, the transport and housing constraints that underpin the scheme remain valid.

The uncertainty surrounding the CAM project weakens the case for any pause in the C2C scheme development and consequently does not alter the assumptions and constraints for the scheme which remain valid in the corridor. The C2C HQPT remains the only means of increasing capacity on the A1303/A428 corridor and addressing the public transport travel needs of the growing population. The EWR does not provide an alternative to travel along the corridor to West Cambridge and the City Centre. The two schemes serve different travel markets and should be planned as complementary services. The housing developments in Cambourne West and Bourn Airfield require the C2C project to be opened by 2025, otherwise the planned growth will be put at risk.

National Bus Strategy

The changes in bus strategy by central government are positive in their potential impacts on the Better Public Transport program and the C2C scheme. The assumptions in the OBC need updating and in some cases adding to, to incorporate these changes. There is little said in the OBC, for instance, on ticketing and fares which probably reflected the bus de-regulation policy in place at the time of the Better Public Transport policy but should be included as a central plank of the delivery strategy.

The national bus strategy and the funding that comes with it allows LTA's to be more ambitious in developing bus services for their area. The C2C scheme assumptions remain valid in this context but should be updated to take account of the opportunities, including closer working between the CPCA and GCP, on bus strategy in the Greater Cambridge area.

Similarly, the strategy promotes bus priority schemes to overcome network constraints as a means of improving the performance and attraction of bus services; for example, in Cambridge city centre and along the A1303. This latter option was rejected in favour of a segregated busway paralleling the A1303/A482, but perhaps the two are not incompatible and short-term bus priority measures could be a catalyst for mode shift in preparation for the when the C2C busway is operational?

COVID-19 travel impacts

There are clearly challenges in how to respond to travel demands in a post-COVID world. Some trends point in the direction of less travel or changes in travel behaviour that is more local and accessible by active modes. At the same time there is evidence that traffic is returning to pre-pandemic levels but perhaps spread out more across the day. If so, traffic congestion will remain a key constraint on growth that still requires alternative solutions. In this context the strategic case for schemes like C2C remain valid but the assumptions regarding passenger demand may need revisiting as will potentially the need for on-going support to bus services. These effects apply to CAM as much as the C2C busway, and possibly more so to EWR. The pandemic has heightened the risks for these schemes. The government at least sees buses as being an important part of the post-COVID landscape and in this respect the C2C poses less of a risk than either CAM or EWR.

7.2 Key Findings: Business Case Options Development and Appraisal

7.2.1 C2C Scheme Objectives

The C2C scheme objectives are a valid response to the constraints identified along the corridor, with some ambitious assumptions to deliver a HQPT that can compete with car travel. There are a couple of caveats. Firstly, while accepting that these objectives relate to the scheme once open, the phasing of the housing and employment development along the corridor is a constraint that is not analysed in the Business Case. This omission should be addressed in further modelling of incremental growth scenarios. For example, with respect to the specification of six buses or more in the peak hours this seems incongruous in outlining the overarching objectives. The scheduling of bus services will be determined by the level of demand that is generated as the housing and employment growth takes place, so represents more of an ambition rather than an objective.

Secondly, there is no objective to integrate with other public transport services including EWR or to integrated ticketing/fares that would incentivise bus use. Thirdly, the only environment objective is to improve air quality – a valid objective – but omits any other goals related to climate change or impact on the environment. There seems to a 'strategy' gap between the policy related objectives and the scheme specific objectives.

So while the three components of the scheme – HQPT route, new Park & Ride facilities, and active travel facilities - are complementary features and consistent with the scheme objectives, it is not clear how the scheme fits into the broader transport strategy to address the constraints described earlier. This vacuum was filled by the previous Mayor's CAM network project that was central to the Local Transport Plan strategy for the area. At the time of writing there is uncertainty over the future of CAM and what may be required to replace it. If it is to be the Better Public Transport program and schemes like the C2C, then the objectives need updating and widening to fill the gaps in transport strategy.

7.2.2 Options Development

The business case development has broadly followed the guidelines and procedures laid out in the HM Treasury Green Book and DfT's TAG methodology. These documents provide the guiding principles within which projects should be appraised but allow some leeway for scheme proposers to employ different methods and techniques where appropriate. It is accepted that in scheme appraisal there will be a need for judgement alongside quantitative assessment so long as there is a robust evidence base to support the decisions made.

It appears that the appraisal has been conducted in a robust manner. The process has included consultation with stakeholders at each phase and in addition a Local Liaison Forum has been established to represent stakeholder interests. These have been given ample opportunity to present their evidence and opinions on the C2C route options and in response the GCP has amended some features of the scheme.

Generally, the appraisal covers the required elements for the business case and appraises the options against the assumptions and constraints specified in the scheme objectives. The only question is whether the objectives remain valid in light of developments with CAM (now uncertain) and EWR, as well as changes in transport policy and strategy evident in the CPCA's Local Transport Plan? The appraisal took place while these projects were at an early planning stage and could not reasonably incorporate them into the appraisal given that they were not committed schemes. The recent announcement by the new Mayor to discontinue the CAM project validates this approach but the EWR has since taken a step forward and should be brought into the appraisal framework.

Likewise, pronouncements on government policies on climate change, Bus Back Better and the effects of the COVID-19 pandemic. These have both positive and negative implications for the C2C scheme.

Preferred Option Impacts

The projected demands for the C2C scheme indicate that mode shifting from private cars to buses will be moderate and growth along the corridor is likely to bring more traffic. The OBC does not present any forecasts of traffic growth after the scheme opens or when the housing is fully built out, although it is understood with and without development scenarios have been modelled using the D Series Cambridge Sub Regional Model 2 for 2026 and 2036. It would be helpful to compare the model outputs on general traffic as well as ridership on the C2C to understand better the impacts of the developments as well as the C2C scheme. The C2C scheme objectives include increasing bus mode share along the corridor, and local transport policy aims to reduce traffic in Cambridge City Centre and on radials like the A1303. It is not clear from the analyses how much these will be achieved, and it is therefore difficult to comment on the validity of these assumptions and constraints.

The environmental impact of the scheme is mixed. The Business Case emphasises the benefits in terms of improving air quality, biodiversity and its compatibility with national policies on climate change and greenhouse gas emissions, and assumes these will outweigh any negative impacts of the scheme on the green belt, landscape character and heritage assets.

The validity of these assumptions will need further investigation as part of the Environmental Impact Assessment that has yet to be conducted for the scheme.

Economic Case

The technical appraisal of wider economic impacts is a problematic area in welfare economics, especially surrounding the assumptions over dependency versus displacement in estimating GVA associated with jobs and land value uplift from housing. The dependency assumptions are key to the economic justification for the scheme and its overall value-for-money.

A series of sensitivity test were performed to assess the robustness of the scheme against varying levels of growth. This supports the economic case for the scheme in that where costs may increase the VfM of the scheme remain unchanged, and that if a greater level of growth does materialise then the VfM of the scheme will increase. Overall, the preferred option is judged to have medium VfM but is sensitive to changes in land value uplift and GVA generated by additional jobs. If these are less than expected, then the VfM would be poor.

The methods employed in the analysis appear to follow the appraisal guidelines, and in that respect remain valid.

Financial Case

The assumptions and constraints underpinning the Financial Case remain valid. However, the financial case does not include Optimism Bias (currently 44%), which is used within the economic appraisal, but does include a risk allowance of 25%. Applying the optimism bias would increase the potential scheme cost to £195m.

Commercial Case

The assumptions and constraints need updating to reflect shifts in government policy announced in the Bus Back Better: national bus strategy for England and the Bus Services Act 2017, as well as the bus strategy to be adopted by the new Mayor. There are opportunities presented by these through

the enhanced partnership or franchising arrangements. Generally, these are all positive changes that support ambitious schemes like the C2C.

Assumptions and constraints related to the CAM network also need amending or removing in the light of the approach proposed by the incoming Mayor.

Management Case

The assumptions and constraints relating to risk assessment remain valid apart from those pertaining to the CAM network. The interdependencies should be updated to reflect recent developments in national and local transport priorities.

These assumptions and constraints on public consultation remain valid and should be continued through the remainder of the project. Submissions to the audit have queried the consultation process and whether the GCP has adequately considered concerns raised by various parties. It is important for stakeholders and the wider community to have confidence in the consultation process and be given the opportunity to comment on plans and be involved in the scheme development.

7.3 Key Findings: Preferred Route Option

The strategic assumptions and constraints that underpin the scheme and the options development remain valid. However, local constraints that emerged following the preferred route alignment need further evaluation which will be undertaken in the Environmental Impact Assessment. The preferred option may still be amended following the outcome of the EIA including any recommended mitigation measures to offset the scheme's impact.

Alternative route options have been put forward by opponents of the preferred route, who object to the scheme's impact on the local environment and suggest that better alignments are feasible and more in keeping with the scheme objectives as well as being compatible with other developments such as the CAM (now in doubt) and EWR projects. These are reviewed in the body of the audit and briefly commented on below.

On-line scheme of bus priority measures along the A1303 Madingley Road

The in-highway proposal for a HQPT along the A1303 are essentially short-term measures that are consistent with the C2C scheme objectives. However, this does not invalidate the assumptions and constraints for the preferred option as a long-term solution to meet the growth in travel demand along the corridor. The proposers of this option acknowledge that a longer-term solution is required and propose that this can be provided by the CAM network – although this approach may no longer be available. As this now looks uncertain the case for the on-road scheme is weakened but not entirely without merit. The short-term measures are boosted by recent government announcements in the national bus strategy that the GCP and CPCA may wish to take advantage of and use a catalyst for attracting ridership to public transport for when the preferred option opens.

Northern route options

The alternative 'northern route' options and have been reviewed at various stages in the scheme options development process. The CAM route alignment proposed by the previous Mayor appears unsuitable for the busway, not least because of the higher cost compared with the preferred route and would run into considerable opposition from affected parties such as the American Cemetery and residents in Madingley.

The Girton Interchange option is ambitious and expensive and would take longer to deliver especially as it is reliant on Highways England committing to upgrade the junction. It looks like a high risk compared to the preferred option. The hybrid A428 Co-alignment scheme is a compromise

between the other two that incorporates some of their features but avoids the riskier elements. In this sense it is more viable and closer aligned to the scheme objectives than the others. Nevertheless, it is likely to perform less well on cost and other performance metrics while potentially scoring higher on environmental and social impact.

The alternative route options are created to overcome the local impacts constraints identified in the Business Case. The Business Case needs to address a wide range of constraints as well as local concerns and balance these through a rational appraisal process. Objectors may feel that this process is biased in favour of strategic goals, yet it is incumbent on the GCP to adhere to an appraisal process that complies with the methods laid down in the guidelines. The C2C scheme assumptions and constraints are not invalidated by the alternative options. It is not the role of this audit to adjudicate between different options. Opponents of the preferred option will have the opportunity to present their alternative route options to the Public Inquiry and cross-examine the GCP and its consultants on the options development and preferred scheme appraisal. There is no guarantee, for instance, that any of the alternative route options would perform any better if subject to a detailed appraisal than the preferred option evaluated in the business case.

Audit Conclusion:

The conclusion of this audit is that there is no reason why the Executive Board of the GCP should not proceed to the next stage in the development of the C2C scheme.

The audit has concluded thatthe scheme is in alignment with national, regional and local policies on the economy and transport. Stakeholder engagement has been carried out in a robust man ner and the business case development followed the HMT Treasury Green Bookand the Department for Transport's TAG methodology. The appraisal has also been carried out in a robust manner and the economic analysis and financial case remain valid.

The environmental impact of the scheme is mixed and the validity of some of the assumptions will need to be investigated further as part of an Environmental Impact Assessment which would form part of the next stages.

A number of alternative route options have been put forward and have been examined in this audit. It is important to stress, however, that the business case must balance local concerns with the wider strategic goals. The GCP has complied with national guidance on how to balance local and national considerations in relation to schemes such as this.

Overall, the audit has confirmed that the key constraints and assumptions on which the C2C business case is based remain valid. There have, however, been some significant changes in the wider context, including the impact of Covid-19, the increasing importance of climate change, the government's new bus policy, East-West Rail and the CAM scheme. These factors will have to be taken into account in the next stages of developing the C2C scheme.

It has been argued that progress with the C2C scheme should be delayed pending confirmation of the CAM and East-West Rail alignments. This audit has concluded that the case for delay is not strong and has been significantly weakened as a result of the increasing uncertainty ab out CAM in the light of statements by the incoming Mayor.

7.4 Recommendations

It is recommended that the assumptions and constraints in the following areas needs updating in the Business Case to incorporate the latest developments in transport policies and strategies that influence the C2C scheme:

- CAM network. The uncertainty now surrounding the CAM project affects the context for the C2C scheme in particular and the Better Public Transport project in general. This is a significant change in local transport strategy that needs reflecting in the Business Case. The implications should become clearer as the oncoming Mayor develops his transport strategy, but it presents an opportunity to reset the C2C scheme.
- City Centre access remains a constraint on achieving the ambitions of the C2C scheme and needs further examination, perhaps as part of a more ambitious bus strategy for Cambridge.
- National bus strategy. The assumptions in the OBC need updating and in some cases adding to, to incorporate changes in government policy. There is little said in the OBC, for instance, on ticketing and fares which probably reflected the bus de-regulation policy in place at the time of the Better Public Transport policy but should be included as a central plank of the delivery strategy.
- Similarly, the move to implement Enhanced Partnership or franchising models for bus operations is a significant shift in government policy, which has implications (mainly positive?) for schemes like C2C.
- The environmental impact of the scheme is mixed. The Business Case emphasises the benefits in terms of improving air quality, biodiversity and its compatibility with national policies on climate change and greenhouse gas emissions, and assumes these will outweigh any negative impacts of the scheme on the green belt, landscape character and heritage assets. The validity of these assumptions will need further investigation as part of the Environmental Impact Assessment that has yet to be conducted for the scheme.
- The GCP should continue to consult with stakeholders as the preferred option progresses and implement any recommendations that may arise from the Environmental Impact Assessment.
- EWR: the issues around potential impacts on demand should be subjected to further analysis. This could be done through more detailed modelling of passenger demands or through sensitivity analysis of projected demands for the C2C under different scenarios.
- Short-term bus priority measures along the A1303 could be a catalyst for mode shift in preparation for the when the C2C busway is operational, i.e., considered as complementary measures.
- Scheme cost and benefits. A question remains over the assumptions regarding the wider economic impacts of the scheme and extent to which the scheme supports housing and jobs growth. More testing of travel demands under different scenarios would be helpful, in understanding the long-term impacts of the scheme on general traffic in the corridor as well as on bus ridership.

Appendices

Appendix A. Statement of Assumptions and Constraints

Preamble: The register of assumptions and constraints has been amended following the first round of consultations to correct errors and clarify some points where the information was ambiguous. Otherwise the original Statement remains largely intact. More expansive comments on and challenges to the Statement are addressed in the Audit Report.

The Greater Cambridge Partnership (GCP) has instigated an independent audit of the key assumptions and constraints underpinning the selection of the preferred route for the Cambourne to Cambridge Better Public Transport Project. The focus of the audit is on the assumptions and constraints that underpinned the analysis that led to the selection of the preferred route and the elimination of alternative options. The objective is to test the robustness of those assumptions and constraints anddetermine whether they remain appropriate in the context of the current strategic frameworks, the emerging Cambridgeshire Autonomous Metro (CAM) network and the East West Rail plans.

This first stage of the audit comprises the preparation of a statement on the assumptions and constraints. This statement will be published on the GCP web site and will form part of an invitation to representative groups to submit further written representations on the assumptions and constraints and their application throughout the process.

The assumptions and constraints are documented in the tables below. These are derived from the Outline Business Case for the scheme together with supporting materials prepared for the business case and other reports produced by the GCP and its partners. The information sources are referenced against each entry in the table.

Examination of these sources has revealed 51 individual assumptions and constraints which are grouped into 12 categories:

- A. Policy Context
- B. Scheme Objectives
- C. Project Deliverables
- D. Strategic Fit
- E. Connections to CAM and EWR
- F. C2C Options Selection
- G. Economic Case
- H. Financial Case
- I. Commercial Case
- J. Management Case
- K. Full Business Case
- L. Covid-19 Impacts

These categories expand upon the 5-case business model framework used in the outline business case including consideration of the wider context for the scheme.

Broadly, the constraints fall into two types: on the positive side, the strategic growth targets and ambitions of the GCP and the Cambridgeshire and Peterborough Combined Authority (CPCA) dictates the development of new public transport capacity to meet future travel demands; on the negative side, deploying this new infrastructure, like the C2C scheme, impacts on local communities and the environment with queries about the premise for the preferred option. The assumptions

outline a scheme that can address both areas of concern and demonstrate through evidence the justification for the preferred option. At this stage, the objective is to produce a comprehensive list of assumptions and constraints without prejudice for stakeholders to review and comment on.

For comparison the assumptions are matched with the constraints (or vice versa). This 'mapping' is not always clear cut and there are overlaps and some matters that are more distinct. Nevertheless, this format helps to link the assumptions with the constraints to better understand the need for the intervention, the process of selecting the preferred option, evaluating its impacts, how it will be delivered, and interdependencies with the future CAM and EWR networks. No weighting is given to the categories or individual items. At this stage it is considered appropriate to present the assumptions and constraints in a neutral manner.

The continuing validity and appropriateness of the assumptions and constraints will be analysed in the second part of the audit.

Table A: Policy Context

	Assumptions	Constraints	*Reference*
	A. Policy Context		
A.1	Greater Cambridge Partnership: Created in 2014 to implement City Deal agreed with government to deliver growth aspirations in support of regional and national economic policies.	The C2C corridor has been identified by the GCP's Executive Board as a priority project for development in the first five years of the GCP's transport programme.	*Greater Cambridge City Deal. GCP 2014*
A.2	Local Plan policies for the strategic developments of sites along the C2C corridor require High Quality Public Transport (HQPT) to link new homes to employment and services in and around Cambridge.	Local Plans prepared by Cambridge City & South Cambridgeshire Councils: Confirm targets for housing and employment growth and allocate sites in West Cambourne, Bourn Airfield and other sites along the A428 corridor for development as well as at West Cambridge and North West Cambridge. In light of this policy requirement, the County Council has been working with developers re: pre/post application development proposals, mindful of the need to secure appropriate local contributions to the C2C (financial and direct works), in line with the C2C funding strategy and the planning need for this strategic intervention.	*Greater Cambridge Local Plan. Transport Evidence Report. Cambridgeshire County Council Transport Strategy and Funding Team, November 2020.*
A.3	Policy within the TSCSC requires a range of infrastructure interventions on the St Neots and C2C corridor as a key part of the integrated land use and transport strategy responding to levels of planned growth.	The Transport Strategy for Cambridge and South Cambridgeshire (TSCSC) was prepared in parallel with the development of the Local Plans and was agreed in March 2014. The strategy provides a plan to manage the rising population and increasing demand on the travel network by shifting people from cars to other means of travel including public transport, walking and cycling.	*Transport Strategy for Cambridge and South Cambridgeshire, March 2014*

	Assumptions	Constraints	*Reference*
A.4	Cambridgeshire County Council are working with Greater Cambridge Shared Planning (GCSP) comprising Cambridge City and South Cambridgeshire, to provide a transport evidence base to support the preparation and examination of the Greater Cambridge Local Plan (GCLP) that runs to 2041. The Greater Cambridge Local Plan is at an early stage of preparation and has yet to be adopted.	Three growth level options being tested through the local plan are: • Minimum – Standard Method homes-led • Medium – central scenario employment-led • Maximum – higher employment-led The GCP City Deal constrained to deliver 44,000 jobs and 33,500 homes by 2031 and is consistent with the Minimum growth projection. Higher growth forecasts imply additional infrastructure and development sites beyond 2031.	*Greater Cambridge Local Plan. Transport Evidence Report. Cambridgeshire County Council Transport Strategy and Funding Team, November 2020.*
A.5	The Cambridgeshire and Peterborough Combined Authority is responsible for transport infrastructure improvement and the Local Transport Plan. Drawing on the CPIER the goals of the CPLTP published in 2020 are to deliver a transport system that delivers economic growth and opportunities, provides an accessible transport system and protects and enhances the environment to tackle climate change together.	The CPCA established the Cambridgeshire and Peterborough Independent Economic Review (CPIER). The review provides a robust and independent assessmentof the Cambridgeshire and Peterborough economy and the potential for growth. The CPIER confirmed the growth targets established in the City Deal and the need for a package of transport and other infrastructure projects to alleviate the growing pains of Greater Cambridge including HQPT scheme from Cambridge to Cambourne.	*CPIER - Cambridgeshire and Peterborough Independent Economic Review, CPCA, September 2018*

	Assumptions	Constraints	*Reference*
A.6	In April 2020 the CPCA published a draft Sub-Strategy to the Local Transport Plan specifically dealing with CAM. The route along the A1303/A428 from Cambridge City centre towards Cambourne, St Neots and Bedford has been highlighted as a strategic project to help make travel by foot, bicycle and public transport more attractive than private car journeys, alleviating congestion and supporting the region's growth issues.	The C2C proposals have been assessed against the policies in the Sub-Strategy and it is concluded that the scheme is compliant, although further review of the eastern end of the scheme (City Access) has been undertaken and a review of the western end will be required once there is clarity with regards to proposals for EWR and a station in the Cambourne area.	*Cambourne to Cambridge Better Public Transport Project, Report to GCP Executive Board, 10 December 2020*
A.7	National Infrastructure Commission: The NIC has identified the Cambridge – Milton Keynes – Oxford arc as a national priority stating that its world-class research, innovation and technology can help the UK prosper in a changing global economy.	NIC has proposed the development of EWR. Integrating mass rapid transit with this scheme will enable effective first/last mile connectivity, in a way that enhances the value of these strategic infrastructure projects.	*NIC Report, November 2020. https://nic.org.uk/studies-reports/national-infrastructure-assessment/*
A.8	Highways England. Dualling of A428 Black Cat to Caxton Gibbet included in RIS2 programme, 2020-2025. HE has no other major road schemes planned for the GCP area having recently completed the upgrade to the A14 around the Girton interchange with the M11. HE has agreed to consider an 'all-ways' junction for M11 J13 in RIS 3, 2025-30.	DCO submitted in February 2021 for this Nationally Significant Infrastructure Project connecting the A1 to the A14. Preparatory works are underway. Scheduled for completion by 2023-24? CPCA LTP makes reference to a study of options at Girton Interchange but this is not listed as a priority scheme.	*Highways England. Route Investment Strategy. Road projects in the Eastern Region. https://highwaysengland.co.uk/our-work/east/#roadprojectform*
A.9	East West Railway Company formed to create a new railway connection between Oxford and Cambridge. Consultation on 5 routes is underway on the preferred route alignment which includes stations at Cambourne (north and south options) and in the Sandy/St. Neots area.	The Bedford to Cambridge sectionis the third stage of the project and construction is not expected to start before 2025 with the train service beginning later this decade at the earliest.	*Connecting Communities: The Preferred Route Option between Bedford and Cambridge Executive Summary. EWR, 2019*

Table B: Scheme Objectives

	Assumptions	Constraints	*Reference*
	B. Scheme Objectives:		
B.1	● Achieve improved accessibility to support the economic growth of Greater Cambridge ● Deliver a sustainable transport network/system that connects areas between Cambourne and Cambridge along the A428/A1303 ● Contribute to enhanced quality of life by relieving congestion and improving air quality within the surrounding areas along the A428/A1303 and within Cambridge city centre	• Existing car mode share and car ownership within the A428/A1303 corridor is high, and future growth is expected to generate additional demand for car use in this area. • Traffic data shows that AM peak hour traffic speeds are 75% slower than night time average speeds on the route between the Madingley Mulch Roundabout and M11 Junction. • Planned growth, between 2011 and 2031, along the A428/A1303 corridor eastbound car trips are forecast to increase by 14% in the AM Peak hour, 82% in the Inter-peak period and, 37% in the PM Peak period. Without intervention this could lead to a further deterioration in traffic speeds and reliability of journey times. • Travel to work data for key origins along the C2C corridor also illustrate the high level of car use along the route, with the car mode share for residents of Cambourne being particularly high (65%). • Residents of Cambourne and surrounding villages currently have limited options to use public transport due to the low level of service and current unreliability. • In the absence of substantial bus priority in the corridor, congestion and delays mean journeys of around 10 miles can take over an hour during peak times. Buses therefore offer no competitive	*C2C Outline Business Case, Strategic Case GCP January 2020.*

		advantage over private cars in terms of journey times and reliability.	
B.2	Supporting development through the busway corridor: The scheme is assumed to promote growth in the area and increase investment. It is designed to be the first in a series of steps to push forward growth.	Longer-term plans for the CAM network and EWR need to be taken into account.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*
B.3	Support for the labour market: Through the wider effects of the scheme it is assumed that there will be an increase in accessibility to jobs, education and training. This has the potential to give easier access into both Cambourne and Cambridge and thereby expand the labour market.	Constraints in this are linked to ticketing and frequency of service. If this is an expensive service, then some may still be priced out. There is no information on ticketing and service schedules have yet to be confirmed.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*
B.4	The scheme will create a congestion free, high quality public transport corridor: The OBC assumes that the scheme will be able to create this corridor as a segregated busway.	There are still several pinch points and interactions with general traffic that could create congestion and delay along the route. • Scotland Farm P&R access • The section of the scheme which runs through Bourn Airfield must comply with the SPD for the site and complement the development Masterplan. • Access through Cambourne on public roads • The section of the scheme which runs through West Cambridge must complement the development Masterplan. Consideration must be given to vibration and EMI impacts on sensitive receptors such as the Department of Materials Science and Metallurgy. • City centre access to/from Grange Road	*'C2C Outline Business Case, Strategic Case GCP January 2020.*

B.5	In the City Centre, GCP's City Access project is proposing measures to reduce reliance on car travel and free up the city centre's congested road space, to run better public transport services. • The objectives of the City Access scheme complement the C2C project by seeking to improve conditions for sustainable transport within the City Centre, thereby benefitting users of the C2C scheme either through improved journey times for public transport or better connectivity to pedestrians and cyclists. • City Access will also complement C2C by providing an alternative to car journeys for trips from new developments served by the scheme.	Bus services across the city centre incur substantial delays due to traffic congestion and the layout of city streets. Significant reallocation of road space to active travel and buses alongside on-street parking management measures will be required to improve bus journey times.	*Report to GCP Executive Board, 18 March 2021*

B.6	On 31st October 2018 the CPCA Board agreed that the C2C scheme should be progressed by the GCP as an essential first phase of developing proposals for the CAM. They accepted the independent review of alignment between the C2C scheme and the CPCA plans for a CAM, undertaken by consultants Arup and commissioned by the CPCA in 2018.	Arup has undertaken a high-level review of route options and concluded that: • The process undertaken to date to determine the route is robust and the optimal solution for the corridor is confirmed; • The route is reclassified as a CAM route to serve the wider network, and not an independent guided busway corridor; • The vehicle operating along the A428 corridor will comply with the principles of the CAM; • The route will continue to be designed to align and integrate with the overarching CAM network, comprising one of the phases of the CAM network; and • Options for mitigating the impact of the scheme at West Fields and Coton will be incorporated into scheme design for the SOBC.	*Cambridgeshire and Peterborough Combined Authority CAM Expert Advice A428 Report. Arup, October 2018*

Table C: Project Deliverables

	Assumptions	Constraints	*Reference*
	C. Project Deliverables:		
C.1	The project is made up of three key elements: • a public transport link between Cambourne and Cambridge, • a new Park and Ride facility off the A428/A1303 to supplement the existing Madingley Road Park and Ride, and • new cycling and walking facilities.	The C2C scheme will need to deliver on the following elements: • A HQPT system using rapid transit technology on dedicated routes. • High frequency, reliable services delivering maximum connectivity. • Continued modal shift away from car usage to public transport. • Capacity provided for growth, supporting transit-oriented development. • State of the art environmental technology, with easily accessible, environmentally friendly, low emission vehicles such as electric/hybrids or similar. • A fully integrated solution, including ticketing and linkages with the wider public transport network to maximise travel opportunities. Achieving these may be constrained by factors outside of the GCP's control.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*
C.2	Scotland Farm site chosen as preferred location for Park & Ride site with a capacity for up to 2000 cars. It will also provide a travel hub with potential for cycle storage as well as waiting rooms/information point and retail outlet.	Scotland Farm is attractive location for commuters from areas to the west of Cambridge along the A428 corridor but less so for car users from the south exiting at jnc 13 of the M11. The success as a travel hub will depend on the number of car users and cyclists attracted to the site. • 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	*'C2C Outline Business Case, Strategic Case GCP January 2020.*

		Bus Operator will operate the Park & Ride Bus Services in accordance with the established minimum requirements. • Provide appropriate traffic calming and management proposals to mitigate rat-running to Park & Ride sites. • The alternative P&R site at Madingly Road may be redeveloped for other use when the lease expires later this decade.	
C.3	Increase active travel through improved infrastructure for cycling and walking: • Comberton Greenway will complement the C2C project as it develops improved pedestrian and cyclist routes with a segregated path continuing beyond the proposed bus route. • Madingley Road cycling improvements enabled by reallocation of road space that complements C2C scheme	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. The existing cycling network between Cambourne and Cambridge has sections of segregated links of uneven quality but is discontinuous and does not in total provide a high-quality segregated route which would cater for the potential increased modal share of cyclists along the corridor. Madingley Road potential bus lane/priority measures reallocated to cycling infrastructure.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*

Table D: Strategic Fit

	Assumptions	Constraints	*Reference*
	D. Strategic Fit:		
D.1	A substantial level of housing and employment development is planned, or is already under development, along the C2C corridor include Cambourne West, Bourn Airfield, West Cambridge and North West Cambridge (Eddington).	Based on current plans, both those within the current Local Plan or well established through planning applications or known to be emerging, there are around 11,700 additional houses planned (e.g., Bourn Airfield: 3,500, Cambourne West: 2,350, Eddington: 3,000) and around 13,400 additional jobs (11,000 at West Cambridge) along the C2C corridor. Around 50% of all housing planned (c. 6,000 houses) would be directly linked to Cambridge City centre and other key employment locations via the C2C project.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*
D.2	The C2C project has been recognised in the Local Plans and local transport strategy as a key project to help address these infrastructure constraints on growth by linking Cambridge to growth areas to the west. The provision of a HQPT service supporting journeys to key employment sites presents a viable alternative to car use/purchase for residents in new developments.	Two significant new planned developments (Cambourne West and Bourn Airfield) are, in housing terms, judged to be dependent upon the C2C project given the clear policy position within the adopted Local Plan and as supported by Section 106 commitments and ongoing negotiations. While Bourn (3,500) and Cambourne West (2,350) are fully dependent upon the C2C (with financial contributions and direct works secured) the trigger points allow for delivery of dwellings before the link is completed. For Cambourne, there is a pre-occupation requirement to directly deliver the Broadway Bus Link component of the C2C. For Bourn Airfield, development cannot proceed beyond 500 dwellings until the C2C is delivered.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*

D.3	Supporting increased development density of the corridor: The assumption is that the added capacity of the scheme will support the densification in the areas easily accessible to the busway.	The growth depends on the scheme providing enough capacity to meet anticipated demands.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*
D.4	The scheme offers further capacity and therefore underpins growth. Whilst there is a wealth of supporting evidence for this assertion, it is hard to establish how much effect on relieving the capacity this scheme will have and how much growth that this scheme in isolation will enable. The scheme is assumed to be the launch point for further connections and shift away from private vehicles. For planning purposes, robust Transport Assessment assumptions have been made in terms of the mode shift the C2C will enable. This will be influenced by travel planning and wider transport policies, so will be monitored on an ongoing basis to inform assumptions about how much additional future development could be unlocked.	Existing network cannot increase travel capacity much further. A major constraint is whether this scheme can successfully create the conditions for modal shift? Are other measures required to achieve the 30% modal shift targeted in the GCP transport strategy?	*'C2C Outline Business Case, Strategic Case GCP January 2020.*

Table E: Connections to CAM and EWR

	Assumptions	Constraints	*Reference*
	E. Connections to CAM and EWR		
E.1	The CAM project proposes an expansive metro network that seamlessly connects Cambridge City Centre, key rail stations (Cambridge, Cambridge North and the future Cambridge South), major City fringe employment sites and key 'satellite' growth areas, both within Cambridge and the wider region.	The GCP routes will form the first phase of the Combined Authority's CAM project. The CPCA has proposed a northern route alignment for evaluation alongside the preferred southern route. This could delay a decision on the C2C preferred option.	*Cambridgeshire Autonomous Metro Strategic Outline Business Case, CPCA, February 2019*
E.2	CAM SOBC assumes the portal connecting the city centre underground section to the C2C route will be in West Cambridge at the southern edge of the proposed development area. The CAM station will be at ground level in this vicinity.	Alternative route options for the CAM are still being explored. So far, these rule out any alignment going via the Girton Interchange. A northern route corridor option(s) has been proposed. These would follow an alignment to the north of the A1303 and American Cemetery and connecting to the north side of the A428 and proceeding to Scotland Farm P&R and then crossing over to Bourn Airfield development. An alternative option to extend the CAM tunnel to the west of the M11 on the northern side of A1303 has also been explored. A preliminary evaluation of these route options indicates that they would be higher cost alignments for the busway/CAM and would have environmental impacts on the American Cemetery, 800 Wood, Madingley village and White Pits Plantation, and incur longer journey times compared to the preferred busway option.	*CAM Indicative Northern Route Corridor Options Map, CPCA, October 2020.*

E.3	CAM: As a segregated route, the preferred option for the C2C is aligned with the CAM project, at least on the section between West Cambridge and Bourn Airfield. CAM connections through/around Cambourne will depend on the EWR station location. Connections to rest of the CAM network will be via a tunnel through the City Centre. Any elements of incompatibility between C2C and the wider CAM will be addressed by the CAM overlay project.	C2C travel hubs at Scotland Farm P&R site and in Cambourne may require the CAM to follow a different alignment to the C2C busway in these sections in order to access these facilities depending on the vehicle technology chosen.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*
E.4	EWR: The C2C full business case will also need to include a sensitivity test to assess the impact of EWR Rail once there is clarity with regards to the proposals. It is unlikely that EWR will have an impact of the core business case for C2C given that it is unlikely that any EWR proposals will have achieved consent during the C2C assessment period.	EWR focuses substantially on longer term growth beyond the Local Plan period and not the immediate and worsening issues of congestion and lack of connectivity for expanding communities west of Cambridge. Once a preferred alignment has been agreed for EWR and confirmation of the location of a Cambourne station there will need to be a programme to ensure integration between EWR, C2C and the wider CAM network.	*'C2C Outline Business Case, Strategic Case GCP January 2020.*

Table F: C2C Options Selection

	Assumptions	Constraints	*Reference*
	F. C2C Options Selection		
F.1	Options Sifting: The scheme options were developed in two phases. In total 34 options were considered which were sifted through a multi-criteria assessment framework to derive 6 options (3 phase 1 & 3 phase 2) including the P&R site options. These were then combined into 5 options for both phases including a scheme comparator which was eventually selected as the preferred option. The optioneering process reviewed a wide range of options suggested by stakeholders and following consultation. The assessment criteria followed DfT appraisal guidelines and covered a broad range of issues from policy goodness-of-fit to local environmental impacts.	The key constraint is that the C2C follow a rigorous and robust, evidence-based evaluation methodology. The MCAF criteria is a qualitative exercise that measures the performance of each option against a wide range of factors grouped into 6 themes. The option scoring is justified on the available evidence but by its nature is subjective. The results indicated that the best performing option was the segregated off-road option with Park & Ride at Scotland Farm but only by a small margin. The preferred option would create a new busway crossing designated green belt in West Fields, Coton Orchards and National Trust covenanted lands. Options regarding connections of C2C to the CAM and EWR were not evaluated as these are not confirmed, nor are they committed schemes.	*C2C Outline Business Case, Options Appraisal Reports 1, 2 & 3, GCP January 2020.*
F.2	Alternative alignments to avoid Coton and Hardwick were evaluated as part of the options development process. These were not found to be suitable and performed worse than the preferred option and no better than the other options assessed.	Alternative northern route options via Girton interchange are not deliverable within the time horizons for the project and not compatible with CAM route corridor options. Other northern route options to the north of the American Cemetery are constrained by environmentally sensitive areas and heritage assets. The Cambridge American Cemetery and the American Battle Monuments Commission is regarded as a unique national memorial which honours the American military personnel killed in the second world war. They would oppose any on-road or off-road scheme which impacted the setting of the cemetery including	*C2C Outline Business Case, Options Appraisal Reports 1, 2 & 3, GCP January 2020.* *Madingley Road 'Quick-Win' Options Outline. Technical Note. Mott Macdonald. May 2019.*

		removing the verges along the A1303 and the uninterrupted views to the north. On-road options for bus lanes/bus tidal flows are also constrained by impact on SSSI and American Cemetery along the A1303 as well as impacts on properties along the route.	

Table G: Economic Case

	Assumptions	Constraints	*Reference*
	G. Economic Case		
G.1	Options Appraisal: The preferred route from Cambourne to Grange Road has been analysed for its economic benefits and costs. Benefits were assessed at 3 levels following Transport Appraisal Guidelines: level 1 measures the transport user benefits to bus riders and decongestion benefits for car users; level 2 estimates the wider economic benefits assumed to accrue from the scheme from agglomeration; and level 3 estimates the wider economic benefits from land use changes at national and local level, including Gross Value Added through jobs created and the land value uplift from the scheme. These level 3 additionality benefits are what justify the scheme producing a BCR of 1.47 (increased to 3.48 with Greater Cambridge additionality benefits) compared with just 0.43 for the level 1 benefits and 0.48 for the adjusted level 2 benefits.	The scheme has been presented as creating 975 new jobs and increasing housing by around 6,000 which are dependent on the scheme. There is an increase in GVA of £102.8m per annuum attributed to the scheme. Over a 30-year period this delivers a significant benefit of £676.1m plus £458m from land value uplift, giving a total benefit of £1.13bn. What constrains this assumption is that if the scheme does not support the housing and jobs growth as expected then there is a danger of reduced economic growth.	*C2C Outline Business Case, Economic Case GCP January 2020.*
G.2	Segregated busway: Comparison of wider economic impact assessment of the off-road (preferred option) and the on-road option estimates that the on-road option has a slightly positive BCR when local WEI are included whereas the off-road option has a much higher BCR.	The traffic growth generated by the developments along the corridor would increase congestion and impact on the journey times and reliability of an on-road scheme along the A1303 even with bus priority measures such as bus lanes or a tidal bus way.	*C2C Outline Business Case, Economic Case GCP January 2020.* *'C2C Outline Business Case, Options Appraisal Reports 1, 2 & 3, GCP January 2020.*

G.3	Journey Times, Reliability and Ridership: The traffic modelling for the preferred option estimates a 167% increase in bus ridership when the scheme opens and 233% by 2036 when all the housing and employment in the corridor is assumed to be built. This amount of mode shifting, mainly from private car, is predicated on the C2C delivering significant journey time savings to users from Cambourne, Bourn village and the Scotland Farm P&R. For instance, C2C passengers from Cambourne to Cambridge city centre are predicted to have 23 minutes lower journey time in the morning peak hour compared to a do minimum scenario. Alternative on-road options do not offer anywhere near this journey time saving or reliability.	Despite the forecast increase in bus ridership, there will still be a lot of traffic generated by the developments in the corridor so traffic congestion will remain a problem. The predicted mode shift only increases the bus mode share east of the Scotland Farm P&R site from 4% to 6% of travel demand. Off peak C2C journey times are slightly longer due to the diversion from the busway to the Scotland Farm P&R site.	*'C2C Outline Business Case, Economic Case GCP January 2020.*
G.4	Sensitivity Tests: A series of sensitivity test were performed to assess the robustness of the scheme against varying levels of growth. This supports the economic case for the scheme in that where costs may increase the VfM of the scheme remain unchanged, and that if a greater level of growth does materialise then the VfM of the scheme will increase.	The scheme is judged to have medium VfM but is sensitive to changes in land value uplift and GVA generated by additional jobs. If these are less than expected, then the VfM would be poor.	*'C2C Outline Business Case, Economic Case GCP January 2020.*

G.5	Environmental Impact: Overall it is assumed that environmental factors are very limited in terms of the schemes impact on the proposed route. Noise, Air quality and emissions are all very limited. It is assumed they will have minor benefits or be neutral. Similarly, for the landscape impact it is neutral for the proposed route. There is a slightly higher impact on biodiversity, however there are mitigation opportunities for the scheme to reduce impact. The impact on features of visual, historic and cultural significance is also minor.	The environmental impact of the scheme has yet to be fully assessed in an EIA. The scheme must achieve a 20% net biodiversity gain. The segregated busway alignment has been designed to minimise the impacts on the environment. Nevertheless, it will require mitigation measures to lessen its impact on the landscape especially where it crosses the green belt and National Trust covenanted land. There is also the limitation that if the targets for modal shift are not reached then there will be reduced benefit to the environmental factors such as emissions and air quality.	*C2C Outline Business Case, Economic Case GCP January 2020.*
G.6	Green Belt: Whilst it is always preferable to avoid any impacts on the Green Belt, in the case of C2C, impact is inevitable. The National Planning Policy Framework establishes that "certain other forms of development are also not inappropriate in the Green Belt provided they preserve its openness and do not conflict with the purposes of including land within it. These include local transport infrastructure which can demonstrate a requirement for a Green Belt location."	The C2C scheme has been developed to provide linkage from new settlements located outside the Green Belt to the City of Cambridge. Given the need to connect development outside the Green Belt to the city, some degree of impact on the Green Belt is inevitable.	*A428 Cambourne to Cambridge Segregated Bus Route Consideration of Green Belt Issues, LDA Design, August 2017* *C2C: Report to GCP Executive Board, 10 December 2020* *Interim Addendum Report to Planning Appraisal 2017: Cambourne to Cambridge public transport route (C2C) – Phase 1, Strutt and Parker, September 2019*
G.7	Mitigation measures will be firmed up following the Environmental Impact Statement and in consultation with local landowners and the communities affected.	There are specific concerns about the impact on the Green Belt, West Fields, the Orchards near Coton as well as the alignment close to Coton conservation area, and the busway section between St. Neots Road and the A428 at Hardwick.	*C2C: Report to GCP Executive Board, 10 December 2020*

		• Coton Conservation Area including Grade 1 listed Church. • Land parcels owned by Cambridge Past, Present and Future, which are protected by National Trust Covenants. • 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 are bisected by the alignment for the preferred option	
G.8	Social Impact: Overall the scheme is assumed to benefit a range of social areas. Reduced accidents due to lower private vehicle use. Providing access to services, which are affordable is also assumed. Creating a more secure and easy to use bus service will attract a broader cohort of users.	Cost and accessibility is an issue for people on low incomes. High fares will reduce demand. The transport scheme needs to be financially sustainable and too many services with low patronage will drive costs up threatening service levels which in turn could reduce demand.	*'C2C Outline Business Case, Economic Case GCP January 2020.*

Table H: Financial Case

	Assumptions	Constraints	*Reference*
	H. Financial Case		
H.1	The current estimated capital cost of the off-road option is £160.5m, of which £37.7m is anticipated from Section 106 contributions from other third parties such as the developers of the Bourn Airfield site and West Cambridge. Developer contributions so far include: • Cambourne West**:** £8.7 million secured plus direct delivery of Broadway link (£400k) and internal route within site. • Bourn Airfield: £20 million (approved Heads of Terms – subject to S106) plus direct delivery of internal route within site. • West Cambridge: Not yet determined though £9 million is working assumption if approved	The estimated developer contributions are dependent upon ongoing assessments and negotiations and so are indicative at this stage. However, it is currently anticipated that between 20% and 25% of the scheme costs can be attributed to development and contributions secured accordingly. Any lower contributions would increase the financial risk of the scheme to the GCP.	*C2C Outline Business Case, Financial Case GCP January 2020.*
H.2	The estimated high-level scheme costs at this stage of the project's development are based on a range of assumptions and exclusions, which are detailed within OBC Appendix Q. These will be revisited and updated in the Full Business Case stage.	The financial case does not include Optimism Bias (currently 44%), which is used within the economic appraisal, but does include a risk allowance of 25%.	*C2C Outline Business Case, Financial Case GCP January 2020.*

Table I: Commercial Case

	Assumptions	Constraints	*Reference*
	I. Commercial Case		
I.1	In the SOBC it was concluded that the commercial factors related to the delivery did not significantly differentiate between the options.	As part of the current stage of scheme development and the OBC, a design and build procurement has been selected as the preferred procurement strategy. However, this is subject to further review as part of the next stage of work in developing the scheme and informing the Full Business Case	*C2C Outline Business Case, Commercial Case GCP January 2020.*
I.2	The design and build model will provide GCP with more opportunity to drive value for money and more opportunity to transfer delay risk and interface risks to the contractor.	Adopting a design and build approach puts the responsibility for design, including integration, with the contractor and it would be the responsibility of GCP to define its requirements.	*C2C Outline Business Case, Commercial Case GCP January 2020.*
I.3	The operation of the current bus services along the C2C corridor is largely on a commercial basis. With regard to the new HQPT services which are expected to operate along the C2C infrastructure, it is not the intention of GCP to be directly involved in their procurement and control as that is not within GCP's powers.	The potential public transport operating models currently available for the C2C project have been identified and the following issues and key questions considered: ● Available operating models for providing services; ● Appetite in the market to engage with those models; ● Impact and influence on fares and patronage; ● Risks; and, ● Commercial implications of objectives for clean high-quality transport such as high frequency services operated by high quality electric vehicles.	*C2C Outline Business Case, Commercial Case GCP January 2020.*

	The proposed Bus Network Strategy is based around three direct express services as follows: ● Cambourne to Cambridge City Centre at 10-minute interval service (6 buses per hour) ● Cambourne to BioMedical Campus at 30-minute interval service (2 buses per hour) ● A428 Park and Ride site to BioMedical Campus at 30-minute interval service (2 buses per hour during peak periods) In addition, passengers from Cambourne to Cambridge corridor services would also be able to interchange with the Universal service at West Cambridge which would serve Cambridge North Station and the Cambridge Science Park. ● BioMedical Campus to Eddington at 15-minute interval service (4 buses per hour) ● BioMedical Campus to Cambridge North Station & Cambridge Science Park 30-minute interval service (2 buses per hour)	The routes and schedule are based on anticipated demand and are proposed routes only and have not been agreed with the existing route operators. • Any new Park & Ride service will need to be to a standard similar to that currently operating for Cambridge's Park & Ride 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. • All buses are now required to be accessible for all including wheelchair users. • The scheme must be capable of eventual upgrade to form part of the CAM network.	
I.4	The Local Transport Authority (LTA) that has the relevant powers is the Cambridgeshire & Peterborough Combined Authority (CPCA).	The CPCA Mayor's recently commissioned Strategic Bus Review concluded that further work was required including procurement and completion of a business case to assess different delivery model options. Following completion of this latter piece of work, the CPCA Mayor is expected to make a decision on the future preferred option for delivering bus services in early 2021.	*Strategic Bus Review Report, CPCA 2020*
I.5	There are several options for the Busway maintenance which will be reviewed further at FBC.	The busway maintenance option decided upon will depend to an extent on the arrangement used for the Operation of the bus service, which is yet to be determined, as noted above.	*C2C Outline Business Case, Commercial Case GCP January 2020.*

Table J: Management Case

	Assumptions	Constraints	*Reference*
	J. Management Case		
J.1	The management case also identifies the key risks and mitigations for the project. The management case does not differentiate in terms of the options under consideration.	The success and financial viability of the C2C project will be dependent on several factors. Scheme design and delivery will therefore need to consider the following dependencies outlined in the OBC: • Delivery of housing and employment sites allocated within the South Cambridgeshire Local Plan • Emerging CPCA Policy specified in the Local Transport Plan. Also need to consider Cambridgeshire Transport Delivery Plan (TDP) for transport capital schemes on the local network to be delivered on a three year time frame and the Transport Investment Plan (TIP) that includes the C2C scheme, developed alongside the TDP to identify schemes to support growth • Monitor how development of CAM progresses as the C2C project aims to deliver the first phase of infrastructure for the larger CAM network • City Access Strategy which aims to improve congestion on routes into the City Centre which will be key to reducing the journey times for buses and therefore making the Park & Ride attractive and successful • Oxford-Cambridge Arc. Both the dualling of the A428 between the A1 and Caxton roundabout and EW Railway will impact on the C2C route and whilst the scheme is not dependent directly upon these proposals, they may have a significant influence	*C2C Outline Business Case, Management Case GCP January 2020.*

		• Emerging Technologies. The final specification of C2C will be driven by technology advances and the range of solutions available at the procurement stage.	
J.2	The Management Case reviews the process of public consultation and engagement. A communication plan sets out how this process is managed, identifying key stakeholders and how engagement is managed including the facilitation of a project specific Local Liaison Forum.	Public and stakeholder consultation is essential to ensure that the various aspirations of the general public and key stakeholders are taken into account throughout development and delivery of the project and to manage the communication and flow of information relating to the project.	*C2C Outline Business Case, Management Case GCP January 2020.*

Table K: Full Business Case

	Assumptions	Constraints	*Reference*
	K. Full Business Case		
K.1	The Full Business Case will develop the detailed design for the preferred scheme and update the appraisal for the economic case. Consultation and engagement with stakeholders and partners will continue through this stage. The risk register will identify outstanding issues that need remedial actions or mitigation measures.	Additional information for the financial, commercial and management cases will be provided together with recommendations on the necessary actions to proceed with the scheme.	*The Green Book: appraisal and evaluation in Central Government. HM Treasury 2020.*
K.2	Prepare an application for statutory consent anticipated in 2021 with a determination period estimated of around 18 months – completed in 2023.	Authority to construct the scheme is likely to come from a Transport and Works Act Order which would be determined by the Secretary of State for Transport. This process is likely to include a Public Inquiry directed by an independent Inspector	*C2C: Report to GCP Executive Board, 10 December 2020*
K.3	Prepare Environmental Impact Assessment and Environmental Statement	Work to be undertaken will include Environmental Impact Assessment as well as Transport Assessment, Road Safety Audit etc. This will draw on further work to be done on scheme design including mitigation measures and further stakeholder engagement.	*Report to GCP Executive Board, 10 December 2020*
K.4	Seek authority to construct project in 2023 depending on statutory powers process	Following the completion of the statutory permissions stage, the GCP Board will be presented with the Final Business Case for approval. This will trigger the construction of the project.	*Report to GCP Executive Board, 10 December 2020*
K.5	Opening of the scheme to operational services in 2025	Bus services schedule and routes will be determined in discussion with operators. Phasing in of services in response to planned growth and ridership demand	*Report to GCP Executive Board, 10 December 2020*

Table L: Covid -19 Impacts

	Assumptions	Constraints	*Reference*
	L. Covid-19 Impacts		
L.1	The implications of the global pandemic remain unknown. While there has been a short-term impact on the use of public transport, the longer-term impact is uncertain. The C2C scheme is consistent with the government's agenda for innovative public transport solutions and mode switching from private car use in support of climate change goals and net-zero carbon by 2050. So, the prospects for the scheme are considered good in the long-term. The assumption is that the impact of covid will not negatively affect the benefits of the scheme and the scheme remains viable.	This matter will remain under review. Scheme appraisal will be revisited at Full Business Case stage with sensitivity tests of varying levels of demand and wider economic impacts.	*Transport use during the covid pandemic. Transport use by mode: Great Britain, since 1st March 2020. Department for Transport. https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic*

Appendix B. List of Representations

1st Round – February 2021

Organisation	Title
National Trust	Consultation response 27/03/2019
Coton Parish Council	Submission to C2C Auditor 20/02/2021
Madingley Parish Council	A proposal for a busway through the Parish of Madingley does not make sense in a post pandemic world, and violate an international agreement between the UK and USA November 2020
Local Liason Forum (LLF)	Formal response to the public consultation of the Cambourne to Cambridge busway scheme 10/12/2017
Local Liaison Forum (LLF)	Submission by the Chair of the A428 Local Liasion Forum, for the Cambourne to Cambridge phase 2 public consulation 08/03/2019
Local Liaison Forum (LLF)	Letter to county councillors 10/06/2020
Cambridge Parish Councils	Letter of community consensus from cambridge parish councils, district councillors and community groups 01/05/2019
Greater Cambridgeshire Partnership	Mott Macdonald Technical Note, Northern Route via Girton 14/05/2019
Greater Cambridgeshire Partnership	Strutt & Parker Interim Addendum Report to Planning Appraisal, September 2019
Greater Cambridgeshire Partnership	Mott Macdonald Technical Note, Madingley Road 'Quick-Win' Options outline 14/05/2019
Greater Cambridgeshire Partnership	Arup Report on CAM 15/11/2018
Greater Cambridgeshire Partnership	Steer Davies Gleave report, Greater Cambridge Mass Transit Options Assessment Report, January 2018
Jacobs	Review of C2C against CAM objectives 26/06/2020
LDA Design	A238 Cambourne to Cambridge Segregated Bus Route, August 2017
Coton Parish Council	Richard Buxton Letter 19/09/2017
Coton Parish Council	Mark Abbott Letter 05/04/2018
Coton Parish Council	Richard Buxton Letter 25/10/2017
Coton Parish Council	Stop the C2C Busway Madness: The alternative is staring you in the face 13/01/2020
Arup	CAM Expert Advice 17/10/2018
Iain Spence	Personal Letter 10/03/2021

Coton Busway Action Group (CBAG)	Initial Submission to Independent Audit of Cambourne to Cambridge Busway (C2C), February 2021
Stephen Rose	Personal Email 12/03/2021
Shaun Hughes	Personal Email 15/03/2021
Rev David Instone-Brewer	Personal Email 09/03/2021
Hardwick Parish Council	History of the C2C off road busway, the impact on Hardwick and the Feedback on the Consultation Process 09/03/2021
Local Liaison Forum (LLF)	Letter to Peter Blake 11/06/2019
Local Liaison Forum (LLF)	Letter to Peter and Jo 18/04/2019
District Councillor for Girton	CAM Metro and Cambourne Guided Busway technical issues
Natural England	Cambourne to Cambridge Better Bus Journeys Phase One consultation letter 22/01/2018
Cambridge Past, Present & Future	Cambourne to Cambridge: In-Highway Proposals for High Quality Public Transport scheme 25/02/2021

2nd Round April 2021

Organisation	**Title**
Coton Busway Action Group (CBAG)	Statement of assumptions and constraints 25/04/2021
Coton Busway Action Group (CBAG)	Email April 2021
Coton Parish Council	Written representation on the Statement of Assumptions and Constraints 25/04/2021
Coton Parish Council	Email April 2021
Cambridge Past, Present and Future	Response to independent audit assumptions and constraints report 23/04/2021
Cambridge Past, Present and Future	Cover email 23/04/2021
National Trust	Independent Audit of the Cambourne to Cambridge Better Public Transport Project response 21/04/2021
Mayer Brown	Bourn Airfield, C2C Independent Review 15/04/2021
American Battle Monuments Commission	American Battle Monuments Commission (ABMC) Interests 25/04/2021
Sylvie and John Mann	Letter about the busway April 2021
Barton Parish Council	Barton Parish Council Response 24/04/2021

Cambridgeshire County Council	Cambridgeshire County Council comments on the C2C Audit: Statements of Assumptions and Constraints April 2021
James Littlewood	Cambourne Cambridge Independent Audit Response 23/04/2021
Cambridge Connect	Cambourne - Cambridge Bus Road (C2C) Independent Audit 25/04/2021
Cambridge autonomous metro (CAM)	C2C Independent Audit April 2021
Marian Green	Letter 08/04/2021
Hardwick Parish Council	Hardwick Parish Council Response to the C2C independent Audit Register of Assumptions and Constraints: 25/04/2021
John Goodacre	Independent response 21/04/2021
Natural England	Cambourne to Cambridge - Independent Audit Consultation from Share Intelligence Ltd 26/04/2021
James Palmer	Letter from the Mayor 24/03/2021
Local Liaison Forum	Cambourne to Cambridge Better Public Transport Project: Independent Audit, Statement of Assumptions and Constraints April 2021
Local Liaison Forum	Cover email 25/04/2021
NNRA	Independent Audit Review of Cambourne to Cambridge Public Transport Route response, 23/04/2021
Hardwick Climate Action Group	C2Caudit email 20/04/2021
Cllr Josh Matthews	C2Caudit email 24/04/2021
Robert Mann	Letter of concern 28/03/2021

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[xvi] Cambourne to Cambridge Better Public Transport: Northern Route, Technical Note, Mott Macdonald, May 2018