

CSET Busway Extension - Grange Farm

Technical Note

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1 Introduction

This technical note outlines the analysis of and updated proposals for the Cambridge Southeast Transport (CSET) Phase 2 busway scheme previously developed by Mott MacDonald, comprising a segregated bus route and active travel route. It provides a high-level review of a section of the 'Blue' route option, which proposed a segregated crossing of the A11 and an at-grade link across the A1307 into a new travel hub located within the Grange Farm site. While the travel hub is no longer proposed on this site, the Grange Farm site is still under consideration for potential allocation in the emerging Greater Cambridge Local Plan. This review was sought to confirm the ongoing feasibility of the proposed 'Blue' route option and whether any required amendments could be accommodated within a broadly similar cost scope (here defined as +/- £5m).

The results of this analysis are set out in the following pages.

2 Background and scope

Greater Cambridge Shared Planning Service (GCSP) are assessing the potential deliverability of allocating a new development site of approximately 5,000 dwellings and jobs at Grange Farm in the emerging Greater Cambridge Local Plan to 2045.

As part of the transport evidence required to support the emerging Local Plan, Cambridgeshire County Council (CCC) have indicated that a segregated public transport route (with associated active travel facilities) will be required to link the development site with Cambridge. Linking the site to the proposed CSET A11 travel hub and public transport corridor could address this requirement.

However, the development site lies to the northeast of the proposed A11 travel hub on the other side of the A11 and also to the north of the A1307. Thus, in order to connect the proposed site at Grange Farm to the proposed travel hub and hence to CSET, an extension to the CSET busway scheme which crosses both the A11 and the A1307 is being considered.

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There is a requirement for analysis to be undertaken to advise CCC/GCSP/GCP regarding the infrastructure requirements, and associated indicative costs, for an extension of the CSET busway across the A11 and into the Grange Farm site. This work reviews and builds upon the work previously developed by Mott MacDonald and presented in the Outline Business Case for the CSET Phase 2 scheme (May 2020), which included the 'Blue' route option (see below).

To note, the original blue route proposal included a new roundabout connecting Newmarket Road and the A1307 with what is now the proposed development site. This Technical Note includes reference to that roundabout, but it is important to note that access arrangements for the site have yet to be confirmed.



3 Analysis

The original 'Blue' route proposals included extending the busway over the A11 before curving north and then east in a chicane-like fashion, crossing over Newmarket Road at grade before crossing the A1307 via a signalised junction. This original option explored the possibility of locating the travel hub at Grange Farm – which was not taken forward.



Image 1: Original CSET busway 'Blue' route proposal

Our initial analysis of the above proposal identified the following potential issues:

Busway turning radii: How the route curves between the A11 and Newmarket Road; there are options for the CSET busway which might need wider turning radii than shown here.

Newmarket Road junction: How the route crosses Newmarket Road. If at grade, the junction created may not be acceptable as the busway is not close to perpendicular to the Newmarket Road alignment.

A1307 signalised junction: The proposed busway will require a signalised junction crossing of the A1307 which will need to be considered when any potential new main vehicle access to the Grange Farm site is being developed.

These issues were further investigated and solutions proposed (see below).

4 Options testing and proposals

Constraints analysis

Having identified a number of potential challenges, a constraints analysis was undertaken to inform potential alternative route options, the findings of which are outlined below:

- A topographical analysis of the relevant area didn't present any concerns
- The area between the A11 and Newmarket Road is relatively narrow
- There is an active petrol station, fast food restaurant and hotel to the north of the proposed route between Newmarket Road and the A1307
- There is a Bronze Age Cemetery that lies just to the north of the current proposed route between Newmarket Road and the A1307
- There is active farmland to the southeast of the proposed route.

These constraints narrowed down the land available for potential alternative options. The following section reviews the issues identified with the original proposal, outlines the options testing for alternative routes and presents those that were most feasible.

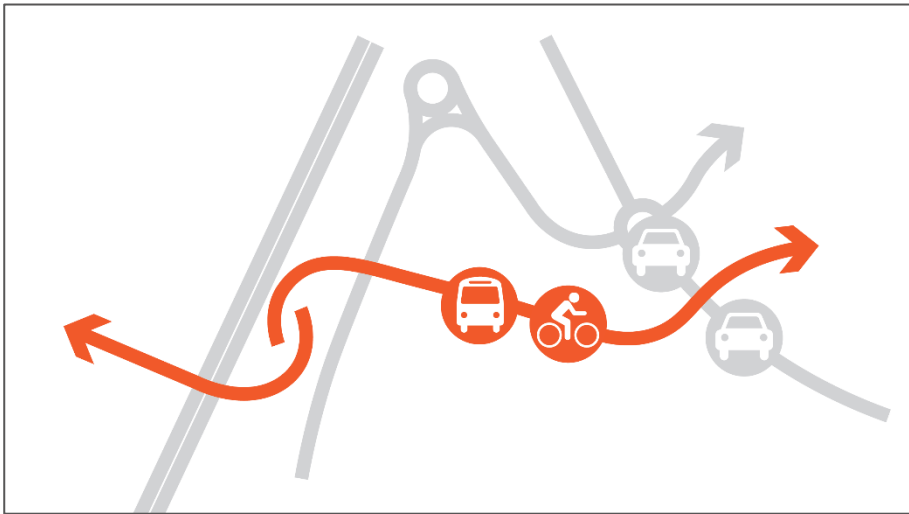
For each issue identified in the previous section, options were identified and tested against both the listed constraints and any relevant national standards.

4.1 Busway turning radii

Challenge

The first issue when reviewing the original 'Blue' route proposal was how the busway runs from the bridge over the A11 and then comes to meet with Newmarket Road at grade.

In order to allow the buses to travel at 60kph a 64m curve radius is required, according to Manual for Streets 2.¹ The original option was tested with this standard and it was found that there is not sufficient space for the two curves of 64m required to meet with Newmarket Road at grade.



Proposal

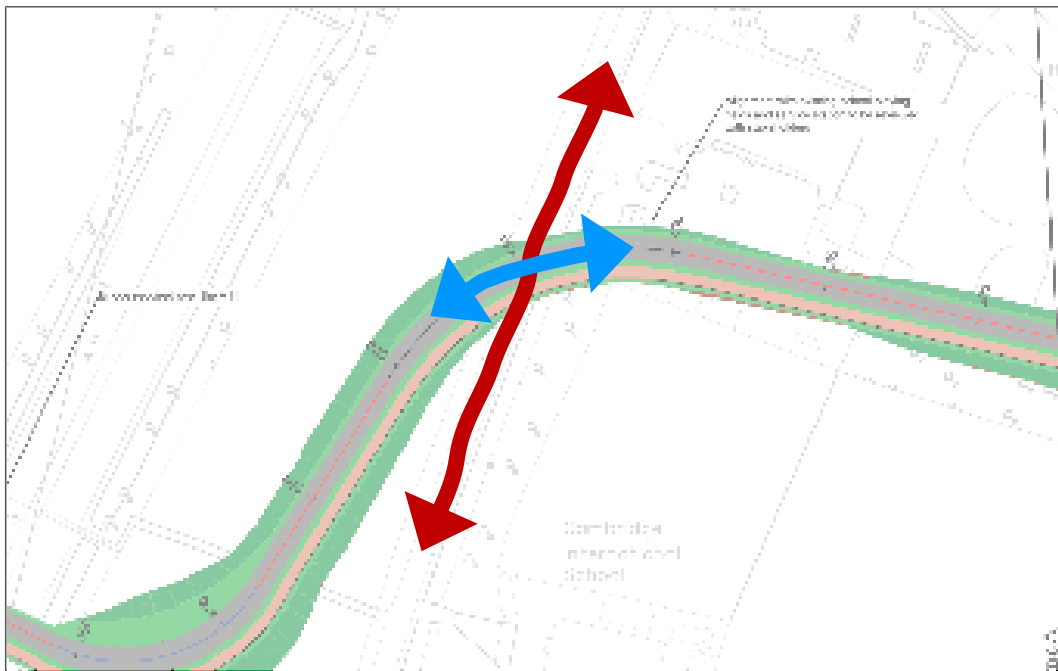
This challenge means that either a single turn is utilised, and the route west of Newmarket Road is abandoned, or the 'chicane' is achieved by use of a pair of signalised junctions on Newmarket Road. These are discussed in more detail below.

¹ <https://www.ciht.org.uk/media/9351/manual-for-streets-2.pdf>

4.2 Newmarket Road junction

Challenge

The proposed junction where the busway crosses Newmarket Road is non-compliant (see below). Ideally the busway would operate perpendicular (or close to) the existing road, creating a crossroad junction.

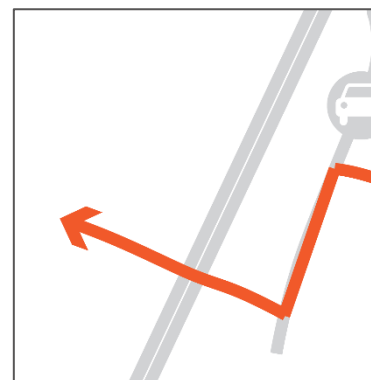


Proposals

The above analysis demonstrates that the identified crossing point cannot be reached with two 64m radius turns. Two alternatives are proposed:

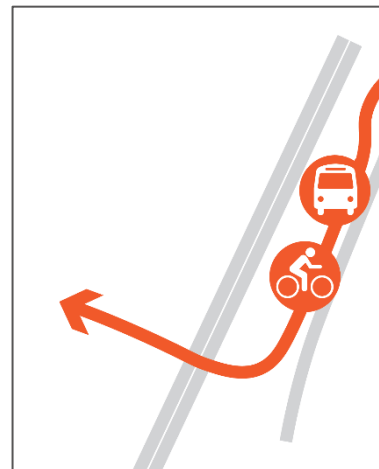
i) Double Junction

In this option the busway would cross the A11 and travel straight ahead towards Newmarket Road. The busway will then briefly join Newmarket Road via a priority signalised junction for approximately 200m before turning right back onto the segregated busway via another signalised junction.



ii) Northbound

This option proposes that the busway turns northwards towards the roundabout that Newmarket Road travels around. In this option the busway would have one curve of 64m which is feasible. It would remain segregated from Newmarket Road.



4.3 A1307 signalised junction

Challenge

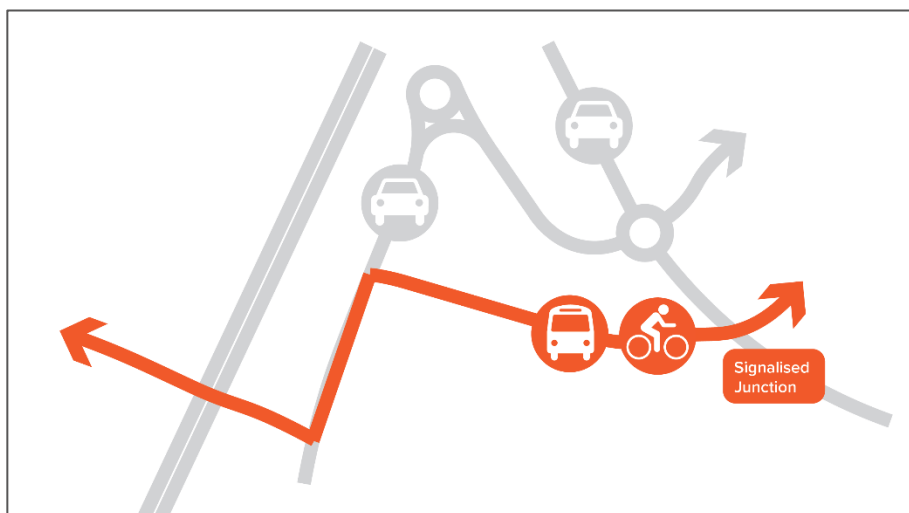
The busway crossing needs to be considered in conjunction with the site access arrangements for the proposed site.

Proposals

The two proposals shown below build on the above proposals and assume that the previously proposed new roundabout remains as shown (of course, this does not necessarily need to remain the case and access arrangements for any development at Grange Farm have yet to be determined).

i) Double junction

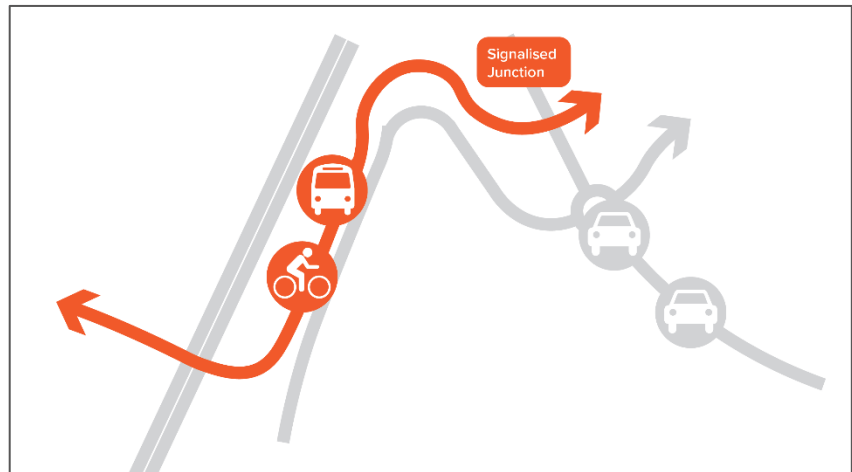
This option proposes to push the crossing further southeast, allowing for a larger gap between the busway crossing and the potential access to the Grange Farm development. This option will need to consider the farmland present to the south. While it is thought that this option could increase the gap by as much as 50 metres, it does not completely remove the possibility of traffic backlogs at the previously proposed roundabout – should an access junction at this location be taken forward.



ii) Northbound

The second option relocates the busway north of the previously proposed roundabout, replacing the redundant existing roundabout there. As noted above, the previously proposed roundabout has no current status and detailed access arrangements for Grange Farm are still to be determined.

Consideration should be given to the petrol station and hotel that are accessed close to the existing roundabout.



The busway crosses the A1307 to the north of the previously proposed roundabout to access the Grange Farm development. As there is some 350m between the A11 junction and the previously proposed new A1307 roundabout, it is easier to create better separation between junctions, reducing the potential for any impact on their functionality, should access to the Grange Farm site remain as originally shown.

5 Cost implications

It is considered that either of the above alternative proposals can be delivered for a capital sum that would be broadly equivalent to the cost exercise undertaken for the original proposal (within a range of £5m uplift or saving). Two points should be noted:

- i) No formal cost estimation updates have been undertaken, and this conclusion has been drawn based on analysis of altered requirements compared to the original proposals.
 - Both have a similar length of new road construction
 - Both require signalisation at the A1307 junction
 - The Newmarket Road double junction option requires two additional signalised junctions, which will be more expensive, but that extra cost is easily accommodated within the +/-£5m cost envelope.
- ii) The previous cost estimates were undertaken in 2019, so the capital cost figure will be subject to indexation to take account of price-uplifts since that time.