

Option Assessment
Report

**Chisholm Trail
Cycleway**

30 September 2009

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List of Acronyms

CCC	Cambridgeshire County Council
DfT	Department for Transport
DMRB	Design Manual for Road and Bridges
TIF	Transport Infrastructure Fund

Executive Summary

This Option Assessment Report has been produced generally in accordance with the Highways Agency DMRB Document TD37/93 (Stage 1 Scheme Assessment Reporting) except where CCC, as Client, has amended the Scope as noted in **Chapter 1** of this report.

The purpose of the report is to provide an assessment of proposed new cycleways, as well as provision for pedestrians, between Cambridge Rail Station and the junction of Milton Road with the new Guided Busway. These proposals have been put forward by the Cambridge Cycling Campaign with a view to improve journey times and conditions. The proposals are for a route that follows as closely as possible the existing railway, either to the east or west, through Cambridge, and identifies constraints in order to assess the feasibility of providing these facilities. CCC have noted that it is expected that a new route would be constructed over the next 5 to 10 years and would likely be built in discrete sections. Therefore the merits of the proposals need to be considered in discrete sections, as well as the whole.

Existing Conditions

Engineering

A Desk Study and Walkover Surveys were undertaken in order to assess the existing conditions.

The main physical constraints along the route are the narrow sections of railway land north of Coldham's bridge and the new bridge at Newmarket Road. To optimise the route a new bridge crossing of the River Cam will be required.

Environmental

An Ecological Report (see **Appendix D**), was undertaken along the corridor of the proposed routes.

The report highlights a number of potential issues along the corridor, that will need further ecological assessment in order to mitigate their impact with due consideration in further design and precautionary methods of working developed for construction of the works.

Options

It is considered that both the eastern and western proposed routes will provide shorter journey times for cyclists and a safer environment for traffic generally, as the potential for cycling conflicts with other road users would be reduced. At this time, neither route has a clear advantage over the other, and it is recommended that further studies are undertaken if the project is progressed. These further studies will include Topographical and Condition Surveys, Cost/ Benefit Analysis and an Environmental Assessment, which should include a further ecological assessment to confirm the presence/ absence of protected species.

It is considered that the construction of the following discrete sections of the proposed routes will provide some benefit for cyclists and other road users, without the whole route being constructed.

- New Off-Road cycleway from Cambridge Rail Station to Hooper Street to the west of the railway. This section is described in further detail in **Chapter 3.1.2 a) & b)**, and would join the existing cycle network at a location that would provide good access to the existing crossings over the River Cam.
- New crossing of the River Cam near the existing rail bridge over the river. The location of the crossing is described in further detail in **Chapter 3.1.1 e)** and **Chapter 3.1.2 e)**. The provision of a new crossing would improve the connections for cyclists and pedestrians between the Abbey/ Fen Ditton communities and the Science Park, as existing routes use either the A14 or travel towards the city centre first.

It is considered that the construction of any other discrete sections of the proposed routes would yield few benefits for cyclists and pedestrians without a new crossing of the River Cam. These sections would provide routes with a higher proportion of Off-Road cycleway, but with only slight reductions in journey lengths.

It is considered that the easiest route for construction of a cycleway that would closely follow the railway would be a combination of the proposed eastern and western routes and the existing cycle network. The cycleway would require the construction of the proposed western route from Cambridge Rail Station to Coldham's Lane, described in **Chapter 3.1.2 a) & b)** and the proposed eastern route from Newmarket Road to the Milton Road/ Guided Busway Junction, described in **Chapter 3.1.1 d) & e)**. The existing cycleway over Coldham's Lane Bridge and through Coldham's Common would connect the eastern and western proposals.

1 Introduction

1.1 Purpose

Atkins has been commissioned to undertake an Option Assessment for proposed cycle routes, which are to follow the existing rail line as closely as possible, from Cambridge Railway Station to the junction of Milton Road with the new Guided Busway.

The report will include the following:

- A **Route Assessment** limited to an analysis of the physical constraints likely to affect the scheme.
- An **Environmental Assessment** consisting of an ecological report identifying biodiversity and the likelihood of protected species, trees and hedgerows being present.

At the request of CCC, the report excludes the following:

- Any assessment of construction costs, land acquisition costs, design and construction supervision fees.
- The report does not include a detailed assessment of the above and neither does it include any information on archaeology, local ground conditions and water courses, environmental effects or possible mitigation strategies.

1.2 Structure

The report is structured as follows:

- **Chapter 2** describes two existing cycle routes, one east of the railway and one west of the railway, selected for the purpose of assessing the routes proposed in **Chapter 3**. The existing engineering, environmental and land ownership along the proposed routes is also described.
- **Chapter 3** describes two proposed routes, one east of the railway and one west of the railway, along with considerations for construction and physical constraints;
- **Chapter 4** contains an assessment of each section along the proposed routes; and
- **Chapter 5** contains the Conclusions and Recommendations.

1.3 Background

The project to provide a cycle route to run adjacent to the existing railway line, from Cambridge Rail Station to the junction of Milton Road with the new Guided Busway, is part of CCC's programme associated with its Cycling Town status. The aim of the overall programme is to encourage continued growth in cycling as a means of travel for journeys within Cambridge out to its necklace villages, by providing high quality infrastructure.

The potential for a cycle route through the heart of Cambridge, adjacent to the existing railway line, was first proposed by the Cambridge Cycling Campaign in a series of articles in their Newsletter between April 1998 and April 1999. The articles are available on the Cambridge Cycling Campaign website at the following addresses:

- The Chisholm Trail Article 15, Newsletter 17 April 1998
<http://www.camcycle.org.uk/newsletters/17/article15.html>
- An Economic Case for Better Cycleways Article 14, Newsletter 18, June 1998
<http://www.camcycle.org.uk/newsletters/18/article14.html>
- The Chisholm Trail: The Outer Reaches Article 12, Newsletter 23, April 1999
<http://www.camcycle.org.uk/newsletters/23/article12.html>

The route, known as "The Chisholm Trail", would become a "Super Cycle Highway", which would provide links between Addenbrooke's Hospital, south of Cambridge City centre, and the Science Park, north of Cambridge City centre, as well as enhancing links to schools, colleges, places of work, residential areas and open spaces through out the city. In order for the land to be maximised to its full potential, the cycleway would also provide space for pedestrians and wheel-chair users, improving their access through the city.

Since the original concept of the Chisholm Trail was first proposed, the Cambridge Guided Busway, which includes a maintenance track/ cycleway beside it, has been chosen to improve public transport links into Cambridge, and is due to be completed in late 2009. The southern part of the Guided Busway will provide a link from Addenbrooke's Hospital to Cambridge Rail Station, and the northern part will provide a link into Milton Road, near the Science Park. This report discusses the routes from Cambridge Railway Station to the junction of Milton Road with the new Guided Busway.

In addition to the Guided Busway, two proposals are being put forward which may affect the feasibility and routes selected for the Chisholm Trail. The first proposal is for a new rail station at the old Chesterton Sidings, near Milton Road, discussed in **Chapter 3.1.1 e)** and **Chapter 3.1.2 e)**. The second proposal is for improvements to Cambridge's public transport infrastructure that could be funded by the Transport Infrastructure Fund, discussed in **Chapter 3.1.1 d) & e)** and **Chapter 3.1.2 e)**. If either of these schemes is progressed then they will have an impact on the Chisholm Trail, which will need to be considered during their detailed design and within the decisions taken to progress this project.

2 Existing Conditions

This section summarises the existing cycleway routes to the east and west of the railway lines, tabulating features, such as junctions, that may contribute to conflicts between road users. This report is limited, at the request of CCC, to a desk study supported by walkover visits. It excludes the level of assessment on engineering, traffic and environmental conditions that are undertaken for a Stage 1 Scheme Assessment Report.

2.1 Existing Cycle Routes

The existing cycle network through Cambridge is extensive and provides a diverse range of routes between Cambridge Rail Station and the junction of Milton Road with the new Guided Busway. The actual routes taken by cyclists will vary depending upon their individual preferences and proficiencies. The existing routes described below have been selected to allow comparison with the proposed routes in **Chapter 3**, and follow the Primary and Local Link routes travelling with traffic, as noted on the Cambridge Cycle Map within **Appendix A**.

The routes are described as if travelling north and have been separated into sections to ease comparison with the proposed routes. The start and end of each section is identified in brackets (i.e. *Cambridge Rail Station (0)*), which are noted on the drawings 5078644/HW/SK/001 to 003 in **Appendix B**.

2.1.1 Route East of Railway

The route selected for comparison with the proposals in **Chapter 3.1** is predominately to the east of the railway line, although the northern section is to the west as there are no existing crossings of the River Cam east of the railway. The route is described in detail in the following sections:

- Cambridge Railway Station to Mill Road
- Mill Road to Coldham's Lane
- Coldham's Lane to Newmarket Road
- Newmarket Road to Green Dragon bridge
- Green Dragon bridge to Milton Road/ Guided Busway Junction

The features that are present along the existing route are summarised in Table 2-1.

Table 2-1 Route East of Railway – Existing Features

	On-Road	Off-Road	Total
Route Length	3140m	2595m	5735m
Signalised Junction(s)	4	0	4
Un-Signalised Junction(s)	29	4	33
Roundabout(s)	4	0	4

a) From Cambridge Railway Station to Mill Road

Cyclists depart Cambridge Rail Station (0) on a Local Off-Road route through the Car Park passing under the foot & cycle bridge before travelling along Devonshire Road, which is a Primary On-Road section, in order to reach the start of the Foot & Cycle Bridge that spans the railway line from Devonshire Road to Rustat Road. They then turn onto the Primary Off-Road network to climb the ramp and cycle over the Foot & Cycle bridge, turning left at its end on to Rustat Road. Cyclists travel along this Primary On-Road route, which is largely residential, turning right into Argyle Street and then left onto Hope Street before reaching a 4-way junction with Mill Road (1E).

The features that are present along the existing route are summarised in Table 2-2.

Table 2-2 From Cambridge Railway Station to Mill Road – Existing Features

	On-Road	Off-Road	Total
Route Length	485m	605m	1090m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	7	0	7
Roundabout(s)	0	0	0

b) From Mill Road to Coldham's Lane

Cyclists continue to travel along a Primary On-Road route once they have crossed Mill Road (1E) onto Catherine Street (a one-way street). Catherine Street crosses St. Philip's Road (a one-way street), before travelling around a roundabout into Cromwell Road. Cyclists then reach the end of Cromwell Road which terminates at a 4-way signalised junction with Coldham's Lane (2E). The route is largely a residential area, although there are some industrial units on the west side of Cromwell Road, which generate a significant volume of HGC traffic. Traffic calming measures have been installed previously, but have been partially removed for a cycle lane on the west side.

The features that are present along the existing route are summarised in Table 2-3.

Table 2-3 From Mill Road to Coldham's Lane – Existing Features

	On-Road	Off-Road	Total
Route Length	1100m	0m	1100m
Signalised Junction(s)	1	0	1
Un-Signalised Junction(s)	3	0	3
Roundabout(s)	2	0	2

c) From Coldham's Lane to Newmarket Road

Cyclists cross Coldham's Lane (2E), On-Road, with the traffic signals, but travel straight over onto the Coldham's Common shared use foot & cycleway. The Primary Off-Road route, which is lit, travels through the Common, passing under the rail branch to Newmarket, and reaches Newmarket Road (3E) at a toucan crossing near the Cambridge United FC ground.

The features that are present along the existing route are summarised in Table 2-4.

Table 2-4 From Coldham's Lane to Newmarket Road – Existing Features

	On-Road	Off-Road	Total
Route Length	0m	865m	865m
Signalised Junction(s)	1	0	1
Un-Signalised Junction(s)	0	1	1
Roundabout(s)	0	0	0

d) From Newmarket Road to Green Dragon Bridge

Cyclists cross Newmarket Road (3E), a main arterial road into Cambridge, using the toucan crossing and turn left onto the shared use foot & cycleway in order to crossover the railway, as there are no bridges over the River Cam East of the Railway. The Primary On-Road route then turns right down Swann's Road and then left into Mercers Row and then right into Garlic Row, all of which is an industrial area, before turning right into a Primary Off-Road section through Stourbridge Common to Green Dragon bridge (4W).

The features that are present along the existing route are summarised in Table 2-5.

Table 2-5 From Newmarket Road to Green Dragon Bridge – Existing Features

	On-Road	Off-Road	Total
Route Length	500m	465m	965m
Signalised Junction(s)	1	0	1
Un-Signalised Junction(s)	6	3	9
Roundabout(s)	0	0	0

e) **From Green Dragon Bridge to Milton Road/ Guided Busway Junction**

Cyclists must then dismount to cross Green Dragon bridge (4W), and then remount on the other side, where the route returns to Primary On-Road section. The route turns right into Water Street, and then left at a junction with Water Lane, at the end of which the route turns right onto Green End Road at a mini-roundabout. At the junction with Scotland Road, cyclists turn right staying on Green End Road, which is now a Local On-Road route, to a mini-roundabout with Nuffield Road, where cyclists may cross over onto a shared use foot & cycleway, up to Milton Road that continues up to the Milton Road/ Guided Busway Junction (5).

The features that are present along the existing route are summarised in Table 2-6.

Table 2-6 From Green Dragon Bridge to Milton Road/ Guided Busway Junction – Existing Features

	On-Road	Off-Road	Total
Route Length	1055m	660m	1715m
Signalised Junction(s)	1	0	1
Un-Signalised Junction(s)	13	0	13
Roundabout(s)	2	0	2

2.1.2 Route West of Railway

The route selected for comparison with the proposals in **Chapter 3.2** is described in detail in the following sections:

- Cambridge Railway Station to Mill Road
- Mill Road to Coldham's Lane
- Coldham's Lane to Riverside bridge
- Riverside bridge to Milton Road/ Guided Busway Junction

The features that are present along the existing route are summarised in Table 2-7.

Table 2-7 Route East of Railway – Existing Features

	On-Road	Off-Road	Total
Route Length	3680m	1965m	5645m
Signalised Junction(s)	5	0	5
Un-Signalised Junction(s)	29	4	33
Roundabout(s)	4	0	4

a) **From Cambridge Railway Station to Mill Road**

Cyclists depart Cambridge Rail Station (0) on a Local Off-Road route through the car park passing under the foot & cycle bridge, where they turn left on to Devonshire Road, a Primary On-Road route. At the end of the road, cyclists turn right on to Tenison Road and then right on to St. Barnabas Road, where the route becomes a Local On-Road section up to the signalised junction with Mill Road (1W).

The features that are present along the existing route are summarised in Table 2-8.

Table 2-8 From Cambridge Railway Station to Mill Road – Existing Features

	On-Road	Off-Road	Total
Route Length	615m	240m	855m
Signalised Junction(s)	2	0	2
Un-Signalised Junction(s)	3	0	3
Roundabout(s)	0	0	0

b) From Mill Road to Coldham's Lane

Cyclists then continue on the Local On-Road route, through residential housing, after crossing Mill Road (1W), with the traffic signals, into Gwydir Street, taking a right turn into Hooper Street. Cyclists travel on a shared foot & cycleway, which restricts motor vehicle access, before turning left into Ainsworth Street. Cyclists then have Right of Way at the junction with Sleaford Street, and the road becomes York Street. The route then takes a right turn on to a Local Off-Road section through the Beehive Centre car park before meeting Coldham's Lane (2W) at a roundabout.

The features that are present along the existing route are summarised in Table 2-9.

Table 2-9 From Mill Road to Coldham's Lane – Existing Features

	On-Road	Off-Road	Total
Route Length	950m	330m	1280m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	8	1	9
Roundabout(s)	1	0	1

c) From Coldham's Lane to Riverside Bridge

Cyclists travel around the roundabout at Coldham's Lane (2W) and travel through the Cambridge Retail Park's car park, which is noted as a Local On-Road section, and reach the signalised junction with Newmarket Road. Cyclists cross with the signals into Cheddars Lane, which quickly becomes a Local Off-Road section through to a right turn at Riverside, a Primary On-Road route and residential area, and cycle to the New Riverside bridge (3W).

The features that are present along the existing route are summarised in Table 2-10.

Table 2-10 From Coldham's Lane to Riverside Bridge – Existing Features

	On-Road	Off-Road	Total
Route Length	625m	315m	940m
Signalised Junction(s)	1	0	1
Un-Signalised Junction(s)	3	1	4
Roundabout(s)	3	0	3

d) From Riverside Bridge to Milton Road/ Guided Busway Junction

Cyclists cross the River Cam using the new Riverside bridge (3W) and new Primary Off-Road link to St. Andrews Road. After turning right on to St. Andrews Road, cyclists follow the Local On-Road route around as it becomes Church Street. The right turn at the junction with Chesterton High Street takes cyclists back onto the Primary On-Road, which continues with a left turn into Union Lane, which ends at a signalised junction with Milton Road, a main arterial road into Cambridge. Cyclists then either cross using two toucan crossings or wait in the centre of the junction for right turn filter or for a gap in traffic from Arbury Road. Once across the junction, cyclists travel along the shared foot & cycleway, which crosses several side roads, up to Ramsden Square where the route returns On-Road with a cycle lane, which continues though to the Milton Road/ Guided Busway Junction (5).

The features that are present along the existing route are summarised in Table 2-11.

Table 2-11 From Riverside Bridge to Milton Road/ Guided Busway Junction – Existing Features

	On-Road	Off-Road	Total
Route Length	1490m	1080m	2570m
Signalised Junction(s)	2	0	2
Un-Signalised Junction(s)	16	2	18
Roundabout(s)	0	0	0

2.2 Engineering Conditions

Site Walkovers have been undertaken as part of the assessment, which have been attended by representatives of the Cambridge Cycling Campaign. These have served to identify potential areas of disused land adjacent to the railway line, as well as available archways under both the Mill Road and Coldham's Lane road bridges over the railway, which could be used to provide the necessary infrastructure for the proposed cycleways. The visual assessment undertaken of the road bridges along the proposed routes was limited, as access on to Network Rail land was unavailable, but has not revealed any obvious defects. It is recommended that a condition survey is undertaken, as the archways may require remedial works to allow safe passage through them. Also a structural survey should be undertaken to establish the construction details of the bridges, as while there is no requirement to increase the size of any of the archways, the construction of the cycleway could affect their foundations.

The available space on the Railway land was determined from the Ordnance Survey plans and remote inspection from bridges and adjacent land. The location of Network Rail plant, such as overhead power lines has been determined from aerial photographs. It is recommended that a full topographical survey is undertaken to determine that there is sufficient land between the railway land boundary and the live tracks to allow the construction of the proposed cycleways.

Network Rail have been previously consulted regarding the possibility of cantilevering a new Foot & Cycle bridge over the River Cam (4) off their existing rail bridge. They have advised that it will not be acceptable for any proposals for a crossing that would use any part of their structure.

The walkover of the existing network noted the general condition of the cycleways. It was found that several sections of the On-Road cycleways are in a poor condition with potholes and uneven carriageway surfaces, which can impact the safety of cyclists earlier than other road users. The walkover survey further noted that signage of the existing designated routes is poor in places, and may increase the potential for incidents between cyclists and other road users.

The drainage of the existing cycleway routes has been investigated as part of this report. The surface water of the On-Road sections is drained as part of the main carriageway, the ponding observed is a result of uneven pavement surfaces. The existing Off-Road cycleways are generally in a better condition than the On-Road sections, although some sections have uneven surfaces leading to localised ponding in the depressions.

2.3 Environmental Conditions

The Environmental Assessment has been limited to an Ecological Report (see **Appendix C**), by CCC. It shows a number of potential constraints that may require mitigation if they are affected by the potential works. The assessment for the report has surveyed the corridor for the proposed Chisholm Trail cycleways in order to highlight any possible ecological issues that will inform the selection of the preferred routes.

The report has identified that there are habitats and structures within the corridor that have the potential to support protected species namely:

- bats;
- breeding and notable bird species;
- great crested newts;
- water voles;
- otters.

The potential for these protected and notable species, and the locally and regionally valuable habitats and their connections do present a number of constraints to any potential cycle routes through the corridor, which are detailed within the Ecological Report. However, more detailed surveys that will be required to be undertaken at later stages, will identify appropriate mitigation that could be incorporated within the detailed design and construction programme, in order to avoid any significant effects. There is also potential for the design of the cycleway to enhance wildlife habitats locally through initiatives such as increasing links within the current corridors.

2.4 Land Ownership

Searches have been undertaken to establish the ownerships of the land either side of the railway land from Cambridge Rail Station to the junction of Milton Road with the new Guided Busway. A schedule of the land registration documents is within Appendix D, along with drawings 5078644/HW/LP/001 – 003 showing the areas in Network Rail, private or local authority ownership.

The ownership of the land has been considered for each of the proposed routes described within **Chapter 3**, although no financial assessment has been undertaken to ascertain the cost of acquiring any of the land. Further, it is our experience that the acquisition of land from Network Rail and private owners can be protracted, and therefore the potential costs that may be incurred should be included within any decisions on the proposed routes.

3 Proposed Options

This section defines the options for cycleway routes from the Cambridge Rail Station to the Milton Road/ Guided Busway Junction, tabulating features, such as junctions, that may contribute to conflicts.

3.1 Proposed Cycle Routes

Two cycleway routes are proposed that are located as close as possible to the existing railway lines through Cambridge, and are Off-Road where possible. The proposals take into account the existing cycle network, the existing engineering conditions, noted within **Chapter 2.2**, and any land that could be acquired for the proposed cycleways.

It is proposed that the new cycleways will be designed to DfT guidance LTN 2/08 – Cycling Infrastructure Design, with any new ramped access being designed to meet DDA requirements to ensure that the cycleways are also suitable for use by pedestrians and wheelchair users. Where new cycleways will be between high fences, such as alongside the railway, a minimum width of 4m of land-take will be required. For new cycleways crossing open land a minimum width of 3m will be required.

Where the proposals include On-Road cycleways it is intended that the existing street lighting and drainage systems are retained. For the Off-Road cycleways it is intended that new street lighting will be provided, which will be connected into the existing network at either end. For the surface water it is proposed that it will drain into the verges.

In addition, the provision of CCTV is proposed along the Off-Road sections that are between the railway and the rear of any properties, as these are generally long sections with access and egress only available at either end, which raises concerns with regards to the personal safety of those using the new cycleways.

The routes are described as if travelling north and have been separated into sections to ease comparison with the proposed routes. The start and end of each section is identified in brackets (i.e. *Cambridge Rail Station (0)*), which are noted on the drawings 5078644/HW/SK/001 to 003 in **Appendix B**.

3.1.1 Route East of Railway

The proposed route, which will be assessed against the existing route in Chapter 2.1.1, is described in detail in the following sections:

- Cambridge Railway Station to Mill Road
- Mill Road to Coldham's Lane
- Coldham's Lane to Newmarket Road
- Newmarket Road to a New River Cam bridge
- A New River Cam bridge to the Milton Road/ Guided Busway Junction.

The features that are present along the proposed route are summarised in Table 3-1.

Table 3-1 Route East of Railway – Proposed Features

	On-Road	Off-Road	Total
Route Length	1045m	4340m	5385m
Signalised Junction(s)	2	0	2
Un-Signalised Junction(s)	7	6	13
Roundabout(s)	0	0	0

a) From Cambridge Railway Station to Mill Road

The proposed route would permit cyclists to depart Cambridge Rail Station (0) on the existing Local Off-Road route, which is on Network Rail land, through the car park and access the existing foot & cycle bridge (see **Photograph F.1**), via a new ramp, which will reduce the distance that cyclists and wheelchair users will need to travel to access the bridge. As this area is being redeveloped by Ashwell PLC with Network Rail, discussions will need to be held to select the appropriate solution. Two options for the proposed ramp onto the bridge are shown on drawing 50786644/HW/SK/013 in **Appendix E**.

Once cyclists have travelled over the bridge, it is proposed that the route turns right down Rustat Road, followed by a right turn down Rustat Avenue, where entrance onto Network Rail land could be achieved. A small area of land may need to be acquired from a private owner in order to form the entrance. A detail of the entrance onto the railway land is shown on drawing 5078644/HW/GN/004 in **Appendix E** and in **Photograph F.2**.

The route then follows alongside the railway up to Mill Road bridge (1), passing the end of Fletcher's Terrace, which is an existing Network Rail entrance and currently provides access to the sidings by the Cambridge Rail Station. As this section of the route is in the ownership of Network Rail and in current use, it is possible that only a Right of Access Over would be acceptable to Network Rail. The area required for land-take would be approximately 1300m². Fletcher's Terrace would provide a second access for cyclists along the proposed section, which would connect to the existing cycle network via Argyle Street.

The features that are present along the proposed route are summarised in Table 3-2.

Table 3-2 From Cambridge Railway Station to Mill Road – Proposed Features

	On-Road	Off-Road	Total
Route Length	280m	885m	1165m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	3	1	4
Roundabout(s)	0	0	0

Alternatively, the area of Network Rail land required could be reduced to approximately 260m². Instead of turning right, cyclists would turn left off of the Foot & Cycle bridge on to Rustat Road up to Argyle Avenue. From Argyle Avenue cyclists would travel against the existing one-way system on a new On-Road section around and onto to Fletcher's Terrace. At the end of Fletcher's Terrace cyclists will take a right turn through the existing Network Rail access (shown on drawing 5078644/HW/GN/003 in **Appendix E**) and onto a new Off-Road section up to Mill Road bridge (1), which will require Network Rail land. Although this route is 205m shorter than the proposed route, it is 70m further On-Road and passes 4 more junctions, in addition to having a section against the flow of traffic.

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from either Clifton Road, using a route through the yard of some industrial units, or from the end of Rustat Avenue. At its northern end, construction traffic would access the potential site from Fletcher's Terrace.

The new street lighting and CCTV proposed for the Off-Road sections can be connected into the existing networks at Rustat Avenue, Fletcher's Terrace or Mill Road bridge.

The construction of the cycleway will need to include a precautionary method of working should further investigation of Mill Road bridge confirm the presence of bats, which potentially roost within the archways.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

b) From Mill Road to Coldham's Lane

The proposed route would continue alongside the railway from the previous section by passing under Mill Road bridge (1), using an existing open archway. This route continues to follow a Network Rail access road (see **Photograph F.3**) up to Cavendish Road, which is the entrance for Network Rail, and would provide an access point for cyclists' mid-way along the proposed section. As this section of the route is in the ownership of Network Rail and in current use, it is possible that only a Right of Access Over would be acceptable to Network Rail. The area required for land-take would be approximately 1475m².

Once reaching the Network Rail access at Cavendish Road, it is proposed that the route continues up to Coldham's Lane bridge (2). This would require the acquisition of land from Network Rail of an area approximately 3000m² as it would require the clearance of a rail siding, demolition of a shed (see **Photograph F.4**) and may require the relocation of Network Rail overhead power lines, needed to serve the sidings that are being retained.

The existing cycle network may then be accessed either through the existing open archway under Coldham's Lane bridge (see **Photograph F.5**), or between the bridge ramp and the car park of Green's Health and Fitness, which would connect the route with the existing cycle network. The existing open archway would also provide access onto subsequent proposed section detailed in **Chapter 3.1.1 c**).

The features that are present along the proposed route are summarised in Table 3-3.

Table 3-3 From Mill Road to Coldham's Lane – Proposed Features

	On-Road	Off-Road	Total
Route Length	0m	1040m	1040m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	0	1	1
Roundabout(s)	0	0	0

Should the Network Rail Land from Cavendish Road to Coldham's Lane bridge not be available for purchase or use, then the proposed route would need to connect into the existing cycle network via Cavendish Road. The route on the existing network would then take cyclists onto St Philips Road and then turn left on to Catharine Street, before travelling around a roundabout into Cromwell Road. Cyclists will then reach the end of Cromwell Road which terminates with a 4-way signalised junction at Coldham's Lane (2E). This alternative is 730m longer than the route requiring the acquisition of Network Rail land, with 1380m On-Road and passing through 10 more un-signalised junctions, 1 signalised junction and 2 roundabouts.

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from Fletcher's Terrace and under Mill Road bridge. Although, larger plant, unable to pass through the archway, would need to access the potential site from Cavendish Road, which may only be reached through narrow residential streets. At its northern end, construction traffic may access the proposed route through the archway under Coldham's Lane bridge. Although, larger plant, unable to pass through the archway, would need to access the potential site through the Green's Health and Fitness car park, and with the assistance of a crane or temporary ramp.

The new street lighting and CCTV proposed for the Off-Road sections can be connected into the existing networks at either Mill Road bridge, Cavendish Road or Coldham's Lane bridge.

The construction of the cycleway will need to include a precautionary method of working should further investigation of both Mill Road bridge and Coldham's Lane bridge confirm the presence of bats, which potentially roost within the archways.

The construction of the cycleway will need to include a precautionary method of working should further investigation around Coldham's Lane bridge confirm the presence of Japanese Knotweed within the area required for construction.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

c) From Coldham's Lane to Newmarket Road

The proposed route continues from Coldham's Lane bridge (2), by passing through an existing open archway, (see **Photograph F.5**) and onto Coldham's Road (see **Photograph F.7**), as the railway branches off towards Newmarket (see **Photograph F.6**). This railway branch is crossed by Coldham's Road at a level crossing (see **Photograph F.8**). As Coldham's Road is currently a private road, it will either need to be adopted or Rights of Access Over agreed with the private owner.

At the end of Coldham's Road (see **Photograph F.9**) land would need to be acquired, approximately 400m², from a private owner in order to leave the industrial estate. The land around the commercial fishing lake is privately owned and further land would need to be acquired, approximately 160m², to allow the proposed route to reach Coldham's Common, which is owned by the local authority.

Once the proposed route reaches Coldham's Common, the cycleway crosses Coldham's Brook and joins the existing foot & cycleway, which terminates on Newmarket Road (3E) at the toucan crossing near the Cambridge United FC ground.

The features that are present along the proposed route are summarised in Table 3-4.

Table 3-4 From Coldham's Lane to Newmarket Road – Proposed Features

	On-Road	Off-Road	Total
Route Length	505m	405m	910m
Signalised Junction(s)	1	0	1
Un-Signalised Junction(s)	1	1	2
Roundabout(s)	0	0	0

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from Coldham's Road. At its northern end, construction traffic would access the potential site via the existing gated access on to Coldham's Common from Newmarket Road.

The new street lighting proposed for the Off-Road section can be connected into the existing network for the foot & cycleway crossing Coldham's Common.

The construction of the cycleway will need to include a precautionary method of working should further investigation of Coldham's Lane bridge confirm the presence of bats, which potentially roost within the archways.

The construction of the cycleway will need to include a precautionary method of working should further investigation around Coldham's Lane bridge confirm the presence of Japanese Knotweed within the area required for construction.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

d) From Newmarket Road to New River Cam Bridge

The proposed route continues from Newmarket Road (3E), by crossing this main arterial road into Cambridge, using the existing toucan crossing. The route then travels towards the Chapel of St. Mary Magdalene using the existing shared use foot & cycleway, before turning right at Coldham's Brook.

The proposed Off-Road cycleway will run alongside Coldham's Brook (see **Photograph F.10**) up to the disused rail line through Ditton Meadows. This section will require the acquisition of private land, approximately 1225m², from the Cambridge Preservation Society. The disused railway is in the ownership of Network Rail, and is likely to require an agreement for a Right of Access Over.

From the disused railway, the proposed route would cross Ditton Meadows, in local authority ownership, reaching the existing cycleway beside the River Cam, and travelling under the rail bridge (see **Photograph F.11**) in order to reach the new ramped access of a new crossing over the River Cam (4), which would be on Stourbridge Common. The route taken across Ditton Meadows is likely to depend, in part, upon the findings of further environmental studies that will be required to be undertaken.

The features that are present along the proposed route are summarised in Table 3-5.

Table 3-5 From Newmarket Road to New River Cam Bridge – Proposed Features

	On-Road	Off-Road	Total
Route Length	0m	905m	905m
Signalised Junction(s)	1	0	1
Un-Signalised Junction(s)	0	2	2
Roundabout(s)	0	0	0

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from Newmarket Road, but would require a new access to be formed, which would likely be greater than that required for the cycleway. At its northern end, access could only be achieved from Fen Road on the northern bank of the River Cam. Access could also be achieved through the industrial estate off of Ditton Walk as it backs onto the dismantled railway.

The existing cycleways across Ditton Meadows and beside the River Cam are not lit, and therefore it may not be required to light the proposed route. However, should lighting be required for the proposed Off-Road sections then a connection to the existing network can be made at Newmarket Road. An additional connection could be made from Fen Road, should the new crossing of the River Cam be constructed.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

The proposed cycle route is similar to that put forward as part of the proposals for the Transport Infrastructure Fund for a segregated busway, which would provide part of a link between Newmarket Road and the proposed Chesterton Rail Station. Cyclists would follow a cycleway alongside the busway across Ditton Meadows to a new crossing of the River Cam. This would need to be discussed further with the project team for the TIF proposals, should they receive funding for their schemes, and with the local planners to ensure that the cycleway is included in potential future works.

e) From New River Cam Bridge to Milton Road/ Guided Busway Junction

In order to continue from Stourbridge Common, the proposed route will need to travel over a new crossing of the River Cam (4), of which an indicative arrangement is shown on drawing 5078644/HW/GN/001 in **Appendix E**. In addition to the permission of the Environmental Agency for the new bridge, land would need to be acquired from the Conservators of the River Cam who own the north bank of the River Cam (see **Photograph F.12**). The area required for land-take would be approximately 250m², as it would also need to include the existing path from the river to Fen Road (see **Photograph F.13**).

From Fen Road, the proposed route travels On-Road along Moss Bank, at the end of which an entrance can be formed onto the disused railway. A new Off-Road cycleway will then follow the disused railway, past Bramble Field Nature Reserve, and will meet Milton Road at the junction with the Guided Busway (5). Approximately 4200m² of land will need to be acquired from Network Rail for this Off-Road section, although it will probably be necessary to purchase the full width of the disused railway.

The features that are present along the proposed route are summarised in Table 3-6.

Table 3-6 From New River Cam Bridge to Milton Road/ Guided Busway Junction –
Proposed Features

	On-Road	Off-Road	Total
Route Length	260m	1105m	1365m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	3	1	4
Roundabout(s)	0	0	0

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from Fen Road. At its northern end, construction traffic would access the potential site from Milton Road and along the disused railway. Access can also be achieved through the disused railway sidings off of Cowley Road.

The new street lighting proposed for the Off-Road section can be connected into the existing network from either Moss Bank or Milton Road.

The construction of the cycleway will need to include a precautionary method of working should further investigation of the existing railway bridge over the River Cam confirm the presence of bats, which potentially roost within the structure, or any protected species that potentially inhabit the banks of the River Cam.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

The proposed cycle route is similar to that put forward as part of the proposals for the Transport Infrastructure Fund for a segregated busway, which would provide part of a link between Newmarket Road and the proposed Chesterton Rail Station. This proposed busway could incorporate a cycleway similar to that constructed along the new Guided Busway. From Ditton Meadows, cyclists would follow a cycleway alongside the busway, which will include a new crossing of the River Cam, to Fen Road. A second section of busway would then pass under the railway, providing a connection to the forecourt of the proposed Chesterton Rail Station. From the proposed station, the busway then follows the disused railway and will meet Milton Road at the junction with the Guided Busway (5). This would need to be discussed further with the project teams for the TIF proposals and Chesterton Rail Station, should they receive funding for their schemes, and with the local planners to ensure that the cycleway is included in potential future works.

3.1.2 Route West of Railway

The proposed route, which will be assessed against the existing route in Chapter 2.1.1, is described in detail in the following sections:

- Cambridge Railway Station to Mill Road
- Mill Road to Coldham's Lane
- Coldham's Lane to Newmarket Road
- Newmarket Road to a New River Cam bridge
- A New River Cam bridge to Milton Road/ Guided Busway Junction

The features that are present along the proposed route are summarised in Table 3-7.

Table 3-7 Route West of Railway – Proposed Features

	On-Road	Off-Road	Total
Route Length	945m	4010m	4955m
Signalised Junction(s)	2	0	2
Un-Signalised Junction(s)	13	6	19
Roundabout(s)	2	0	2

a) **From Cambridge Railway Station to Mill Road**

The proposed route would permit cyclists to depart Cambridge Rail Station (0) on the existing Local Off-Road route, which is on Network Rail land, through the car park and then pass under the foot & cycle bridge. This route is retained within the re-development plans for Cambridge Rail Station, but discussions will need to be held to coordinate any changes in alignment that may be required by either project.

From the foot & cycle bridge, a new Off-Road section is proposed that would require the acquisition of Network Rail land in order to pass through the Network Rail yard (see **Photograph F.14**), and then follow beside the railway to reach Mill Road bridge (1). As this section of the route is in the ownership of Network Rail and in current use, it is possible that only a Right of Access Over would be acceptable to Network Rail. The area required for land-take would be approximately 1400m².

Users would be able to access Mill Road via an existing gated entrance off of the railway on the northern side of Mill Road bridge (see **Photograph F.15**). Additionally, pedestrians could access Mill Road bridge via existing steps on the southern side of Mill Road bridge, which are currently secured by Network Rail.

The features that are present along the proposed route are summarised in Table 3-8.

Table 3-8 From Cambridge Railway Station to Mill Road – Proposed Features

	On-Road	Off-Road	Total
Route Length	0m	560m	560m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	1	1	2
Roundabout(s)	0	0	0

i) **Construction Considerations**

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from the Cambridge Rail Station car park. At its northern end, construction traffic may access the potential site from the entrance at Mill Road bridge, although this would only be suitable for smaller construction plant.

The new street lighting and CCTV proposed for the Off-Road sections can be connected into the existing network at Devonshire Road and Mill Road bridge. Additionally, an agreement may be reached that would allow connections to be made into the networks that serve the Cambridge Rail Station car park

The construction of the cycleway will need to include a precautionary method of working should further investigation of Mill Road bridge confirm the presence of bats, which potentially roost within the archways.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

b) From Mill Road to Coldham's Lane

The proposed route would continue alongside the railway from the previous section by passing under Mill Road bridge (1), using an existing open archway (see **Photograph F.15**). The proposed route would then continue beside the railway up to Hooper Street. This section could be located within Network Rail land, which would require the acquisition of approximately 1175m² of land and would necessitate the relocation of Network Rail plant, such as overhead power lines (see **Photograph F.16**). The land adjacent to the railway is in local authority ownership and could provide an alternative route through to Hooper Street, although some demolition of existing structures would be required.

A new entrance onto Hooper Street would need to be constructed for this proposed route, for which indicative details are shown on drawing 5078644/HW/GN/002 in **Appendix E**. From Hooper Street, the route follows both On-Road and Off-Road sections of the existing cycle network, as there is insufficient space between the railway and adjacent properties. The route travels On-Road along Ainsworth Street and then crosses Sleaford Street into York Street at a junction for which they would have a right of way. An Off-Road section through the Beehive Centre car park provides the link to Coldham's Lane (2W) at a roundabout.

The features that are present along the proposed route are summarised in Table 3-9.

Table 3-9 From Mill Road to Coldham's Lane – Proposed Features

	On-Road	Off-Road	Total
Route Length	610m	635m	1245m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	6	1	7
Roundabout(s)	1	0	1

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from the access road off of Mill Road. Access may also be possible from Hooper Street, although it may only be reached through narrow residential streets.

The new street lighting and CCTV proposed for the Off-Road section can be connected into the existing networks at either Mill Road bridge or Hooper Street.

The construction of the cycleway will need to include a precautionary method of working should further investigation of Mill Road bridge confirm the presence of bats, which potentially roost within the archways.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

c) From Coldham's Lane to Newmarket Road

The proposed route continues from Coldham's Lane (2W) with a right turn on the roundabout, followed by a left onto an old access road to the railway (see **Photograph F.17**), which would be the start of a new Off-Road route. There is an existing business at the end of the access road, with some out-buildings that would need to be relocated in order to form the entrance to the railway, the details of which are shown in drawing 5078644/HW/GN/005 in **Appendix E**. An area of approximately 40m² of private land may need to be acquired for the cycleway to reach the railway.

The proposed Off-Road cycleway would then follow beside the railway, behind the Cambridge Retail Park (see **Photograph F.18**), up to Newmarket Road (3). This would require the acquisition of land from Network Rail of an area approximately 3120m², which may require the relocation of Network Rail overhead power lines that serve the main line through Cambridge.

A new ramp will need to be constructed to provide access to Newmarket Road, as the construction of the newer bridge prevents the cycleway continuing beside the railway. Details of the ramp are shown on drawing 5078644/HW/GN/006 in **Appendix E**, and would require the acquisition of approximately 40m² of private land, as it crosses a corner of an existing retail car park.

The features that are present along the proposed route are summarised in Table 3-10.

Table 3-10 From Coldham's Lane to Newmarket Road – Proposed Features

	On-Road	Off-Road	Total
Route Length	40m	865m	905m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	1	1	2
Roundabout(s)	1	0	1

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from the access road off of Coldham's Lane bridge. At its northern end, construction traffic would access the potential site through the car park of an adjacent retail unit.

The new street lighting and CCTV proposed for the Off-Road sections can be connected into the existing networks at either Coldham's Lane bridge or Newmarket Road bridge.

The construction of the cycleway will need to include a precautionary method of working should further investigation of both Coldham's Lane bridge and Newmarket Road bridge confirm the presence of bats, which potentially roost within the archways.

The construction of the cycleway will need to include a precautionary method of working should further investigation around Coldham's Lane bridge confirm the presence of Japanese Knotweed within the area required for construction.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

d) From Newmarket Road to New River Cam Bridge

The proposed route would continue from the new ramp at Newmarket Road (3) using a pair of new toucan crossings to reach the existing shared use foot & cycleway in to Swann's Road. Details are shown on drawing 5078644/HW/GN/006 in **Appendix E**. Without the provision of new crossings, cyclists would be more likely to cross the River Cam at Green Dragon bridge, decreasing the benefit of a new crossing of the River Cam.

From Swann's Road, cyclists would then turn right on to a new Off-Road section, through the industrial estate. The first section would be on local authority land, which would be through the car park area of 2 units, and would connect to a wooded area of a private property adjacent to the railway (see **Photograph F.19**) providing access to Stourbridge Common. The area of private land that needs to be acquired would be approximately 700m². Alternatively, access to Stourbridge Common could be achieved from Mercer's Row off of Swann's Road, which would not require the acquisition of any private land, although it would be a slightly longer route.

The route then continues alongside the railway over Stourbridge Common, which is in local authority ownership, reaching the existing cycleway beside the River Cam (4). This would also be the location of the new ramped access of a new crossing over the River Cam (see **Photograph F.20**).

The features that are present along the proposed route are summarised in Table 3-11.

Table 3-11 From Newmarket Road to New River Cam Bridge – Proposed Features

	On-Road	Off-Road	Total
Route Length	35m	845m	880m
Signalised Junction(s)	2	0	2
Un-Signalised Junction(s)	2	2	4
Roundabout(s)	0	0	0

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from Swann's Road. At its northern end, access could only be achieved from Fen Road on the northern bank of the River Cam. Access could also be achieved through the industrial estate off of Mercer's Row as it ends at Stourbridge Common.

The new street lighting for the Off-Road section through the industrial estate can be connected into the existing network at Swann's Road. The existing cycleways across Stourbridge Common and beside the River Cam are not lit, and therefore it may not be required to light the remainder of the proposed route. However, should lighting be required then the proposed extension to the network through the industrial estate could be extended. An additional connection could be made from Fen Road, should the new crossing of the River Cam be constructed.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

e) From New River Cam Bridge to Milton Road/ Guided Busway Junction

In order to continue from Stourbridge Common, the proposed route will need to travel over a new crossing of the River Cam (4), of which an indicative arrangement is shown on drawing 5078644/HW/GN/001 in **Appendix E**. In addition to the permission of the Environmental Agency for the new bridge, land would need to be acquired from the Conservators of the River Cam who own the north bank of the River Cam (see **Photograph F.12**). The area required for land-take would be approximately 250m², as it would also need to include the existing path from the river to Fen Road (see **Photograph F.13**).

From Fen Road, the proposed route travels On-Road along Moss Bank, at the end of which an entrance can be formed onto the disused railway. A new Off-Road cycleway will then follow the disused railway, past Bramble Field Nature Reserve, and will meet Milton Road at the junction with the Guided Busway (5). Approximately 4200m² of land will need to be acquired from Network Rail for this Off-Road section, although it will probably be necessary to purchase the full width of the disused railway.

The features that are present along the proposed route are summarised in Table 3-12.

Table 3-12 From New River Cam Bridge to Milton Road/ Guided Busway Junction – Proposed Features

	On-Road	Off-Road	Total
Route Length	260m	1105m	1365m
Signalised Junction(s)	0	0	0
Un-Signalised Junction(s)	3	1	4
Roundabout(s)	0	0	0

i) Construction Considerations

The location of the proposed route allows the areas for construction to be accessed, at its southern end, from Fen Road. At its northern end, construction traffic would access the potential site from Milton Road and along the disused railway. Access can also be achieved through the disused railway sidings off of Cowley Road.

The new street lighting proposed for the Off-Road section can be connected into the existing network from either Moss Bank or Milton Road.

The construction of the cycleway will need to include a precautionary method of working should further investigation of the existing railway bridge over the River Cam confirm the presence of bats, which potentially roost within the structure, or any protected species that potentially inhabit the banks of the River Cam.

Planning permission will be required for the section of new Off-Road cycleway and should be suitably allowed for within the project programme and contingency.

The proposed cycle route is similar to that put forward as part of the proposals for the Transport Infrastructure Fund for a segregated busway, which would provide part of a link between Newmarket Road and the proposed Chesterton Rail Station. This proposed busway could incorporate a cycleway similar to that constructed along the new Guided Busway. From Ditton Meadows, cyclists would follow a cycleway alongside the busway, which will include a new crossing of the River Cam, to Fen Road. A second section of busway would then pass under the railway, providing a connection to the forecourt of the proposed Chesterton Rail Station. From the proposed station, the busway then follows the disused railway and will meet Milton Road at the junction with the Guided Busway (5). This would need to be discussed further with the project teams for the TIF proposals and Chesterton Rail Station, should they receive funding for their schemes, and with the local planners to ensure that the cycleway is included in potential future works.

4 Assessment of Options

This section assesses the proposed route sections for new cycleways to the east and west of the railway lines from Cambridge Rail Station to the Milton Road/ Guided Busway Junction, against the equivalent existing routes. The assessment does not include a detailed assessment of engineering issues and does not include any information for road pavement condition, hydrology, highway structure condition, geology or geomorphology.

The assessment is therefore limited to an analysis of the viability of the sections in relation to space available, the physical constraints that exist, limited environmental issues and the opportunity to construct sections in isolation.

4.1 Proposed Cycle Routes

4.1.1 Route East of Railway

The relative merits of the proposed eastern cycleway from Cambridge Rail Station to the Milton Road/ Guided Busway Junction, detailed in this report in **Chapter 3.1.1**, have been assessed against the existing cycleway route, detailed in this report in **Chapter 2.1.1**, and the proposed western cycleway, detailed in **Chapter 3.1.2**.

The results of the evaluation are tabulated in Table 4-1.

Table 4-1 Route East of Railway – Comparison of Key Issues

Advantages	Disadvantages
Proposed route is 6% shorter (350m shorter) Length of On-Road cycleway is reduced by 67% (2095m shorter) Proportion of Off-Road cycleway is increased from 45% to 80% Signalised Junctions reduced from 4 to 2 Un-Signalised Junctions reduced from 33 to 13 No Roundabouts along Route	A new crossing of the River Cam is required 2035m ² of Private land would need to be acquired 9975m ² of Network Rail land would need to be acquired or Rights of Access Over obtained Loss of woodland and potential wildlife habitats, which would require appropriate mitigation measures
<i>Comparison against Proposed Western Cycleway</i>	
Quantity of Signalised Junctions are the same 6 fewer Un-Signalised Junctions 2 fewer Roundabouts along route	Eastern cycleway is 9% longer (430m longer) Length of On-Road cycleway is 10% longer (100m longer) Length of Off-Road cycleway is 8% longer (330m longer) Area of Private land to be acquired is 97% greater (1005m ² greater) Area of Network Rail land to be acquired or Right of Access Over obtained is 1% greater (80m ² greater)

a) From Cambridge Railway Station to Mill Road

The relative merits of the proposed eastern cycleway section from Cambridge Rail Station to Mill Road, detailed in this report in **Chapter 3.1.1 a)**, have been assessed against the existing cycleway route, detailed in this report in **Chapter 2.1.1 a)**.

The results of the evaluation are tabulated in Table 4-2.

Table 4-2 From Cambridge Railway Station to Mill Road – Comparison of Key Issues

Advantages	Disadvantages
Length of On-Road cycleway is shorter by 42% (205m shorter) Proportion of Off-Road cycleway is increased from 55% to 76% Signalised Junctions remains as 0 Un-Signalised Junctions reduced from 7 to 4 No Roundabouts along Route	Proposed route is 7% longer (75m longer) 1300m ² of Network Rail land would need to be acquired or Rights of Access Over obtained Disruption of possible bat roost around Mill Road bridge during construction
<i>Considering Alternative Route via Fletcher’s Terrace to Access Arch under Milton Road bridge</i>	
Alternative is 18% shorter (205m shorter) than Proposal Signalised Junctions remains as 0 Roundabouts remains as 0 Area of Network Rail land to be acquired or Right of Access Over obtained is 80% less (1040m ² less) Likely to be more Cost Effective than Proposal	On-Road length of Alternative is 25% longer (70m longer) than Proposal 4No additional Un-Signalised Junctions along Alternative than Proposal Part of On-Road cycleway is Contra-Flow

i) Benefits of Discrete Construction

The construction of the whole of this proposed section will only benefit the cycle network if the subsequent section from Mill Road to Coldham’s Lane is also constructed, as the purpose of this section is to provide access to a route alongside the rail lines, and the existing cycle routes provide a more direct connection with the routes north of Mill Road. However, the construction of a new ramp onto the existing Foot & Cycle bridge would benefit the existing cycle network, as it would remove the loop that cyclists currently use to access the existing ramp onto the bridge.

b) From Mill Road to Coldham’s Lane

The relative merits of the proposed eastern cycleway section from Mill Road to Coldham’s Lane, detailed in this report in **Chapter 3.1.1 b)**, have been assessed against the existing cycleway route, detailed in this report in **Chapter 2.1.1 b)**.

The results of the evaluation are tabulated in Table 4-3.

Table 4-3 From Mill Road to Coldham’s Lane – Comparison of Key Issues

Advantages	Disadvantages
Proposed route is 6% shorter (60m shorter) Length of On-Road cycleway is shorter by 100% (1100m shorter) Proportion of Off-Road cycleway is increased from 0% to 100% Signalised Junctions reduced from 1 to 0 Un-Signalised Junctions reduced from 3 to 1 Roundabouts reduced from 2 to 0 Existing open archway is used to pass under Mill Road bridge	4475m ² of Network Rail land would need to be acquired and/ or Rights of Access Over obtained Construction would require the demolition of a rail shed and at least one rail siding. Disruption of possible bat roost around Mill Road bridge and Coldham’s Lane bridge during construction Presence of Japanese Knotweed around Coldham’s Lane bridge

Advantages	Disadvantages
<i>Considering Alternative Route without using Network Rail Land North of Cavendish Road</i>	
Area of Network Rail land to be acquired or Right of Access Over obtained is 67% less (3000m ² less) No demolition or removal of sidings is required	Alternative is 70% longer (730m longer) than Proposal Alternative is 60% longer (670m longer) than Existing On-Road length of Alternative is 100% longer (1380m longer) than Proposal 1 No additional Signalised Junction along Alternative than Proposal 10 No additional Un-Signalised Junctions along Alternative than Proposal 2 No additional Roundabouts along Alternative than Proposal

i) Benefits of Discrete Construction

This proposed section’s main benefit to the cycle network can only be achieved if its whole length can be constructed through the rail sheds near Coldham’s Lane bridge. While the construction of the route alongside the railway up to Cavendish Road on its own would provide a less interrupted route and move cyclists out of the narrow, car lined roads of the existing route, the route is longer than the existing as cyclists need to double back to reach the existing network.

c) From Coldham’s Lane to Newmarket Road

The relative merits of the proposed eastern cycleway section from Coldham’s Lane to Newmarket Road, detailed in this report in **Chapter 3.1.1 c)**, have been assessed against the existing cycleway route, detailed in this report in **Chapter 2.1.1 c)**.

The results of the evaluation are tabulated in Table 4-4.

Table 4-4 From Coldham’s Lane to Newmarket Road – Comparison of Key Issues

Advantages	Disadvantages
Signalised Junctions remains as 1 along route No Signalised Crossing required for Coldham’s Lane, as route passes under bridge. No Roundabouts along Route Existing open archway is used to pass under Coldham’s Lane bridge	Proposed route is 5% longer (45m longer) Length of On-Road cycleway is increased by 100% (505m longer) Proportion of Off-Road cycleway is decreased from 100% to 45% Un-Signalised Junctions increased from 1 to 2 560m ² of Private land would need to be acquired Existing Level Crossing used to cross Newmarket Rail Branch Crossing of Coldham’s Brook required which may require ecological mitigation measures Loss of woodland and potential wildlife habitats between end of Coldham’s Road and existing cycle-route through Coldham’s Common, which would require appropriate mitigation measures Presence of Japanese Knotweed around Coldham’s Lane bridge

i) Benefits of Discrete Construction

This proposed section will provide minimal benefit to the cycle network if constructed in isolation, as it would run parallel to the existing route through Coldham's Common. The significant benefit of this route would only be achieved if the previous section is constructed allowing cyclists to pass under the arch of Coldham's Lane bridge.

d) From Newmarket Road to New River Cam Bridge

The relative merits of the proposed eastern cycleway section from Newmarket Road to the River Cam, detailed in this report in **Chapter 3.1.1 d)**, have been assessed against the existing cycleway route from Newmarket Road to Green Dragon bridge, detailed in this report in **Chapter 2.1.1 d)**.

The results of the evaluation are tabulated in Table 4-5.

Table 4-5 From Newmarket Road to New River Cam Bridge – Comparison of Key Issues

Advantages	Disadvantages
Proposed route is 6% shorter (60m shorter) Length of On-Road cycleway is reduced by 100% (500m shorter) Proportion of Off-Road cycleway is increased from 48% to 100% Signalised Junctions remains as 1 along route Un-Signalised Junctions reduced from 9 to 2 No Roundabouts along Route Potential tie-in with TIF proposals	1225m ² of Private land would need to be acquired Loss of woodland and potential wildlife habitats alongside Coldham's Brook, which would require appropriate mitigation measures

i) Benefits of Discrete Construction

This proposed section would provide minimal benefits to the cycle network unless a new crossing of the River Cam is also constructed, as the purpose of the section is to provide a more direct access to a new bridge.

e) From New River Cam Bridge to Milton Road/ Guided Busway Junction

The relative merits of the proposed eastern cycleway section from the New River Cam crossing to the Milton Road/ Guided Busway Junction, detailed in this report in **Chapter 3.1.1 e)**, have been assessed against the existing cycleway route from Green Dragon bridge to the Milton Road/ Guided Busway Junction, detailed in this report in **Chapter 2.1.1 e)**.

The results of the evaluation are tabulated in Table 4-6.

Table 4-6 From New River Cam Bridge to Milton Road/ Guided Busway Junction – Comparison of Key Issues

Advantages	Disadvantages
Proposed route is 21% shorter (350m shorter) Length of On-Road cycleway is reduced by 76% (795m shorter) Proportion of Off-Road cycleway is increased from 38% to 81% Signalised Junctions reduced from 1 to 0 Un-Signalised Junctions reduced from 13 to 4 Roundabouts reduced from 2 to 0 Potential tie-in with TIF proposals	New Foot & Cycle bridge over the River Cam required 250m ² of Private land would need to be acquired 4200m ² of Network Rail land would need to be acquired or Rights of Access Over obtained

i) Benefits of Discrete Construction

The construction of a new crossing of the River Cam could be constructed in isolation, even from the rest of the proposed route in this section, as it would connect to the existing cycle network on both sides of the river. The benefits of a new crossing are increased if the previous proposed section from Newmarket Road is also constructed. The remainder of the proposed section from a new crossing up to the Milton Road/ Guided Busway Junction, if constructed in isolation, would provide minimal benefits to the cycle network, until the proposed Chesterton Rail station is constructed.

4.1.2 Route West of Railway

The relative merits of the proposed western cycleway from Cambridge Rail Station to the Milton Road/ Guided Busway Junction, detailed in this report in **Chapter 3.1.2**, have been assessed against the existing cycleway route, detailed in this report in **Chapter 2.1.2**, and the proposed eastern cycleway, detailed in **Chapter 3.1.1**.

The results of the evaluation are tabulated in Table 4-7.

Table 4-7 Route West of Railway – Comparison of Key Issues

Advantages	Disadvantages
Proposed route is 13% shorter (690m shorter) Length of On-Road cycleway is reduced by 75% (2735m shorter) Proportion of Off-Road cycleway is increased from 35% to 81% Signalised Junctions reduced from 5 to 2 Un-Signalised Junctions reduced from 33 to 19 Roundabouts reduced from 4 to 2	A new crossing of the River Cam is required. 1030m ² of Private land would need to be acquired 9895m ² of Network Rail land would need to be acquired or Rights of Access Over obtained Loss of woodland and potential wildlife habitats, which would require appropriate mitigation measures
<i>Comparison against Proposed Eastern Cycleway</i>	
Western cycleway is 8% shorter (430m shorter) Length of On-Road cycleway is 10% shorter (100m shorter) Length of Off-Road cycleway is 8% shorter (330m shorter) Quantity of Signalised Junctions are the same Area of Private land to be acquired is 51% less (1005m ² less) Area of Network Rail land to be acquired or Right of Access Over obtained is 1% less (80m ² less)	6 more Un-Signalised Junctions 2 more Roundabouts along route

a) From Cambridge Railway Station to Mill Road

The relative merits of the proposed western cycleway section from Cambridge Rail Station to Mill Road, detailed in this report in **Chapter 3.1.2 a)**, have been assessed against the existing cycleway route, detailed in this report in **Chapter 2.1.2 a)**.

The results of the evaluation are tabulated in Table 4-8.

Table 4-8 From Cambridge Railway Station to Mill Road – Comparison of Key Issues

Advantages	Disadvantages
Proposed route is 35% shorter (295m shorter) Length of On-Road cycleway is reduced by 100% (615m shorter) Proportion of Off-Road cycleway is increased from 28% to 100% Signalised Junctions reduced from 2 to 0 Un-Signalised Junctions reduced from 3 to 2 No Roundabouts along Route	1400m ² of Network Rail land would need to be acquired or Rights of Access Over obtained Replacement of existing Network Rail steel access steps to be suitable for pedestrian access Disruption of possible bat roost around Mill Road bridge during construction No access on to Mill Road

i) Benefits of Discrete Construction

This proposed section can be constructed in isolation and provides a significantly and completely Off-Road route to Mill Road bridge, and would rejoin the road near the existing cycle network. The benefit of this proposed section is increased further if the following section up to Hooper Street is also constructed, as this would end closer to the existing network.

b) From Mill Road to Coldham's Lane

The relative merits of the proposed western cycleway section from Mill Road to Coldham's Lane, detailed in this report in **Chapter 3.1.2 b)**, have been assessed against the existing cycleway route, detailed in this report in **Chapter 2.1.2 b)**.

The results of the evaluation are tabulated in Table 4-9.

Table 4-9 From Mill Road to Coldham's Lane – Comparison of Key Issues

Advantages	Disadvantages
Proposed route is 3% shorter (35m shorter) Length of On-Road cycleway is reduced by 36% (340m shorter) Proportion of Off-Road cycleway is increased from 26% to 51% No Signalised Junctions along route Un-Signalised Junctions reduced from 9 to 7 Roundabouts remains as 1 along Route Existing open archway is used to pass under Mill Road bridge	1175m ² of Network Rail land would need to be acquired and/ or Rights of Access Over obtained Disruption of possible bat roost around Mill Road bridge and Coldham's Lane bridge during construction Presence of Japanese Knotweed around Coldham's Lane bridge

i) Benefits of Discrete Construction

This proposed section can be constructed in isolation, although the benefits are minimal as the new off-road cycleway rejoins the existing network after a few hundred metres. However, if this proposed section is constructed with the previous section then the benefits are greatly increased.

c) From Coldham's Lane to the New River Cam Bridge

The relative merits of the proposed western cycleway section from Coldham's Lane to the River Cam, detailed in this report in **Chapter 3.1.2 c) & d)**, have been assessed against the existing cycleway route from Coldham's Lane to Riverside bridge, detailed in this report in **Chapter 2.1.2 c)**.

The results of the evaluation are tabulated in Table 4-10.

Table 4-10 From Coldham’s Lane to the New River Cam Bridge – Comparison of Key Issues

Advantages	Disadvantages
<p>Length of On-Road cycleway is reduced by 88% (550m shorter)</p> <p>Proportion of Off-Road cycleway is increased from 33% to 96%</p> <p>Roundabouts reduced from 3 to 1</p>	<p>Proposed route is 89% longer (845m longer)</p> <p>Signalised Junctions increased from 1 to 2</p> <p>Un-Signalised Junctions increased from 4 to 6</p> <p>780m² of Private land would need to be acquired</p> <p>3120m² of Network Rail land would need to be acquired or Rights of Access Over obtained</p> <p>Loss of woodland and potential wildlife habitats, which would require appropriate mitigation measures</p>

i) Benefits of Discrete Construction

The proposed section from Coldham’s Lane bridge to Newmarket Road could be constructed in isolation, although the main benefit would be relocating cyclists from a main road to the new off-road section.

The proposed section from Newmarket Road to a new crossing of the River Cam could be constructed in isolation although it would provide minimal benefits to the cycle network unless the new crossing is also constructed, as the purpose of the section is to provide a more direct access to the new bridge.

d) From the Existing/New River Cam Bridge to Milton Road/ Guided Busway Junction

The relative merits of the proposed eastern cycleway section from the New River Cam crossing to the Milton Road/ Guided Busway Junction, detailed in this report in **Chapter 3.1.2 e)**, have been assessed against the existing cycleway route from Riverside bridge to the Milton Road/ Guided Busway Junction, detailed in this report in **Chapter 2.1.2 d)**.

The results of the evaluation are tabulated in Table 4-11.

Table 4-11 From the Existing/New River Cam Bridge to Milton Road/ Guided Busway Junction– Comparison of Key Issues

Advantages	Disadvantages
<p>Proposed route is 47% shorter (1205m shorter)</p> <p>Length of On-Road cycleway is reduced by 83% (1230m shorter)</p> <p>Proportion of Off-Road cycleway is increased from 42% to 81%</p> <p>Signalised Junctions reduced from 2 to 0</p> <p>Un-Signalised Junctions reduced from 18 to 4</p> <p>No Roundabouts along Route</p>	<p>New Foot & Cycle bridge over the River Cam required</p> <p>250m² of Private land would need to be acquired</p> <p>4200m² of Network Rail land would need to be acquired or Rights of Access Over obtained</p> <p>Loss of woodland and potential wildlife habitats, which would require appropriate mitigation measures</p>

i) Benefits of Discrete Construction

The construction of a new crossing of the River Cam could be constructed in isolation, even from the rest of the proposed route in this section, as it would connect to the existing cycle network on both sides of the river. The benefits of a new crossing are increased if the previous proposed section from Newmarket Road is also constructed. The remainder of the proposed section from a new crossing up to the Milton Road/ Guided Busway Junction, if constructed in isolation, would provide minimal benefits to the cycle network, until the proposed Chesterton Rail station is constructed.

5 Conclusions and Recommendations

5.1 Conclusions

From the Options Assessment in **Chapter 4**, the following conclusions have been made:

- The provision of a new cycleway alongside the railway would benefit the Cambridge cycling community as the proposed routes have significantly longer Off-Road sections and fewer junctions. This will reduce potential for conflict with other road users, particularly through the narrow residential roads.
- Of the proposed eastern and western cycleway options, the eastern route would follow the railway closest, moving away only to utilise the proximity of existing cycle routes. The proposed western cycleway route deviates from the railway where there is insufficient space between Hooper Street and Coldham's Lane.
- A new crossing of the River Cam near the existing rail bridge would provide the single greatest benefit, as without it cyclists would travel away from the railway earlier in order to use existing crossings of the River Cam. A new bridge would also enhance connections between Fen Ditton and Abbey areas with Cambridge Science Park and the proposed Chesterton Rail Station.
- Both of the proposed routes require the acquisition of land and/ or rights of access over private land, the majority of which would be Network Rail land for the proposed sections alongside the railway. Also, the eastern route requires the demolition of an existing building, which is the rail shed near Coldham's Lane.
- Neither of the proposed routes appear to require any structural works to any of the bridges in order to allow access under them. Although the eastern route also includes a proposal for a new ramp onto the Foot & Cycle bridge near Cambridge Rail Station, which would enhance the existing access. The western route also requires a new ramp to access Newmarket bridge from the proposed cycleway alongside the railway.
- The proposed western cycleway is the shorter route of the two proposals, although there are more junctions along its length. However, the eastern route has longer uninterrupted sections that would enable cyclists to travel at greater speeds, and may allow quicker journey times for cyclists travelling the whole length of the route.
- Some benefits to the existing cycle network can be realised by the construction of some of the proposed sections in isolation from the whole proposal. This would also allow a whole route to be constructed over the next 5 to 10 years, which would better fit with CCC's budget, and the periods required for the acquisition of land and any agreements for rights of access over land that would remain in non-local authority ownership.
- The bridges over the railway would allow a route to be constructed between Cambridge Rail Station and the Milton Road/ Guided Busway Junction that would be a combination of the eastern and western proposed routes. It is considered that the following combination of sections could provide a good cost/ benefit ratio if evaluated during further investigation. It would require less land acquisition than either of the proposed options and the new Off-Road sections are constructed in wider areas allowing simpler construction methods.
 - Proposed western section from Cambridge Rail Station to Mill Road bridge, as described in **Chapter 3.1.2 a)**.
 - Proposed western section from Mill Road bridge to Coldham's Lane bridge using the local authority land, as described in **Chapter 3.1.2 b)**.
 - Cross over railway at Coldham's Lane to reach Coldham's Common, on existing On-Road cycle route.
 - Existing section from Coldham's Lane to Newmarket Road, as described in **Chapter 2.1.1 c)**.
 - Proposed eastern section from Newmarket Road to new crossing of the River Cam, as described in **Chapter 3.1.1 d)**.

- New crossing of River Cam to Milton Road/ Guided Busway Junction, as described in **Chapter 3.1.1 e)** and **Chapter 3.1.2 e)**.
- Table 5-1 summarises the features along the existing and proposed routes including the combination of sections described above.

Table 5-1 Summary of Key Features Along Existing and Proposed Routes

	Existing Eastern	Existing Western	Proposed Eastern	Proposed Western	Proposed Combination
Route Length	5735m	5645m	5385m	4955m	5200m
%age Off-Road Route	45%	35%	80%	81%	78%
Signalised Junction(s)	4	5	2	2	2
Un-Signalised Junction(s)	33	33	13	19	16
Roundabout(s)	4	4	0	2	1
Area of Private Land for Acquisition	N/A	N/A	2035m ²	1030m ²	1475m ²
Area of Network Rail for Acquisition	N/A	N/A	9975m ²	9895m ²	5600m ²

- The proposed routes from Newmarket Road to the Milton Road/ Guided Busway Junction need to be considered with the outcome from the application of the TIF proposals.
- The proposed route from the River Cam to the Milton Road/ Guided Busway Junction needs to be considered with the outcome from the proposal for the new Chesterton Rail Station.
- The main environmental issues identified at this stage that may affect the routes is the presence of trees and hedgerows that will need to be removed resulting in a loss of potential habitats. This may be mitigated by the construction of new habitats beside the proposed route. Other environmental issues, such as the potential of bats within bridge structures, are likely to constrain the construction of the cycleway rather than the route.

5.2 Recommendations

Considering the assessments and conclusions we would recommend the following:

- Discussions with Network Rail are undertaken to establish whether land may be purchased from them and/ or whether rights of access over can be granted. Information will also be required for measures to separate the proposed cycleways from the railway.
- Undertake a detailed topographical survey to confirm space available between the railway and property boundaries, and include the location of Network Rail plant.
- Undertake a detailed assessment of the structures and ground investigation along the route to evaluate the cost required to construct the proposed sections.
- Discussions with both the Cambridgeshire County and Cambridge City planners are undertaken in order to preserve the areas for the proposed routes and, where possible, obtain any additional land from future developments. Discussions should also include any requirements for the preparation of the necessary planning applications.
- Undertake a Cost/ Benefit study to establish which of the proposed routes will provide the greatest benefit, and identify which sections may be considered for discrete construction. The study should include traffic modelling to estimate the impacts on cyclists' journey times and on the flow of all traffic around the proposed routes.

- Consider the construction of a new crossing of the River Cam near the existing rail bridge in isolation from any other works for the cycleway, as it will provide a significant benefit to cyclists and pedestrians even without any new cycleways being constructed.
- Undertake further environmental studies to establish whether any of the potential habitats support any populations of protected species.
- Co-ordinate the design of the routes with the proposals for Chesterton Rail Station to ensure that an appropriate cycle link through the station can be established.
- Discussions with the project team responsible for the TIF proposals are undertaken, as the cycleway proposals may support some of the schemes within the proposals. Co-ordination of the design of the routes can then follow should funding be granted.
- Discussions with Ashwell PLC are undertaken to ensure that space for the new ramp onto the existing Foot & Cycle bridge at Cambridge Rail Station is included in their detailed planning submissions for this area of the CB1 development.

Appendix A – Cambridge Cycle Map

Appendix B – Existing and Proposed Cycle Routes

Appendix C – Ecological Report

Appendix D – Land Ownership

Appendix E – Proposed Junction and Crossing Details

Appendix F – Site Photographs

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