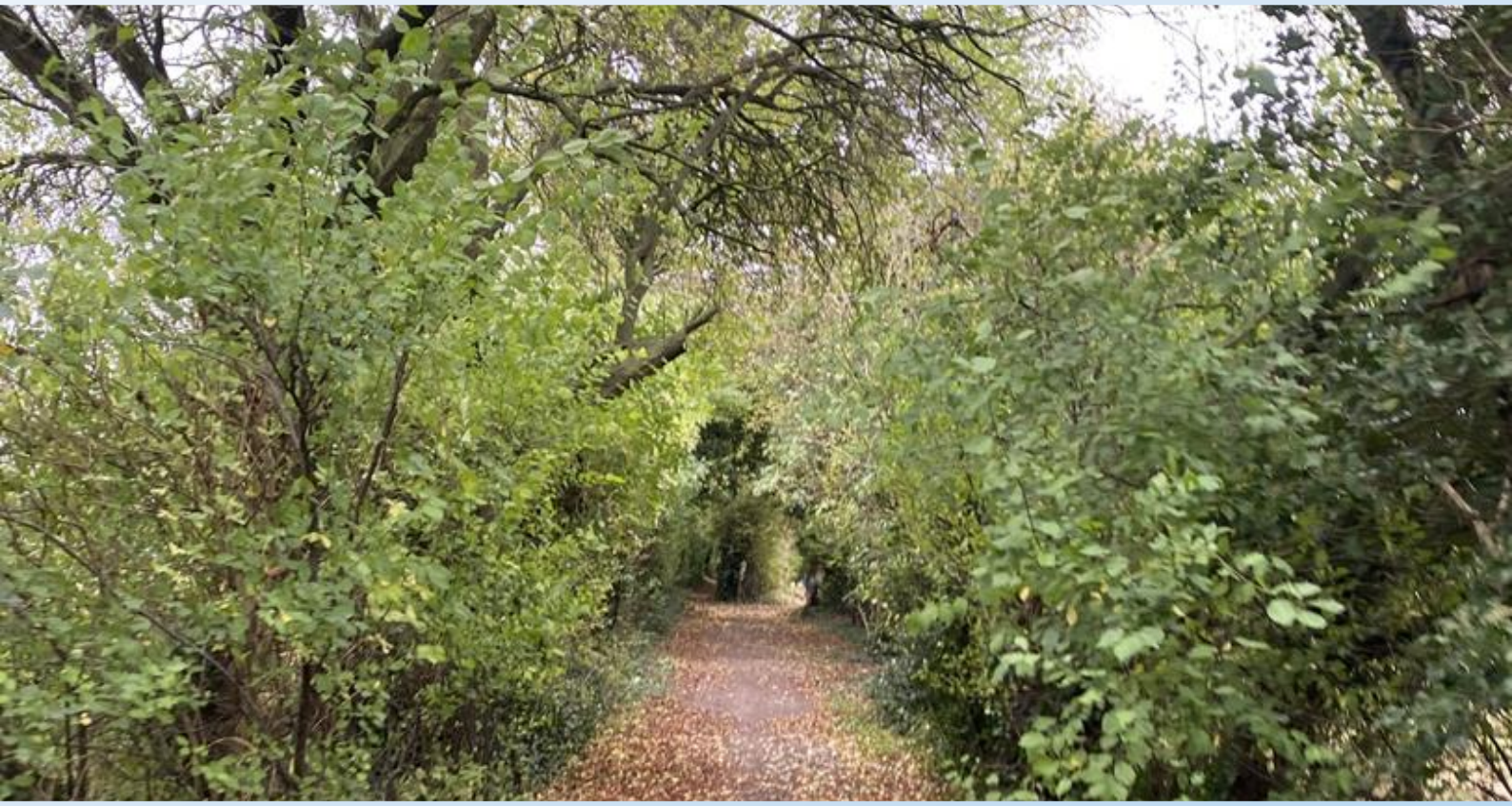
Cambridge and Peterborough JPSF

BARTON GREENWAY

Outline Business Case



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1 STRATEGIC CASE

1.1 OVERVIEW

1.1.1. The Barton Greenway scheme will offer improved active mode connectivity. The Greenway will include upgrades to shared-use paths on the northern side of Barton Road, enhancements to two roundabouts to provide safer routes as well as widening of a shared-use path over the M11 bridge. The scheme will also include traffic calming measures including raised tables and 20mph speed limits.

1.1.2. This Strategic Case for the Barton Greenway project forms the first of the five cases for the Outline Business Case (OBC). The purpose of the Strategic Case is to set out the strategic and policy context for the Barton Greenway, to demonstrate the need for the project and provide an assessment of the project's ability to address transport and wider policy requirements.

1.1.3. The Barton Greenway is one of the twelve sustainable travel corridor schemes proposed as part of the Greenways project by Greater Cambridge Partnership (GCP). A Programme Outline Case (POC) for the Greenways Project was prepared in August 2022. This document focuses on the strategic need for the Barton Greenway scheme.

1.2 APPROACH

1.2.1. The Strategic Case has been structured to align with the Department for Transport's (DfT) Transport business case guidance for the strategic dimension which outlines key areas that should be covered as part of the business case documentation.

1.3 BUSINESS STRATEGY

1.3.1. The Greater Cambridge City Deal was signed between Government and local representatives in 2014. The GCP is the local delivery body, responsible for overseeing the delivery of the City Deal and the promotion of local economic growth and development. The GCP aims to:

- Deliver up to £1 billion of investment, providing vital improvements to infrastructure, supporting and accelerating the creation of 44,000 new jobs and 33,500 new homes to Greater Cambridge by 2031; and
- Enable a new wave of innovation-led growth in the Greater Cambridge area by investing in infrastructure, housing and skills, thereby addressing housing shortages and transport congestion bottlenecks, that will facilitate its continued growth and a continuation of the 'Cambridge Phenomenon'.

1.3.2. To ensure infrastructure investment aligns with the above aims, the Greater Cambridge City Deal Assurance Framework has established key strategic objectives against which projects will be prioritised. The objectives aim to create and retain high-tech businesses of the future, target investments to the needs of the Greater Cambridge economy, improve connectivity between clusters and labour markets, and attract and retain skilled people by investing in transport and housing.

1.3.3. The Barton Greenway effectively meets multiple strategic objectives of the City Deal as it offers a green active travel corridor that enables safe and easy travel to workplaces, local schools, colleges and shops. The scheme is in line with GCP's objective of delivering fast, reliable and affordable

ways of travelling between employment and housing hubs as it provides improved links to Cambridge from Barton and Grantchester. Lastly, the scheme reduces community severance by improving transport links across the M11 and provides safe active travel connections between the places where people live, work and shop, thus encouraging more walking and cycling trips.

1.4 SCHEME BACKGROUND

1.4.1. In 2016, the Greater Cambridge Greenways project began with a review of the existing cycling and walking routes into Cambridge. GCP then consulted local communities to understand how the Greenways could best meet their needs and mitigate concerns. Formal consultations were then carried out on each route, before reports were issued for approval at Executive Board meetings throughout 2020.

1.4.2. Barton Greenway is one of the twelve Greenways which aim to make cycle journeys easier, cheaper, healthier, greener and pleasant into and out of Cambridge as well as promoting the enjoyment of the countryside for leisure purposes. Additionally, the scheme also contributes to making local cycle journeys, such as school and nursery runs safer and easier.

1.4.3. Barton is located approximately 6km southwest of Cambridge. Cyclists are currently served by shared use paths adjacent to the A603.

1.4.4.

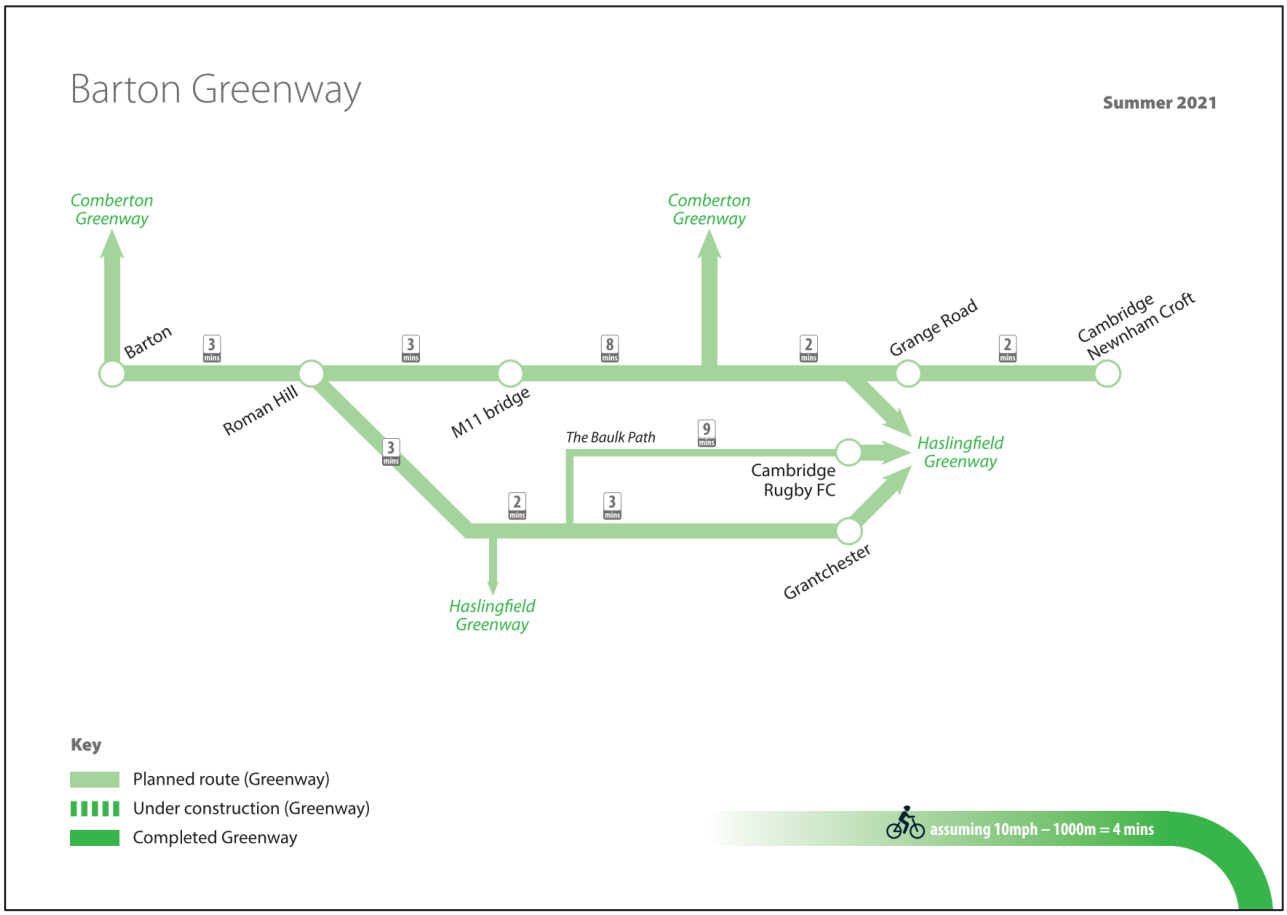
1.4.5.

1.4.6. **Figure** 1-1 shows the Barton Greenway which provides improvements to walking and cycling facilities between Barton, Grantchester and west Cambridge (Grange Road and Newnham Croft) and connectivity with other Greenways. Parts of the existing cycle network in the corridor have already been improved (path widening, improving surfacing and incorporating solar lighting in places). The Barton Greenway route will pass through Roman Hill and include crossing over the M11 and off-road sections around Grantchester. Barton Greenway includes the Baulk Path to Grantchester Road connecting with the Haslingfield Greenway.

1.4.7. The Barton Greenway was part of the previous public consultation on Greenways, undertaken in 2018. The latest public engagement was undertaken in autumn 2022. The Barton Greenway scheme was approved by the GCP Executive Board in October 2020.1

[1] Document.ashx (cmis.uk.com)

Figure 1-1 - Barton Greenway



Source: Summer 2021, GCP

1.5 POLICY CONTEXT

1.5.1. This section provides the policy context within which the development of the Barton Greenway has been considered. It demonstrates that the delivery of the cycle scheme aligns with the strategic objectives of policies set at local, regional and national scales.

1.5.2. The alignment of the Barton Greenway with national policy is shown in Table 1-1. Further detail on national policy for the Greenways programme as a whole is set out in the Greenways POC.

Table 1-1 National Policy Summary

Policy	Key Strategic Objectives	Barton Greenway Scheme alignment
National Policy		
Net Zero Strategy: Build Back Greener (2021)	▪ Decarbonising all sectors of the UK economy to meet net zero target by 2050.	Provision of cycling and walking networks and equine facilities encourages active travel, reducing reliance on the car and reduced greenhouse gas emissions. Delivery of the Barton Greenway will contribute towards the Net Zero Strategy's goal of making active travel a natural first choice for all who can take them by providing safer cycling and walking infrastructure between Barton and Cambridge.
The Environment Act (2020)	▪ Protection of the natural environment from the effects of human activity ▪ Protection of people from the effects of human activity on the natural environment ▪ Maintenance, restoration or enhancement of the natural environment ▪ Monitoring, assessing, considering, advising or reporting on environmental protection	The Barton Greenway aligns with the goals of the Environment Act, in supporting carbon reduction through encouraging sustainable transport and in producing biodiversity net gain, a key influence along with the general duty to conserve and enhance biodiversity in Cambridge.
Ten Point Plan for a Green Industrial Revolution (2020)	UK to be the world's number one centre for green technology, laying the foundations for economic growth, delivering Net Zero emissions.	Delivery of the Barton Greenway will directly contribute to the strategic goals of The Ten Point Plan by providing better air quality through delivering a sustainable active travel route, and in doing so protect our natural environment. Provision of a cycle network will further encourage active travel, reducing reliance on the car and greenhouse gas emissions.
Gear Change (2020)	▪ Better streets for cycling and people ▪ Cycling and walking at the heart of decision making ▪ Empowering and encouraging local authorities	Delivery of the Barton Greenway closely aligns to the vision of Gear Change, creating a safer and more attractive active travel environment in and around Cambridge. Through enabling residents and cycle user groups

Policy	Key Strategic Objectives	Barton Greenway Scheme alignment
National Policy		
	▪ Enabling people to cycle and protecting them when they do	to use the cycle network as a form of active travel, the strategic goals of Gear Change shall be met.
Cycling and Walking Investment Strategy (CWIS) LTN 1/20 (2020)	Cycling and walking to be the natural choice for short journeys, and to increase cycling and walking levels.	The Barton Greenway will align with the CWIS by providing infrastructure in line with design outlined in the LTN 1/20. Being developed in liaison with local communities and cycling user groups, the route is designed to be inclusive of different stakeholder groups as outlined in both the CWIS and LTN 1/20. Delivery of the Barton Greenway will provide communities access to a well-connected cycle network for both commuting and recreational purposes.
National Planning Policy Framework (updated 2021)	▪ To provide strong, vibrant, healthy communities ▪ To contribute to protecting and enhancing our natural, built, and historic environment; including making effective use of land	The Barton Greenway will help to further the sustainable development goals of the NPPF and align with its key principles by: ▪ Improving the health of communities by promoting the use of sustainable modes of transport by the provision of an active travel network ▪ Encouraging the use of non-car modes to minimise air quality effects of car travel ▪ Creating a well-designed, beautiful and safe environment for pedestrians and cyclists ▪ Providing Natural Capital benefits and ecosystem services delivered through green infrastructure strategies, which combined offer an effective use of land.
Transport Investment Strategy (2017)	▪ To create a more reliable, less congested and better-connected transport network ▪ To support the creation of new housing	Delivery of the Barton Greenway will help to achieve the objectives of the TIS by providing an alternative way of travelling to the car, minimising the potential for increased congestion. Provision of alternate attractive travel option will enable the network to better

Policy	Key Strategic Objectives	Barton Greenway Scheme alignment
National Policy		
		cope with increased demand from planned housing and population growth.

1.5.4. The alignment of the Barton Greenway with regional policy is shown in Table 1-2**.** Further detail on regional policy for the Greenways programme is set out in the Greenways POC.

Table 1-2 – Regional Policy Summary

Policy	Key Strategic Objectives	Barton Greenway Scheme alignment
Cambridgeshire and Peterborough Independent Commission on Climate (2021)	Better air quality and access to nature, to improve health and wellbeing.	Delivery of the Barton Greenway will contribute to the Commission's recommendations for active travel which includes making cycling and walking more accessible. Reducing the number of journeys made by car will reduce levels of greenhouse gas emissions and improve local air quality. An uptake of active travel will contribute to better health and wellbeing.
England's Economic Heartland Transport Strategy (2020)	Improve local and rural connectivity to support a green recovery from COVID-19 and sustainable growth, whilst reaching Net Zero by 2050.	Delivery of the Barton Greenway will directly contribute to the furthering of this strategic aim to 'improve local and rural connectivity.' The Barton Greenway along with the other Greenway schemes will together provide a network of radial routes from the centre of Cambridge, providing surrounding communities with access to the centre. Doing so through active travel will reduce greenhouse gas emissions.

Policy	Key Strategic Objectives	Barton Greenway Scheme alignment
The Cambridgeshire and Peterborough Local Transport Plan (2019)	Aims to connect all new and existing communities sustainably and provide an integrated rural public transport network.	Delivery of the Barton Greenway will further these strategic goals by providing a sustainable and active travel network in Cambridgeshire and Peterborough. Communities will be safer and better connected, whilst air quality levels will be improved. The delivery of Barton Greenway will be key to ensuring a positive uptake of technologies such as affordable e-bikes and cargo bikes, and for new bike sharing schemes that are supported by the policy.
Local Transport and Connectivity Plan (Draft, 2022)	Aims to address four transportation challenges highlighted by the impact of the pandemic: ▪ Connectivity and accessibility ▪ Making systems work ▪ Affordability and flexibility ▪ Environmental impact Aims to provide improvement in six key areas of productivity, connectivity, climate, environment, health and safety.	The Barton Greenway scheme contributes towards delivering elements of an integrated transport system recognised in the LTCP, such as providing safe and attractive walking and cycling infrastructure. The delivery of Barton Greenway scheme will encourage mode shift to sustainable modes of transport by providing active travel infrastructure.

1.5.5. This section addresses local policies and the alignment of the Barton Greenway with these polices.

Cambridge Local Plan (2018)

1.5.6. The Cambridge Local Plan covers the period of 2018-2031 and identifies the need for 14,000 additional homes and 22,000 jobs. It identifies a series of 'Areas of Major Change' (AOMC), through which a number of the Greenways will run. The Barton Greenway will provide connections for local residents and provide an opportunity for an active commute to new businesses and for employees in the area.

South Cambridgeshire Local Plan (2018)

1.5.7. Chapter 10 of the Local Plan addresses transport, outlining the aim to 'promote and deliver sustainable transport and infrastructure.' The plan highlights the need for transport provision to be balanced in favour of sustainable modes, to give people a choice as to how they travel.

1.5.8. The Barton Greenway will contribute directly to this strategic aim, providing a sustainable and active travel choice for local communities and commuters alike. By investing in the cycle network, both first and last mile journeys may be made by an active mode, thereby integrating into the wider transport network.

First Proposals: Emerging Greater Cambridge Local Plan (2021)

1.5.9. The Greater Cambridge Local Plan aims to effectively plan and allocate sites over both Cambridge and South Cambridgeshire. The plan aims to make Greater Cambridge a place where a large decrease in climate impacts correlates with a large increase in quality of life for all communities. It outlines that new development must reduce carbon emissions and reliance on the private car and contribute towards creating thriving neighbourhoods.

1.5.10. Delivery of the Barton Greenway furthers the aims of the emerging Joint Local Plan as active travel is proven to improve quality of life through better health and access to greenspace. It will also contribute to a reduction in greenhouse gas emissions through reducing the demand on the road network and thereby levels of car use.

Active Travel Strategy for Cambridgeshire Consultation Draft (2022)

1.5.11. The Active Travel Strategy for Cambridgeshire builds on achievements in encouraging active travel to date reflected in the high levels of cycling in the city of Cambridge, with the aim of further improving and increasing the proportion of journeys made by active modes across all of Cambridgeshire. The Strategy will enable and encourage more people to switch some of the journeys they once made by private car to active modes, making the use of active modes, travellers preferred mode of travel.

1.5.12. Following consultation, which came to an end in November 2022, a programme of schemes for future funding bids and delivery will be finalised, aligning with the Local Cycling and Walking Infrastructure Plan.

1.5.13. The Strategy will provide a comprehensive set of policies that will enable quality provision of active travel infrastructure and initiatives in Cambridgeshire to contribute to the County Council's target to achieve Net Zero Carbon by 2045.

SUMMARY OF POLICY CONTEXT

1.5.14. Delivery of the Barton Greenway contributes to key strategic policies through delivering an active and sustainable mode of travel via a green infrastructure network which will encourage a modal shift away from the car. In doing so, the scheme will deliver multiple environmental, social and economic benefits, and contribute to the reduction in greenhouse gas emissions required to meet Net Zero targets by 2050.

1.6 CONTEXT AND CURRENT SITUATION

1.6.1. This chapter sets out the socio-economic context, the current situation and outlining the strategic need for the scheme.

ECONOMIC CONTEXT

Employment and Skills

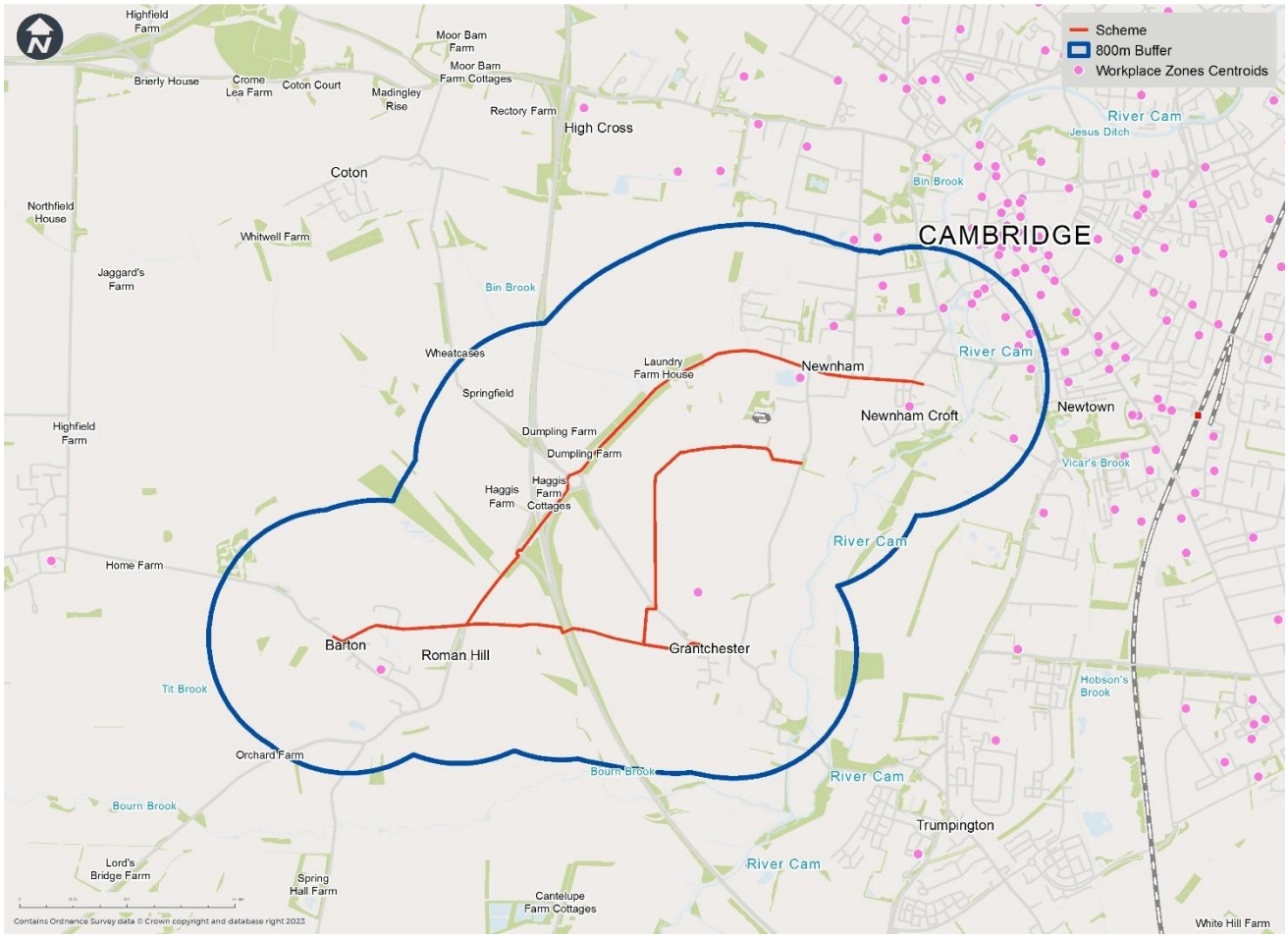
1.6.2. Cambridge is a key economic centre for research, innovation and technology, and is strategically important for attracting international investors into the UK. This relies heavily on Cambridgeshire continuing to offer strong links between businesses, training campuses and housing developments.

1.6.3. Tackling congestion was identified in the City Deal as a key barrier to growth. GCP aims to reduce traffic by up to 15% on 2011 levels, equivalent to taking one in four cars off the road compared to today's traffic flows. Commuters into Cambridge by car spend on average a quarter of their journey time stuck in traffic, with significant implications for their productivity and wellbeing. Absence of attractive sustainable travel options linking housing, education and employment further adds to reliance on car use.

1.6.4. The village of Barton is less than one mile from the M11, via Barton Road. Baton is located on the A603, a radial single carriageway linking the village with Cambridge. The A603 also joins the A505 and M1, linking Barton to London. Cambridge railway station is approximately a fifteen-minute drive from Barton and provides rail connections to London King's Cross and Liverpool Street. Given Barton's proximity to Cambridge, most residents commute to work at locations in the city and across southern Cambridgeshire. The proposed Barton Greenway provides an alternative active travel commuter link from the south western settlements at Barton and Grantchester to Cambridge city centre.

1.6.5. As indicated in Figure 1-2 the workplace zone centroids are concentrated in the east of the scheme corridor in the city centre. To the west of Cambridge, the workplace zone centroids are located further apart at Barton and Grantchester. In the absence of a safe, continuous, and attractive active travel option, workers commuting from residential areas in the Barton corridor to these workplace zones are reliant on cars for these shorter commuting trips further adding to traffic flows along not only strategic corridors, but also local routes. Increased traffic on local village roads creates an unsafe and unpleasant environment for active travel, hence further discouraging uptake of cycling or walking.

Figure 1-2 : Workplace Zone Centroids



1.6.6. The Draft LTCP identified through stakeholder engagement that poor transport services and transport connectivity is a major challenge and constraint for students, adult learners, and employees to access opportunities. The cost of transport that inhibits many lower-income groups to access learning or employment opportunities and exacerbates rural disparities has also been raised. It is noted that transport in the towns and rural communities is a particular challenge for accessing learning or employment opportunities.

Spatial Development

1.6.7. The 'city fringe' growth in Cambridge has been shown to yield at least 41% active travel mode share and only 33% travel by car.[2] This indicates that there is existing demand and potential new demand for active travel infrastructure from 'city fringe' markets such as Barton, Roman Hill and Grantchester.

1.6.8. In addition to the allocations in South Cambridgeshire region, as per the HELAA Published Sites November 2021 and HELAA Site Updates (Amended Land Use or Development Amount) July 2022

[2] Draft LTCP. Draft-LTCP.pdf (yourltcp.co.uk)

sites, 2,800 residential units are proposed at the mixed-use development at Land north of Barton Road and Land at Grange Farm.[3]

1.6.9. Considering 56% of workers in the scheme area MSOA commute to Cambridge for work and that 56%[4] of the population from MSOA containing Barton and Grantchester use car for work trips to Cambridge, a higher residential allocation would be anticipated to result in increased car use in these areas. This would result in increased traffic flows from these areas to Cambridge on the A603 unless an alternative attractive sustainable transport option is provided.

1.6.10. The Census 2021 distance travelled to work data for the LSOA containing Barton, Roman Hill, Grantchester and other villages along the Barton Greenway corridor indicates that 45% of total commuting trips are less than 5km in distance. A high proportion of smaller distance commuter trips indicates an opportunity to encourage mode shift to active modes with improved cycling and walking infrastructure.

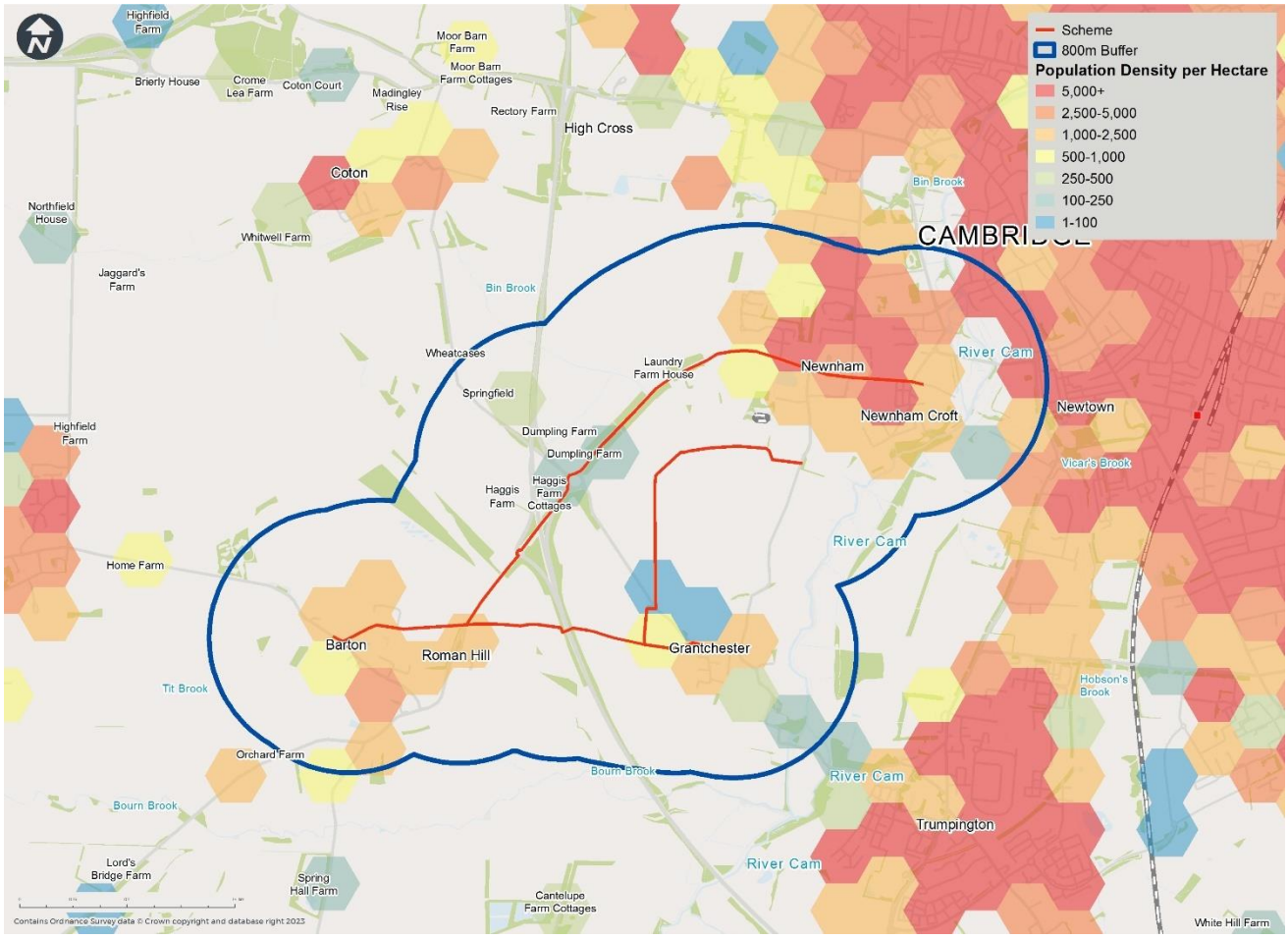
Population Growth

1.6.11. The population of Cambridge is expected to grow in the coming years, and the transport network is required to accommodate that growth. In South Cambridgeshire, the population size has increased by 8.9% from around 148,800 in 2011 to 162,000 in 2021[5]. This figure is higher than the overall increase for England which was 6.6%.

1.6.12. Barton is located within the Cambridge greenbelt. The Barton Greenway would enable a sustainable travel link from these settlements to Cambridge which is the major employment centre for the South Cambridgeshire urban fringe. Figure 1-3 shows the resident population per hex-cell, with each hex-cell representing an area of 5 hectares to enable consistent comparison across the study area.

[3] Site submissions (greatercambridgeplanning.org)
[4] MSOA level Method of travel to work Census 2011 (WU03EW)
[5] https://www.ons.gov.uk/visualisations/censuspopulationchange/E07000012/

Figure 1-3 Resident Population (Census 2021 estimate)



1.7 SOCIAL CONTEXT

Community Characteristics

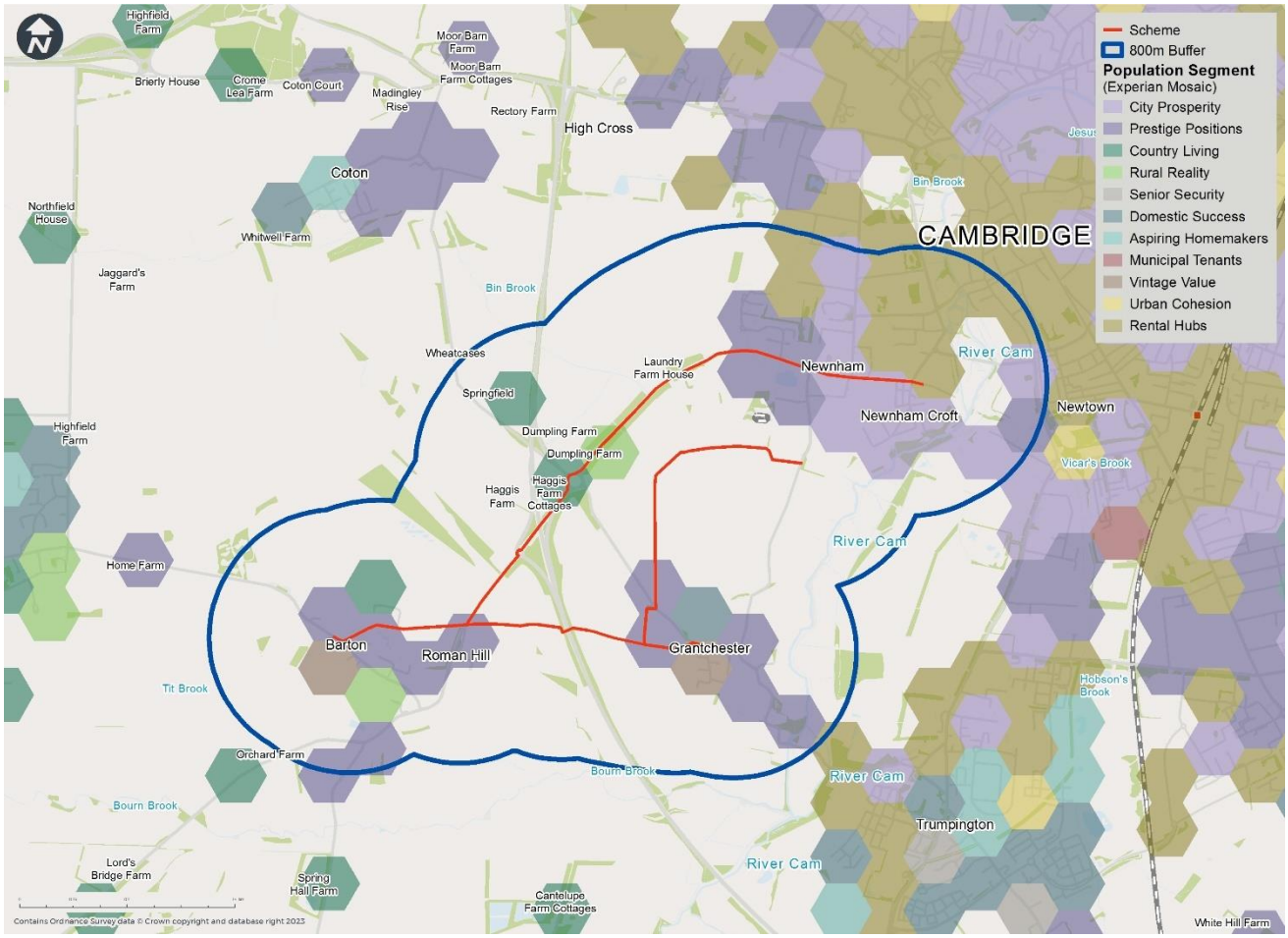
1.7.1. Figure 1-4 presents Mosaic data (collected by Experian), a cross-channel consumer classification system which segments the population into 15 groups based on their consumer behaviour.

1.7.2. The mosaic presents clusters of ‘Prestige Positions’, ‘County Living’, and ‘Rural Reality’ population segments in the scheme area near Barton, Roman Hill and Grantchester. Closer to Cambridge concentrations of ‘City Prosperity’ population are identified.

1.7.3. ‘Prestige Positions’ segment has low propensity for using public transport or shared modes and rely majorly on cars. ‘Rural Reality’ consist of low income and middle-income households respectively and have a preference for affordable modes of transport services. Limited affordable alternative transport options create challenges such as inequitable access to education and employment for these population segments.

1.7.4. ‘City Propensity’ are higher income individuals with low levels of car ownership associated with their desire to live in urban centres. This population segment consists of individuals that are highly educated (such as university employees), very ambitious and focused on their careers. Many of this group are single and are less likely than others to have children. Lack of car ownership in this population segment indicates demand and propensity towards active travel, however poor cycling and walking infrastructure might impact uptake of active travel use.

Figure 1-4 Mosaic Groups



Ageing Population

1.7.5. In South Cambridgeshire there has been an increase of 28.7% in people aged 65 years and over and a 11.5% increase in the population of people between 50 and 70 years in the last decade. Figure 1-5 shows the proportion of 50 – 70-year-olds in the scheme area based on Census 2011 data. It is observed that the majority of LSOAs in the scheme area consist of 21- 30% of the population being between 50 to 70 years of age.

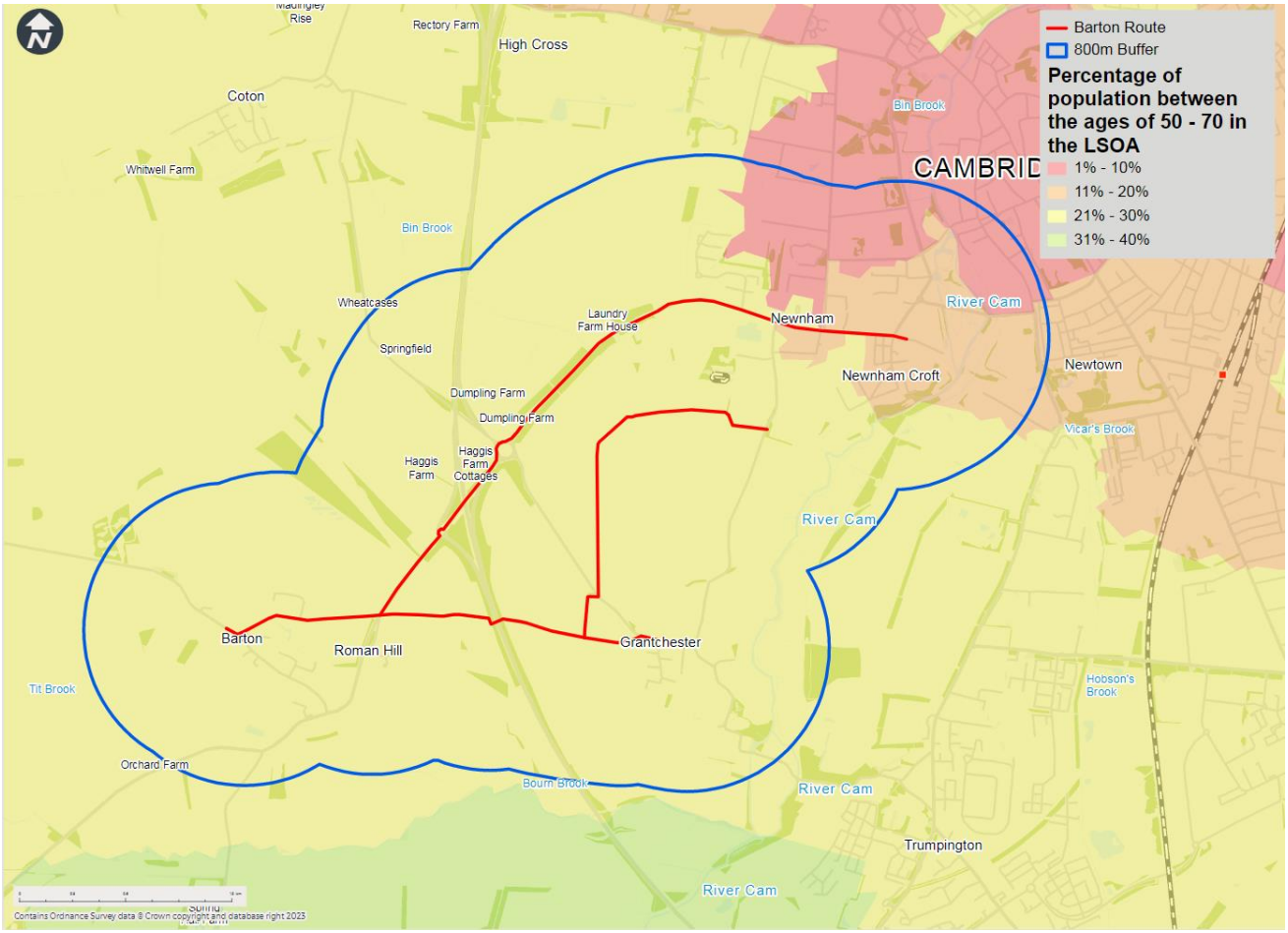
1.7.6. In a report prepared by the Centre for Ageing Better and Sustrans[6], it is noted that levels of physical activity and of active travel drop off rapidly with age. Considering physical activity levels make people healthier and help to lead to longer and more independent lives, it is deemed essential that older people should be targeted to address the decline. Given that around one-third of the

[6] Best foot forward: Exploring the barriers and enablers to active travel among 50-70 year olds | Centre for Ageing Better (ageing-better.org.uk)

population in the scheme area are between 50 – 70 years old, the lack of active travel infrastructure and options to enjoy the outdoors adversely impacts overall community health and wellbeing. Active travel improvements and opportunities are considered factors that contribute to encouraging active travel and result in physical and mental wellbeing in people within the 50 – 70-year-old age group.

1.7.7. Barriers to cycling are identified to be more pronounced for some user groups. In terms of age, the percentage of the population that cycles at least once a week drops from 46% of people aged 56-65 to 24% of people aged 66+. Recognising that South Cambridgeshire has seen an increase of 28.7% in elderly population in the region, the negative correlation between cycling and age is a major challenge. Improvements to cycling infrastructure including surface improvement, lighting, and safer crossings all of which contribute to road safety and personal safety are considered necessary to encourage uptake of cycling, specifically in the elderly.

Figure 1-5 : Percentage of population between 50 and 70 years by LSOA (Census 2011)



1.8 TRANSPORT CONTEXT

Road Network

1.8.1. The areas which Barton Greenway connects can currently be accessed by vehicles from Cambridge using the A603 from Barton and Grantchester Road from Grantchester. The A603 intersects with the M11 at Junction 12. The highest flows on the strategic network in Cambridge were observed on the M11 between Junction13 and 11 to the west of Cambridge, this implies that approximately a third of traffic on this section of the M11 is accessing Cambridge as the flows either side of these junctions drops considerably.[7]

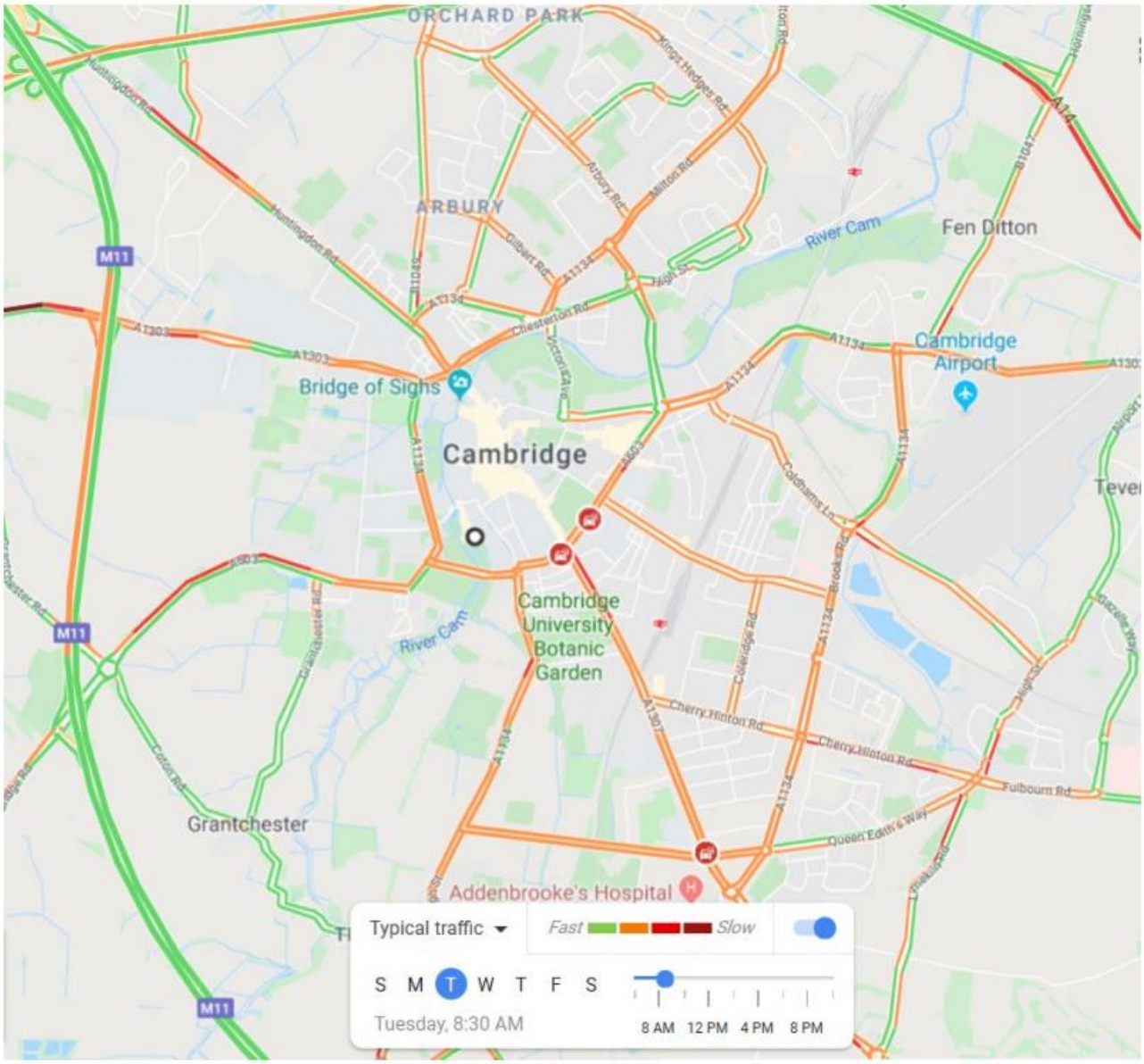
1.8.2. The Existing Transport Conditions Report notes that congestion acts to limit the effectiveness of the transport network. The average speed on all radial routes entering Cambridge during the peak hour is less than 60% of the 'free flow' speed (i.e. the speed that a motorist would travel at on a road if there were no congestion or other adverse conditions).

1.8.3. As indicated in Figure 1-6, all the major arterial routes into the city were showing very slow to stationary traffic at 8:30 in the morning. The A603, in particular, shows worst conditions among all radial routes entering Cambridge at AM peak.

1.8.4. With an expected rise in traffic flows from allocated and proposed developments west of Cambridge and along the A603, it is evident that a lack of alternate provision will result in congestion further acting as a barrier to the uptake in cycling.

[7] Existing Transport Conditions Report (November 2020) prepared as an evidence base for Greater Cambridge Local Plan Greater Cambridge Local Plan: Existing Transport Conditions Report (Cambridgeshire County Council Transport Infrastructure Policy and Funding Team) November 2020 (greatercambridgeplanning.org)

Figure 1-6 : Observed AM Traffic Congestion in Cambridge City 2019[8]



Bus Network

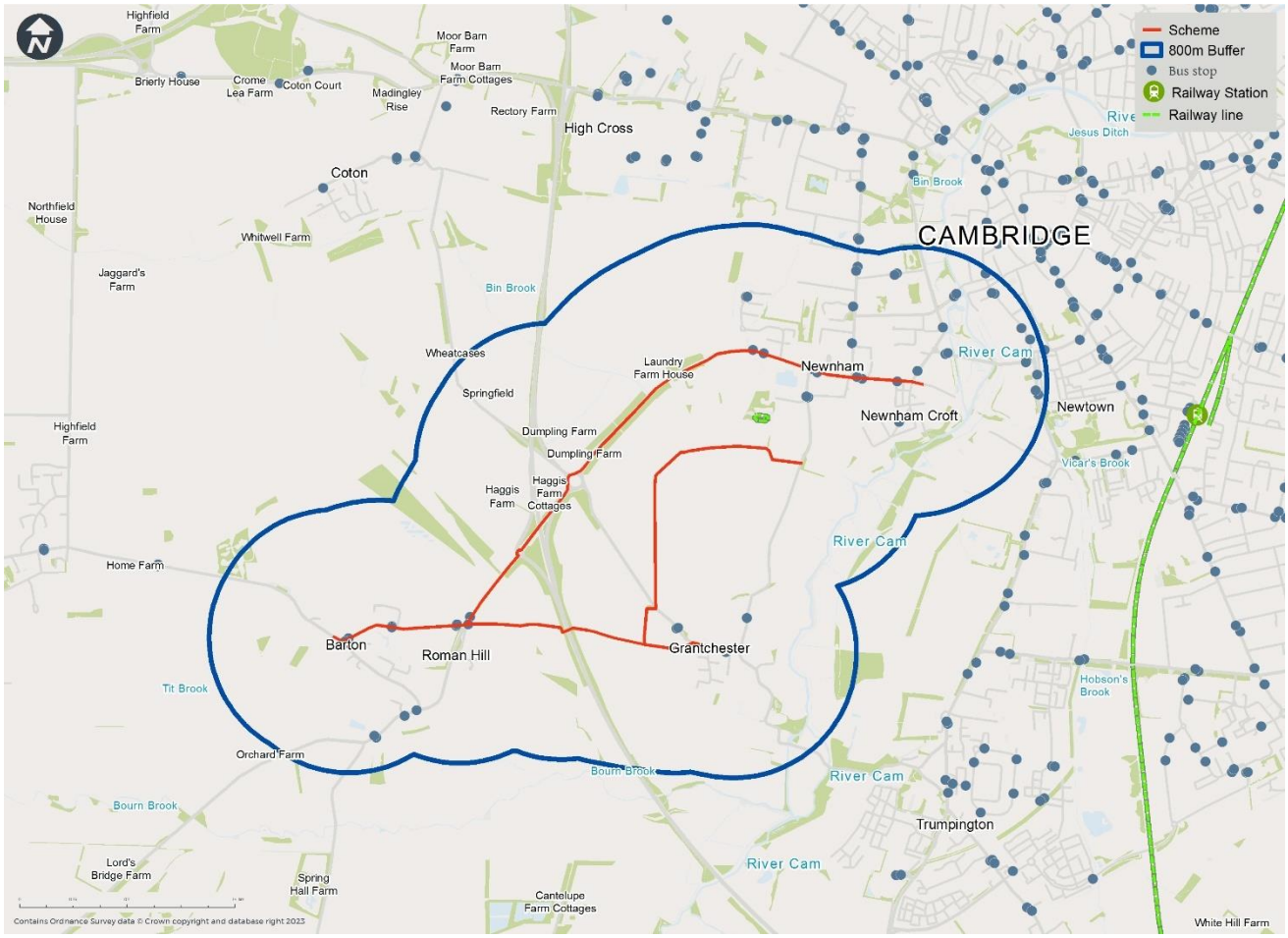
1.8.5. Barton bus stops are serviced by routes 18 and 75. Route 18 connects Barton to St. Neots and Cambridge while 75 connects to Wrestlingworth and Cambridge. Grantchester is served by Route 18 and Route 118. Route 118 connects Grantchester to Cambridge.

1.8.6. As indicated in **Figure 1-7,** bus stops are located only at Barton, Roman Hill, Grantchester and Newham along the Barton Greenways scheme corridor. However, there are multiple trip generators,

[8] Greater Cambridge Local Plan: Existing Transport Conditions Report (Cambridgeshire County Council Transport Infrastructure Policy and Funding Team) November 2020 (greatercambridgeplanning.org)

especially leisure and education, that are present along the corridor. Some of the leisure trip generators include Cambridge Polo Club, King's College and Selwyn College Sports Ground, Cambridge Rugby Football Club, and the Peter Boizot Sports Ground. Laundry Farm school and MATELab Research Institute are also accessed by A603. Improvements to active travel infrastructure along the corridor has the potential to encourage mode shift to public transport by providing safe and accessible first / last mile connectivity to these key trip generators along the corridor as they fall well within 10 minutes cycling distance from the nearest bus stops.

Figure 1-7 : Public Transport Network



Cycle Network

1.8.7. Barton is within easy cycling distance from Cambridge and was one of the first villages to have its own dedicated off-road cycle link with the city. It is an important gateway to the city for a number of villages. The local cycling network is shown in Figure 1-9.

1.8.8. Between Grantchester and Barton there is an existing bridleway that is a very direct and potentially attractive route. It crosses the M11 on an existing farm accommodation bridge and links well with roads at both ends.

1.8.9. On average, 36% of commuters travel to work by bicycle to Cambridge from the Barton Greenway scheme corridor. As further indicated in Figure 1-8 and

1.8.10. Figure 1-10**,** there is an existing east-west movement demand and the A603 is a popular cycle route connection between Barton and Cambridge.

1.8.11. Currently, there is a shared-use path on the northern side of Barton Road (A603), connecting Barton and Roman Hill and other settlements along the route to Cambridge. This route crosses the M11 bridge and two main roundabouts at the M11 North slip road and at the Barton Road, Coton Road and Grantchester Road roundabouts, all of which are points of safety concerns for cyclists. The route generally works well, but space is constrained at the Lammas Land end, the crossings of side roads can cause safety issues at times, the crossings of motorway slip roads are a safety concern and the need for path surfacing is an issue, therefore providing a need to improve the route.[9] The Strava heatmap (Figure 1-8**)** below also indicates strong cycling demand along the route.

Figure 1-8 STRAVA Heatmap indicating current cycling demand

[9] Barton Greenway Review, Nigel Brigham & Associates (2016)

1.8.12. Unsafe crossing conditions over the M11 bridge is an identified challenge for cyclists along the route. The existing shared use path over the bridge is narrow and is not segregated from motor vehicle traffic worsening safety concerns for cyclists.

1.8.13. Within Barton, the existing shared use path stops on Barton High Street. Beyond there is a footway of variable standard to the edge of the village, where the Greenway route finishes. With respect to LTN 1/20 cycling infrastructure design standards the existing path should be widened to encourage more active travel usage by the local population.

1.8.14. Cyclists from Comberton are currently served by a shared use path via Barton which is relatively narrow in places, but is well-used. In 2018/19, a Greenways 'quick win' scheme provided some improvements to the Comberton to Barton link..

Figure 1-9 - Existing cycle network

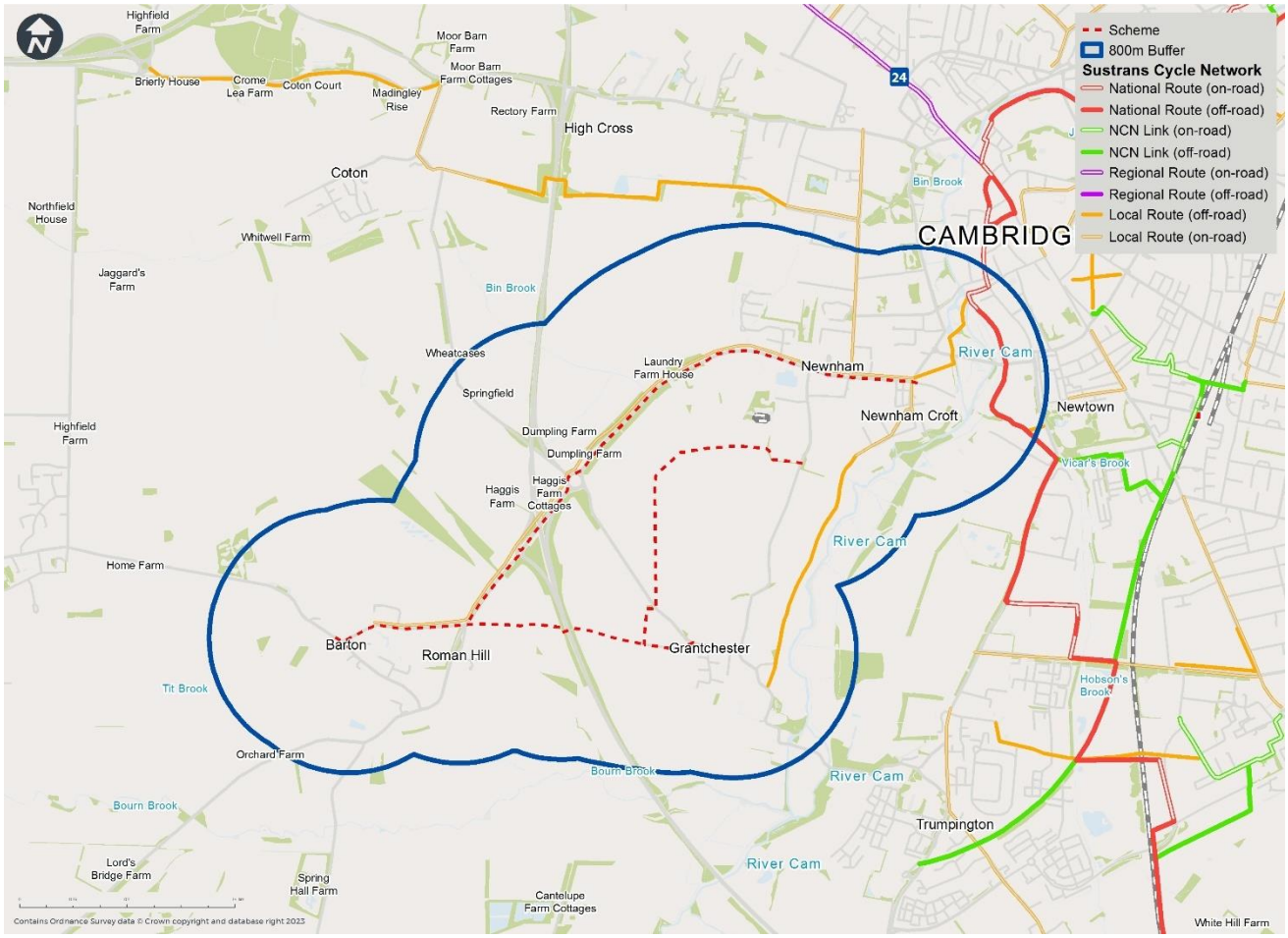
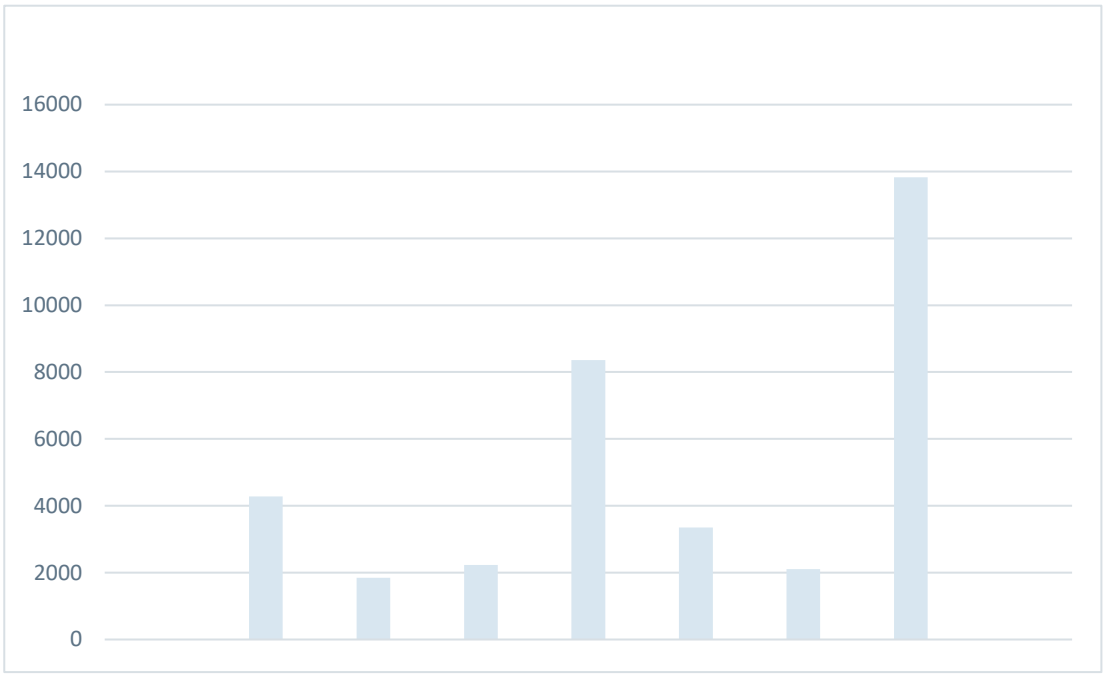


Figure 1-10 - Existing Cycle Trips in the Barton Corridor[10]



1.8.15. There is a high-density cycle network closer to Cambridge City which the Barton Greenway connects to via Comberton and Haslingfield Greenways. The scheme also connects to other city cycle schemes such as the Chisholm Trail and the other Greenways schemes and is linked to the C2C scheme via Comberton Greenway and 'quick win' schemes. The Barton Greenway provides an opportunity to connect residents at Barton, Roman Hill and Grantchester to the regional cycling network.

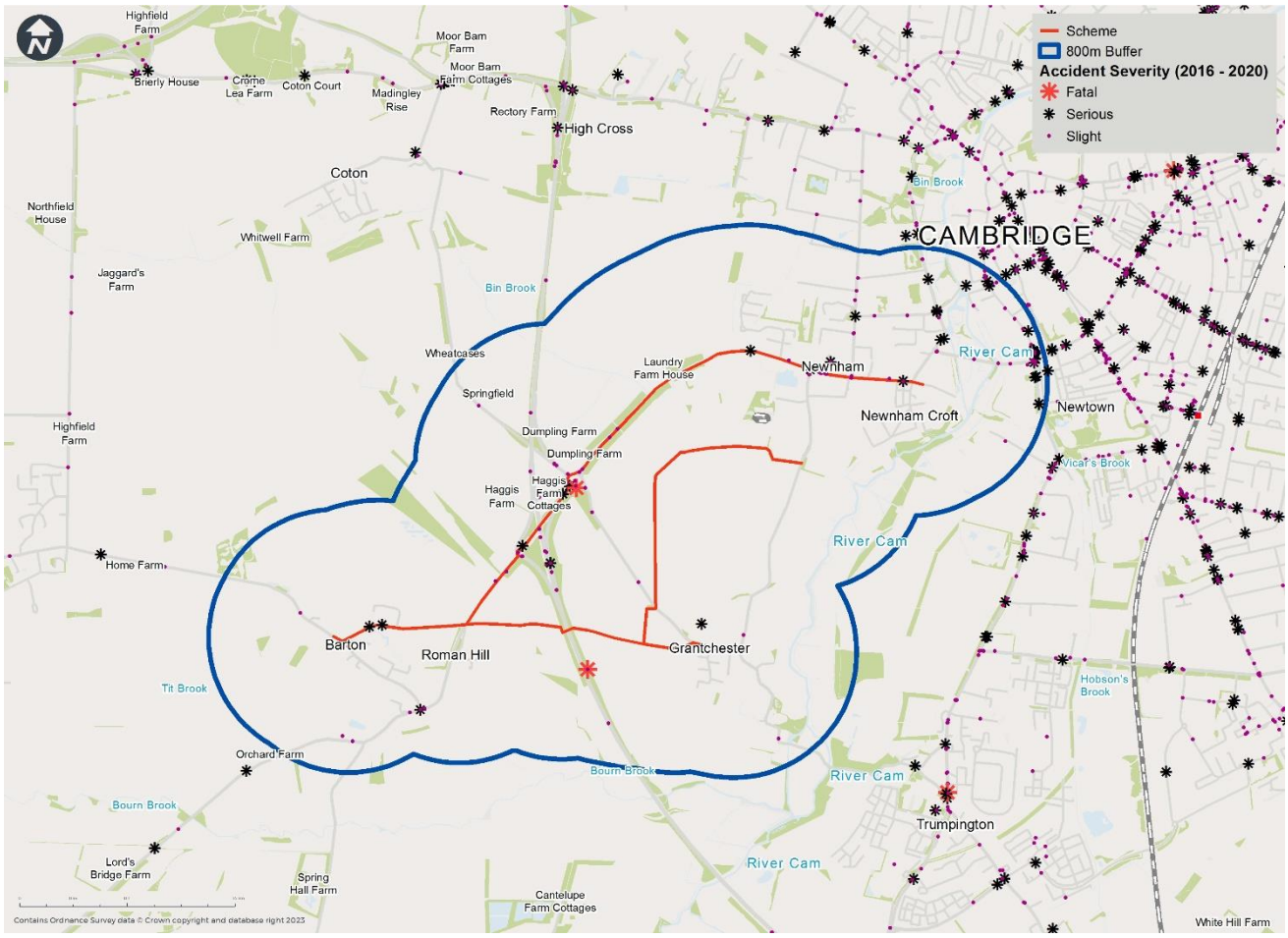
Road Safety

1.8.16. A study of accidents involving cyclists over the five-year 2016-20 time period indicated that 1 was fatal, 2 serious and 11 were slight, indicated in Figure 1-11. The two roundabouts along the scheme corridor were identified as hotspots for these accidents. One slight severity accident was recorded at the M11N Slip roundabout and 1 fatal, 1 serious and 2 slight accidents involving cyclists was noted at the Barton Road, Coton Road and Grantchester Road roundabout.

1.8.17. The main impediments to safety along the existing routes include surface quality, lack of safe crossing locations and absence of speed limits and traffic calming measures on shared routes.

[10] The demands have been estimated using CCRM01 and 2022 traffic surveys

Figure 1-11 : Accidents by Severity (2016-2020)



Demand and Support for Active Mode Infrastructure

1.8.18. The Walking and Cycling Index[11] is delivered by Sustrans in collaboration with Cambridgeshire County Council and GCP. The results presented in the report for 2021 include local walking and cycling data, modelling and an independent survey of 1,296 residents aged 16 or above in Greater Cambridge.

1.8.19. It is evident from the report that leisure and destination-based trips are approximately equal in the Greater Cambridge region. Of all walking and wheeling[12] trips, 48% were undertaken by adults to a destination (such as work, school, shopping), 46% of trips were for enjoyment or fitness by adults and children and 6% were trips undertaken only by children to school.

[11] https://www.sustrans.org.uk/media/10484/greater-cambridge-walking-and-cycling-index-2021.pdf

[12] The Walking and Cycling Index recognises some people, for example wheelchair or mobility scooter users, identify with the term wheeling instead of walking. Therefore, the terms walking and wheeling together and consider walking and wheeling to include the use of mobility aids and pushchairs. All walking survey responses within this report include responses from people who wheel.

1.8.20. 74% of the surveyed residents agree that more cycle tracks along roads, physically separated from traffic and pedestrians will support more liveable neighbourhoods. 68% support the creation of more low-traffic neighbourhoods and 65% agree that increasing space for people socialising, walking and cycling on their local high street would improve their local area.

1.8.21. An increase in the number of people walking and wheeling regularly (at least five days a week) from 2019 is noted. The counts from the River Cam Screenline monitoring showed that there has been an increase in the level of cycling in the city up to 2017, but there are signs of the trend levelling off in 2018.[13] The statistics from the Walking and Cycling Index also note that the number of people cycling in Greater Cambridge has stayed the same from 2019.

1.8.22. Barriers to cycling in Greater Cambridge are more pronounced for some user groups. Safety including road safety and personal safety is recognised as the single largest barrier to cycling. 50% of men cycle at least once a week as opposed to only 40% of women. While 49% of non-disabled people cycle at least once a week only 29% of disabled people cycle at least once a week.

1.8.23. Wider pavements, more frequent road crossings, with reduced wait times, nicer places along streets to stop and rest, better accessibility, fewer cars parked on pavements and reduced fear of crime and antisocial behaviour in the area have been noted as improvements that would encourage residents to walk more.

1.8.24. Similarly for cycling improvements such as traffic free routes, cycle tracks with physical segregation, signposted cycle routes along quieter roads, and better links to public transit are noted to encourage cycling.

1.9 ENVIRONMENTAL CONTEXT

1.9.1. Implementation of the Barton Greenway scheme will encourage some mode shift away from motorised forms of transport resulting in a reduction in levels of traffic along A603 and through-traffic in Barton, Roman Hill and Grantchester along the route, reducing the impact of greenhouse gases and health-related pollutants such as NOx and PM10. A healthier environment will contribute to meeting strategic aims of reducing greenhouse gas emissions and achieving Net Zero targets

1.9.2. Construction of the Barton Greenway will also have Green Infrastructure and Natural Capital impacts. The scheme will be designed to provide environmental, cultural and social benefits including wildlife corridors, linking areas of habitat together and creating new areas of habitat. The net impact will be to create well-designed places that deliver on natural capital enhancements and biodiversity gain in line with the Cambridge Local Plan and Environment Bill.

Air Quality

1.9.3. Cambridge is located within an AQMA (Cambridge AQMA). The Barton Greenway partially lies within the south-western corner of the Cambridge AQMA. The Proposed Scheme is a greenway and

[13] https://www.greatercambridgeplanning.org/media/1398/gclp-strategic-spatial-options-assessment-existing-transport-conditions-report-nov2020.pdf

therefore is intended to introduce enhanced walking and cycling facilities meaning it is not anticipated that there will be any operational effects on the AQMA.

1.9.4. AQMAs are areas declared by the council for monitoring and improvement where it has been found that air quality objectives are not being met. The delivery of the Barton Greenway will improve air quality locally by providing safer cycling and walking infrastructure that encourages mode shift away from car travel.

Noise

1.9.5. Noise has a large impact on both the physical and mental health of those living and working near major road links such as the A603. Traffic noise can be a significant contributor to ambient noise levels; by delivering the Greenways and encouraging modal shift away from the car, noise levels in and around the scheme area can be expected to reduce.

Historic Environment

1.9.6. There are 5 Conservation Areas[14] in Barton, Grantchester, West Cambridge, Newnham Croft and Central Cambridge, which the local councils have a duty to protect that are within or adjacent to the Barton Greenway scheme.

1.9.7. It is vital to preserve the setting of the historic buildings and open spaces and ensure that the development of any transport scheme contributes to this preservation. There is a need to manage traffic levels to avoid noise, congestion, and pollution which all have a significant negative impact. This can be partly achieved through the delivery of sustainable active transport networks such as the Barton Greenway.

1.10 IMPACT OF NOT CHANGING

1.10.1. Without delivery of the Barton Greenway scheme, the car will remain the dominant mode of transport for commuting even for shorter trips that could be undertaken by active travel. There is a risk that existing demand for cycling declines due to an increasingly unattractive cycling environment, and reliance on the car will increase. Not only will this have negative consequences for local communities with increased congestion, but the environment will also suffer from high levels of greenhouse gas and carbon emissions, and physical and mental wellbeing will be negatively affected. The Cambridge City Deal objectives of developing active travel modes to support the planned travel needs of new housing developments and employment will also be adversely impacted.

1.10.2. Without the delivery of the Barton Greenway, the opportunity to realise net biodiversity gains will be reduced, resulting in a less attractive environment without an enhanced natural habitat.

Delivery of the Barton Greenway is therefore key in meeting the challenges identified with the current situation, and as described below, in supporting national, regional, and local strategic priorities.

[14] https://www.scambs.gov.uk/planning/search-by-map/

1.11 STRATEGIC NEED

1.11.1. The strategic need for the Barton Greenway is set out in this section. The key objectives are aligned with the Greenways Programme as a whole. **Table** 1-3 focuses on the more specific needs for the Barton Greenway.

Table 1-3 – Strategic Need for the Barton Greenway

Facilitating a growing economy	As the economy and population of Cambridge continues to grow, with the planned delivery of 33,480 new home and 44,000 new jobs by 2031, there is a strategic need to provide a sustainable transport network to cater for the increased demand. The Transport Strategy for Cambridge and South Cambridgeshire indicates that 19,000 new homes are needed in the area to keep up with rapid population growth, which will result in an increase in the number of people making road-based commuter trips into Cambridge along A10 and A603. Without the provision of a sustainable alternative, current levels of congestion will worsen, and journey times will increase on the local road network. As has been shown in Section 3.3, the majority of local residents work in Cambridge and will use the already congested A603, A10 and/or M11 corridors to access the city centre. Stationary traffic in queues is the leading contributor to levels of NOx. Reducing levels of congestion will contribute to a cleaner air environment. The Barton Greenway will provide residents of Barton with a new direct cycle connection between Barton and west Cambridge and offer a connection to Grantchester and the Haslingfield Greenway, reducing cycling journey times by as much as 11.88 minutes. This will provide an incentive for both existing and new residents to consider switching mode from car to cycling. This will not only lessen the impact of traffic congestion as new residential developments are completed but encourage a shift by current car users to cycling. In the Economic Case an assessment of new to cycle demand as a result of the implementation of the Barton Greenway shows that an uplift to existing cycle demand of 25% and pedestrian demand of 10% is anticipated.
Connecting the city with sustainable transport modes	Economic growth will correlate with a greater number of trips made, and therefore a greater demand on the road network if nothing changes. Without new sustainable transport interventions peak hour journey times are forecast to increase by as much as 90%. This traffic congestion will cause delays resulting in a fall in productivity. Sections of the traffic corridor connecting Barton to Cambridge such as A603 (Barton Road) and M11 at Junction 12 suffer traffic congestion at peak times. There is therefore a strategic need to reduce the number of trips made by car and provide a sustainable and active alternative transport solution. The Barton Greenway will provide a key element of this sustainable transport plan providing cycling and walking corridors connecting the city with rural settlements in south Cambridgeshire. The Greenway will provide significant improved cycling connectivity. By providing a more direct sustainable transport connection between Barton and Cambridge, the Barton Greenway will improve sustainable transport connectivity between south-west Cambridge and the city centre. At a strategic level the Barton Greenway will link into the City Access / Making Connections plans prioritising sustainable transport through a new bus network, better cycling and walking routes and high-quality public spaces.

	The City Access programme will increase the attractiveness of the cycling network, connecting the Greenway programme of active mode corridors with the city centre including the Barton Greenway. The impact of this wider cycling connectivity will be to encourage significant mode shift to non-car modes. Making Connections will implement a Sustainable Travel Zone (a road-user charging scheme) to funding public transport, cycling and walking improvements, whilst discouraging car use in the city centre. Improved cycling infrastructure and connectivity will, in conjunction with improvements to the bus network, offer attractive active mode and public transport options as an alternative to the car.
Sustainability Agenda	The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries, developed and developing, in a global partnership. They recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth. All while tackling climate change and working to preserve our oceans and forests. Barton Greenway supports the sustainability agenda as part of the overall Greenways project which promotes sustainable development of the Greater Cambridgeshire region by making cycling more attractive as a mode of transport. The enhanced active travel connectivity to employment and education provided by the Greenways encourages modal shift to sustainable modes of transport. It further reduces inequitable access to opportunities by providing affordable travel options to education and job centres.
Decarbonisation Agenda	National policies outlined in Section 1.5 detail the strategic need to align with Net Zero targets through the Ten Point Plan for a Green Industrial Revolution, Gear Change, and the Cycling and Walking Investment Strategy. At a regional level, the Cambridgeshire and Peterborough Independent Commission on Climate outline the importance of acting on sustainable opportunities to improve air quality, greenspace, and meet Net Zero targets. The Barton Greenway has the potential to be a Net Zero carbon project by offsetting construction carbon and adhering to the strategic aims of the outlined policies. With 81% of NOx coming from road traffic in Cambridge, there is a strategic need for modal shift away from the private car towards more sustainable modes of cycling and walking. Through the delivery of the Barton Greenway a net reduction in highway-kilometres is expected as a result of modal shift to active modes, which in turn will lead to a net decrease in greenhouse gas emissions.
Delivery of Biodiversity Net Gain	In order to align with Net Zero targets, the principle of Biodiversity Net Gain (BNG) has been developed. Both the National Planning Policy Framework (NPPF) and the Government's 25 Year Environment Plan sets out the strategic need to incorporate net gains for biodiversity. This is detailed through the Environment Bill and the Town and Country Planning Act (TCPA), which present the requirement of a minimum 10% BNG. The Greater Cambridge Partnership takes the commitment to BNG further through its commitment of 20% as outlined in the Cambridge Local Plan. The Local Plan also

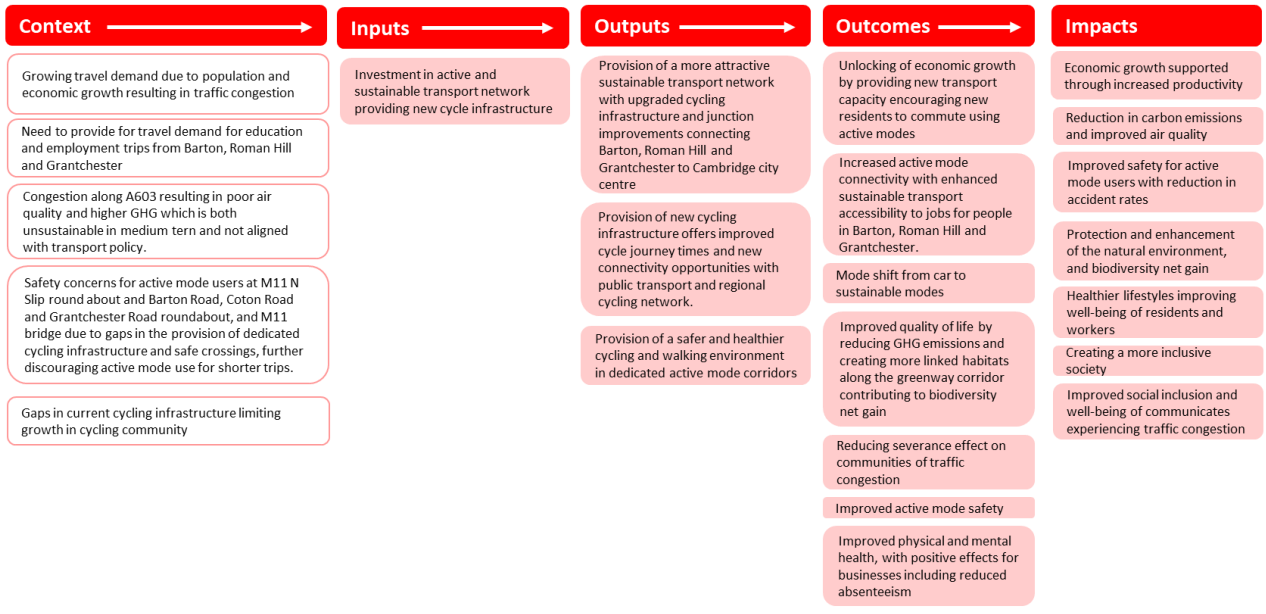
	details the importance of the maintenance of the Green Belt surrounding Cambridge, which will contribute to the biodiversity of the region. The Greenways project as a whole has strong potential to deliver positive gain for biodiversity. There are significant opportunities to achieve this by providing both wildlife corridors adjacent to the road network and prioritising the linking of areas of habitat together and creating new habitats where possible.

1.12 STRATEGIC OBJECTIVES

LOGIC MAPPING

1.12.1. The logic mapping process reflects the current situation, the strategic priorities established in the key national, regional, and local policies and the strategic needs. These relationships apply both to the overall Greenways Programme and individual schemes including the Barton Greenway. The exercise to map these factors and the opportunities has resulted in the identification of the objectives and planned impacts of the Barton Greenway project. This logic map is shown in Figure 1-12.

Figure 1-12 - Logic Map



1.13 SMART OBJECTIVES AND MEASURES OF SUCCESS

1.13.1. The Greater Cambridge City Deal (2014) outlines strategic objectives aimed at enabling a new wave of innovation-led growth by investing in the infrastructure, housing and skills that will facilitate the continued growth of the Greater Cambridge area. The City Deal will provide £1billion of local and national public sector investment to fund growth in Greater Cambridge, enabling an estimated £4bn

of private sector investment in the Greater Cambridge area focussing on areas such as West Cambridge, supported by the implementation of the Barton Greenway.

1.13.2. Delivery of the Barton Greenway will further the strategic goals of the GCP through providing enhanced opportunity for active travel to new residents and commuters. With an increased number of people using active travel modes, levels of congestion will be reduced, and air quality and public health improved.

1.13.3. Table 1-4 presents the Barton Greenway SMART strategic and operational objectives that are aligned with the overall Greenways Programme together with measures of success.

Table 1-4 – Barton Greenway SMART Objectives

Strategic Objectives	Operational Objectives	Measures of Success
Encourage commuting by sustainable transport modes and reduce traffic congestion	Capacity: Provide the cycle network capacity to accommodate increases in active travel demand due to new housing and employment growth	Increase in cycle network capacity Ability to contribute to a reduction in vehicular road traffic Propensity to reduce congestion/delay
Contribute to improved air quality and better public health	Connectivity: Improve accessibility to jobs and opportunities by active modes through a reduction in journey times and increase ease of interchange with public transport modes	Reduced journey time for cycling Scale of catchment (jobs, housing) Ability to unlock growth Ease of interchange with public transport
	Communities: Contribute to the creation of safe and attractive communities by reducing emissions, severance and the dominance of traffic improving personal security and road safety, further resulting in improved community health and wellbeing through uptake of active travel	Road safety Protection of green spaces; net biodiversity gain (across the Greenways programme) Environment (air quality and carbon reduction) Quality of the public realm Severance Increase in cycling and walking trips Improved public health and wellbeing

1.13.4. To plan for the successful delivery of the scheme, the following shall be monitored:

- Planning consents
- Phased programme of construction
- Dependencies are to be understood and delivered

1.14 SCOPE

1.14.1. The Barton Greenway extends from the village of Barton along the B1046 New Road to a major arterial road, A603 Cambridge Road/Barton Road, linking to central Cambridge.

1.14.2. Starting in the west, a section of the Greenway runs from the B1046 / High Street junction in Barton to the New Road (B1046) and Cambridge Road (A603) junction.

1.14.3. At this junction, the Greenway splits into two routes;

- One route runs along an existing shared-use path from the junction with the A603 Cambridge Road and the B1046 New Road in Barton, over the M11, and continues into Cambridge.
- A second route continues east from the A603 Cambridge Road and the B1046 New Road junction along an existing bridleway, and connects to an arm of the Haslingfield Greenway. The track crosses the M11 in the direction of Grantchester. Prior to reaching Grantchester, the track splits into a route section continuing on the bridleway and joining Coton Road in Grantchester, and a second route section continuing along an unsurfaced track and crossing Coton Road to the north of the bridleway, to join another unsurfaced track, and then merging with Grantchester Road and Haslingfield Greenway, adjacent to Cambridge Rugby Football Club.

1.14.4. The Barton Greenway will provide a footpath, bridleway or cycleway for pedestrians, horse riders or cyclists alongside hedges, other planting and landscaping. The Barton Greenway will utilise existing roadways, dirt tracks, footpaths, bridleways and bridges, which will be improved to increase usability and connectivity.

1.14.5. The proposed scheme includes traffic calming measures such as raised tables are proposed at side roads with safer crossings to prioritise pedestrians and cyclists. Junction improvements to increase safety for cyclists and pedestrians at Barton Road, Coton Road and Grantchester Road roundabout and M11N slip road roundabout are also included in the Barton Greenways scheme proposal.

1.15 COMPLEMENTARY SCHEMES

1.15.1. There are a number of complementary schemes which will support the development of the Barton Greenway by extending the network of cycling infrastructure across Cambridge. These complementary schemes are also described in the Greenways POC.

Cambridge City Access

1.15.2. The City Access project aims to improve access to Greater Cambridge by introducing measures to reduce congestion, encourage active travel and improve air quality. The Barton Greenway project is aligned with the objectives of the City Access project. The scheme provides improvements to existing cycling and walking infrastructure and proposes to develop additional routes which encourages active travel and improves air quality as well as provides high quality public spaces.

1.15.3. The City Access Programme comprises of three elements: firstly, the Making Connection Programme improving the environment for active travel modes, transforming the city's bus network and reducing congestion and pollution, secondly, development of an Integrated Parking Strategy, including the delivery if more residents' parking schemes, and thirdly, making the best use of the city's road network including the recent road network classification consultation.

1.15.4. The City Access project is developing a package of measures to deliver a commitment to reduce traffic in Cambridge by 10-15% from 2011 levels by 2030, and is a key complementary scheme for

the Greenways programme. To optimise the success of both, it is vital that the Greenways programme is delivered in conjunction with the eight packages comprising the City Access Strategy (illustrated in **Figure 1-13**).

Figure 1-13 - Cambridge City Access Strategy Measures

Source: Greater Cambridge Partnership

1.15.5. The Barton Greenway will benefit from the positive impacts on reallocation of road space for public transport and active modes incorporated in the City Access Strategy including:

- Reduced traffic congestion within the city centre;
- Faster, cheaper and more reliable bus journeys, enabling expansion of Park & Ride capacity and facilities;
- Safer, easier, and more attractive walking and cycling journeys;
- Reduced pollution and cleaner air;
- Fewer stationary or slow-moving vehicles;
- More cycling and pedestrian infrastructure;
- Preservation and enhancement of Cambridge's historic environment;
- Improvements to the quality and reliability of public transport; and
- Continued growth in cycling.

1.15.6. The Barton Greenway scheme forms part of the larger Greenway Program network that provides improvements to existing cycling and walking infrastructure and proposes to develop additional routes which encourages active travel and improves air quality as well as provides high quality public spaces. The Barton Greenway will enable the achievement of Cambridge City Access objectives in the Barton travel corridor and provide an alternative active travel corridor to car travel on the B1046 and A603 into Cambridge.

Greenways and Madingley Road Scheme

1.15.7. The Barton Greenway will be delivered as a part of a larger network consisting of twelve Greenways that focus on improving existing corridors and development of new corridors to create a more connected active travel network. The complete Greenways network provides active travel infrastructure within Cambridge as well as to and from surrounding villages and market towns.

1.15.8. The Madingley Road project focuses on improvements for walking and cycling along the Madingley Road. The preferred option includes a two-way cycleway on the northside of Madingley Road. Cycleways are mostly segregated from general traffic by a landscaping strip between the carriageway and cycleway. The scheme includes improved, safer crossings for pedestrians and cyclists.

1.15.9. The Barton Greenway provides active travel connections to the southwest of Cambridge and links to both the Haslingfield and Comberton Greenway routes.

Haslingfield Greenway

1.15.10. Haslingfield is located approximately 8km south west of Cambridge and is currently served by shared use paths off Cambridge Road and the A603. The route is proposed to follow the bridleway from Haslingfield to Hauxton and link directly to the Melbourn Greenway and the Cambridge South West Travel Hub at Hauxton. It will then pass through Cantelupe Farm to Grantchester over the M11 Bridge, linking directly to the Barton Greenway. The Greenway will follow Broadway, linking into the north east end of the Baulk path, before extending to Barton Road.

Comberton Greenway

1.15.11. Comberton is located approximately 9km west of Cambridge across relatively flat terrain. For cyclists it is currently served by a shared use path via Barton which is relatively narrow in places but is well-used. Some housing growth is taking place in the village and Comberton has a large and very well-regarded village college. In 2018/19 a Greenways ‘quick win’ scheme provided some improvements to the Comberton to Barton link which has proven popular.

1.15.12. Comberton Greenway would provide a further improved link to Barton as well as important connections to the villages of Hardwick and Coton. The onward route would continue via the Cambridge West Campus and into the city via a new link to Grange Road and Sidgwick Avenue. Finally, a new link across to Barton Road would bring useful and safe connections to the proposed future Barton and Haslingfield Greenway routes.

1.16 STRATEGIC IMPACTS

1.16.1. This section discusses the economic, social and environmental strategic impacts of investment in the Barton Greenway.

1.16.2. The Barton Greenway forms part of a wider policy of developing sustainable transport in the Greater Cambridge area. It contributes to the provision of a sustainable transport network that adds to transport capacity and connectivity essential to maximise the opportunities for housing and economic growth.

1.16.3. Reliance on the road network will increase congestion and delay as traffic growth occurs which will increase in frequency and impact, which investment in additional highway capacity, even if feasible, will not be able to mitigate. Therefore, investment in high quality, safe, attractive and comprehensive

infrastructure to support pedestrians, cyclists and public transport users is essential to meeting this need.

Economic Impacts

1.16.4. From an economic standpoint investment in Barton Greenway will help reinforce Cambridge's competitive knowledge-based economy. It will provide employees in Barton and the other areas served by the Greenway with accessibility benefits due to the improved active mode linkage to the city centre. Segregated cycle infrastructure and reduced cycling times will make sustainable travel to work an attractive option for commuting. Associated with this there will be productivity benefits and reduced employee absences due to sickness. Furthermore, an active travel network is an attractive feature for future businesses looking to locate in Cambridge. Provision of the high-quality active travel corridor enables future-proofing behavioural change for sustainable travel use by connecting planned new housing and employment developments.

1.16.5. A secondary economic impact will be benefits to general road traffic in the congested transport corridors as continuing road users benefit from a reduction in road traffic levels and a reduced rate of growth in road traffic as others choose to use the Barton Greenway as an alternative transport corridor.

Social Impacts

1.16.6. The Barton Greenway will achieve health benefits by encouraging active lifestyles as residents switch to cycling. Physical activity will also have a positive impact on mental health too. The scheme will encourage modal shift resulting in reduced levels of congestion and hence creating a more pleasant living environment. The Barton Greenway will also improve the safety of both active travel and road network users through reduced congestion and a reduction in potential accidents involving cyclists.

Environmental Impacts

1.16.7. The Barton Greenway will encourage mode shift from motorised forms resulting in reduced levels of greenhouse gases and pollutants such as NOx and PM10. This will contribute towards achieving strategic aims of Net Zero targets and improving the air quality of surroundings.

1.16.8. There are also Green Infrastructure and Natural Capital impacts. The Barton Greenway will be designed to provide multiple environmental, cultural and social benefits. The route will also be sensitive to the conservation status of Grantchester Village. The net impact will be to create well-designed and beautiful places that deliver on natural capital enhancements and biodiversity gain in line with the Cambridge Local Plan and Environment Bill.

Table 1-5 – Scheme Benefits

Benefit	Description
Journey time saving	The Barton Greenway will create time saving benefits for cyclists through the provision of more direct and traffic-free routes. Journey time savings translate into improved access to jobs and opportunities.
Increased safety of the cycle network	Segregated travel away from general traffic on the congested road network will decrease the number of accidents.

Benefit	Description
Reduced road traffic for motorists	Users who continue to use the road network will benefit from a reduction in traffic volume and congestion, translating into journey time savings and improved access to jobs and services.
Environmental benefits	Improvement in air quality and carbon reduction as the Barton Greenway encourages a switch from motorised forms of transport and reduced levels of congestion.
Health benefits	A modal shift towards active travel will bring about numerous health benefits, both physical and mental. Access to an active-travel network will future-proof behavioural change.
Improved connectivity and accessibility	Improved access to a quality sustainable transport mode linking the city centre and the Barton corridor.

1.17 OPTION DEVELOPMENT

Overview

1.17.1. The Barton Greenways scheme was developed through a process of identification, prioritisation and consultation

1.17.2. The proposed Barton Greenway links to Cambridge with a spur to Grantchester. The route follows existing quiet roads, off-road paths and busier roads, with the aim of providing a high-quality route to improve and enhance walking, cycling and where appropriate, horse riding in the area.

1.17.3. The proposal includes upgrading the existing shared-use paths to provide safer and more direct routes for pedestrians and cyclists. Traffic calming measures including raised tables are proposed at side roads with safer crossings to prioritise pedestrians and cyclists.

Option Assessment

1.17.4. Schematic/concept design-based work was carried out by 5th Studio. Nigel Brigham carried out an independent review of the 5th Studio designs. The Barton Greenways' initial designs then went to public consultation between 25th June – 20th August 2018.

Consultation

1.17.5. A 'blank canvas' approach was taken during the Barton Greenway consultation and the public were asked their preferences for route alignment.

1.17.6. 532 respondents answered the question about how far they agreed with the individual elements of the proposed Greenway Route.

- The majority of respondents supported the following elements of the proposed Greenway Route:
  - Element 8: 'resurfacing and widening of existing path along the Barton Road' (82%),
  - Element 9: 'improvements to Barton Road, including widening the cycle path and reconfiguring junctions with wider verges' (82%),

- Element 6: ‘changes to the carriageway and widening the path between the two roundabouts and across the M11 Bridge on Barton Road’ (79%),
- Element 4: ‘surfacing improvements on the path between Barton and Grantchester’ (75%),
- Element 2: ‘widening of the existing path along New Road’ (72%),
- Element 1: ‘new raised table at the entrance to Burwash Manor’ (64%),
- Element 5B: ‘roundabout (M11N slip road) Option B’, creation of an underpass (59%),
- Element 7A: ‘Barton Road/Coton Road/Grantchester Road roundabout Option A’, smaller roundabout with underpass (59%),
- Element 3B: ‘New Road/Cambridge Road (A603) junction Option B’, a traffic light system (56%).

- Respondents were not as clear on element 10 ‘development of a route along the Baulk’, with just over two fifths supporting it (41%) and under two fifths opposing it (35%).

1.17.7. 532 respondents answered the question about how far they supported the installation of solar studs in several locations. The majority of respondents supported all four solar stud installation locations.

- 76% supported them at location d: along Barton Road between the M11 roundabout and Cambridge
- 73% supported them at location c: along Cambridge Road towards the M11
- 68% supported them at location a: along New Road towards Cambridge Road (the A603)
- 65% supported them at location b: along the path between Barton and Grantchester

1.17.8. Through a ‘bottom up’ methodology, the GCP has engaged with local communities to ensure that routes meet the local needs of people and take advantage of local knowledge. Overall, the feedback received in 2018 was supportive of the Barton Greenway and provided valuable feedback to help shape developments of the schemes. The key findings from the initial concept designs consultation are presented in Table 1-6.

Table 1-6 – 2018 Consultation

Consultation	Dates	Key findings
Initial concept designs	25th June – 20th August 2018	▪ The majority of respondents being supportive of resurfacing and widening the existing path along the Barton Road. ▪ Support for improvements to Barton Road, with the cycle path widened and the junctions reconfigured with wider verges. ▪ Support for changes to the carriageway and widening the path between the two roundabouts and across the M11 Bridge on Barton Road. ▪ Support for the installation of all four solar stud locations. However, there were also concerns regarding: ▪ The cost of the development. ▪ The negative impact the schemes would have for those with disabilities and younger/older

		residents/travellers, due to the potential increase in cycle speeds on shared use paths.

GCP Board Approval

1.17.10. A summary of findings and final route options were presented to the public and the GCP Executive Board in 2019. The GCP Executive Board then considered the elements of the scheme and selected preferred attributes to be taken forward to the next stage of project development. Approval to proceed to planning and detailed design was granted by the Executive Board of GCP in December 2020.

Options

1.17.11. Feedback from residents and other local stakeholders from the 2018 consultation have shaped the proposals presented in the technical design engagement document. Indicative plans used as a basis for technical design engagement are presented in Figure 1-14.

1.17.12. The scheme presented in the technical design engagement links Barton and villages along the route to each other and enables a direct connection with Cambridge.

1.17.13. The proposals involve upgrading the existing shared-use path on the northern side of Barton Road to provide a safer and more direct two-way cycle track with a separate footway for pedestrians. Raised tables are proposed at side roads with safer crossings to prioritise pedestrians and cyclists.

1.17.14. Through Barton village and other sections along the route, traffic calming measures including raised tables to improve safety as part of a 20mph speed limit throughout the village are proposed.

1.17.15. Additionally, the greenway proposal includes a safer off-road route to Grantchester via the bridleway from New Road / Cambridge Road to Bridle Way, as well as an off-road route north along the Baulk Path to Cambrige Rugby Club.

1.17.16. Over the M11 bridge, a widened shared-use path with a grass verge and higher parapets to provide more space for Greenway users is proposed. Safer route across two roundabouts, including enhancements to the Barton Road, Coton Road and Grantchester Road roundabout and the M11N slip road roundabout are included.

<u>Barton Road, Coton Road and Grantchester Road</u>

1.17.17. In 2018 consultation, three options were presented to improve the Barton Road, Coton Road and Grantchester Road roundabout, including an underpass along the northern arm with a new smaller roundabout.

1.17.18. Since 2018, a number of surveys have been undertaken and a high-pressure gas main has been identified along the eastern side of the Grantchester Road arm of the junction. Surveys have also found that an underpass in this location may be prone to flooding. Significant land works would therefore be required to accommodate the underpass, and there would be severe disruption to the road network during construction.

1.17.19. The underpass option therefore represented poor value for money, therefore in the 2022 engagement a two-stage signalised crossing on the northern arm was presented. This controlled

crossing will be complemented with new 40mph speed limits on all four arms of the roundabout with speed reduction measures on the approach to the crossing.

M11N slip road roundabout

1.17.20. In 2018, two options were explored for the M11 slip road roundabout, including an underpass and a crossing. Since then, surveys have found that significant land works will be required to accommodate the underpass, which would be environmentally damaging and costly.Therefore, a single stage signalised crossing to provide a safe and direct route for Greenway users to cross the roundabout was recommended in the design presented for the 2022 engaegment.

2022 Engagement

1.17.21. The scheme is currently at preliminary design stage. Site surveys are being carried out and will be used, alongside feedback, to finalise the preliminary design before starting the detailed design.

1.17.22. The public engagement on the preliminary technical design was undertaken between 7th November – 16th December 2022. The review of the feedback and comments collected during the engagement is currently ongoing and will be reported at the March GCP Executive Board.

Constraints

1.17.23. The following significant constraints on the delivery of the scheme have been identified:

- Obtaining the rights for use and construction of the Greenway, which may involve private landowners.
- The need to ensure continuity, which can involve the need for high quality crossings of roads, rivers, and other barriers.
- The need to satisfy planning requirements, which may include habitat, flooding and other issues.

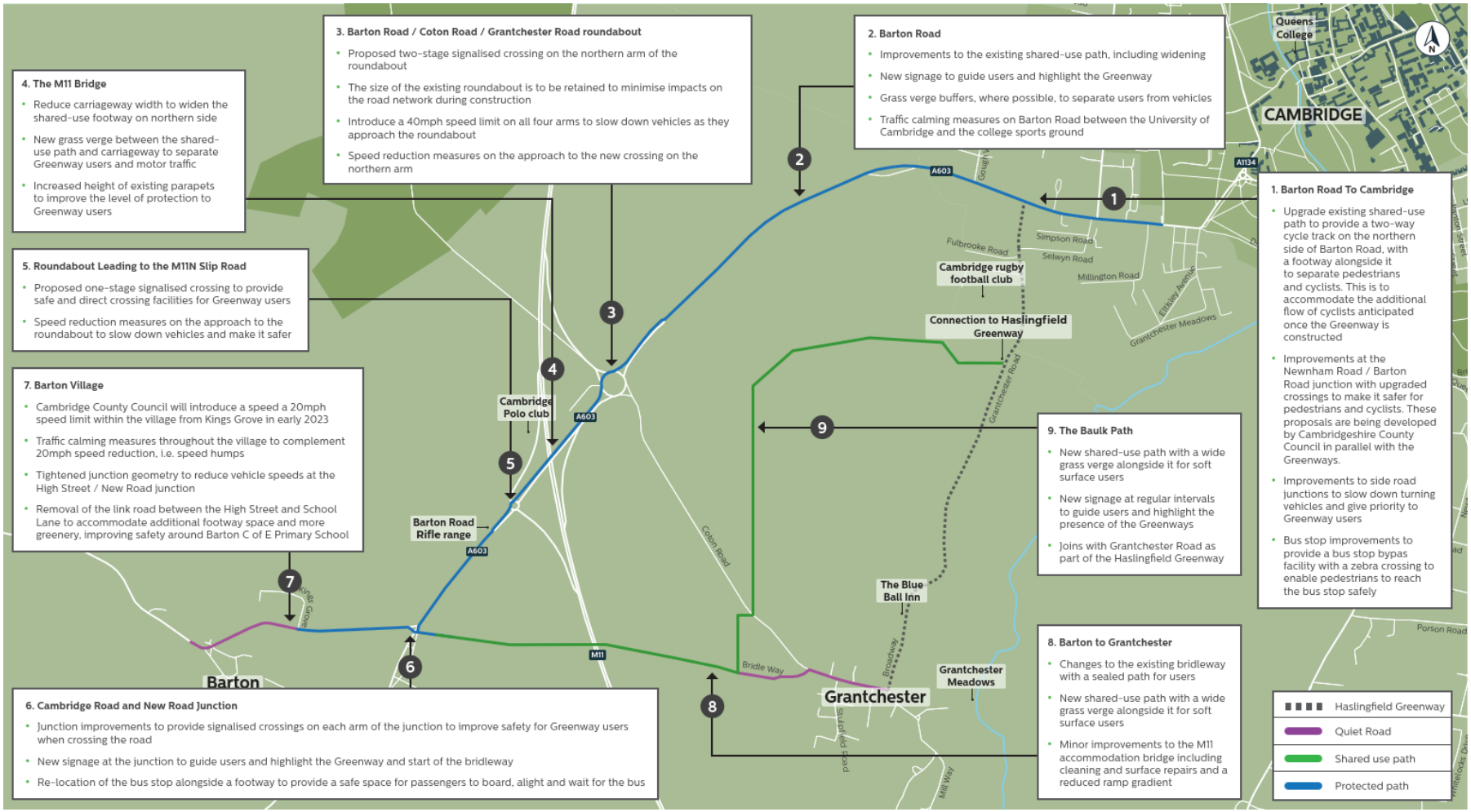
1.17.24. These will be addressed through the ongoing development of the scheme and engagement with stakeholders and the feedback received from the 2022 public engagement. A review of the public engagement feedback is being undertaken.

Next Steps

1.17.25. The next stages in the design process will undertake the following tasks:

- Engagement with landowners and stakeholders
- Traffic modelling
- Environmental and ecology impacts
- Planning consent
- Parking surveys.

Figure 1-14 Preferred Option – Barton Greenway

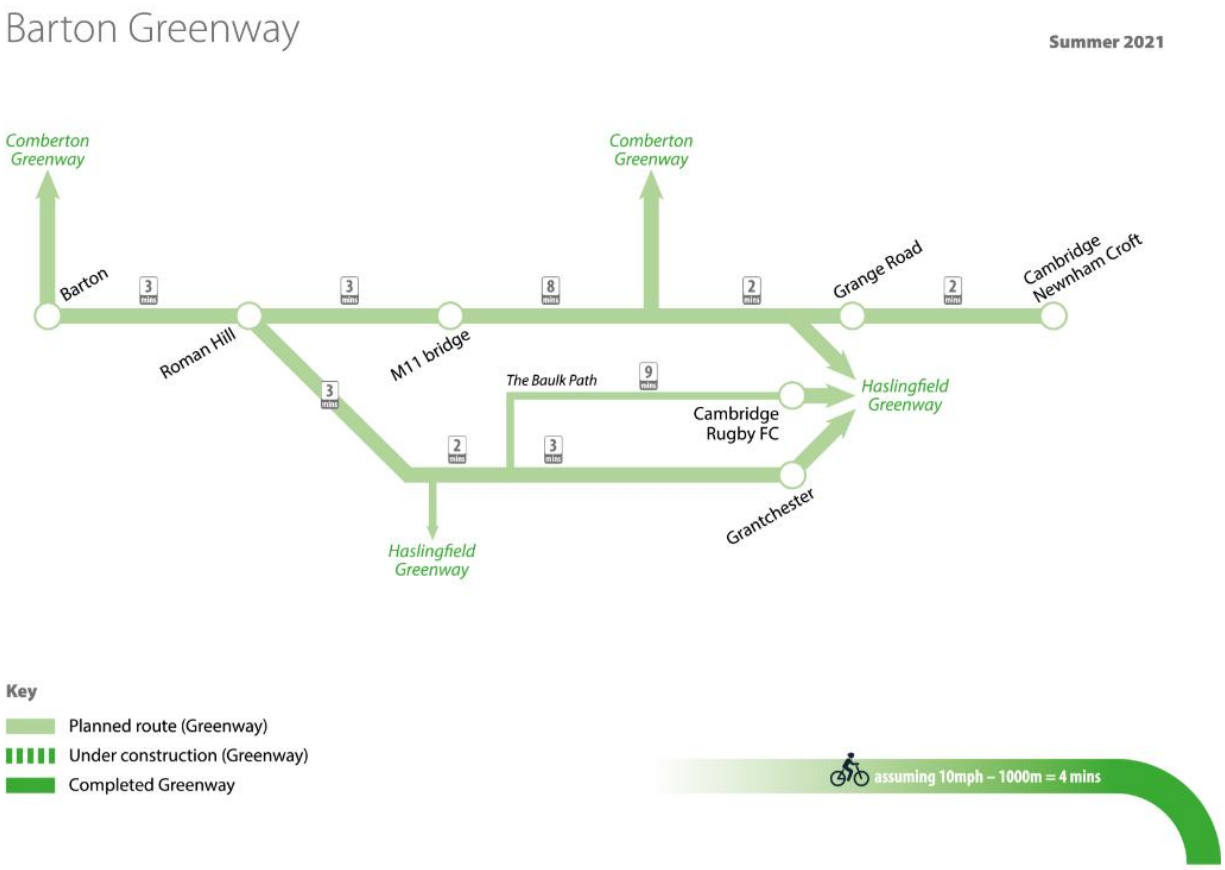


2 ECONOMIC CASE

2.1 INTRODUCTION

2.1.1. The Economic Case identifies the impacts of the scheme to inform the assessment of the Value for Money (VfM). It considers the impacts that can be measured and quantified, and those which can be assessed qualitatively. To assess the VfM, these impacts have been compared to the scheme costs.

Figure 2-1 - Barton Greenway Scheme[15]



2.1.2. The Barton Greenway will be an improved walking and cycling route between Barton and Cambridge. The Barton Greenway is one route within a wider and developing sustainable travel network that is being created by the Greater Cambridge Partnership. The Greenways network will run through many different environments. These range from quiet rural settings along field edges or country lanes to busier built-up urban locations that may have more limitations on space. Within

[15] https://www.greatercambridge.org.uk/sustainable-transport-programme/active-travel-projects/greater-cambridge-greenways/barton-greenway

each environment the Greenways project aims to deliver a safe, attractive and cost-effective sustainable travel route which users can enjoy all year round.

Table 2-1 – Summary of Scheme Elements

Element	Infrastructure
Walking & Cycling	▪ Quiet Roads – speed limits reduced to 20mph ▪ Traffic calming – raised tables and removal of centre lining ▪ Protected path – A 3-metre-wide path with features that separate cyclists and pedestrians. ▪ Shared use paths – A 3-metre-wide path with a 2-metre grassy strip running parallel. Where the path runs beside the carriageway a green verge will separate the path from the road, this will be as wide as possible. ▪ Signage – Greenway specific wayfinding marker posts could be placed at regular intervals and junctions. ▪ Surfacing – Routes will be made from a hard, smooth surface.
Public Realm	▪ Lighting – solar studs could be used at specific points to aid wayfinding in low light ▪ Maintenance – a maintenance package for the route is being planned

2.1.3. Detailed drawings of the scheme measures are included in Appendix A.

2.1.4. The appraisal considers the incremental benefits of the intervention, comparing the benefits (and costs) of the scheme against the without scheme case.

2.2 APPROACH TO ECONOMIC APPRAISAL

2.2.1. The appraisal has been undertaken in alignment with the principles of the HM Treasury Green Book and the Department for Transport (DfT) Transport Analysis Guidance (TAG) for schemes of this nature. As set out in these guidance documents, the appraisal of the scheme will be largely undertaken in line with guidance of, the following:

- TAG Unit A1-1 (May 2018): Cost-Benefit Analysis
- TAG Unit A1-2 (July 2017): Scheme Costs
- TAG Unit A1-3 (March 2017): User and Provider Impacts
- TAG Unit A4-1 (May 2020): Social Impact Appraisal
- TAG Unit A4-2 (May 2020): Distributional Impact Assessment
- TAG Unit A3 (May 2019): Environmental Impact Appraisal
- TAG Unit A5-1 (May 2020): Active Mode Appraisal
- DfT Value for Money Framework

2.2.2. The appraisal of the scheme considers both the impacts that can be quantified, and monetised, as well as those that can only be assessed qualitatively. Considering the range of proposals along the corridor, various appraisal techniques have been used to assess the impacts which can be quantified. All benefits and costs have then been consolidated in a wider economic appraisal model.

2.2.3. In line with TAG, all costs and benefits in the appraisal have been presented in 2010 Present Values (PV), market prices. Costs and benefits have been deflated to 2010 prices using the GDP Deflator forecasts within the November 2022 TAG Data Book and discounted to 2010 values using the social discount rates also within the TAG Data Book. The market price adjustment factor of 1.19 from the TAG Data Book has been used to convert from factor prices to market prices.

2.2.4. It has been assumed that the scheme opening year is 2026. The impacts have been considered over a 20-year appraisal period. TAG Unit A1-1 Cost Benefit Analysis states that the appraisal period should 'cover the period of usefulness of the assets encompassed by the options under consideration'.

2.2.5. The following sections set out the approach employed to appraise the various elements of the scheme.

ACTIVE MODE APPRAISAL TOOLKIT

2.2.6. In line with TAG Unit A5-1, the DfT's Active Mode Appraisal Toolkit (AMAT) (November 2022 update) has been used to estimate the benefits associated with improved cycling infrastructure along the proposed Barton Greenway. The tool considers the benefits in terms of physical activity, absenteeism, journey quality, environmental, indirect tax and congestion.

2.2.7. The current and anticipated scheme demand is input to the AMAT, as well as the change in infrastructure provision. Combining this with a number of assumptions from the National Travel Survey (NTS) regarding journey length, journey speed, purpose split and cycling diversion factors, the tool outputs the benefits associated with the intervention. The scheme costs can also be input to the tool such that the Benefit to Cost Ratio (BCR) can be calculated, however for this submission the benefits and costs have been brought together in the economic appraisal model. A wider appraisal model was used so that a number of benefit streams could be collated and compared against the scheme costs to produce an overall BCR for the scheme.

2.2.8. Two assumptions in the AMAT were refined in order to more accurately represent the local conditions in Cambridge, as outlined below.

Table 2-2 – Refined Assumptions

	Default Assumption	Altered Assumptions	Rationale
Cycling – Average Length of Trip	4.84	5.14	National Travel Survey updated from 2012-14 to 2019 values
Number of days for which intervention data is applicable per year	253 days	305 days	Count data demonstrates that levels of demand in the corridor on Saturdays are broadly equivalent to weekday levels

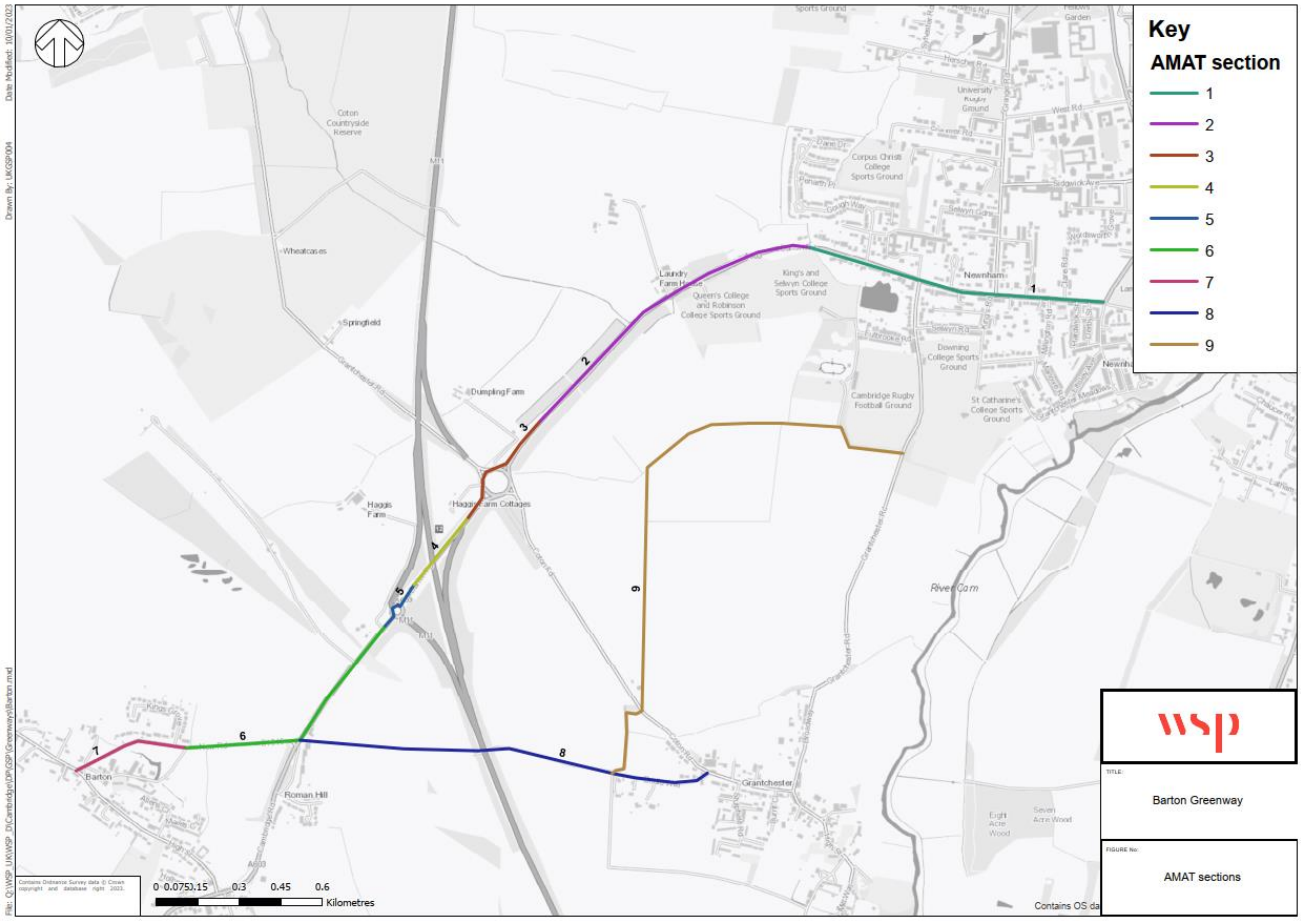
2.2.9. In line with DfT guidance and to ensure the scheme benefits were not double-counted, the AMATs were split into sections depending on the type of existing and proposed infrastructure present along the corridor. For example, the AMAT requires an input of how much of an average cycling trip will use the intervention, where the length of an AMAT section is divided by average trip length (5.14km). This allowed the route to be broken by length, ensuring benefits were not replicated. The sections are set out in Table 2-3.

Table 2-3 – Summary of AMAT Sections

Section	Description	Length of Route	Existing Infrastructure	Proposed Infrastructure
1	Barton Road to Cambridge	1.08km	Segregated shared-use path	Segregated cycle track and footway
2	Barton Road	1.10km	Shared-use path (part segregated)	Widening of shared-use path, traffic calming measures, signage, grass buffers where possible
3	Barton Road – Coton Roundabout	0.58km	Segregated shared-use path	Two-stage signalised crossing on northern arm, traffic calming measures
4	The M11 bridge	0.29km	Shared-use path adjacent to carriageway	Widening of shared-use path, new grass verge to separate path from carriageway
5	Roundabout leading to M11 bridge	0.20km	Segregated shared-use path	Widen segregated shared-use path, single stage crossing on northern arm
6	Cambridge Road / New Road	0.96km	Shared-use path	Widening shared-use path
7	New Road (Barton Village)	0.38km	Shared-use path	Traffic calming measures
8	Barton to Grantchester bridleway	1.52km	Off-road bridleway	Off-road shared-use path
9	The Baulk Path	2.20km	Off-road permissive bridleway	Off-road shared-use path

2.2.10. The sections discussed above are also shown in Figure 2-2 below.

Figure 2-2 - AMAT Sections

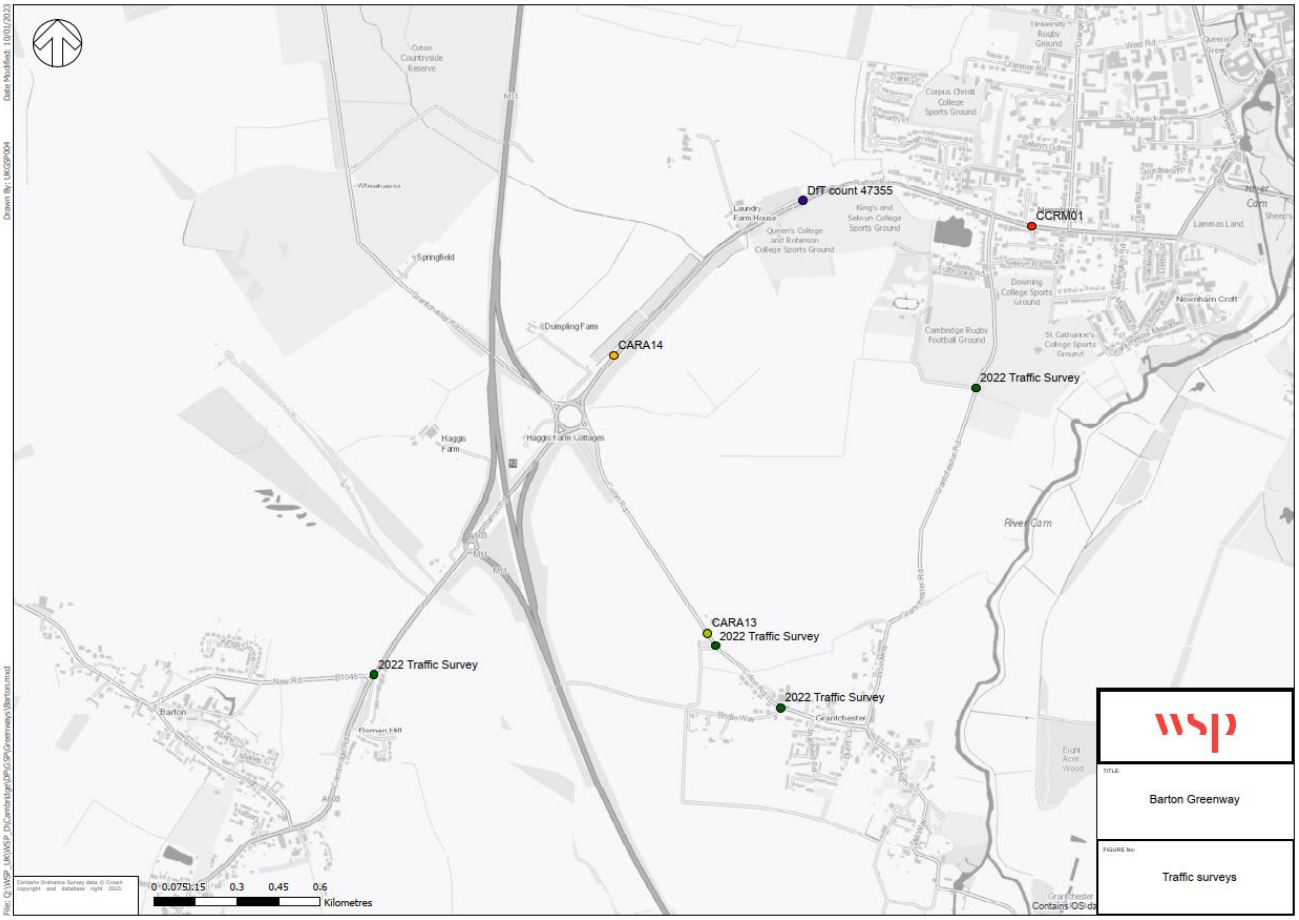


2.2.11. The following sections discuss the approach to using the AMAT toolkit in this submission.

Existing Demand

2.2.12. The AMAT requires the existing and scheme induced demand to be included as an input. To establish the existing cycling demand along the Barton Greenway route, existing Cambridgeshire County Council (CCC) and DfT counts were reviewed. Manual Classified Turning Counts (MCCs) were commissioned for sections of the route not covered by existing counts. Figure 2-3 shows the count locations.

Figure 2-3 - Count locations



2.2.13. As the counts were not completed over a 24 hour period, and AMAT assumes a 24-hour flow as input to calculate benefits, the MCCs were factored up to 24-hour flows. This adjustment used 24-hour count data collected in March 2022 on Vinery Road, Cambridge. The flows have been annualised within the AMAT, using an annualization factor of 305 days. Table 2-4 below outlines the cycling and walking demand used for each AMAT section.

Table 2-4 – AMAT Existing Demand (Daily Trips – 24 Hours)

Section	Source	Walking Demand	Cycling Demand
Barton Road to Cambridge	CCRM01	994	1438
Barton Road	CARA14 / DfT count (2021 estimated from manual count in 2018)	33	440
Barton Coton Road Roundabout	CARA14	33	440
The M11 bridge	CARA14	33	450
Roundabout leading to M11 bridge	2022 traffic surveys	19	450
Cambridge Road / New Road	2022 traffic surveys	19	450
New Road (Barton Village)	2022 traffic surveys	41	396
Barton to Grantchester bridleway	2022 traffic surveys	32	57
The Baulk Path	2022 traffic surveys	15	3

2.2.14. Table 2-4 demonstrates that there is a variable demand level across the Barton Greenway corridor, with much higher demand levels seen towards Cambridge compared with the more rural areas such near Barton. Demand on the sections of the shared-use path adjacent to the A603 between Barton and Cambridge (sections 2-6) is relatively high and constant across the sections. The existing users recorded on the Barton to Grantchester bridleway and Baulk Path are low. With the scheme improvements in place, it is possible that some users will reroute from the current shared-use path adjacent to the A603 to the Barton to Grantchester bridleway/ Baulk Path as a means of connecting between Barton and Cambridge. However, there is no supporting evidence to quantify this impact.

Scheme Induced Demand

2.2.15. To estimate the scheme induced cycling demand, an uplift percentage of 25% was used, which was derived from pre- and post-implementation traffic surveys from several comparable schemes

outlined in the GCP Impact Evaluation Evidence Paper (2019)[16], Cycle City Ambition Programme (2013-2018)[17], and Outcomes of the Cycling City and Town Programme (2017)[18], including:

- Arbury Road (Cambridge) – Traffic lanes narrowed to 2.6m with removed centre line and kerb lines moved to accommodate new raised cycleway as well as carriageway / footway resurfacing.
- Links to east Cambridge – shared foot and cycleway, parking restrictions and carriageway resurfacing.
- Filwood Greenway (Bristol) – mixed strategic route including off road cycle track though green space.

2.2.16. A walking demand uplift of 10% was used, which was derived from an average of case studies outlined in Making the Case for Investment in the Walking Environment (2011).[19] Examples from this study include:

- Kensington High Street
- Five Roads Home Zone, Ealing
- Wanstead High Street Walking Improvements

2.2.17. The demand forecasts are show in Table 2-5.

Table 2-5 – Barton Greenway Demand Forecasts (24 hours)

Section	Description	Walking demand	Cycling demand
1	Barton Road to Cambridge	1093	1798
2	Barton Road	36	550
3	Barton Coton Road Roundabout	36	550
4	The M11 bridge	36	563
5	Roundabout leading to M11 bridge	21	563
6	Cambridge Road / New Road	21	563
7	Barton Village	45	495
8	Barton to Grantchester	35	71

[16] GCP Impact Evaluation Evidence Paper (2019)
[17] Cycle City Ambition Programme 2013-18
[18] https://www.sustrans.org.uk/media/2970/2970.pdf
[19] https://www.livingstreets.org.uk/media/1394/2011-making-the-case-full-report.pdf

9	The Baulk Path	17	4

Intervention

2.2.18. The AMAT allows the existing infrastructure for the route to be selected, and the proposed new infrastructure. Within the tool, the options that can be selected to capture this before and after state include:

- No provision
- Shared bus lane
- Wider lane
- On-road non-segregated cycle lane
- On-road segregated cycle lane
- Off-road segregated cycle track

2.2.19. The AMAT toolkit classifications for existing and proposed infrastructure only capture a certain number of cycle interventions and therefore the most comparable selection was made in the toolkit according to examples outlined in the user guidance. For example, the proposed infrastructure for the route includes several sections of shared use footways, which is not specifically a selection in the AMAT Toolkit and has therefore been categorised as 'off-road segregated cycle track' in most instances. This category was selected as AMAT user guidance states that an off-road segregated cycle track is 'a path or track with right of way for pedal cycles that is separate to the road, typically with a level difference (that may or may not also be useable for pedestrians)'.

2.2.20. Sections 3, 4 and 5, have been classified as 'No provision' for their existing infrastructure despite having an existing shared-use path. The existing shared-use path in these sections is very narrow and adjacent to the carriageway, with the cycle path requiring several crossings of the A603, with very high average speeds.

2.2.21. Shared bus lane has been used for the proposed infrastructure for section 7 through Barton village as the intervention includes light touch on road measures such as sinusoidal speed humps, reduced speed limits and carriageway markings. The AMAT Shared bus lane classification was selected in order to differentiate these sections from existing on road sections, which were classified as 'no provision'. Table 2-6 below outlines the type of existing / proposed infrastructure for each section of the route, alongside the subsequent classification for each section in the AMAT Toolkits.

2.2.22. Sections 8 and 9 have been classified as 'no provision' for the existing infrastructure type for cyclists, despite cyclists recorded as part of the surveys carried out. This decision is based on the existing provision being a very narrow dirt track, and the assumption that existing cyclists are off-road cyclists. Therefore, these sections are not currently suitable for the majority of cyclists.

Table 2-6 – Type of infrastructure for the AMAT classification

Section	Existing Infrastructure	Proposed Infrastructure	AMAT Classification (Existing)	AMAT Classification (Proposed)
1	Segregated shared-use path	Segregated cycle track and footway	Off-road segregated cycle track	Off-road segregated cycle track
2	Shared-use path (part segregated)	Widening of shared-use path, traffic calming measures, signage, grass buffers where possible	Off-road segregated cycle track	Off-road segregated cycle track
3	Segregated shared-use path	Two-stage signalised crossing on northern arm, traffic calming measures	No provision	Off-road segregated cycle track
4	Shared-use path adjacent to carriageway	Widening of shared-use path, new grass verge to separate path from carriageway	No provision	Off-road segregated cycle track
5	Segregated shared-use path	Widen segregated shared-use path	No provision	Off-road segregated cycle track
6	Shared-use path	Widening shared-use path	Off-road segregated cycle track	Off-road segregated cycle track
7	Shared-use path	Traffic calming measures	No provision	Shared bus lane
8	Off-road footpath	Off-road shared-use path	No provision	Off-road segregated cycle track
9	Off-road footpath	Off-road shared-use path	No provision	Off-road segregated cycle track

2.2.23. The AMAT requires the average proportion of a trip which uses the scheme infrastructure to be input. This has been calculated by comparing the length of each section to the average length of a cycle journey (5.14km).

Outputs

2.2.24. The output of the AMAT tool are the monetised impacts of the infrastructure under the following headings in 2010 PV:

- Congestion benefit
- Infrastructure
- Accident

- Local air quality
- Noise
- Greenhouse gases
- Reduced risk of premature death
- Absenteeism
- Journey ambience
- Indirect Tax

ACCIDENT REDUCTION

2.2.25. Accident data was obtained along the Barton Greenway corridor for the period between 2017 and 2022. During this period, eight accidents occurred along the corridor in total, with six being slight and two serious.

2.2.26. The scheme proposals include improved cycle facilities along the corridor, such as:

- Introducing new off-road cycle paths
- Controlled crossings on roundabouts
- Widening of shared use paths
- Traffic calming including:
  - Reducing speed limits from 30mph to 20mph
  - Raised tables
  - Removing centre lining

2.2.27. Of the 8 accidents over the 5-year period, 3 involved cyclists. Of these 3 accidents, one serious collision and one slight collision were considered to have been avoidable with the scheme in place. This was then divided to determine a yearly average, and then multiplied against the TAG values for accidents by severity, as shown in Table 2-7.

Table 2-7 – Accident Savings by Severity

	Accident Savings by Severity		
	Fatal	**Serious**	**Slight**
Cost of a casualty (£, 2010, TAG Databook v1.20.2)	£1,833,608	£210,760	£21,483
Number of collisions involving cyclists	-	1	2
Number of cycle accidents that may have been prevented by the scheme (5 years)	-	1	1
Number of prevented cycle accidents per annum	-	0.2	0.2
Accident savings per annum (£, 2010)	-	£ 42,152.00	£ 4,296.60

2.2.28. This annual value of accident saving was then projected and discounted in the appraisal model for a 20- year period. The results are presented in the appraisal results section below.

JOURNEY TIME SAVINGS

2.2.29. The Barton Greenway route will establish a new direct and quicker cycle connection between Barton and Grantchester. Traffic surveys indicate that there is leisure-based usage of the existing bridleway which connects the two villages. However the condition of the bridleway will discourage the average cyclist from using the bridleway, in preference for the route via the A603 and Coton Road.

2.2.30. However, these potential journey time savings have not been quantified at this stage, as there is no travel data on how many users currently travel between Barton and Grantchester via A603 and Coton Road.

NON-MONETISED IMPACTS OF THE SCHEME

2.2.31. There are a number of elements of the scheme for which the impacts cannot be quantified and monetised, these include:

- Reduced speed limits – the Barton Greenway includes traffic calming measures reducing 30mph roads to 20mph
- Maintenance – a maintenance package is planned for the Barton Greenway. This will be carried out with reference to the GCP Greenways Maintenance Guidance. However, the maintenance costs rates by type of active mode infrastructure have not yet been assessed by the GCP

2.2.32. Where appropriate, these elements of the scheme are considered within the Environmental and Social Impacts sections of the Economic Case.

SCHEME COSTS

2.2.33. It is estimated that the Barton Greenway scheme will cost in the region of £13.83m, based on direct construction works, design and other fees, risk contingency and inflation. Further detail on the estimation of the scheme costs is presented in the Financial Case. For the economic appraisal, risk was removed from the costs as per TAG Unit A1.2 guidance. The cost profile of the scheme used in the economic appraisal is outlined in Table 2-8 below.

Table 2-8 – Cost Profile, £m, Q2 2022 Prices

	2024-25	2025-26	**Total**
Outturn Cost excluding risk contingency	4.93	4.93	**9.86**

2.2.34. The following investment costs have been considered:

- Construction costs
- Professional Fees
- Land Take

2.3 ECONOMIC APPRAISAL ASSUMPTIONS

2.3.1. The main appraisal assumptions are set out in Table 2-9.

Table 2-9 – Economic Appraisal Assumptions

Criteria	Assumption	Source
Opening year	2026	GCP
Base year	2010	DfT Base Year
Appraisal period	20 years	AMAT default
Discount rate	3.5% 0-20 years	Jan 2023 TAG Databook (A1.3.2)
GDP Deflator	-	Jan 2023 TAG Databook (Annual Parameters)
Existing path cycle demand	See Table 2-4 for a breakdown of demands used	Count data/ CCC data/ DfT data
Scheme induced cycle demand	25%	Schemes outlined in GCP Impact Evaluation Evidence Paper Cycle City Ambition Programme 2013-2018
Existing path pedestrian demand	See Table 2-4 for a breakdown of demands used	Count Data
Scheme induced pedestrian demand uplift	10%	Living Street: Making the Case for Investment in the Walking Environment
Journey purpose split	Business: 12% Commuting: 25.5% Other: 62.5%	Jan 2023 TAG Databook
Values of time	Commuter – 9.95 Other – 4.54 (£,2010)	Jan 2023 TAG Databook (A1.3.2)
Market price adjustment factor	1.19	Jan 2023 TAG Databook (A1.3.1)
Optimism bias on capital costs	23%	TAG Unit A1-2
Cost spend profile	2024/25 (50%) -2025/26 (50%)	WSP

2.4 APPRAISAL RESULTS

PRESENT VALUE OF BENEFITS

2.4.1. The tables below show a summary of the results of the appraisal for each element of the scheme by area of interventions.

Cycling and Pedestrian Provision

2.4.2. Table 2-10 shows the monetised benefits associated with the improved cycling and walking infrastructure which includes new off-road cycle paths, improvements to existing cycling infrastructure, traffic calming, footway widening and improved pavement evenness.

Table 2-10 – Cycling and Pedestrian Monetised Benefits

Cycling and pedestrian provision	£, 2010 PV over 20-year appraisal period
All Sections Combined	
Congestion	612,864
Infrastructure	3,363
Accident	103,324
Local air quality	13,671
Noise	6,888
Greenhouse gases	43,214
Reduced risk of premature death	6,222,461
Absenteeism	922,998
Journey ambience	375,962
Indirect taxation	-49,846

2.4.3. The largest benefit associated with the increased number of cyclists as a result of the scheme is the health benefit through increased physical activity including reduced risk of premature death. Absenteeism accounts for the second largest benefits impact.There are decongestion benefits as a result of modal shift from private car to cycling, and associated impacts – fewer road accidents, improved air quality, reduced noise and reduced greenhouse gase emissions. The scheme benefits are in line with the objectives outlined in the strategic case including encouraging commuting by sustainable modes and reducing traffic congestion as well as contributing to improved air quality and better public health. The reduction in private car use has a negative impact on indirect tax revenues to central government due to the impact of mode shift resulsting in less road traffic and a consequent reduction in fuel duty. However, the reduction of car trips is considered a positive when considering the strategic objectives of the scheme.

2.4.4. It is likely that some of the benefits of the scheme have been understated. Where the AMAT classification indicates no change in provision i.e. off road segregated cycle track there is no AMAT quantified impact. In practice, the scheme widening of shared use paths will improve journey ambience and reduce the likelihood of accidents involving cyclists and pedestrians.

Accidents

2.4.5. Table 2-11 below shows the benefits of the scheme induced accident reduction.

Table 2-11 – Accident Benefits

Impact	£, 2010 PV over appraisal period
Accidents (Collision savings)	969,716

2.4.6. The scheme proposals, which include greater separation from general traffic for active modes, is estimated to result in a total saving of £0.97m as a result of fewer collisions involving cyclists over the 20-year appraisal period. This is in addition to the accident benefit estimated in AMAT which results from a reduction in highway-kilometres due to mode shift to active modes.

PRESENT VALUE OF COSTS

2.4.7. The cost assessment included direct construction costs, indirect construction costs, indirect non-construction costs, and inflation. Inflation was assumed of 11.9% from 2Q 2022 to 3Q 2024, as well as an additional inflation contingency of 6% (3% per annum) over the construction period, due to current economic circumstances.

2.4.8. For the economic appraisal optimism bias has been applied to the scheme costs to reflect the systematic tendency to underestimate scheme costs. In July 2021, DfT adjusted the methodology for how optimism bias should be applied within the economic appraisal. The revised guidance (TAG Unit 1.2) states that the base costs with optimism bias applied should be compared to the risk-adjusted cost. The costs should be similar, but if there is a large disparity, the higher costs should be used. Due to a low variation between the two costs, the base cost with optimism bias has been used as the core scenario for the appraisal. A sensitivity test (8) has been included with risk-adjusted costs.

2.4.9. TAG Unit A1-2 provides guidance for the recommended level of optimism bias to be applied for different types of projects at different stages of the scheme development. For a scheme of this nature, at the OBC stage, a 23% optimism bias has been applied to the base scheme costs within the economic appraisal.

2.4.10. Following the application of optimism bias, the scheme costs have been adjusted to produce costs consistent with the benefits, namely in 2010 prices and values, with the market factor adjustment applied.

2.4.11. The present values of the scheme costs are shown in Table 2-12.

Table 2-12 - Present Value Costs

	£,2010 PV
Present Value of Costs (PVC)	6,436,562

2.5 VALUE FOR MONEY ASSESSMENT

2.5.1. The core scenario benefits and costs described above produce a benefit to cost ratio (BCR) of 1.4:1, as presented in Table 2-13 below.

Table 2-13 – Economic Appraisal, Core Scenario, £2010 PV

Benefit / Cost Type	£ 2010 PV, 20-year appraisal
Noise	6,888
Local air quality	13,761
Greenhouse gases	43,214
Journey quality	375,962
Physical activity	7,145,458
Accidents	969,716
Economic efficiency: commuters	156,210
Economic efficiency: other	382,747
Economic efficiency: business users and providers	73,907
Wider public finances (indirect tax)	-49,846
Present Value of Benefits (PVB)	**9,117,926**
Present Value of Costs (PVC)	**6,436,562**
Net Present Value (NPV)	**2,681,364**
Benefit-Cost Ratio (BCR)	**1.4**

2.5.2. Appendix B provides the disaggregation of results in the Transport Economic Efficiency (TEE), Public Accounts (PA) and Analysis of Monetised Costs and Benefits (AMCB) tables. Appendix C provides the Appraisal Summary Table (AST).

2.6 SENSITIVITY TESTS

2.6.1. Sensitivity testing has been undertaken to explore the sensitivity of the expected outcomes of the appraisal to changes in inputs. The following sensitivity tests have been carried out, drawing on the key assumptions made in the core scenario:

- Test 1: New to cycle demand reduced to 12.5%
- Test 2: New to cycle demand increased to 30%
- Test 3: New to cycle demand reduced to 20%
- Test 4: No pedestrian demand uplift
- Test 5: 30-year appraisal
- Test 6: Accidents reduced by 50%
- Test 7: 46% optimism bias
- Test 8: Capital costs including risk / no optimism bias

2.6.2. The table below shows the impact on PVB, PVC, NPV and BCR of each of these tests compared to the BCR for the core scenario.

Table 2-14: Sensitivity Analysis

Test	PVB (£m)	PVC (£m)	NPV (£m)	BCR
Core Scenario	**9.12**	**6.44**	**2.69**	**1.4**
Test 1: 20% cycle demand uplift	7.70	6.44	1.26	1.2
Test 2: 12.5% cycle demand uplift	5.58	6.44	-0.86	0.9
Test 3: 30% cycle demand uplift	10.51	6.44	4.07	1.6
Test 4: No pedestrian demand uplift	8.76	6.44	2.32	1.4
Test 5: 30-year appraisal period	13.32	6.44	6.88	2.1
Test 6: 50% adjustment to accidents	8.68	6.44	2.24	1.4
Test 7: 46% optimism bias	9.12	7.64	1.48	1.2
Test 8: Capital cost inc.risk / no optimism bias	9.12	7.34	1.78	1.2

2.7 ENVIRONMENTAL IMPACTS

2.7.1. The section below sets out the appraisal of the active travel elements of the scheme considering the environmental impacts set out in TAG Unit A3.

NOISE

2.7.1. Overall, the scheme is expected to reduce vehicle traffic as people transfer to foot or bicycle. Traffic noise would reduce accordingly. Based on the outputs of the AMAT, the monetised impact on noise of modal shift from private car is estimated to be £6,888 (2010 PV).

2.7.2. Given the nature of interventions, the impact of construction noise is expected to be minimal and short lived.

AIR QUALITY

2.7.3. Modal shift to cycling and walking, and associated reduced road traffic, will result in locally improved air quality. Based on the outputs of the AMAT, the monetised impact on air quality of modal shift from private car is estimated to be £13,671 (2010 PV).

GREENHOUSE GASES

2.7.4. The net reduction in highway-kilometres as a result of modal shift to active modes, will lead to a net decrease in greenhouse gas emissions. Based on the outputs of the AMAT, the monetised impact on greenhouse gases of modal shift from private car is estimated to be £43,214 (2010 PV).

LANDSCAPE AND TOWNSCAPE

2.7.5. The landscape along the route is characterised by agricultural land with fragmented hedgerow boundaries and small scattered woodlands. The Scheme is anticipated to have a beneficial effect on the landscape pattern and landcover, a neutral effect on the tranquillity and a neutral to slight adverse effect on cultural elements of the landscape. As the Scheme is not significantly different to

the baseline views and will represent only a slight change to those experienced by users of the Scheme, a neutral effect is anticipated overall.

2.7.6. The townscape is on the urban-fringe of south-west Cambridge which is heavily dominated by large period houses mixed with larger college buildings and accommodation blocks for the University of Cambridge. The Scheme is anticipated to have a neutral effect on the layout, density and mix, scale, appearance, human interaction and land use of the townscape. However, a neutral to slight adverse effect is anticipated on the culture of the townscape. Overall, the changes to the townscape due to the Scheme are minor and do not impact wider townscape character, with minor changes for local visual amenity. A neutral effect is anticipated overall. The TAG worksheet is included in Appendix D.

HISTORIC ENVIRONMENT

2.7.7. Potential effects on the form, survival, condition, complexity, context and period of designated heritage assets would be neutral. Potential effects on the form and condition of Grade II listed early/mid-19th century gates to No. 78 Barton Street, form and context of West Cambridge Conservation Area and form Newnham Croft Conservation Area are anticipated to be slight adverse. The impact to non-designated heritage assets and buried heritage assets has not been determined at this stage. Overall, the assessment concludes a slight adverse effect upon the historic environment. The TAG worksheet is included in Appendix D.

BIODIVERSITY

2.7.8. Impacts on the Eversden and Wimpole Woods Special Area of Conservation (SAC), and on the barbastelle bats that use the woods and are the principal reason for its European designation, will be neutral. Neutral impacts are also expected for birds, barn owl, reptiles, hedgehog and brown hare. Slight adverse impacts could affect hedgerows, potentially an Important Hedgerow under the Hedgerow Regulations 1997, however neutral impacts are anticipated on the traditional orchard a Habitats of Principal Importance. Slight adverse impacts, as a result of pollution risk from the construction of the scheme, could affect the Bin Brook City Wildlife Site and as a result of habitat loss Barton Orchard County Wildlife Site, as well as on bats in general, badger, water vole, otter, great created newts, fish and aquatic invertebrates due to the scheme's impact on habitat and uncertainty of species presence. Overall, the assessment concludes a slight adverse impact upon biodiversity. The TAG worksheet is included in Appendix D.

WATER ENVIRONMENT

2.7.9. The scheme is located within Flood Zone 3, with a high risk of flooding. Its fluvial flood risk comes from the River Cam and Bin Brook. There are numerous land drains and ditches in the area, as well as the Bin Brook in the northern section of the scheme, which is classified as a main river. To the east of the scheme is the River Cam which are also classified as main rivers. With standard mitigation, any risks of chemical contamination of ground or surface waterbodies is not considered to be significant and therefore overall, the summary assessment score is neutral – slight adverse. The TAG worksheet is included in Appendix D.

SUMMARY

2.7.10. The table below summarises the environmental impacts of the scheme.

Table 2-15 – Summary of Environmental Impacts

Environmental Impact	Assessment, £, 2020 PV
Noise	£6,888
Air Quality	£13,671
Greenhouse Gases	£43,214
Landscape	Neutral
Townscape	Neutral
Historic Environment	Slight Minor Adverse
Biodiversity	Slight Adverse
Water Environment	Neutral to Slight Adverse

2.8 SOCIAL IMPACTS

RELIABILITY

2.8.1. The Barton Greenway by providing a continuous walking and cycling route from Barton into Cambridge city centre, will improve reliability for those travelling by active modes along the corridor.

2.8.2. The impact of the scheme on reliability is estimated to be **Slight Beneficial**.

PHYSICAL ACTIVITY

2.8.3. The improvement to active mode facilities will encourage more cycling and pedestrian travel. Increased usage of the cycle network will promote more physical activity. Greater levels of cycling will result in health benefits through reduced health problems including diabetes and high blood pressure. TAG uplift in physical activity is also likely to result in a reduction in absenteeism which will give rise to positive benefits for the user and businesses, and economic growth in the region.

2.8.4. AMAT estimates the monetised impact of physical activity to be £7,145,458 (2010 PV).

2.8.5. In addition, an increase in walking trips along the Barton Greenway route will result in further health benefits. These benefits have not been fully captured within the appraisal (i.e. health impacts as a result of the increase in pedestrians due to the provision of dedicated crossings and improved lighting).

JOURNEY QUALITY

2.8.6. TAG Unit A4.1 sub-divides journey quality impacts into three groupings:

- traveller care (including cleanliness, level of facilities, information and the general transport environment)
- travellers' views (including the view and pleasantness of external surroundings in the duration of the journey)
- traveller stress (including frustration, fear of accidents and route uncertainty)

2.8.7. The improvements to the cycling and walking infrastructure along the route will improve the pleasantness of surroundings for users.

2.8.8. Based on the outputs of the AMAT tool, the monetised impact on journey quality is estimated to be £375,962 (2010 PV).

ACCIDENTS

2.8.9. The scheme is anticipated to result in a reduction in traffic movements as people are encouraged to use active modes. Users of motorised modes who shift mode to active modes will result in fewer vehicles and an overall reduction in highway-kilometres travelled and therefore the number of highway accidents.

2.8.10. Accident savings have also been captured in the form of existing cycling accidents which could have been prevented through the provision of improved infrastructure.

2.8.11. Based on the outputs of the AMAT and the existing accident calculations, the total monetised impact on accidents is estimated to be £969,716.

SECURITY

2.8.12. The improved lighting provision in the form of lighting studs along sections of the route will increase the perception of safety for pedestrians and cyclists. Lighting improvements such as solar studs will give a sense of security to users of the Greenway, particularly on off-road sections.

2.8.13. The impact of the scheme on security is estimated to be **Slight Beneficial**.

ACCESS TO SERVICES

2.8.14. The expansion, and improvement, of cycling and pedestrian infrastructure provided by the Barton Greenway scheme will improve accessibility between the rural villages of Barton, Grantchester and Cambridge. In addition, accessibility for both pedestrians and cyclists will be enhanced with respect to improvements in pavement evenness and level access.

2.8.15. The impact of the scheme on access to services is estimated to be **Slight Beneficial**.

AFFORDABILITY

2.8.16. Affordability will increase for previous bus or car users as the cost of travel will decrease as they will no longer pay fares or fuel and non-fuel vehicle operating costs.

2.8.17. The impact of the scheme on affordability is estimated to be **Slight Beneficial**.

SEVERANCE

2.8.18. The introduction of the Barton Greenway will provide an improved new cycle facility between Barton and Cambridge, and a new cycling facility between Barton and Grantchester, reducing the severance currently created due to the lack of a direct route between these settlements and the severance effect of the M11 bridge safety issues.

2.8.19. The impact of the scheme on severance is estimated to be **Slight Beneficial**.

OPTION AND NON-USE VALUES

2.8.20. The proposed scheme does not introduce new travel options and therefore the impact is considered to be **Neutral**.

SUMMARY

2.8.21. The table below summaries the social impacts of the scheme.

Table 2-16 – Summary of Social Impacts

Social Impact	Assessment
Reliability	Slight Beneficial
Physical Activity	£7,145,458
Journey Quality	£375,962
Accidents	£969,716
Security	Slight Beneficial
Access to Services	Slight Beneficial
Affordability	Slight Beneficial
Severance	Slight Beneficial
Option and Non-Use Values	Neutral

2.9 DISTRIBUTIONAL ANALYSIS

2.9.1. Distributional Impacts (DIs) consider the variance of transport intervention impacts across different social groups. The analysis of DIs is a constituent of the AST. Both beneficial and/or adverse DIs of transport interventions need to be considered, along with the identification of social groups likely to be affected.

2.9.2. In terms of distributional analysis, the categories that need to be considered include user benefits, accidents and affordability, together with the effects of the scheme on local noise and air quality. The effect of these impacts is assessed for the following social groups:

- Income distribution
- Children
- Young adults
- Older people
- Disabled
- Black and minority ethnic groups
- Those without access to a car
- Carers

2.9.3. Based on the proportionate approach set out in TAG Unit A4.2, the DI assessment for the active travel elements of the Barton Greenway scheme has identified the likelihood of impacts for each indicator. Where it is anticipated there will be impacts a qualitative commentary identifying the social groups most likely to be affected has been provided.

2.9.4. The findings from this DI assessment are set out in Table 2-17 below.

Table 2-17 – Distribution Impact Assessment

Indicator	Appraisal output criteria	Potential impact	Qualitative Comments	Assessment
User benefits	The TUBA user benefit analysis software or an equivalent process has been used in the appraisal; and/or the value of user benefits Transport Economic Efficiency (TEE) table is non-zero.	Yes, positive	AMAT has been used to appraise user benefits for the scheme. This analysis does not produce spatial distribution of the benefits, but an overall benefit.	User benefits for walkers and cyclists are forecast providing benefits for those who do not have access to a car including due to age, affordability and physical ability.
Noise	Any change in alignment of transport corridor or any links with significant changes (>25% or <-20%) in vehicle flow as an indicator of significant change.	Yes, positive	There are no significant changes (>25% or <-20%) in vehicle flow, speed, %HGV content expected as a result of the scheme.	No further assessment.
Air quality	Any change in alignment of transport corridor or any links with significant changes in vehicle flow, speed or %HGV content: ▪ Change in 24-hour AADT of 1000 vehicles or more ▪ Change in 24-hour AADT of HGV of 200 HGV vehicles or more ▪ Change in daily average speed of 10kph or more ▪ Change in peak hour speed of 20kph or more ▪ Change in road alignment of 5m or more	Yes, positive	There are no significant changes in vehicle flow, speed, %HGV content expected as a result of the scheme.	No further assessment.
Accidents	Any change in alignment of transport corridor (or road layout) that may have positive or negative safety impacts, or any links with significant changes in vehicle flow, speed, %HGV content or any significant change (>10%) in the number of pedestrians, cyclists or motorcyclists using road network.	Yes, positive	The scheme is expected to reduce the number of collisions that occur along the Greenway corridor as a result of the scheme proposals such as greater separation between active modes and vehicles. It is anticipated that there will also be an overall reduction in highway-kilometres travelled as a result of the scheme, which will reduce the number of highway accidents.	Through benefitting those who walk and cycle the scheme will benefit those who do not have access to a car, including due to age, affordability and physical ability.
Security	Any change in public transport waiting/ interchange facilities including pedestrian access expected to affect user perceptions of personal security.	Yes, positive	The installation of lighting studs along off-road sections of the route will improve the security of users along the corridor.	This may provide a particular benefit to socially vulnerable groups such as the disabled, elderly and ethnic minorities.

Severance	Introduction or removal of barriers to pedestrian movement, either through changes to road crossing provision, or through introduction of new public transport or road corridors. Any areas with significant changes (>10%) in vehicle flow, speed, %HGV content.	Yes, positive	The introduction of a new cycle facility between Barton and Grantchester will reduce the severance currently created by the safety issues associated with the M11 Bridge and the uncontrolled crossings at the roundabouts along the route	This may provide a particular benefit to the economically disadvantaged along the greenway corridor who are most reliant on walking and cycling.
Accessibility	Changes in routings or timings of current public transport services, any changes to public transport provision, including routeing, frequencies, waiting facilities (bus stops / rail stations) and rolling stock, or any indirect impacts on accessibility to services (e.g. demolition & re-location of a school).	Yes, positive	The expansion, and improvement, of existing cycling and pedestrian infrastructure along the route will improve accessibility between settlements and into Cambridge. In addition, the improved paving infrastructure will improve accessibility for both pedestrians and cyclists in terms of pavement evenness and level access.	This may provide a particular benefit to the economically disadvantaged and those most reliant on walking and cycling along the greenway corridor who are most reliant on walking and cycling.
Affordability	In cases where the following charges would occur; Parking charges (including where changes in the allocation of free or reduced fee spaces may occur); Car fuel and non-fuel operating costs (where, for example, rerouting or changes in journey speeds and congestion occur resulting in changes in costs); Road user charges (including discounts and exemptions for different groups of travellers); Public transport fare changes (where, for example premium fares are set on new or existing modes or where multi-modal discounted travel tickets become available due to new ticketing technologies); or Public transport concession availability (where, for example concession arrangements vary as a result of a move in service provision from bus to light rail or heavy rail, where such concession entitlement is not maintained by the local authority).	Yes, positive	The scheme will encourage modal shift to active modes, which may reduce the cost of travel for users	This may provide a particular benefit to the economically disadvantaged and those most reliant on walking and cycling along the greenway corridor who are most reliant on walking and cycling.

2.10 VALUE FOR MONEY ASSESSMENT

2.10.1. The economic appraisal for the Barton Greenway scheme produces a BCR of 1.4:1, implying low value for money.

2.10.2. The main benefits are associated with increased physical activity as a result of health benefits from users of other modes switching to active modes and reduced absenteeism. Other scheme benefits include decongestion from fewer vehicles being on the highway network as a result of modal shift, and journey ambience for pedestrians and cyclists from improved route safety and infrastructure. Overall, the benefits amount to £9.12m (2010 PV). The cost of the scheme is £6.44 (2010 PV), which includes 23% optimism bias.

2.10.3. Sensitivity tests undertaken demonstrate that if the scheme is appraised over a 30-year period, the scheme has potential to deliver high value for money, as the benefit cost ratio increases to 2.1. If the cycling demand uplift increases to 30%, the scheme has potential to deliver medium value for money. Other sensitivity tests carried out indicate that the scheme can withstand an increase in costs reflected through higher assumed optimism bias, or no uplift in pedestrian demand and still deliver a BCR of 1.2:1 and 1.4:1 respectively. If the cycling demand uplift was halved to 12.5%, the scheme would fall into the poor value for money category with a BCR of 0.9:1.

2.10.4. There are also other impacts not captured or monetised in the appraisal that positively impact on the case for the scheme, strengthening the value for money implied by the BCR. These include social benefits in terms of severance, security, affordability and access to services, particularly along the Cambridge Road and New Road, and on Barton Road between the M11 roundabout and Cambridge.

2.10.5. This appraisal has considered the Barton Greenway as a standalone scheme. There are potential connectivity benefits encouraging additional demand arising from the network effects of integration with neighbouring planned schemes including the Cambourne to Cambridge guided busway scheme (cycling and pedestrian facilities), Haslingfield Greenway, and Comberton Greenway. Proposals for encouraging use of active modes as part of the Making Connections scheme will also increase the attractiveness of cycling from the Barton Greenway corridor into the city centre. Hence there is a strategic fit with GCP's policy ambitions to promote sustainable modes and deliver mode shift from private vehicles in order to ensure the ongoing economic growth of the region.

3 FINANCIAL CASE

3.1 INTRODUCTION

3.1.1. This chapter presents the Financial Case for the Barton Greenway scheme and demonstrates its initial affordability. It sets out the currently identified scheme costs and funding cover for the development and the implementation of the Barton Greenway.

3.2 SCHEME COSTS

3.2.1. Scheme costs and a cost profile for the Barton Greenway is provided in Table 3-1. The capital costs have been estimated by WSP. The outturn cost estimate is based on the concept design scheme drawings for the Barton Greenway and assumes scheme opening in 2026, with planned completion of construction by December 2025. It should be recognised that any delay to the scheme opening is likely to result in an increase in costs from those presented here.

3.2.2. It is estimated that the Barton Greenway will cost in the region of £13.8m, including allowances for inflation, as set out in Table 3-1. Indirect construction costs include main contractor's preliminaries, traffic management, overheads and profit. Indirect non-construction costs include Stats and professional fees.

Table 3-1 - Barton Greenway Scheme Costs, £000s, Quarter 4, 2021 Prices

Item	2024	2025	Total
Direct Construction Costs	2,141	2,141	4,282
Indirect Construction Costs	924.5	924.5	1,849
Indirect Non-Construction Costs	1,115	1,115	2,230
Sub-total	**4,180.5**	**4,180.5**	**8,361**
Risk / Contingency	1,674.5	1,674.5	3,349
Inflation	1,065	1,065	2,108
Scheme Total	**6,920**	**6,920**	**13,840**

3.2.3. The Barton Greenway scheme will incur maintenance costs. A Greenway Maintenance Guidance has been produced by the GCP. Currently, CCC and the GCP are assessing the costs of maintaining the Greenways network in coordination with the County Council's Highways team in order to apply for maintenance funding to accompany the development funding. This will provide the resources required by the maintenance teams to uphold the quality of the Barton Greenway. It is not expected that the maintenance costs will be excessive. The Barton Greenway will include an upgrade of existing cycling infrastructure.

3.2.4. Approximately 5km of the Barton Greenway is existing road or path, with only 2.21km of new infrastructure to be created. Gritting, grass verge cutting, and hedge cutting are the only three treatments provided by Highways when maintaining paths. However, it is likely that the Barton

Greenway will require other interventions such as pothole filling, siding out, tree root damage and surface cracks filling, adding to the cost of maintaining the network.

3.3 FUNDING COVER

3.3.1. The development and implementation of the Barton Greenway is funded by the GCP through City Deal funding. The City Deal funding aims to enable the GCP to promote economic growth and development. However, the GCP is looking to secure an appropriate proportion of the costs from local developer contributions through the planning process. Third party funding will be reviewed for the Barton Greenway project. The GCP is also seeking opportunities to bid for other development funds such as the Transforming Cities Fund and National Highways designated funding to consolidate the GCP's overall programme budget.

4 COMMERCIAL CASE

4.1 INTRODUCTION

4.1.1. This chapter presents the Commercial Case for the Barton Greenway scheme, describing the proposed procurement approach, risk allocation and contract management processes which are aligned with the overall approach for the Greenways programme. Specific details are provided for the Barton Greenway.

4.2 PROCUREMENT APPROACH

4.2.1. The Greenways Programme will be implemented using established Cambridgeshire County Council contracts, or Government Procurement Frameworks will be used to procure external support for tasks including Design, Early Contactor Involvement and Communications (where not available internally). For the Barton Greenway scheme WSP has been procured for the design role under the Joint Professional Services Framework (JPSF), as shown in Table 4-1. JFG Comms via WSP is supporting the communications activities, CBRE are acting as Land Agents, Pathfinder Legal are providing legal services, and Milestone (formerly Skanska) has been appointed as ECI contractor for the scheme. This appointment has been made via Cambridgeshire County Council's Highways Framework Contract ECI during 2022 into main construction.

Table 4-1 – Programme Consultants and Contractors

Consultant	Role	Procurement Route
Atkins	Design, Business Case, Planning and main consultant for Waterbeach, St Ives, Sawston and Melbourn Greenways	Joint Professional Services Framework
WSP	Design, Business Case, Planning and main consultant for Comberton, Haslingfield, Barton, Fulbourn, Swaffhams, Horningsea and Bottisham Greenways	Joint Professional Services Framework
JFG Comms	Support the Communications activities required including day to day management of stakeholders and landowners	Joint Professional Services Framework via WSP
CBRE	Land Agents for the scheme, to value, negotiate and organise acquisition of land for the Greenways	Crown Commercial Services Framework
Pathfinder Legal	Legal support for land acquisition and any rights requirements	County Council Legal Services Agreement
Milestone	Early Contractor Involvement	CCC Highways Contract

4.2.2. To date, GCP has commissioned the consultants WSP and Atkins through its JPSF to prepare the Barton Greenway preliminary scheme designs and provide business case support.

4.2.3. Milestone Infrastructure has successfully managed and carried out similar construction works in and around Cambridge, for example the Histon Road project. Milestone Infrastructure has also committed to developing a major projects team to work on larger scale projects demonstrating Milestone's commitment to providing the necessary resources for the implementation of the Greenways network.

4.2.4. GCP is satisfied that Milestone continues to have:

- An appropriate recent history of carrying out highways / pavement works.
- A proven capability to administer and successfully complete works of similar value to the scheme.
- Site Management / Supervision capability with suitable experience of working adjacent to live carriageways and public interfaces.
- Health and Safety Management systems compliant with the type and locations for these works.
- The capability in resources either through direct labour force or subcontractor labour.
- An appropriate supply chain for the procurement of materials and plant to suit the Barton Greenway scheme requirements.

4.2.5. Early contractor involvement is expected to be incorporated with the traditional approach of separate contracts for the design and construction works for the scheme. This will allow close control of the design process by the client, but also enable the delivery contractor to influence the design to reduce risks and cost by using their experience of the buildability and risks of designs.

Construction Procurement

4.2.6. Under the County Council's Highways Term Service Framework (TSF), the project has access to Milestone Infrastructure to deliver the main construction of the scheme. Milestone are well placed as they also deliver the maintenance of the network, are in close liaison with Street Works and have already competitively tendered to win the TSF. They also have smaller teams able to do work that is relatively minimal, for example widening of existing footpaths in a more agile way than other frameworks or a full tender process would allow. However, it may be that other contractors are required to complete the scheme given the overall volume of works to deliver the overall Greenways Programme. In this situation, the primary option would be utilisation of the Eastern Highways Alliance Framework which provides access to multiple major contractors.

4.3 PAYMENT MECHANISM

4.3.1. The main payment option mechanism to be used for Milestone is the NEC contract Target cost Option C. GCP has Option A and Option E available, but Option C is the GCP's preferred option.

4.4 RISK ALLOCATION

An overall risk register has been produced for the Greenways programme. A scheme specific management of risk will be undertaken using the Barton Greenway risk management plan / risk register. The risk register is detailed in the Management Case. Specific factors pertaining to the Barton Greenway scheme, including construction risks, the stage that the project is at in its development and importantly, the level of risk in the project and the appetite to accept or transfer it to a contractor will be considered in making an informed decision on risk allocation. The approach will be to ensure that the contractual arrangements for the delivery of the Barton Greenway scheme places risks with the party best positioned to deal with them.

4.5 CONTRACT MANAGEMENT

4.5.1. Management of the contracts for the design and delivery of the Barton Greenway scheme is undertaken by the Programme Manager, who is employed by GCP and has day to day responsibility for the delivery of the scheme.

5 MANAGEMENT CASE

5.1 INTRODUCTION

5.1.1. The purpose of the Management Case of the business case is to demonstrate that robust arrangements are in place for the delivery, monitoring and evaluation of the scheme.

5.1.2. Demonstrating that the scheme can be successfully delivered requires evidence of successful delivery of similar projects, evidencing that the scheme is being managed in accordance with best practice, and that the necessary arrangements are in place for change and contract management, benefits realisation and risk management.

5.2 EVIDENCE OF SIMILAR PROJECTS

5.2.1. The GCP will deliver the Barton Greenway as part of the Greenways Programme using delegated powers from CCC, although in some areas such as Right of Way restrictions the GCP will rely on the County Council's statutory powers.

5.2.2. As a relatively new delivery body, the GCP has delivered a limited number of schemes within the current City Deal. However, the constituent members of the GCP have a long history of successfully delivering schemes both large and small in scale, to time and budget. Cambridgeshire County Council has successfully delivered large-scale public transport and active mode orientated transport projects in recent years, including those shown in Table 5-1.

Table 5-1 – Evidence of Similar Projects

Scheme Name	Objectives & Scope	Implementation
Chisholm Trail Phase 1 (c.£21m)	The 2.1km long Phase 1 of the Chisholm Trail is a walking and cycling route which aims to provide a mostly traffic-free route between Cambridge North and Cambridge stations and intermediate communities.	Phase 1 opened in December 2021, connecting Cambridge North to Coldham's Lane. Phase 1 of the trail is a joint project between the GCP and Cambridgeshire County Council.
Chisholm Trail Phase 2 (c.£21m)	The 1.4km long walking and cycling route connects to Phase 1 at Coldham's Common on Coldham's Lane, providing a link to Cambridge railway station and new housing developments alongside the railway line.	Ongoing
Babraham Road cycleway improvement works (£6m)	The 1.1km long 2.5m wide cycleway connects the Babraham Research Campus and Babraham with surrounding villages.	The cycleway was completed in December 2017 and delivered by Cambridgeshire County Council contractors.
Fendon Road roundabout (£2.1m)	Fendon Road roundabout is the UK's first Dutch-style roundabout which is designed with an outer ring for cyclists, in a contrasting red surface,	The scheme was opened in August 2020, and implemented by Cambridgeshire County Council and contractor, Milestone.

Scheme Name	Objectives & Scope	Implementation
	to give them equal priority with pedestrians over oncoming vehicles to provide a safer environment for cycling and pedestrians.	
Fen Ditton and Stow-cum-Quy. (Five Cross City Cycling Schemes total of £8m)	Construction of a new foot/cycleway on Ditton Lane and Horningsea Road which is part of the Cross City Cycling schemes being funded by the GCP.	The scheme was delivered by the GCP.
The Cambridge Core Traffic Scheme (c.£7m[20])	This scheme delivered improved access for pedestrians, cyclists and public transport through traffic management and priority measures in the area bounded by the inner ring road.	The measures were implemented in phases from 1997, promoting sustainable travel modes to improve the city centre environment. Between 1993 and 2003 the number of private vehicles in the city centre reduced by 15%. Public transport patronage on routes into Cambridge also increased.
Cambridgeshire Guided Busway (c.£150[21])	This busway was designed to provide a high-quality public transport connection between Huntingdon and St Ives, to the north west of Cambridge, and Addenbrooke's Hospital and Trumpington Park & Ride to the south of Cambridge.	The overall route is 42km long with 25km of that being guided busway and 17km of on-street provision including bus priority measures. Access to Cambridge City Centre is provided via on-street running. Construction began in July 2006 with the busway opened in August 2011. Although there were challenges during the delivery of the scheme, learning from this can benefit the delivery of future significant transport measures in the county.
Histon Road (c.£10.6m)[22]	The Histon Road project aims to provide better bus, walking and cycling facilities for those travelling on this busy key route into Cambridge. This is to be achieved through: - A new bus lane from Blackhall Road to Carisbrooke Road, - New bus stop bypasses for cyclists	Ongoing

[20] This is an estimate as the scheme was implemented over several phases since 1996 and includes a range of supporting measures
[21] Total cost of the Cambridgeshire Guided Busway including £109m contribution from Cambridgeshire County Council.
[22] https://www.greatercambridge.org.uk/transport/transport-projects/histon-road/histon-road-background

Scheme Name	Objectives & Scope	Implementation
	- Improved cycle lanes - 2 new pedestrian crossings - Removal of on-street parking	

5.3 COMPLEMENTARY SCHEMES

5.3.1. The Greater Cambridge Greenways Programme forms part of the GCP's wider strategy to create better and greener transport networks. There are several planning and transport proposals which have varying degrees of synergy with the objectives of the Greenways project.

5.3.2. This section details planning and transport proposals across Greater Cambridge which offer potential complementarity with the Greenways Programme and hence with the Barton Greenway. Key complementary schemes include the planned Comberton and Haslingfield Greenways which will offer connectivity to the north and south of the scheme.

5.3.3. The complementary schemes identified in this section offer network opportunities to maximise the benefits to cyclists and pedestrians through an extensive and inter-connected system of routes. This is a continuation of the current linkage which has been developed by delivering both Cross City Cycling and the Chisholm Trail and future projects through schemes such as Cambridge City Access.

Comberton Greenway

5.3.4. Comberton is located approximately 9km west of Cambridge across relatively flat terrain. For cyclists it is currently served by a shared use path via Barton which is relatively narrow in places but is well-used. Some housing growth is taking place in the village and Comberton has a large and very well-regarded village college. In 2018/19 a Greenways 'quick win' scheme provided some improvements to the Comberton to Barton link which has proven popular.

5.3.5. The 6-mile route would provide a further improved link to Barton as well as important connections to the villages of Hardwick and Coton. The onward route would continue via the Cambridge West Campus and into the city via a new link to Grange Road and Sidgwick Avenue. Finally, a new link across to Barton Road would bring useful and safe connections to the proposed Barton and Haslingfield Greenway routes.

Cambridge South West Travel Hub

5.3.6. The Cambridge South West Travel Hub will intercept thousands of motorists who drive into the city and employment sites from the M11 and A10. The M11 Junction 11 is a vital access point into Cambridge from the south. Currently, Travel Hub provision is located on the city-side of this junction, the Trumpington Travel Hub site. A new Travel Hub site at Junction 11 in addition to the existing site would enable journeys to be faster and more reliable, reducing the increasing number of cars travelling into Cambridge.

5.3.7. The Travel Hub will have up to 2,150 car parking spaces, with 108 blue badge spaces and 108 electric vehicle charging bays, and 326 cycle spaces to encourage more people to get out their cars and cycle, walk, or use public transport. It will also have 12 parking spaces for coaches and an off-

road public transport link between the hub and the A10 Hauxton Road/Addenbrooke's Road junction.

5.3.8. Plans for the Travel Hub were provisionally approved in July 2022. Further detailed design work will now be carried out and construction is expected to begin in 2024.

Haslingfield Greenway

5.3.9. Haslingfield is a community 6.5 miles from Cambridge via Barton Road/ A603, but isolated from the city by busy roads. Opportunities for links with Cambridge are limited because of the limited number of crossings of the M11. The Haslingfield Greenway will provide the active mode connectivity linking Haslingfield and other rural settlements with Cambridge. The Haslingfield Greenway scheme will connect to the Barton Greenway to the north and west and the Melbourn Greenway to the east of Hauxton. In the city, Haslingfield Greenways users will have onward access using the Chisholm Trail, and City Access cycle routes.

Chisholm Trail

5.3.10. The Chisholm Trail is a mostly off-road walking and cycling route under construction in Cambridge. Once completed, the full trail will run over 26 kilometres, linking Addenbrooke's Hospital and the Biomedical Campus in the south to Cambridge North railway station and the business and science parks. Phase 1 of the Chisholm Trail between Coldham's Common and Cambridge North railway station is 2.1km in length and opened in December 2021. The route also connects with the Guided Busway and the national Cycle Network, and green spaces in Cambridge including: Coldham's Common, the Leper Chapel Meadows and Barnwell Lake area, Ditton Meadows and Stourbridge Common.

5.3.11. Phase 2 is currently underway, however, it requires access to land owned by Network Rail and other private owners in order for the trail to be completed. Phase 2 of the Chisholm Trail includes links to the Melbourn Greenway and the Fulbourn Greenway.

5.3.12. As part of the Greenways network, the Haslingfield Greenway will benefit from the additional connectivity offered by the Chisholm Trail improving accessibility to a range of destinations in the city.

Cross City Cycling Project

5.3.13. In January 2015, the Executive Board agreed that the Cross City Cycling projects should form part of the City Deal programme. The Cross City Cycling projects are a network of five cycling routes linking residents to workplaces and other centres of activity. These projects are as follows:

- Arbury Road
- Cambridge North Railway Station and Science Park
- Ditton Lane & Links to East Cambridge
- Hills Road and Cambridge Biomedical Campus
- Fulbourn/Cherry Hinton Eastern Access

5.3.14. The GCP has worked with partners in the County Council and contractors to deliver these projects which aim to reduce congestion and encourage cycling as a healthier mode of transport. These projects located on radial routes in residential areas improved connectivity with the city centre and are complementary to the Greenways network connecting the city with the surrounding rural villages.

Cambridge City Access

5.3.15. The Cambridge City Access project is promoting ways to improve access by sustainable transport to the city centre and key employment sites, and to reduce congestion by encouraging commuters away from cars. The programme has been conceived and developed to:

- Reduce traffic by 15% from the 2011 baseline, freeing up road space for more public transport services, and other sustainable transport modes
- Ensure public transport is more affordable, accessible and connects to where people want to travel, both now and in the future
- Raise the money needed to fund the delivery of transformational bus network changes, fares reductions and improved walking and cycling routes
- Make it safe and attractive to walk and cycle for everyday journeys
- Support decarbonisation of transport and improvements to air quality
- Make Greater Cambridge a more pleasant place to live, work, travel or just be

5.3.16. A package of eight measures, ranging from the development of an integrated parking strategy to a review of the city's road network classification have been developed to help support sustainable growth in Greater Cambridge (illustrated in Figure 5-1). Central to this is the Making Connections programme.

Making Connections

5.3.17. The Making Connections programme is being proposed and consulted on, this could provide a transformational change in travel behaviour which will complement the strategy measures set out in Figure 5-1. Making Connections comprises a complete overhaul of the bus network to provide new routes, longer operating hours, more affordable fares and new destinations, funded by a charge for driving that will reduce congestion and free up space for public transport, walking and cycling. Investment in the bus network will reach around £50m a year, making it one of the biggest changes outside London since deregulation of the bus industry in the 1980s.

5.3.18. The programme will rebalance the use of highway space to enable more people to travel, whilst making Greater Cambridge a more attractive place in which to live and work, and to visit. It will reduce congestion, reduce emissions, increase public transport use, and boost walking and cycle use for short journeys in the city.

Figure 5-1 – Cambridge City Access Strategy Measures

Source: Greater Cambridge Partnership

5.3.19. The Greenways Programme as a whole will benefit from the positive impacts on reallocation of road space for public transport and active modes incorporated in the City Access Strategy including:

- Reduced traffic congestion within the city centre
- Faster, cheaper and more reliable bus journeys, enabling expansion of Park & Ride capacity and facilities
- Safer, easier, and more attractive walking and cycling journeys
- Reduced pollution and cleaner air
- Fewer stationary or slow-moving vehicles
- More cycling and pedestrian infrastructure
- Preservation and enhancement of Cambridge's historic environment
- Improvements to the quality and reliability of public transport; and
- Continued growth in cycling

5.4 GOVERNANCE, ORGANISATIONAL STRUCTURES AND ROLES

5.4.1. This section describes the programme governance and roles of the entities. The overall structure is shown in Figure 5-2.

Executive Board

5.4.2. The delivery of the Project will involve at least five key stage decisions to be taken by the Executive Board, as follows:

- Decision to proceed with the development of the Project; (Complete)
- Consideration of options and approval to consult on initial options; (Complete)

- Selection of a preferred option following consultation and agreement to take forward preliminary design;
- Approval of preliminary design and Outline Business Case with agreement to enter relevant statutory processes and the preparation of a Full Business Case; and
- Final approval to implement the project and complete a Detailed Design.

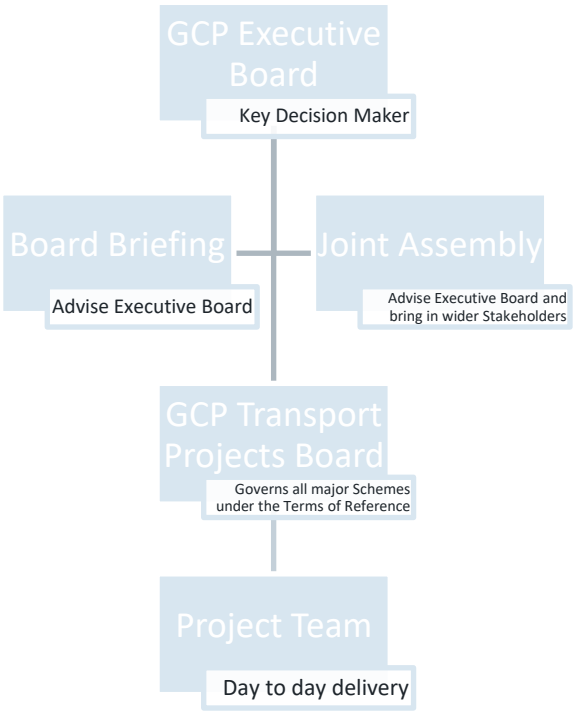
Transport Programme Board

5.4.3. The Transport Programme Board is the regular decision-making body for the Greenways. It takes decisions by exception on matters raised by the Senior Project Managers. It is held on a monthly basis with Highlight reports provided one week in advance of the meetings. It is the responsibility of the Senior Project Managers to attend the Board and ensure they are provided with any issues which are in exception.

5.4.4. A project is in exception if:

- The project will not deliver the objectives agreed with the Executive Board
- The forecast overall cost of the project exceeds what has been reported to the Executive Board
- The forecast completion of the project exceeds the date reported to the Executive Board
- A key decision milestone is forecast to be missed by 3 months (in line with the Executive Board cycle of meetings).
- A project is at risk of causing significant reputational damage to GCP or its partners

Figure 5-2 – Overall Greenways Programme Governance Structure



Cycling Projects Meeting

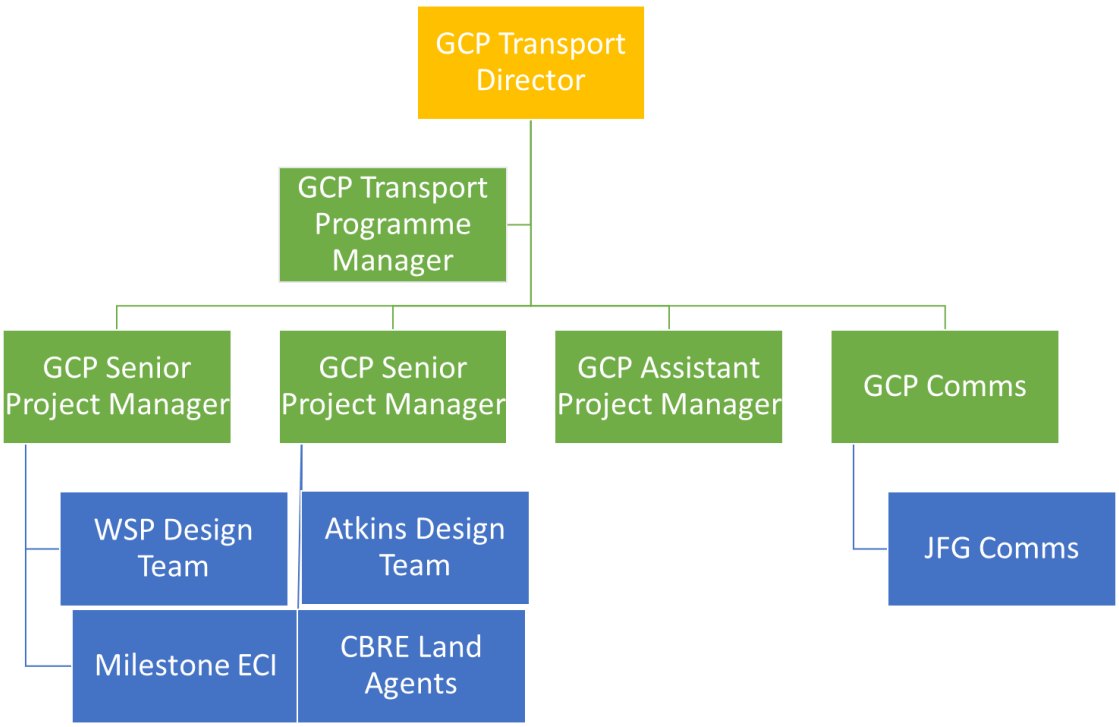
5.4.5. The Cycling Projects Meeting is primarily a coordination meeting between the different Active Travel projects. It includes:

- Construction Programming, including prioritisation of routes (before ultimate sign off by Transport Programme Board)
- Decisions on design options (unless controversial at which point they will be escalated)
- Initial review of documents including the overall Business Case for the Greenways and design principles (before going on to appropriate decision-making bodies such as the Transport Programme Board)
- Decisions on timing of communications with the public and stakeholders

Resources

5.4.6. The Greenways is a complex programme of works. Figure 5-3 sets out the structure of the Greenways management team.

Figure 5-3 – Structure of the Greenways Management Team



5.4.7. The roles and responsibilities of each of the management team is detailed below.

Internal GCP Resources

5.4.8. The internal GCP resources are set out below.

GCP Transport Director

- Overall accountable for the project, responsible for the structure of the project team and owns the Business Case
- Monitor & control the project tolerance at a strategic level

- Make decisions on escalated issues

GCP Transport Programme Manager

- Responsible for monitoring and reporting on the programme budget to Transport Programme Board (TPB)
- Responsible for ensuring that Project Managers are adhering to the Assurance Framework
- Overall responsibility for producing the Procurement Strategy (i.e., Working with Project Managers to ensure the appropriate options are available)
- Monitors the progress of the programme against agreed key milestones (aligned to the reporting cycle for GCP)
- Resolutions of day-to-day issues (specific to Greenways Programme only)
- Escalates significant issues to GCP Transport Director
- Sign off of all key contract documentation where commercially sensitive (specific to Greenways Programme only)

GCP Senior Project Managers

5.4.9. The Senior Project Manager run the programme on a day-to-day basis in accordance with this document. The main responsibilities of the Project Manager are to:

- Be the face of the project, representing GCP at main stakeholder events to provide updates on the projects
- Be responsible for the relationship with key stakeholders including County, District and Parish Councils as well as bodies such as National Highways and Network Rail;
- Deliver the project to a required specification and quality within budget and according to plan
- Direct and motivate project support resources
- Project manage and plan all stages of the project
- Prepare project, stage and exception plans
- Manage project risks (includes contingency planning)
- Monitor progress, expenditure, and resources, initiating corrective action as required
- Keep the Transport Programme Board informed of deviations in plans and seek endorsement for associated action
- Prepare stage reports for the Joint Assembly and Executive Board
- Identify, commission and oversee external resources necessary for the assessment, evaluation, design, management and planning of the project
- Be responsible for project administration
- Facilitate a post construction review of the project; and
- Ensure that all new highway assets created/network amended is recorded. This includes the legal category of any new highway e.g., cycle track, together with details of extent, boundaries, and infrastructure

GCP Assistant Project Manager

- Organise Project meetings and taking minutes as appropriate
- Coordinate communications with stakeholders when required
- Update finance, programme and risk registers etc. as required
- Provide support to Senior Project and Programme Manager when required

GCP Communications Team

- Responsible for producing the overall Communications Plan for the Greenways Programme
- Responsibility for stakeholder management that is not specific to design, i.e., Councillors and Parishes
- Responsible for coordinating responses to enquiries (this is partly delegated to JFG Comms)
- Ensure the overall story of the Greenways is understood and communicated positively
- Produce regular updates for the public and key stakeholders

Consultant and Contractor Support

5.4.10. External support resources are procured through established County Council contracts or Government Procurement Frameworks for various tasks including Design, Early Contactor Involvement, Communications (where not available internally). The Barton Greenway scheme consultants and contractors have been procured, namely Atkins and WSP, as shown in Table 5-1. Milestone will be the proposed contractor responsible for construction under the Cambridge County Council Highways Contract. The consultant / contractor responsibilities are set out below.

Atkins and WSP

5.4.11. Atkins and WSP have been appointed to deliver the following aspects of the Greenways programme:

- Concept and Preliminary Design
- Transport modelling (as required)
- Transport assessment (as required)
- Environmental Impact Assessment and other relevant surveys and assessments (as required)
- Initial Cost estimating
- CDM Principal Designer
- Preparation of a proportionate TAG compliant Outline Business Case
- Preparation of Planning Application, submission, and determination support (as required)
- Wayfinding Strategy (Atkins only)
- Land referencing (WSP only)
- Engagement event materials

5.4.12. They will also be procured at the suitable time for:

- Detailed Design
- Full Business Case
- Procurement support
- Construction Supervision

Milestone

5.4.13. Milestone have been appointed in Early Contractor Involvement for the Greenways Programme. This work consists of:

- Producing budget estimates for the GCP schemes / projects
- Managing and co-ordinating the GCP programme of works, including co-ordination with highways contract to achieve efficiencies where possible linking planned GCP and CCC schemes / projects
- Producing and reviewing risk and opportunity registers for the schemes / projects
- Design maturity and buildability assessments

- Value engineering opportunities
- Review of utility diversions
- Assist where required for land take assessments, with particular focus on temporary land take requirements for construction period
- Construction programme development
- Planning and execution of design surveys including but not limited to; Ground Penetrating Radar ("GPR"), trial holes, ground investigation, TOPO and drainage surveys
- Developing traffic management solutions and co-ordinate with the CCC Streetworks team to confirm road space availability

5.4.14. Subject to performance and capacity this will lead to Milestone constructing the Greenways projects.

CBRE and Pathfinder Legal

5.4.15. CBRE have been appointed as the land agents responsible for the Greenways Programme. They are procured to:

- Complete land acquisition strategies for each Greenway
- Complete land valuation for each Greenway
- Advise on the process of CPO as required
- Negotiate land on behalf of the GCP

5.4.16. They are supported by Pathfinder Legal who are responsible for

- Preparation of CPO documentation as required
- Legal advice on the process for CPO
- Completion of acquisition paperwork
- Advice on legal process to designate, or change designation of PRoWs

5.5 PROJECT ASSURANCE, APPROVAL PLAN AND PROGRAMME

Programme Assurance

5.5.1. Responsibility for assuring the delivery of the project rests with the Programme Board and Cycling Projects Meeting and includes:

- Ensuring good liaison and collaboration throughout the project to achieve good governance
- Assuring that user needs and expectations are being met or managed
- Ensuring that risks are being controlled
- Monitoring project expenditure versus benefits
- Informing the project of any changes caused by external events
- Ensuring adherence to relevant procedures, standards and specifications; and
- Ensuring highway aspects designed in accordance with Manual for Streets 2 and the Design Manual for Roads and Bridges, LTN1/20, as appropriate

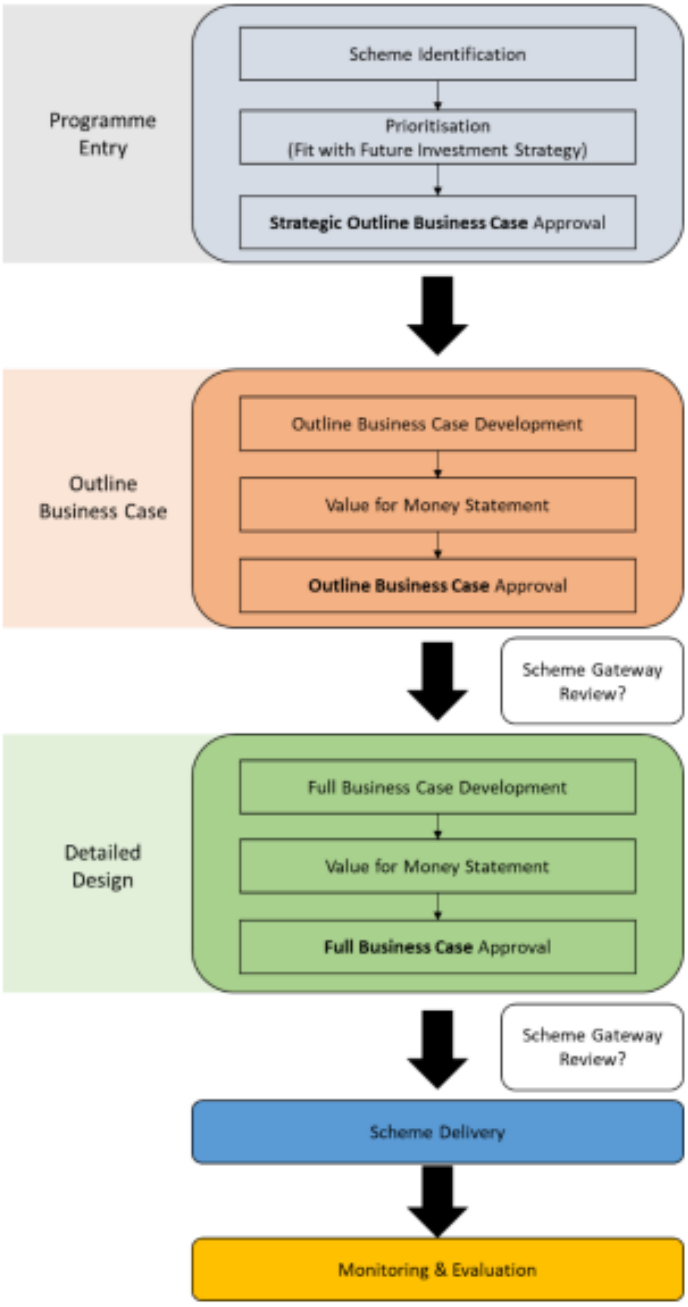
GCP Work Stages

5.5.2. The programme for the overall Greenways project is aligned with the GCP work stages process set out in the GCP Local Assurance Framework (LAF). This LAF sets out, "membership, responsibilities, and principles that are in place for agreeing and overseeing investments to deliver the overarching City Deal objectives". The LAF process is shown in Figure 5-4 commencing with programme entry through to full business case development. The Barton Greenway scheme, as with the other

individual schemes, is developed at Outline Business Case stage as an addendum to the Programme Outline Case.

5.5.3. The Framework ensures compliance with DfT's minimum requirements for Assurance Frameworks.

Figure 5-4 - GCP Indicative Process for Business Case Development



Source: Greater Cambridge City Deal Assurance Framework

Approvals to Date

5.5.4. The programme entry work stage has been completed with the development of the programme outline case and approval by the Executive Board.

High Level Programme

5.5.5. This section provides an overview of the staged process through which the project will be delivered.

5.5.6. The high-level programme for the delivery of the Greenways is based on an approximately four-year programme. The Project will consist of a number of stages in line with the Major Infrastructure Project Delivery Stage, Key Decision Matrix and GCP Assurance Framework. This is shown in Table 5-2. This has been slightly adapted to allow for an additional stage for sign-off for the first versions of technical design.

5.5.7. Individual greenway scheme's outline business case development takes place in Delivery Stage 2a Approved Option and Delivery in Stage 3 Preliminary Design.

Table 5-2 – Greenways Programme Project Stages

Stage	Description	Approval
Strategy Stage 0: Policy and Strategy	Preparation of Project Initiation Document (PID)	Complete
Delivery Stage 1: Project Set Up / Initial Options	Project resource planning, development of stakeholder engagement strategy and preparation of project development briefs	Complete
Delivery Stage 2: Feasibility Study	Identification of options, conceptual design work, strategic business case and assessments to facilitate initial stakeholder engagement to allow selection of a Preferred Option	GCP Executive Board (Complete)
Delivery Stage 2a: Approved option	Feasibility Design of Preferred Option	GCP Transport Programme Board
Delivery Stage 3: Preliminary Design	Preliminary Design of Preferred Option and agreement of Outline Business Case	GCP Executive Board
Delivery Stage 4: Detailed Design	Final business case and detailed design to facilitate project approval Processes for planning permission, traffic regulation orders, compulsory purchase orders and Government statutory approvals as required	GCP Executive Board
Delivery Stage 5: Construction (Mobilisation and Construction)	Procurement of a provider(s) to construct the project Construction of the project	GCP Executive Board

	Post-project review to assess how well the project objectives and outputs have been met	

Barton Greenway Outline Delivery Plan

5.5.8. The technical concept design for the Barton Greenway route has now been completed. This has given greater clarity on what the key delivery risks and opportunities are. This has enabled the project team to develop a more accurate programme for the subsequent preliminary and detailed design stages, as well as an indicative construction programme. As requested by the Executive Board, officers are now in a position to demonstrate how the programme can be achieved. The Outline Delivery Plan, shown in Table 5-3, sets out an indication of when the Barton Greenway route will be constructed, and what early works can be expected in 2023. The Outline Delivery Plan for the Barton Greenway provides milestones and scheduled dates for completion.

Table 5-3 – Barton Greenway Outline Delivery Plan 2022-2025

Year	Delivery Plan
2022	▪ Development of preliminary designs ▪ Public Engagement and preceding Stakeholder Engagement completed – autumn 2022 ▪ Topographical Surveys ▪ Environmental Surveys ▪ Planning and Consents Strategies ▪ Traffic Surveys ▪ Land Owner Discussions
2023	▪ Land Owner Negotiations ▪ Detailed design and technical approvals ▪ Planning Applications ▪ Traffic Regulation Orders (TRO) (Barton Village 20mph) ▪ Compulsory Purchase Orders (CPO) / PRoW orders ▪ Full Business Case ▪ Early Physical Works: - Barton Village - Barton Road to Cambridge
2024	▪ Compulsory Purchase Orders (CPO) / PRoW order work to continue as in 2023 ▪ Finalisation of land agreements ▪ Construction (subject to approvals): - Baulk Path improvements - Section from Barton through to the M11 bridge
2025	▪ Construction to be completed of all remaining sections of the Barton Greenway: - A306 Cambridge Road and Roundabout (M11 North slip road) - Barton Road, Coton Road, Grantchester Road Roundabout
2026	▪ Scheme opening

5.6 STAKEHOLDER ENGAGEMENT AND COMMUNICATIONS

5.6.1. This section sets out the strategy for developing communications and stakeholder management on the project. Effective communication is critical to the success of the Barton Greenway project. The key priorities for communications during the development of the design of the project are to:

- Provide all relevant stakeholders with clear, well-structured details of the GCP vision, project objectives and possible options, as well as being clear about what this project does and does not cover
- Create opportunities for stakeholders to express their opinions and encourage the opportunity to share their views on the options freely and openly
- Use an appropriate methodology for collecting stakeholder responses and analyse them
- Build upon the feedback received during the public consultation period
- Create a consistent message to convey that the Barton Greenway is part of the greenways programme to ensure stakeholders are aware that the Barton Greenway is not only part of the Greenways Programme, but also a part of a wider vision set forward by the GCP
- Ensure the benefits and impacts of the scheme are clearly presented to all stakeholders
- Identify advocates for the scheme
- Manage any reputational risks associated with the scheme
- Raise the profile of the GCP and its work
- Ensure all engagement and communication is recorded and reported where necessary

5.6.2. The Barton Greenway is now proceeding with development of the agreed alignments and initial design work. This involves environmental surveys, key structure design, more detailed costing, and land negotiation. Stakeholder engagement at this point has involved discussions with residents and stakeholders to understand and incorporate needs and concerns within principal design standards across all routes. The initial consultation event in 2018 was met with a positive response with the majority of respondents in favour of the majority of the elements of the proposed Barton Greenway.

5.6.3. The majority of respondents supported the majority of the elements of the proposed Barton Greenway after the initial consultation even in 2018, with the exception of element 10 ‘development of the route along the Baulk’ which was nearly equally supported and opposed. There were several concerns regarding the safety of cyclists on the Baulk route. Accordingly, this information was then fed into the designs for initial proposals for the Barton route.

5.6.4. Responses from the initial public consultation undertaken in 2018 shaped the proposals that were presented in the four-week engagement period that ran between 7th November 2022 and 2nd December 2022. It was then extended until 16th December 2022. A range of key stakeholders along the Barton Greenway were engaged and continue to be engaged as the project progresses. These include partner authorities, council members, parish councils, representatives of walking, cycling and equestrian groups, and owners of land where access agreements are needed to operate or construct the route.

5.6.5. The consultation strategy for this stage of the Barton Greenway proposal was designed by the GCP communications team with input from the County Council’s Research Team. The strategy involved the identification of the audience, the design of consultation materials and design, and the analysis of the results.

Scheme Communications Plan

5.6.6. In addition to the strategic programme-wide communication messages and objectives set out above, an individual route engagement and communications plan has been developed and implemented for the Barton Greenway.

5.6.7. There are two key channels for proactive communications that the GCP will use to tell the story of the Barton Greenway as it is developed in the context of the Greenways Programme:

- The Website - The Greater Cambridge Partnership website is the key communications platform where information regarding the Greenways project is provided
- Quarterly GovDelivery Updates – Communication updates are issued quarterly to outline the progress made on the Greenways project

Designed by the GCP communications team with input from the County Council's research team, project communication is governed through the Communications Plan, as outlined in Table 5-4. The purpose of the strategy is to ensure that accurate and timely messages about the scheme are disseminated to a range of identified stakeholder groups.

Table 5-4 – Communications Method for the Barton Greenway

Audience	Type of Communication	Frequency	Responsibility
General Public	Formal consultation – online survey and paper return survey Regular website updates provided on GCP Greenways webpages (i.e., Greenway specific updates and preliminary design) GovDelivery Updates	Initial Barton consultation summer 2018 Barton engagement autumn 2022 Quarterly	GCP Communications Team
Other Key Stakeholders	Meetings Emails	As Required	Project Manager
Members	Reports Briefing Sessions	As per Scheme Updates / Progress	Project Manager
Technical Officers **CCC / GCP**	Project Team Meetings	As Required	Project Manager

General Correspondence	Letters, Emails, GCP social media	As Required	Project Manager / Communications Team

5.7 RISK AND ISSUES MANAGEMENT

5.7.1. The Barton Greenways scheme risk management is documented in the Issues and Risks Log produced by WSP.

5.7.2. Key Risks for the Greenways Programme as a whole, are as follows:

- Resourcing – staffing of the project team and the Communications team
- Procurement process – the risk of time and cost extensions to procurement
- Consents – obtaining planning consents, and Network Rail and Highways England approvals
- Acquisition of land - potential delays in obtaining land access consents with possible associated delays to the completion of the elements of the preliminary design
- Cost escalation – effectiveness of project controls to manage costs
- Environmental impacts affecting the route of the scheme
- Other infrastructure schemes/developments taking precedence over the Greenway

5.7.3. Mitigation measures identified include the following:

- The Issues and Risks Log for the overall Greenways programme forms the basis for developing the individual Risk Issues and Logs for each of the Greenways schemes
- An overarching Stakeholder Engagement & Comms Plan and Tracker has been produced to plan and log all engagement across the Greenways project including undertaking re-engagement and wider stakeholder engagement. The GCP Comms team issue quarterly progress and communications updates via its website and Gov-delivery.
- Costings for the scheme to be reviewed by designers at every design stage
- Development of a land access strategy / prioritising land acquisition critical to the scheme development.
- Identification of alternative routes to minimise environmental impacts

5.7.4. A project risk register has been produced for the Barton Greenway scheme for the current stage of scheme development, namely preliminary design. Risk mitigation will be assessed from a strategic perspective and will be reviewed monthly.

5.7.5. The key risks to the scheme are as follows:

- Environmental risks associated with scheme works exacerbating existing Japanese Knotweed on the bridleway
- Programme risk that connecting the Cambridge works may delay the Greenway construction programme
- Programme risk that Milestone delay to the start work on Barton Road (following Grantchester Rd and Newnham sections) in 2023 due to the December embargo. Whilst the impact on programme is likely to be a matter of weeks there may be reputational damage to the GCP
- There is a project management risk that the scope is changed during the Preliminary Design stage causing delay to completion and extra cost to project.

- A project management risk associated with changes to the Milestone programme for acceleration of Quick Wins
- Project capital cost risk that inflation will be above forecast increasing scheme cost above forecast cost

5.7.6. Mitigation measures identified are as follows:

- Mitigate Japanese Knotweed through communication with the GCP, identifying the party responsible for remediating contaminated ground and recommending to the GCP that specific section is not programmed for works until ground is remediated.
- Mitigate construction programme risk by confirming the scope of 'Connecting Cambridge' requirements for the Barton Greenway route and confirm with the GCP that the Design Team will be requested to produce a design for installation of ducts.
- Mitigate construction programme risk of delay to start of works on Barton Road through Milestone liaising with Cambridge Streetworks to remove the embargo, reschedule the wider programme to enable earlier start of works and identify more labour to allow for improved scheduling
- Mitigate project management scope risk through updates on programme/cost forecasts and report changes as a part of change agreements
- Mitigate project management risk to Milestone accelerated delivery of Quick Wins through regular coordination with Milestone and programme review to ensure the design programme remains on target
- Mitigate project capital cost risk through Programme design to support Milestone's programme

5.8 MONITORING AND EVALUATION

5.8.1. On completion of the construction of the Barton Greenway, a review of the delivery process will be undertaken in accordance with the Greater Cambridge City Deal Project Review Protocol.

5.8.2. The Project Manager will facilitate the review to produce a review report for consideration by the Project Board, ahead of scrutiny by the Joint Assembly and sign off by the Executive Board.

5.8.3. A monitoring and evaluation plan and benefits realisation plan have been produced for the Barton Greenway scheme.

5.8.4. The DfT's 'Monitoring and Evaluation Framework for Local Authority Major Schemes' guidance document forms the basis of the monitoring strategy alongside the GCP's Assurance Framework.

5.8.5. The DfT guidance sets out the requirements for the monitoring of schemes and outlines three tiers of monitoring and evaluation, these are:

- Standard monitoring;
- Enhanced monitoring; and
- Fuller evaluation.

5.8.6. It is proposed that the Greenways programme follows enhanced monitoring practice as the scheme is likely to be more than £50m in value.

Monitoring and Evaluation Plan

5.8.7. The outline Monitoring and Evaluation Plan is set out below in Table 5-5. Monitoring of the key outcomes including cycle and pedestrian usage of the scheme will be implemented at key locations on the route. The monitoring will be undertaken through targeted counts, as a minimum on an annual basis, preferably more regularly to assess seasonal effects, assessing the new active mode

usage with baseline demand. The Monitoring and Evaluation Plan will also monitor actual scheme expenditure compared to budget, and project delivery compared with key scheme programme milestones.

Benefits Realisation Plan

5.8.8. The Benefits Realisation Plan is shown in Table 5-6.

Table 5-5 – Outline Monitoring and Evaluation Plan

Objective	Enabling objective / outcome	Performance indicator	Methodology	Timescale	Owner of Monitoring Task
Encourage commuting by sustainable transport modes and reduce traffic congestion	Capacity: Provide the cycle network capacity to accommodate increases in active travel demand due to new housing and employment growth	Increase in cycle network capacity Ability to contribute to a reduction in vehicular road traffic Propensity to reduce congestion/delay	Active travel surveys Non-motorised user counts Traffic counts Before and after implementation queue length survey	Pre or during delivery / post opening (up to 5 years)	GCP
Contribute to improved air quality and better public health	Connectivity: Improve accessibility to jobs and opportunities by active modes through a reduction in journey times and increase ease of interchange with public transport modes	Reduced journey time for cycling Scale of catchment (jobs, housing) Ability to unlock growth Ease of interchange with public transport	Before and after air quality monitoring using air quality measurement facilities Active travel surveys Land use surveys and land value change assessments	Pre or during delivery / post opening (up to 5 years)	GCP
	Communities: Contribute to the creation of safe and attractive communities by reducing emissions, severance and the dominance of traffic improving personal security and road safety	Road safety Protection of green spaces; net biodiversity gain Environment (air quality and carbon reduction) Quality of the public realm Severance	Assessment of road traffic collisions Before and after air quality monitoring using air quality measurement facilities	Pre or during delivery / post opening (up to 5 years)	GCP
Efficient project delivery	Cost during construction and outturn costs against budget	Cost expenditure compared to milestones	Cost monitoring by area of spend compared with programme	During and post opening	GCP

Table 5-6 – Benefits Realisation Plan

Objective Supported	Enabling changes	Benefits experienced	Who will benefit	Benefit Owner
Capacity: Provide the cycle network capacity to accommodate increases in active travel demand due to new housing and employment growth	Provision of segregated cycling infrastructure: attract new active mode users in the Barton corridor	Unlock economic growth by providing new transport capacity / encouraging new residents to commute using active modes into Cambridge	Residents / employees / wider community	GCP / South Cambridgeshire District Council / Cambridge City Council
Connectivity: Improve accessibility to jobs and opportunities by active modes through a reduction in journey times and increased ease of interchange with public transport modes	Provision of new cycling infrastructure offering more direct routes/links and developing network connectivity with the Comberton and Haslingfield Greenways and other Cambridge active mode networks	Increased active mode transport accessibility to jobs in the city centre Mode shift from car to active modes	Residents / employees / wider community	GCP / South Cambridgeshire District Council / Cambridge City Council
Communities: Contribute to the creation of safe and attractive communities by reducing emissions, severance and the dominance of traffic improving personal security and road safety	Provision of new cycling infrastructure – development of dedicated active mode corridor leading to safer and healthier cycling & walking environment	Greater active mode travel safety Reduced GHG emissions, more linked habitats along the Barton Greenway corridor contributing to Bio-diversity Net Gain Reduced severance effect on residential communities due to traffic congestion relief Improved well-being of travellers, with positive effects for businesses through higher productivity	Residents / employees / wider community	GCP / South Cambridgeshire District Council / Cambridge City Council

Appendix A

CONCEPT DESIGN DRAWINGS

PROPOSED REFLECTIVE BOLLARD WITH SEGREGATED USE / END OF SIGNS.

PROPOSED REFLECTIVE BOLLARD WITH SEGREGATED USE / END OF SIGNS.

PROPOSED REFLECTIVE BOLLARD WITH SEGREGATED USE SIGNS.

EXISTING SIGN RE-LOCATED.

PROPOSED REFLECTIVE BOLLARD WITH SEGREGATED USE / SHARED USE SIGNS.

PROPOSED EDGING KERB WITH SLIGHT UPSTAND TO GUIDE IMPAIRED VISIBILITY USERS.

EXISTING SIGN FACE TO BE RENEWED.

ADDITIONAL FOOTWAY RE-SURFACING.

CUTLINE A

CUTLINE B

ROAD MARKINGS AND SURFACING TO BE REFRESHED +20m DISTANCE FROM MOUTH OF JUNCTION.

EXISTING UNCONTROLLED CROSSING RE-CONSTRUCTED.

ROAD MARKINGS AND SURFACING TO BE REFRESHED +20m DISTANCE FROM MOUTH OF JUNCTION.

ROAD NAME PLATE RE-POSITIONED.

CYCLE STANDS RE-INSTATED.

THE DRIFTWAY

PROPOSED CYCLIST DISMOUNT SIGN.

FINGER SIGN POST TO BE RELOCATED.

PROPOSED LAMBETH TACTILE PAVING OR SIMILAR RAISED PROFILE SURFACE TO DETER UNAUTHORISED CROSSING.

HARDWICK STREET

DERBY STREET

GRANTCHESTER STREET

PROPOSED ADVISORY CYCLE LANE TO COMMENCE AFTER RAISED TABLE (1.0m WIDTH).

RE-SURFACING EXTENTS UP TO EXISTING RAISED TABLE.

PARKING AVAILABILITY TO BE REDUCED FROM 15.0m to APPROX 10m LENGTH.

ROAD MARKINGS TO TIE BACK INTO EXISTING.

CARRIAGEWAY WIDTHS REVISED.

DOUBLE YELLOWS TO TIE BACK INTO EXISTING.

RE-SURFACING EXTENTS UP TO EXISTING PARKING.

PROPOSED ADVISORY CYCLE LANE TO COMMENCE AFTER EXISTING PARKING BAYS. MIN WIDTH 1.2m.

EXISTING CONTROLLED CROSSING AND ASSOCIATED CABLES AND COVERS TO BE REMOVED.

ADDITIONAL FOOTWAY RE-SURFACING.

PROPOSED REFLECTIVE BOLLARD WITH CYCLE ONLY / SHARED USE SIGNS.

PROPOSED CYCLE ONLY FACILITY.

No.2

PRIVATE ACCESS

PROPOSED ADVISORY CYCLE LANE MIN WIDTH 1.2m.

CYCLE RAMP UP.

EXISTING PARKING EXTENTS.

SITE LOCATION
X: 544341.50
Y: 257460.25

LOCATION PLAN
SCALE 1:20,000

KEY

- PROPOSED 110mm UPSTAND KERB. (HB2 PROFILE)
- PROPOSED DROP KERB (LEFT / RIGHT).
- PROPOSED 0-6mm UPSTAND KERB (BN PROFILE)
- PROPOSED 25mm UPSTAND KERB. (BN PROFILE)
- PROPOSED EDGING KERB. (FLAT TOP)
- PROPOSED EDGING KERB. (BN PROFILE)
- PROPOSED CARRIAGEWAY RE-SURFACING.
- PROPOSED RED ASPHALT CONSTRUCTION/RE-PROFILE.
- PROPOSED FOOTWAY CONSTRUCTION/RE-PROFILE.
- PROPOSED VERGE / GRASS RE-SEEDING.
- PROPOSED RED BLISTER TACTILE PAVING. (CONTROLLED CROSSING)
- PROPOSED BUFF BLISTER TACTILE PAVING. (UNCONTROLLED CROSSING)
- PROPOSED BUFF LADDER & TRAMLINE TACTILE PAVING.
- PROPOSED DRAINAGE GULLY (APPROX LOCATION).
- PROPOSED TRAFFIC SIGNALS (APPROX LOCATION).
- PROPOSED SIGN/BOLLARD (APPROX LOCATION).
- REVISION CLOUD.

NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. SITE VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
3. REPORT ALL DISCREPANCIES TO THE DRAWING ORIGINATOR IMMEDIATELY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTS AND DRAWINGS.
5. FOR SITE CLEARANCE DETAILS REFER TO DRAWING 5020499/MIN/HSC/ZZ/DR/CH/0201.
6. FOR SIGN AND ROAD MARKING DETAILS REFER TO DRAWING 5020499/MIN/HMK/ZZ/DR/1201.
7. FOR STATUTORY UNDERTAKER APPARATUS REFER TO DRAWING 5020499/MIN/VUT/ZZ/DR/2701.
8. ROAD MARKINGS TO BE REVISED AND REFRESHED WHERE APPLICABLE WITHIN CARRIAGEWAY RE-SURFACING EXTENTS - REFER TO NOTE 6.
9. PROPOSED DRAINAGE GULLY LOCATIONS TO BE CONFIRMED IN DETAILED DESIGN WITH PIPE CONNECTION DETAILS.
10. PROPOSED TRAFFIC SIGNAL LOCATIONS TO BE CONFIRMED IN DETAILED DESIGN WITH DUCTING DETAILS.

RESIDUAL RISK ASSESSMENT
WHEREVER POSSIBLE, RISK IS DESIGNED-OUT OF THIS PROPOSAL DURING THE DESIGN PROCESS. WHERE THIS IS NOT POSSIBLE THE RISK IS INDICATED BY THIS SYMBOL.

SIGNIFICANT CDM HEALTH & SAFETY RISKS

1. OVERHEAD CABLES

Rev	Date	Description	Drn	Chk'd	App
P03	09/05/2022	RSA1 REVISIONS	CM	NT	AB
P02	06/04/2022	REVISED SCOPE	CM	NT	AB
P01	09/02/2022	FIRST ISSUE	CM	NT	AB

Revisions

Client

Cambridgeshire Highways
Working in partnership with Cambridgeshire County Council

Vantage House, Vantage Park,
Washingley Road, Huntingdon, PE29 6SR.

Drawing Originator

MILESTONE INFRASTRUCTURE
A part of MGroupServices

Woodlands Court, Burnham Road,
Beaconsfield , Buckinghamshire, HP9 2SF

Drawing Status

PRELIMINARY DESIGN

Project Name

BARTON ROAD SIGNALS PRELIM

Title

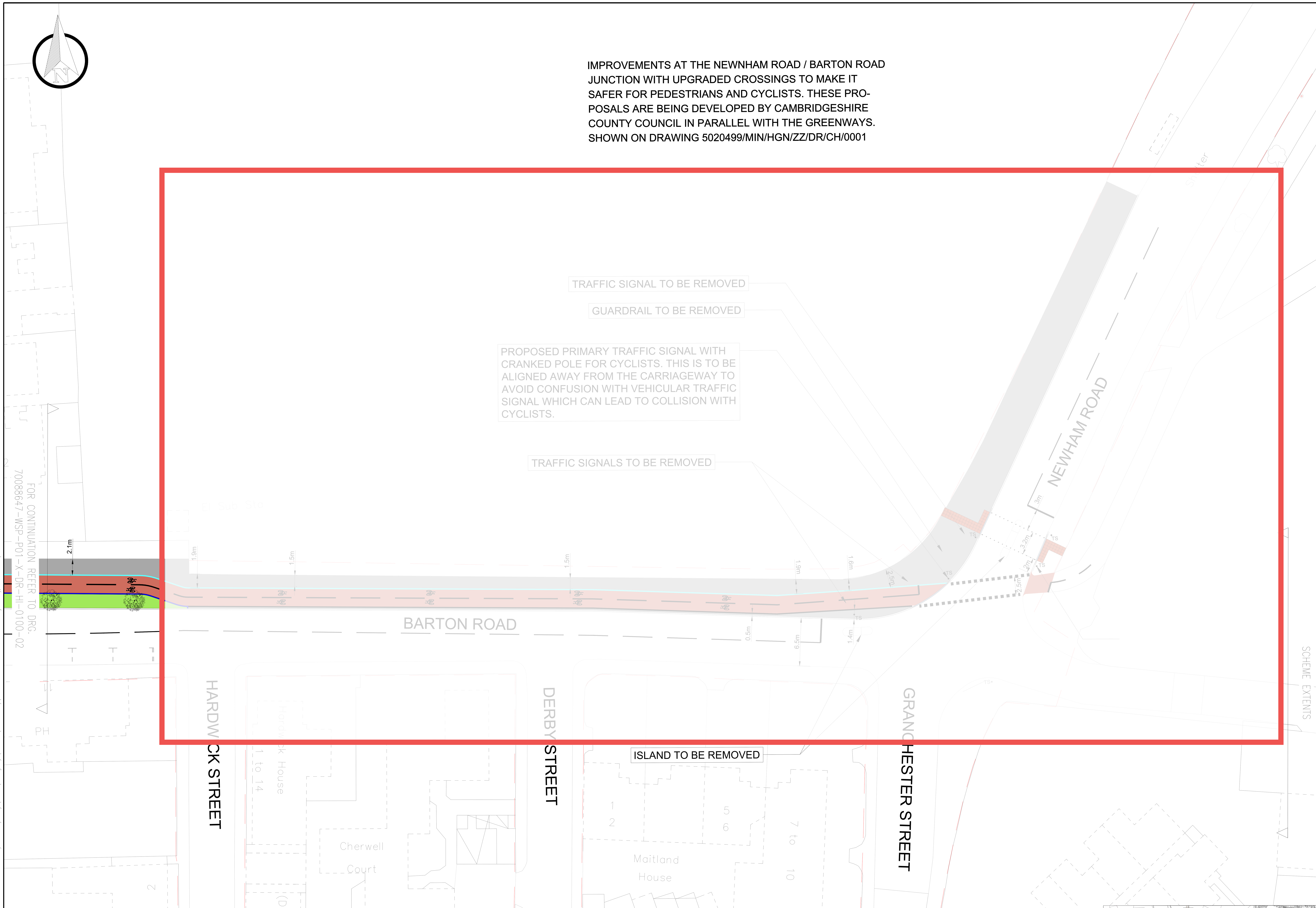
GENERAL ARRANGEMENT

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:200	CM	NT	AB
		Drawn Date 09/02/2022	Checked Date 10/02/2022	Approved Date 10/02/2022

Drawing Number	Status	Rev
5020499/MIN/HGN/ZZ/DR/CH/0001	S2	P03

File Plotted: 20 May 2022 10:28:00 File location: P:\Highways\Cambridgeshire Highways\Projects\5020499- Barton Road Signals Prelim\900 CAD & BIM\910 Drawings\5020499_MIN_HGN_ZZ_DR_CH_0001_S2_P03.dwg Printed by: Moughton, Casey

IMPROVEMENTS AT THE NEWNHAM ROAD / BARTON ROAD JUNCTION WITH UPGRADED CROSSINGS TO MAKE IT SAFER FOR PEDESTRIANS AND CYCLISTS. THESE PROPOSALS ARE BEING DEVELOPED BY CAMBRIDGESHIRE COUNTY COUNCIL IN PARALLEL WITH THE GREENWAYS. SHOWN ON DRAWING 5020499/MIN/HGN/ZZ/DR/CH/0001



KEY

	EXISTING DRAIN
	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

	PROPOSED DELINEATOR STRIP
SP	PROPOSED SIGN AND POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	EXISTING LINE MARKING

KEY

- PROPOSED FOOTWAY ASPHALT
- PROPOSED BUFF TACTILE PAVING
- PROPOSED RED TACTILE PAVING
- PROPOSED CORDUROY
- PROPOSED CARRIAGEWAY RESURFACING
- PROPOSED FULL CARRIAGEWAY CONSTRUCTION
- PROPOSED RED THERMOPASTIC SURFACING
- EXISTING CARRIAGEWAY SETTS TO BE TAKEN UP AND RELAID
- PROPOSED TRAFFIC CALMING MEASURE
- PROPOSED BUFF HIGH FRICTION SURFACING
- PROPOSED PLANTING AREA
- PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
- PROPOSED GRASSED BRIDLEWAY
- PROPOSED STRUCTURE
- EXISTING HIGHWAYS BOUNDARY
- FLOOD ZONE
- PROPOSED KERB
- PROPOSED FLUSH KERB WITH DROPPER
- RELOCATED DRAIN
- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

DRAWING STATUS
FEASIBILITY DESIGN

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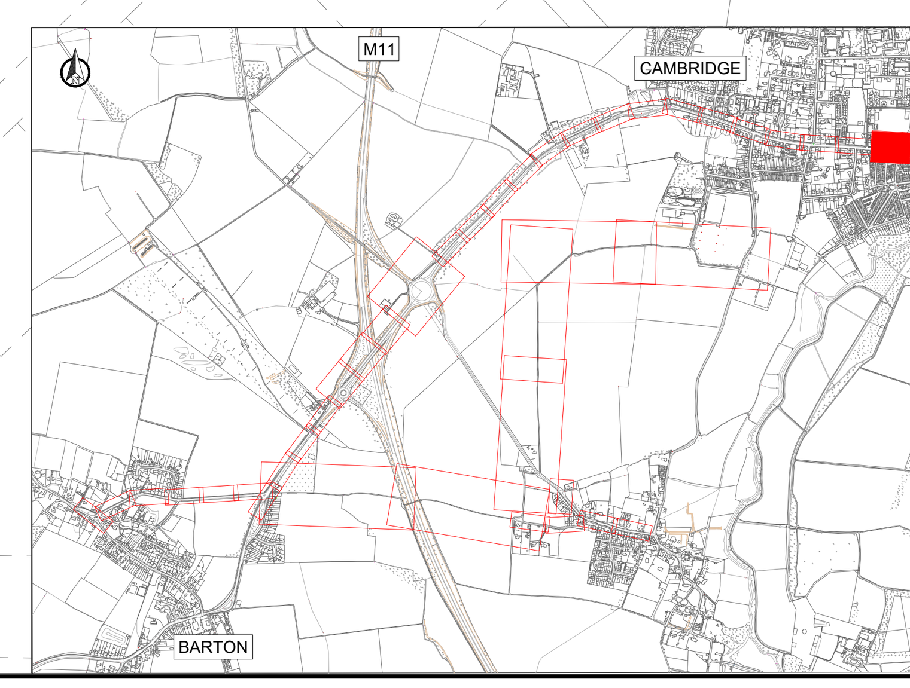
CLIENT
GREATER CAMBRIDGE PARTNERSHIP



PROJECT
BARTON GREENWAY

TITLE
GENERAL ARRANGEMENT
SHEET 01 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

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70088647

DRAWING No.
70088647-WSP-P01-X-DR-HI-0100-01

REV.
P02

KEY

EXISTING DRAIN	
EXISTING FENCE TO BE RETAINED	
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

	PROPOSED DELINEATOR STRIP
SP	PROPOSED SIGN AND POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	EXISTING LINE MARKING

EXISTING TREE TO BE REMOVED IN ORDER TO ALLOW FOR FULL SEGREGATION OF CYCLISTS. PROPOSED TREES TO BE PLANTED IN NEW BUILD OUT AS SHOWN

EXISTING TREES AND LIGHTING COLUMNS TO BE RETAINED. EXACT LOCATIONS TO BE CONFIRMED BY TOPOGRAPHICAL SURVEY.

EXISTING TREES AND LIGHTING COLUMNS TO BE RETAINED. EXACT LOCATIONS TO BE CONFIRMED BY TOPOGRAPHICAL SURVEY.

ST MARKS COURT

CLARE ROAD

MILLINGTON ROAD

GRANGE ROAD

KING'S ROAD

BARTON ROAD

FOR CONTINUATION REFER BELOW

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-01

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-03

FOR CONTINUATION REFER ABOVE

KEY

	PROPOSED FOOTWAY ASPHALT
	PROPOSED BUFF TACTILE PAVING
	PROPOSED RED TACTILE PAVING
	PROPOSED CORDUROY
	PROPOSED CARRIAGEWAY RESURFACING
	PROPOSED FULL CARRIAGEWAY CONSTRUCTION
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	PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
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	PROPOSED STRUCTURE
	EXISTING HIGHWAYS BOUNDARY
	FLOOD ZONE
	PROPOSED KERB
	PROPOSED FLUSH KERB WITH DROPPER
	RELOCATED DRAIN
	PROPOSED RAMP
	PROPOSED PRIMROSE YELLOW LINE MARKING
	PROPOSED WHITE LINE MARKING
	PROPOSED EDGE
	PROPOSED TIMBER FENCE

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

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PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
SHEET 02 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO. 70088647

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BARTON AND HASLINGFIELD GREENWAYS TO TIE IN. DETAIL TO BE CONFIRMED AT NEXT DESIGN STAGE.

BARTON CLOSE

20

BARTON ROAD

ARCHWAY COURT

FOR CONTINUATION REFER BELOW

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-02

EXISTING TREES AND LIGHTING COLUMNS TO BE RETAINED. EXACT LOCATIONS TO BE CONFIRMED BY TOPOGRAPHICAL SURVEY.

3.3m

2.3m

2.3m

R5m

BS

STOP

LC*

PART OF HASLINGFIELD GREENWAY.
BARTON AND HASLINGFIELD GREENWAYS TO TIE IN. DETAIL TO BE CONFIRMED AT NEXT DESIGN STAGE.

2.4m

1.6m

2.6m

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-03

FOR CONTINUATION REFER ABOVE

GRANTCHESTER ROAD

KEEP CLEAR

Language School

KEY

- EXISTING DRAIN
- EXISTING FENCE TO BE RETAINED
- TS EXISTING TRAFFIC SIGNAL
- LC EXISTING LIGHTING COLUMN
- EXISTING TREE
- EXISTING FENCE TO BE REMOVED

KEY

- PROPOSED DELINEATOR STRIP
- SP PROPOSED SIGN AND POST
- B PROPOSED BOLLARD
- BB PROPOSED BELISHA BEACON
- PROPOSED TREE
- EXISTING LINE MARKING

KEY

- PROPOSED FOOTWAY ASPHALT
- PROPOSED BUFF TACTILE PAVING
- PROPOSED RED TACTILE PAVING
- PROPOSED CORDUROY
- PROPOSED CARRIAGEWAY RESURFACING
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- PROPOSED RED THERMOPASTIC SURFACING
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- PROPOSED BUFF HIGH FRICTION SURFACING
- PROPOSED PLANTING AREA
- PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
- PROPOSED GRASSED BRIDLEWAY
- PROPOSED STRUCTURE
- EXISTING HIGHWAYS BOUNDARY
- FLOOD ZONE
- PROPOSED KERB
- PROPOSED FLUSH KERB WITH DROPPER
- RELOCATED DRAIN
- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

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TITLE: GENERAL ARRANGEMENT
SHEET 03 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

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EXISTING TREES AND LIGHTING COLUMNS TO BE RETAINED. EXACT LOCATIONS TO BE CONFIRMED BY TOPOGRAPHICAL SURVEY. EXISTING MATURE TREES ARE LOCATED IN CLOSE PROXIMITY TO EXISTING SHARED USE PATH.

EXISTING UTILITY CABINETS TO BE RETAINED

GOUGH WAY

20

3.5m

2.5m

3.8m

2.4m

R8.7m

BARTON ROAD

FOR CONTINUATION REFER BELOW

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-04

PROPOSED KERB LINE FOR THE BI-DIRECTIONAL CYCLE TRACK TO BE IN LINE WITH EXISTING PATH

KEY

	EXISTING DRAIN
	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

	PROPOSED DELINEATOR STRIP
SP	PROPOSED SIGN AND POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	EXISTING LINE MARKING

KEY

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	PROPOSED BUFF TACTILE PAVING
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	PROPOSED CARRIAGEWAY RESURFACING
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	PROPOSED BUFF HIGH FRICTION SURFACING
	PROPOSED PLANTING AREA
	PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
	PROPOSED GRASSED BRIDLEWAY
	PROPOSED STRUCTURE
	EXISTING HIGHWAYS BOUNDARY
	FLOOD ZONE
	PROPOSED KERB
	PROPOSED FLUSH KERB WITH DROPPER
	RELOCATED DRAIN
	PROPOSED RAMP
	PROPOSED PRIMROSE YELLOW LINE MARKING
	PROPOSED WHITE LINE MARKING
	PROPOSED EDGE
	PROPOSED TIMBER FENCE

EXISTING VARIABLE MESSAGE SIGN TO BE RELOCATED

PROPOSED KERB LINE FOR THE BI-DIRECTIONAL CYCLE TRACK TO BE IN LINE WITH EXISTING PATH

3.2m

2.5m

2.6m

2.9m

2.6m

3.2m

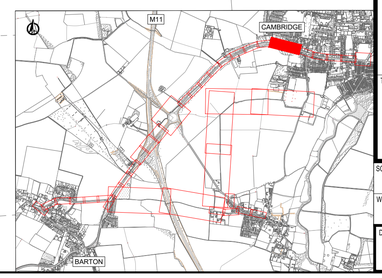
BARTON ROAD

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-05

FOR CONTINUATION REFER ABOVE

EXISTING UTILITY CABINETS TO BE RETAINED

EXISTING TREES AND LIGHTING COLUMNS TO BE RETAINED. EXACT LOCATIONS TO BE CONFIRMED BY TOPOGRAPHICAL SURVEY. EXISTING MATURE TREES ARE LOCATED IN CLOSE PROXIMITY TO EXISTING SHARED USE PATH.



REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

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SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO.: 70088647

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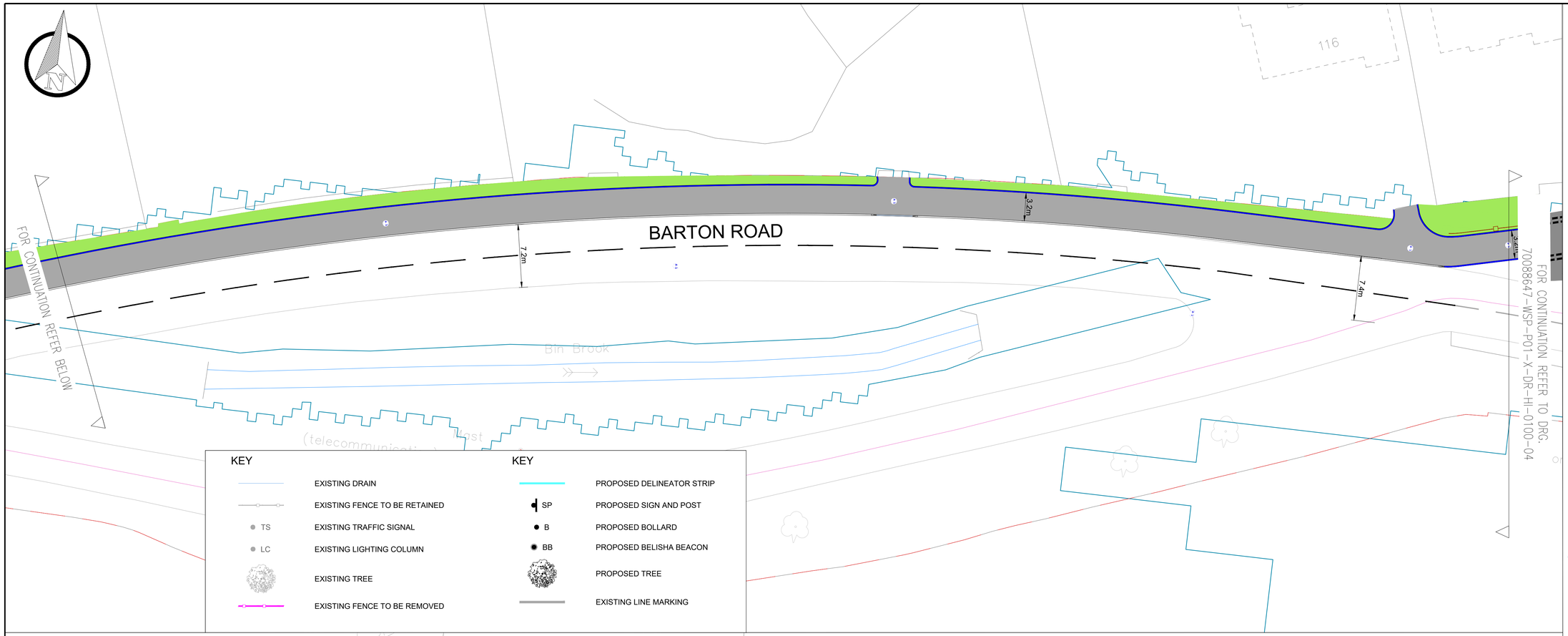

KEY

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TITLE: GENERAL ARRANGEMENT
SHEET 05 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO. 70088647

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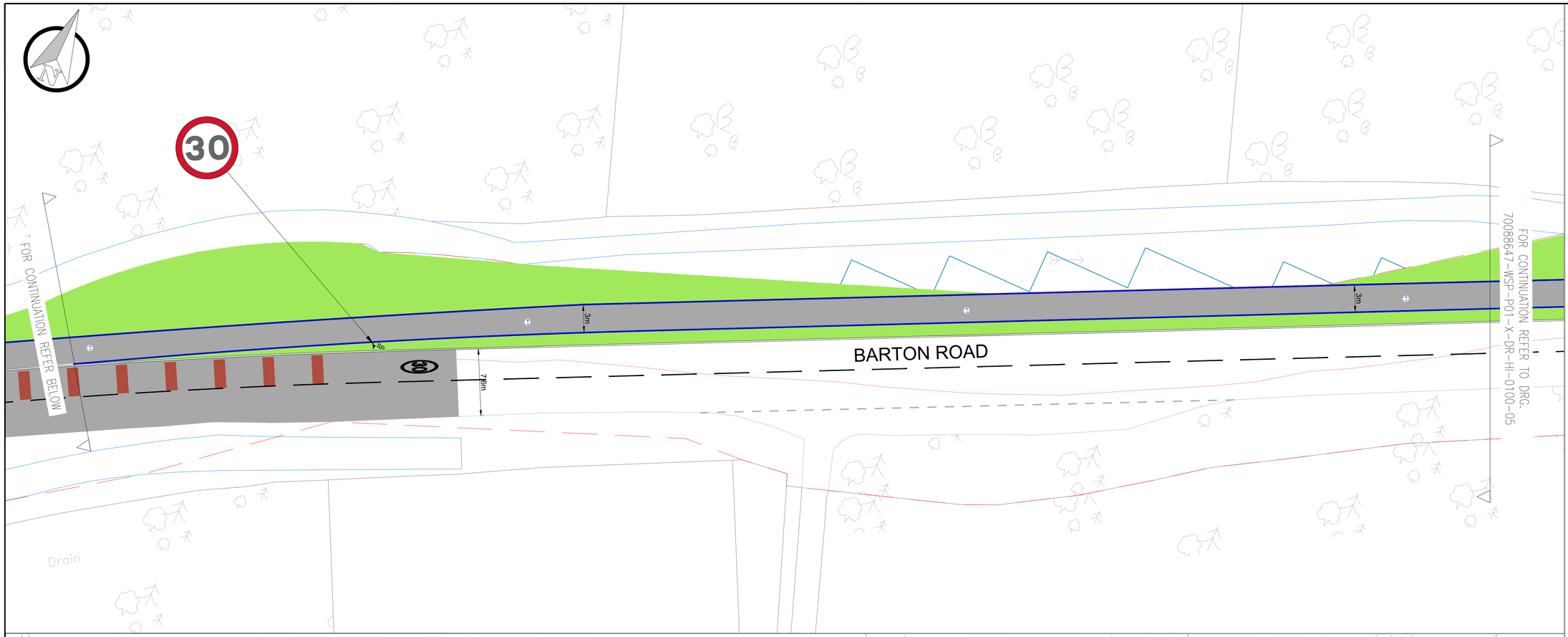

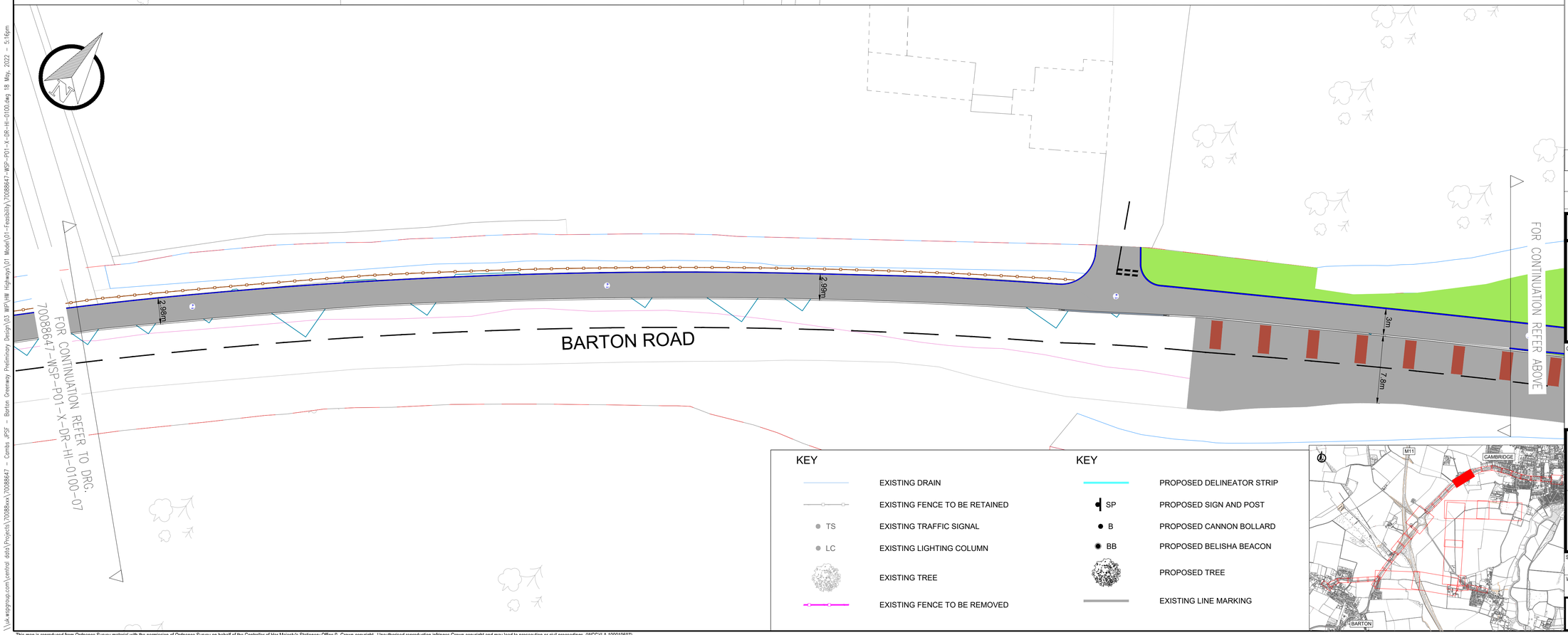

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- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

KEY

- EXISTING DRAIN
- EXISTING FENCE TO BE RETAINED
- TS EXISTING TRAFFIC SIGNAL
- LC EXISTING LIGHTING COLUMN
- EXISTING TREE
- EXISTING FENCE TO BE REMOVED

KEY

- PROPOSED DELINEATOR STRIP
- SP PROPOSED SIGN AND POST
- B PROPOSED CANNON BOLLARD
- BB PROPOSED BELISHA BEACON
- PROPOSED TREE
- EXISTING LINE MARKING

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
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SHEET 06 OF 22

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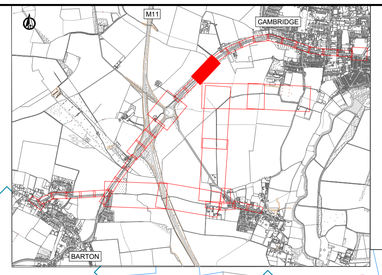
DRAWING No.: 70088647-WSP-P01-X-DR-HI-0100-06 REV.: P02

EXISTING FOOTWAY WIDENED TO ACCOMMODATE UNIFORM 3m SHARED USE PATH



KEY

- EXISTING DRAIN
- EXISTING FENCE TO BE RETAINED
- TS EXISTING TRAFFIC SIGNAL
- LC EXISTING LIGHTING COLUMN
- EXISTING TREE
- EXISTING FENCE TO BE REMOVED

KEY

- PROPOSED DELINEATOR STRIP
- SP PROPOSED SIGN AND POST
- B PROPOSED BOLLARD
- BB PROPOSED BELISHA BEACON
- PROPOSED TREE
- EXISTING LINE MARKING

KEY

- PROPOSED FOOTWAY ASPHALT
- PROPOSED BUFF TACTILE PAVING
- PROPOSED RED TACTILE PAVING
- PROPOSED CORDUROY
- PROPOSED CARRIAGEWAY RESURFACING
- PROPOSED FULL CARRIAGEWAY CONSTRUCTION
- PROPOSED RED THERMOPASTIC SURFACING
- EXISTING CARRIAGEWAY SETTS TO BE TAKEN UP AND RELAID
- PROPOSED TRAFFIC CALMING MEASURE
- PROPOSED BUFF HIGH FRICTION SURFACING
- PROPOSED PLANTING AREA
- PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
- PROPOSED GRASSED BRIDLEWAY
- PROPOSED STRUCTURE
- EXISTING HIGHWAYS BOUNDARY
- FLOOD ZONE
- PROPOSED KERB
- PROPOSED FLUSH KERB WITH DROPPER
- RELOCATED DRAIN
- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

FOR CONTINUATION REFER BELOW

3m
3.6m
3.1m
BARTON ROAD
6.8m
3.15m
3m

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-06

EXISTING FOOTWAY WIDENED TO ACCOMMODATE UNIFORM 3m SHARED USE PATH

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-08

3.1m
3.6m
3.4m
BARTON ROAD

Drain

FOR CONTINUATION REFER ABOVE

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

DRAWING STATUS
FEASIBILITY DESIGN

70 Chancery Lane, London, WC2A 1AF
www.wsp.com

CLIENT
GREATER CAMBRIDGE PARTNERSHIP

PROJECT
BARTON GREENWAY

TITLE
GENERAL ARRANGEMENT
SHEET 07 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO.
70088647

DRAWING No.
70088647-WSP-P01-X-DR-HI-0100-07

REV.
P02

FOOTWAY BUILDOUT TO ACCOMMODATE PROPOSED GREEN AREA

Drain

FOR CONTINUATION REFER BELOW

3.3m

BARTON ROAD

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-07

FOOTWAY BUILDOUT TO ACCOMMODATE PROPOSED GREEN AREA

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-09

3.3m

4m

3m

3.1m

BARTON ROAD

FOR CONTINUATION REFER ABOVE

KEY

- EXISTING DRAIN
- EXISTING FENCE TO BE RETAINED
- TS EXISTING TRAFFIC SIGNAL
- LC EXISTING LIGHTING COLUMN
- EXISTING TREE
- EXISTING FENCE TO BE REMOVED

KEY

- PROPOSED DELINEATOR STRIP
- SP PROPOSED SIGN AND POST
- B PROPOSED BOLLARD
- BB PROPOSED BELISHA BEACON
- PROPOSED TREE
- EXISTING LINE MARKING

KEY

- PROPOSED FOOTWAY ASPHALT
- PROPOSED BUFF TACTILE PAVING
- PROPOSED RED TACTILE PAVING
- PROPOSED CORDUROY
- PROPOSED CARRIAGEWAY RESURFACING
- PROPOSED FULL CARRIAGEWAY CONSTRUCTION
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- EXISTING CARRIAGEWAY SETTS TO BE TAKEN UP AND RELAID
- PROPOSED TRAFFIC CALMING MEASURE
- PROPOSED BUFF HIGH FRICTION SURFACING
- PROPOSED PLANTING AREA
- PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
- PROPOSED GRASSED BRIDLEWAY
- PROPOSED STRUCTURE
- EXISTING HIGHWAYS BOUNDARY
- FLOOD ZONE
- PROPOSED KERB
- PROPOSED FLUSH KERB WITH DROPPER
- RELOCATED DRAIN
- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

DRAWING STATUS: FEASIBILITY DESIGN

wsp
70 Chancery Lane, London, WC2A 1AF
www.wsp.com

CLIENT: GREATER CAMBRIDGE PARTNERSHIP

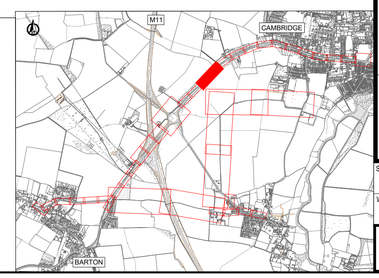
PROJECT: BARTON GREENWAY

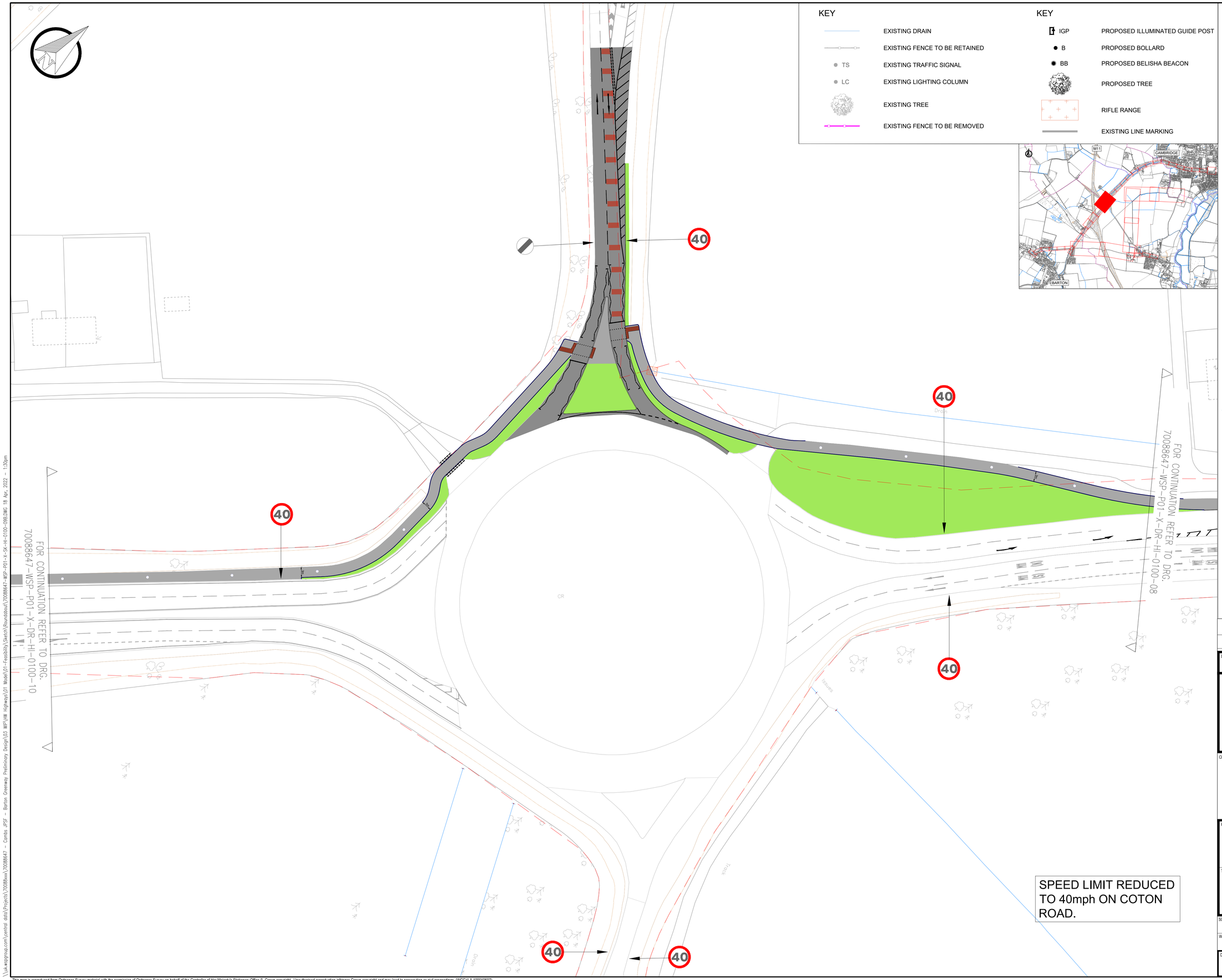
TITLE: GENERAL ARRANGEMENT
SHEET 08 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO. 70088647

DRAWING No. 70088647-WSP-P01-X-DR-HI-0100-08 REV. P02





REV	DATE	BY	DESCRIPTION	CHK	APD
P01	01.04.2022	NP	INITIAL ISSUE	JAH	JN

DRAWING STATUS: SKETCH

wsp
70 Chancery Lane, London, WC2A 1AF
www.wsp.com

CLIENT: GREATER CAMBRIDGE PARTNERSHIP

PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
EAST ROUNDABOUT 40MPH
SHEET 09 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	14.04.2022	NP	JAH	JN	A1

WSP PROJECT NO.: 70088647

DRAWING No.: 70088647-WSP-P01-X-DR-HI-0100-09 REV.: P01

EXISTING FOOTWAY WIDENED TO ACCOMMODATE UNIFORM 3m SHARED USE PATH

KEY

	EXISTING DRAIN
	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

	PROPOSED DELINEATOR STRIP
SP	PROPOSED SIGN AND POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	EXISTING LINE MARKING

KEY

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	PROPOSED TRAFFIC CALMING MEASURE
	PROPOSED BUFF HIGH FRICTION SURFACING
	PROPOSED PLANTING AREA
	PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
	PROPOSED GRASSED BRIDLEWAY
	PROPOSED STRUCTURE
	EXISTING HIGHWAYS BOUNDARY
	FLOOD ZONE
	PROPOSED KERB
	PROPOSED FLUSH KERB WITH DROPPER
	RELOCATED DRAIN
	PROPOSED RAMP
	PROPOSED PRIMROSE YELLOW LINE MARKING
	PROPOSED WHITE LINE MARKING
	PROPOSED EDGE
	PROPOSED TIMBER FENCE

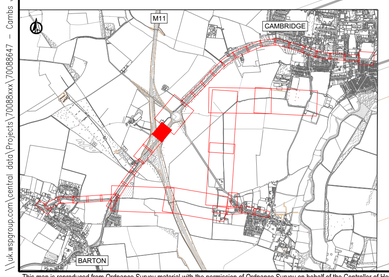
3.9m

BARTON ROAD

M11

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-11

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-09



REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

DRAWING STATUS: FEASIBILITY DESIGN

wsp
70 Chancery Lane, London, WC2A 1AF
www.wsp.com

CLIENT: GREATER CAMBRIDGE PARTNERSHIP

PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
SHEET 10 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO.: 70088647

DRAWING No.: 70088647-WSP-P01-X-DR-HI-0100-10

REV.: P02

CARRIAGEWAY NARROWED TO 6.9m TO ACCOMMODATE SHARED USE PATH. PREFERRED OPTION SHOWN. OTHER OPTIONS AVAILABLE.

PROPOSED PARAPET HEIGHT MIN 1.4M

BARTON ROAD

3.2m

3.2m

3.0m

0.6m

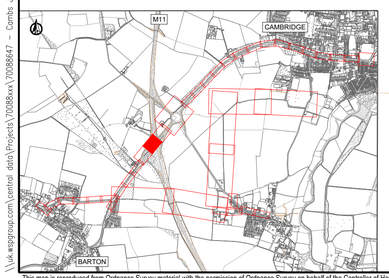
3.3m

3.0m

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-12

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-10

BRIDGE IS TWO INDEPENDENT STRUCTURES THEREFORE THE CENTRAL RESERVATION CANNOT BE ALTERED.
SPEEDS TO BE LOWERED AS WIDTHS AND BUFFER WILL BE BELOW RECOMMENDED WIDTHS



KEY

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	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

	PROPOSED DELINEATOR STRIP
SP	PROPOSED SIGN AND POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	EXISTING LINE MARKING

KEY

- PROPOSED FOOTWAY ASPHALT
- PROPOSED BUFF TACTILE PAVING
- PROPOSED RED TACTILE PAVING
- PROPOSED CORDUROY
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- PROPOSED FULL CARRIAGEWAY CONSTRUCTION
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- PROPOSED STRUCTURE
- EXISTING HIGHWAYS BOUNDARY
- FLOOD ZONE
- PROPOSED KERB
- PROPOSED FLUSH KERB WITH DROPPER
- RELOCATED DRAIN
- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

DRAWING STATUS: FEASIBILITY DESIGN

wsp
70 Chancery Lane, London, WC2A 1AF
www.wsp.com

CLIENT: GREATER CAMBRIDGE PARTNERSHIP

PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
SHEET 11 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO.: 70088647

DRAWING No.: 70088647-WSP-P01-X-DR-HI-0100-11 REV.: P02

DEPARTURE FROM STANDARD REQUIRED. CROSSING IS 16m FROM ROUNDABOUT INSTEAD OF REQUIRED 20m DISTANCE TO ROUNDABOUT TO BE CONFIRMED BY TOPOGRAPHICAL SURVEY

PROPOSAL REQUIRES TREE REMOVAL AND RAISING GROUND LEVEL ON APPROACH TO THE CROSSING

KEY

	EXISTING DRAIN
	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

IGP	PROPOSED ILLUMINATED GUIDE POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	RIFLE RANGE
	EXISTING LINE MARKING

KEY

- PROPOSED FOOTWAY ASPHALT
- PROPOSED BUFF TACTILE PAVING
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- PROPOSED FLUSH KERB WITH DROPPER
- RELOCATED DRAIN
- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE
- PROPOSED DELINEATOR STRIP
- SP PROPOSED SIGN AND POST

REV	DATE	BY	DESCRIPTION	CHK	APD
P01	19.04.2022	NP	INITIAL ISSUE	JAH	JN

DRAWING STATUS: SKETCH

wsp
70 Chancery Lane, London, WC2A 1AF
www.wsp.com

CLIENT: GREATER CAMBRIDGE PARTNERSHIP

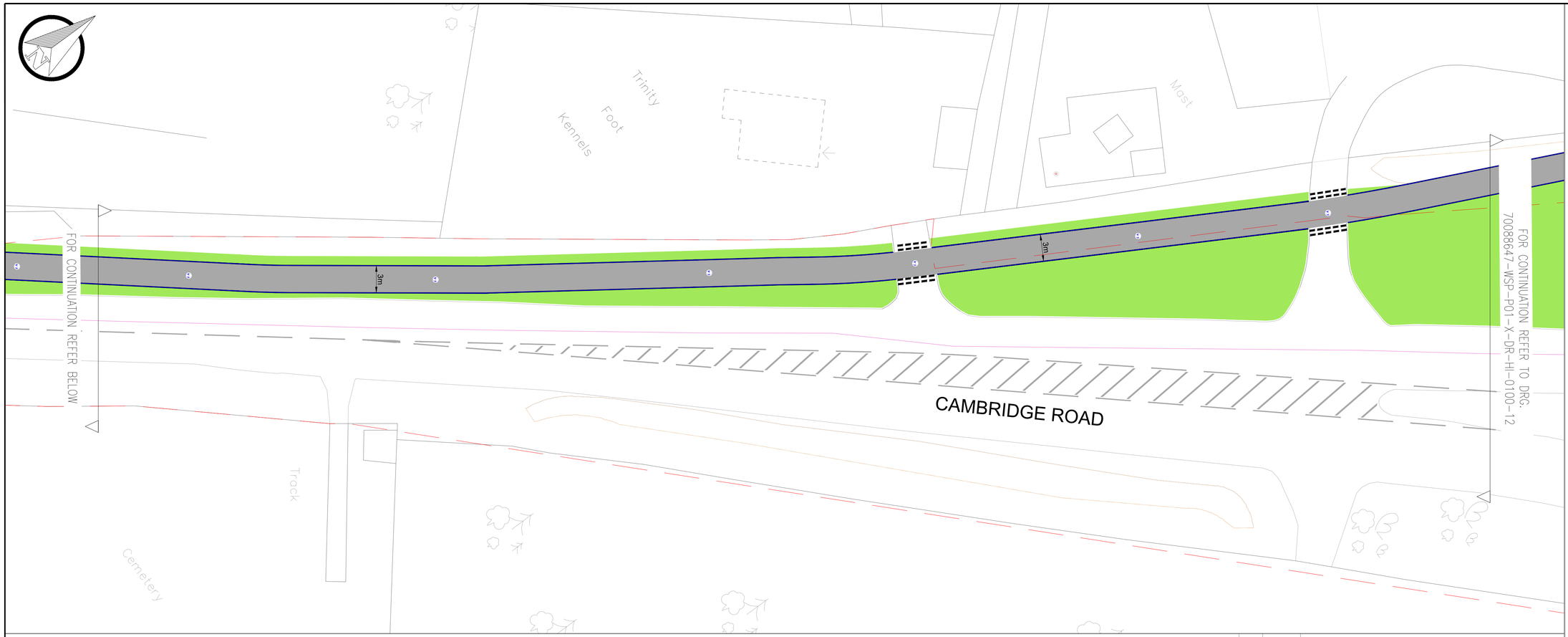
PROJECT: BARTON GREENWAY

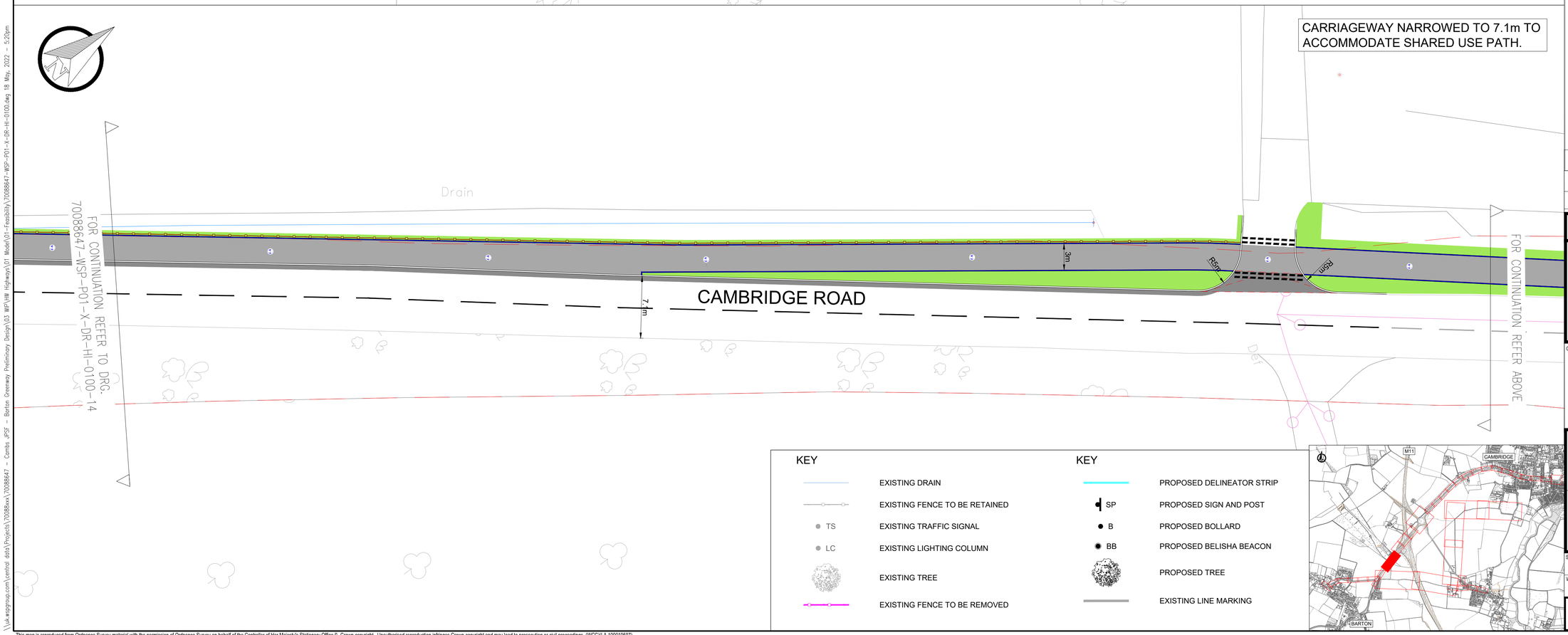
TITLE: WEST ROUNDABOUT LEVEL CROSSING
SHEET 12 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	19.04.2022	NP	JAH	JN	A1

WSP PROJECT NO.: 70088647

DRAWING No.: 70088647-WSP-P01-X-DR-HI-0100-12 REV.: P01





KEY

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KEY

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- EXISTING FENCE TO BE RETAINED
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KEY

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- BB PROPOSED BELISHA BEACON
- PROPOSED TREE
- EXISTING LINE MARKING

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

DRAWING STATUS: FEASIBILITY DESIGN

wsp
70 Chancery Lane, London, WC2A 1AF
www.wsp.com

CLIENT: GREATER CAMBRIDGE PARTNERSHIP

PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
SHEET 13 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO.: 70088647

DRAWING No.: 70088647-WSP-P01-X-DR-HI-0100-13 REV.: P02

CARRIAGEWAY NARROWED TO 7.3m TO ACCOMMODATE SHARED USE PATH

Shelter

3m

CAMBRIDGE ROAD

3m
3.7m
3.2m
7.3m

FOR CONTINUATION REFER BELOW

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-13

KEY

	EXISTING DRAIN
	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
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KEY

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- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

PROPOSED TOUCAN CROSSINGS AND ISLAND REMOVAL ON ON NEW ROAD. REDUCED CORNER RADII AT JUNCTION. BUS STOP RELOCATED SOUTH OF JUNCTION

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-15

EXISTING BUS SHELTER RETAINED

Shelter

4.1m
R7m
NEW ROAD
R15m
3m
3.9m
4m
3.7m
3.6m
BUS STOP

4.1m
7.6m
BUS STOP
BUS STOP

CAMBRIDGE ROAD

3.1m
1.9m
1.8m
1.8m

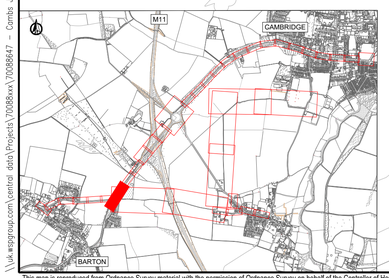
SCHEME EXTENTS

FOR CONTINUATION REFER ABOVE

EXISTING PROPERTY ACCESS MOVED TO SIDE-ROAD

EXISTING PROPERTY ACCESS RETAINED

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-20



REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

DRAWING STATUS: FEASIBILITY DESIGN

wsp
70 Chancery Lane, London, WC2A 1AF
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CLIENT: GREATER CAMBRIDGE PARTNERSHIP

PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
SHEET 14 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO. 70088647

DRAWING No. 70088647-WSP-P01-X-DR-HI-0100-14 REV. P02

PROPOSED 30MPH SPEED LIMIT ALONG NEW ROAD. CARRIAGEWAY WIDTH REDUCED TO 6.5m TO ACCOMMODATE 3m WIDE SHARED USE PATH.

FOR CONTINUATION REFER BELOW

Shelter

NEW ROAD

3.2m 3.3m 3.3m

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-14

NEW ROAD

3m 3.6m R15m 3.9m 4m 3.7m 1.8m 1.8m 1.9m 3.1m R7m

BUS STOP

INDICATIVE EXISTING FRONT OF HEDGEROW

FULL CARRIAGEWAY CONSTRUCTION

KEY

- EXISTING DRAIN
- EXISTING FENCE TO BE RETAINED
- TS EXISTING TRAFFIC SIGNAL
- LC EXISTING LIGHTING COLUMN
- EXISTING TREE
- EXISTING FENCE TO BE REMOVED

KEY

- PROPOSED DELINEATOR STRIP
- SP PROPOSED SIGN AND POST
- B PROPOSED BOLLARD
- BB PROPOSED BELISHA BEACON
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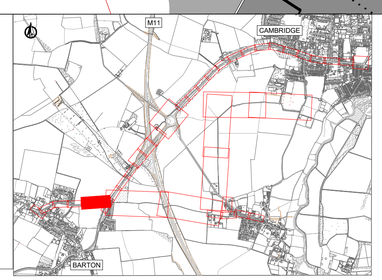

KEY

- PROPOSED FOOTWAY ASPHALT
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- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

PROPOSED 30MPH SPEED LIMIT ALONG NEW ROAD. CARRIAGEWAY WIDTH REDUCED TO 6.5m TO ACCOMMODATE 3m WIDE SHARED USE PATH.

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-16

NEW ROAD

3.2m 3.3m 3.3m

FOR CONTINUATION REFER ABOVE

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

DRAWING STATUS: FEASIBILITY DESIGN

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CLIENT: GREATER CAMBRIDGE PARTNERSHIP

PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
SHEET 15 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO. 70088647

DRAWING No. 70088647-WSP-P01-X-DR-HI-0100-15 REV. P02

REDUCED RADII AT JUNCTION WITH KINGS GROVE WITH RAISED TABLE

PROPOSED 30MPH SPEED LIMIT ALONG NEW ROAD ON EXIT FROM BARTON VILLAGE.

PROPOSED PARALLEL CROSSING TO ALLOW CYCLISTS TO REJOIN/ LEAVE CARRIAGEWAY AT ENTRANCE/EXIT OF BARTON VILLAGE.

KINGS GROVE

FOR CONTINUATION REFER BELOW

30 Zone ENDS

20 ZONE

NEW ROAD

3m

3m

3.2m

3.5m

SP

EXISTING BUS STOP RETAINED. FOOTWAY LENGTH EXTENDED TO ACCOMMODATE NEW PARALLEL CROSSING

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-15

PROPOSED 20MPH ZONE ALONG NEW ROAD WITHIN BARTON VILLAGE

NEW ROAD

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-17

FOR CONTINUATION REFER ABOVE

2.7m

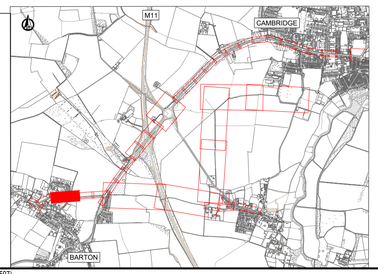
EXISTING BUS STOP RETAINED FOOTWAY LENGTH EXTENDED TO ACCOMMODATE NEW PARALLEL CROSSING

KEY

- EXISTING DRAIN
- EXISTING FENCE TO BE RETAINED
- TS EXISTING TRAFFIC SIGNAL
- LC EXISTING LIGHTING COLUMN
- EXISTING TREE
- EXISTING FENCE TO BE REMOVED

KEY

- PROPOSED DELINEATOR STRIP
- SP PROPOSED SIGN AND POST
- B PROPOSED BOLLARD
- BB PROPOSED BELISHA BEACON
- PROPOSED TREE
- EXISTING LINE MARKING



KEY

- PROPOSED FOOTWAY ASPHALT
- PROPOSED BUFF TACTILE PAVING
- PROPOSED RED TACTILE PAVING
- PROPOSED CORDUROY
- PROPOSED CARRIAGEWAY RESURFACING
- PROPOSED FULL CARRIAGEWAY CONSTRUCTION
- PROPOSED RED THERMOPASTIC SURFACING
- EXISTING CARRIAGEWAY SETTS TO BE TAKEN UP AND RELAID
- PROPOSED TRAFFIC CALMING MEASURE
- PROPOSED BUFF HIGH FRICTION SURFACING
- PROPOSED PLANTING AREA
- PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
- PROPOSED GRASSED BRIDLEWAY
- PROPOSED STRUCTURE
- EXISTING HIGHWAYS BOUNDARY
- FLOOD ZONE
- PROPOSED KERB
- PROPOSED FLUSH KERB WITH DROPPER
- RELOCATED DRAIN
- PROPOSED RAMP
- PROPOSED PRIMROSE YELLOW LINE MARKING
- PROPOSED WHITE LINE MARKING
- PROPOSED EDGE
- PROPOSED TIMBER FENCE

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SHEET 16 OF 22

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WSP PROJECT NO. 70088647

DRAWING No. 70088647-WSP-P01-X-DR-HI-0100-16 REV. P02

KEY

EXISTING DRAIN
EXISTING FENCE TO BE RETAINED
TS EXISTING TRAFFIC SIGNAL
LC EXISTING LIGHTING COLUMN
EXISTING TREE
EXISTING FENCE TO BE REMOVED

KEY

PROPOSED DELINEATOR STRIP
SP PROPOSED SIGN AND POST
B PROPOSED BOLLARD
BB PROPOSED BELISHA BEACON
PROPOSED TREE
EXISTING LINE MARKING

PROPOSED 20MPH ZONE ALONG NEW ROAD WITHIN BARTON VILLAGE (BEING IMPLEMENTED BY CCC)

THE LINK ROAD BETWEEN SCHOOL LANE AND HIGH STREET REMOVED. FOOTWAY IN THIS AREA MAINTAINED. LARGER BUILDOUT RADIUS TO BETTER ACCOMMODATE LEFT TURN FROM NEW ROAD ONTO HIGH STREET

KEY

PROPOSED FOOTWAY ASPHALT
PROPOSED BUFF TACTILE PAVING
PROPOSED RED TACTILE PAVING
PROPOSED CORDUROY
PROPOSED CARRIAGEWAY RESURFACING
PROPOSED FULL CARRIAGEWAY CONSTRUCTION
PROPOSED RED THERMOPASTIC SURFACING
EXISTING CARRIAGEWAY SETTS TO BE TAKEN UP AND RELAID
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EXISTING HIGHWAYS BOUNDARY
FLOOD ZONE
PROPOSED KERB
PROPOSED FLUSH KERB WITH DROPPER
RELOCATED DRAIN
PROPOSED RAMP
PROPOSED PRIMROSE YELLOW LINE MARKING
PROPOSED WHITE LINE MARKING
PROPOSED EDGE
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SHEET 17 OF 22

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WSP PROJECT NO.
70088647

DRAWING No.
70088647-WSP-P01-X-DR-HI-0100-17

REV.
P02

ENVIRONMENTAL REPORT HIGHLIGHTS THE PRESENCE OF ORCHARDS.

POTENTIAL TO EXTEND BRIDLEWAY IF GAPS BETWEEN TREES ALLOW TO REVERT TO SHARED USE PATH AT THIS LOCATION.
TREE LOCATIONS TO BE CONFIRMED BY TOPOGRAPHICAL SURVEY.

EXISTING TREES EITHER SIDE OF THE PATH PROTECTED UNDER TPO.
TREE LOCATIONS TO BE CONFIRMED BY TOPOGRAPHICAL SURVEY.

DESIGN TO TIE INTO HASLINGFIELD GREENWAY.

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-14

FOR CONTINUATION REFER BELOW

FOR CONTINUATION REFER ABOVE

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-21

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-19

CAMBRIDGE ROAD

NEW ROAD

BRIDLE WAY

Shelter

Tumulus (site ref)

KEY

	EXISTING DRAIN
	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

	PROPOSED DELINEATOR STRIP
SP	PROPOSED SIGN AND POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	EXISTING LINE MARKING

KEY

	PROPOSED FOOTWAY ASPHALT
	PROPOSED BUFF TACTILE PAVING
	PROPOSED RED TACTILE PAVING
	PROPOSED CORDUROY
	PROPOSED CARRIAGEWAY RESURFACING
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	PROPOSED RED THERMOPASTIC SURFACING
	EXISTING CARRIAGEWAY SETTS TO BE TAKEN UP AND RELAID
	PROPOSED TRAFFIC CALMING MEASURE
	PROPOSED BUFF HIGH FRICTION SURFACING
	PROPOSED PLANTING AREA
	PROPOSED SEALED CYCLE PATH. WIDTH AND DEPTH TBC.
	PROPOSED GRASSED BRIDLEWAY
	PROPOSED STRUCTURE
	EXISTING HIGHWAYS BOUNDARY
	FLOOD ZONE
	PROPOSED KERB
	PROPOSED FLUSH KERB WITH DROPPER
	RELOCATED DRAIN
	PROPOSED RAMP
	PROPOSED PRIMROSE YELLOW LINE MARKING
	PROPOSED WHITE LINE MARKING
	PROPOSED EDGE
	PROPOSED TIMBER FENCE

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PROJECT
BARTON GREENWAY

TITLE
GENERAL ARRANGEMENT
SHEET 18 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:1000	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO.
70088647

DRAWING No.
70088647-WSP-P01-X-DR-HI-0100-18

REV.
P02

PROPOSED MULTI-USER PATH AND GRASS VERGE ON THE EXISTING PERMISSIVE PATH. THIS IS SUBJECT TO ONGOING DISCUSSIONS WITH LANDOWNERS.

PROPOSED BOLLARDS IN EXISTING LOCATION

PROPOSED WAYFINDING SIGN. EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

BRIDLE WAY

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-18

FOR CONTINUATION REFER BELOW

FOR CONTINUATION REFER ABOVE

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-20

PROPOSED WAYFINDING SIGN. EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

BRIDLE WAY

KEY

- EXISTING DRAIN
- EXISTING FENCE TO BE RETAINED
- TS EXISTING TRAFFIC SIGNAL
- LC EXISTING LIGHTING COLUMN
- EXISTING TREE
- EXISTING FENCE TO BE REMOVED

KEY

- PROPOSED DELINEATOR STRIP
- SP PROPOSED SIGN AND POST
- B PROPOSED BOLLARD
- BB PROPOSED BELISHA BEACON
- PROPOSED TREE
- EXISTING LINE MARKING

KEY

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- PROPOSED EDGE
- PROPOSED TIMBER FENCE

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CLIENT: GREATER CAMBRIDGE PARTNERSHIP

PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
SHEET 19 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO. 70088647

DRAWING No. 70088647-WSP-P01-X-DR-HI-0100-19 REV. P02

20mph ZONE FROM THIS POINT TO THE BROADWAY / COTON ROAD JUNCTION

GRASS VERGE PRESENT ON THE NORTHERN FOOTWAY

PROPOSED WAYFINDING SIGN. EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

EXISTING KERB LINE TO BE RETAINED BETWEEN RAISED TABLES

PROPOSED DESIGN TO TIE INTO EXISTING KERBS

EXISTING ON-STREET PARKING RETAINED

PROPOSED WAYFINDING SIGN. EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

30mph SPEED REINSTATED FROM THIS POINT

SYMONDS LANE

COTON ROAD

BRIDLE WAY

STULPFIELD ROAD

FOR CONTINUATION REFER TO DRG: 70088647-WSP-P01-X-DR-HI-0100-19

FOR CONTINUATION REFER BELOW

KEY

- PROPOSED FOOTWAY ASPHALT
- PROPOSED BUFF TACTILE PAVING
- PROPOSED RED TACTILE PAVING
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- PROPOSED CARRIAGEWAY RESURFACING
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- PROPOSED KERB
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- PROPOSED EDGE
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- EXISTING FENCE TO BE RETAINED
- TS EXISTING TRAFFIC SIGNAL
- LC EXISTING LIGHTING COLUMN
- EXISTING TREE
- EXISTING FENCE TO BE REMOVED

KEY

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- SP PROPOSED SIGN AND POST
- B PROPOSED BOLLARD
- BB PROPOSED BELISHA BEACON
- PROPOSED TREE
- EXISTING LINE MARKING

20mph ZONE FROM THE BROADWAY AND COTON ROAD JUNCTION

PROPOSED DESIGN TO TIE INTO THE HASLINGFIELD GREENWAY PROPOSAL

PEARCES YARD

SCHEME EXTENTS

BURNT CLOSE

FOR CONTINUATION REFER ABOVE

EXISTING KERB LINE TO BE RETAINED BETWEEN RAISED TABLES

PROPOSED WAYFINDING SIGN. EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

EXISTING ON-STREET PARKING RETAINED

REV	DATE	BY	DESCRIPTION	CHK	APD
P02	17.05.2022	NP	M11 BRIDGE WIDTHS AMENDED		
P01	01.04.2022	NP/AOS	INITIAL ISSUE	JAH	JN

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PROJECT: BARTON GREENWAY

TITLE: GENERAL ARRANGEMENT
SHEET 20 OF 22

SCALE @ A1	DATE	DESIGN/DRAWN	CHECKED	APPROVED	SHEET
1:250	01.04.2022	NP/AOS	JAH	JN	A1

WSP PROJECT NO. 70088647

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PROPOSED WIDENING OF CURVE

PROPOSED MULTI-USER PATH AND GRASS VERGE ENCROACHES ONTO EXISTING VEGETATION. THIS IS SUBJECT TO ONGOING DISCUSSIONS WITH LANDOWNERS. VEGETATION TO BE TRIMMED.

PROPOSED WAYFINDING SIGN.
EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-18

COTON ROAD

REDUCE SPEED NOW

40

220 yds

PROPOSED WAYFINDING SIGN.
EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

FOR CONTINUATION REFER BELOW

THE BAULK

BOLLARD MATERIAL AND SPECIFICATION TO BE CONFIRMED.
2m BOLLARD SPACING TO ALLOW FOR CARGO BICYCLES AND HORSE RIDERS.

FOR CONTINUATION REFER TO INSET

FOR CONTINUATION REFER TO MAIN DWG.

PROPOSED WAYFINDING SIGN.
EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

FOR CONTINUATION REFER ABOVE

THE BAULK

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-22

THE BAULK

KEY

	EXISTING DRAIN
	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

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SP	PROPOSED SIGN AND POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	EXISTING LINE MARKING

KEY

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- PROPOSED BUFF TACTILE PAVING
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PROJECT
BARTON GREENWAY

TITLE
GENERAL ARRANGEMENT
SHEET 21 OF 22

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70088647-WSP-P01-X-DR-HI-0100-21

REV.
P02

M11 CAMBRIDGE BARTON

EXISTING BRIDGE TO BE RETAINED. TOPOGRAPHICAL SURVEY TO DETERMINE THE EXACT WIDTH AND LOCATION OF BRIDGE STRUCTURE.

PROPOSED WAYFINDING SIGN. EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

FOR CONTINUATION REFER BELOW

FOR CONTINUATION REFER TO DRG. 70088647-WSP-P01-X-DR-HI-0100-21

PROPOSED TIMBER FENCE ALONG OPEN WATER

THE BAULK

PROPOSED WAYFINDING SIGN. EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

PROPOSED WAYFINDING SIGN. EXACT SIGN AND LOCATIONS TO BE CONFIRMED.

FOR CONTINUATION REFER ABOVE

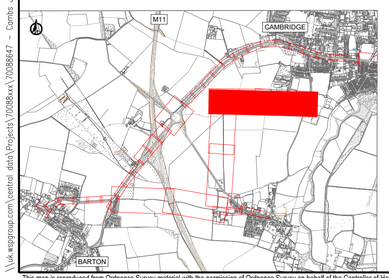
EXISTING BRIDGE TO BE RETAINED. APPROXIMATE WIDTH OF 4.6m THEREFORE THIS WILL BE UTILISED AS A SHARED USE AREA. TOPOGRAPHICAL SURVEY TO DETERMINE THE EXACT WIDTH AND LOCATION OF BRIDGE STRUCTURE.

PROPOSED MULTI-USER PATH AND GRASS VERGE TO BE PROPOSED ON THE EXISTING PERMISSIVE PATH. THIS IS SUBJECT TO ONGOING DISCUSSIONS WITH LANDOWNERS.

PROPOSED DESIGN TO TIE INTO THE HASLINGFIELD GREENWAY PROPOSAL

GRANTCHESTER ROAD

SCHEME EXTENTS



KEY

	EXISTING DRAIN
	EXISTING FENCE TO BE RETAINED
TS	EXISTING TRAFFIC SIGNAL
LC	EXISTING LIGHTING COLUMN
	EXISTING TREE
	EXISTING FENCE TO BE REMOVED

KEY

	PROPOSED DELINEATOR STRIP
SP	PROPOSED SIGN AND POST
B	PROPOSED BOLLARD
BB	PROPOSED BELISHA BEACON
	PROPOSED TREE
	EXISTING LINE MARKING

KEY

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SHEET 22 OF 22

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WSP PROJECT NO.: 70088647

DRAWING No.: 70088647-WSP-P01-X-DR-HI-0100-22

REV.: P02

Appendix B

DFT TABLES

Economic Efficiency of the Transport System (TEE) - Barton Greenway

Non-business: Commuting

	MODES		ROAD	COACH	RAIL	OTHER
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	156,210		156,210			0
Vehicle operating costs	0					
User charges	0					
During Construction & Maintenance	0					
NET NON-BUSINESS BENEFITS: COMMUTING	156,210	*(1a)*		0	0	0

Non-business: Other

	MODES		ROAD	COACH	RAIL	OTHER
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	382,747		382,747			0
Vehicle operating costs	0					
User charges	0					
During Construction & Maintenance	0					
NET NON-BUSINESS BENEFITS: OTHER	382,747	*(1b)*	382,747	0	0	0

Business

			Goods Vehicles	Business Cars & LGVs	Passengers	Freight	Passengers	
User benefits								
Travel time	73,907			73,907				
Vehicle operating costs	0							
User charges	0							
During Construction & Maintenance	0							
Subtotal	73,907	*(2)*	0	73,907	0	0	0	0

Private sector provider impacts				**Freight**	**Passengers**	
Revenue	0					
Operating costs	0					
Investment costs	0					
Grant/subsidy	0					
Subtotal	0	*(3)*	0	0	0	0
Other business impacts						
Developer contributions		*(4)*				
NET BUSINESS IMPACT	73,907	*(5) = (2) + (3) + (4)*				

TOTAL

Present Value of Transport Economic Efficiency Benefits (TEE)	612,864	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table - Barton Greenway

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	0					
Operating Costs	-3,363		-3,363			
Investment Costs	0					
Contributions	0					
Grant/Subsidy Payments	0					
NET IMPACT	-3,363	*(7)*				
Central Government Funding: Transport						
Revenue	0					
Operating costs	0					
Investment Costs	6,439,925					6,439,925
Contributions	0					
Grant/Subsidy Payments	0					
NET IMPACT	6,439,925	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues	49,846	*(9)*				49,846
TOTALS						
Broad Transport Budget	6,436,562	*(10) = (7) + (8)*				
Wider Public Finances	49,846	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and ‘Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Analysis of Monetised Costs and Benefits

Noise	6,888	*(12)*
Local Air Quality	13,671	*(13)*
Greenhouse Gases	43,214	*(14)*
Journey Quality	375,962	*(15)*
Physical Activity	7,145,458	*(16)*
Accidents	969,716	*(17)*
Economic Efficiency: Consumer Users (Commuting)	156,210	*(1a)*
Economic Efficiency: Consumer Users (Other)	382,747	*(1b)*
Economic Efficiency: Business Users and Providers	73,907	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	- 49,846	*- (11) - sign changed from PA*
Present Value of Benefits (see notes) (PVB)	9,117,926	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	6,436,562	*(10)*
Present Value of Costs (see notes) (PVC)	6,436,562	*(PVC) = (10)*

OVERALL IMPACTS

Net Present Value (NPV)	2,681,364	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	1.4	BCR=PVB/PVC

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

Appendix C

APPRAISAL SUMMARY TABLE

Appraisal Summary Table

Date produced:	19	1	2023

Contact:	
Name	Thomas Fitzpatrick
Organisation	GCP
Role	Promoter/Official

Name of scheme:	Barton Greenway
Description of scheme:	The Barton Greenway is one route within a wider and developing sustainable travel network that is being created by the Greater Cambridge Partnership. The Greenways network will run through many different environments. These range from quiet rural settings along field edges or country lanes to busier urban locations that may have more limitations on space. Within each environment the Greenways project aims to deliver a safe, attractive and cost-effective sustainable travel route which users can enjoy all year round.

Impacts		Summary of key impacts	Assessment				
			Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	The scheme will result in decongestion benefits to road users as a result of modal shift to active modes. This impact has been estimated using the DfT's AMAT and applying the journey purpose split from the November 2022 TAG Databook to assign these impacts to business, commuting and other users.	Value of journey time changes(£)			-	73,907	
			Net journey time changes (£)					
			0 to 2min	2 to 5min	> 5min			
	Reliability impact on Business users	Through providing continuity of cycling and walking infrastructure, the scheme will improve reliability for those travelling by active modes. For example, segregated and off road cycle facilities will provide more relaible journey times.	-			Slight Beneficial		
	Regeneration	Not assessed	-			Not Assessed		
	Wider Impacts	Not assessed	-			Not Assessed		
Environmental	Noise	Overall, the scheme is expected to reduce vehicle traffic as people transfer to foot or bicycle. Traffic noise would reduce accordingly.	-			-	6,888	
	Air Quality	Modal shift to cycling and walking, and associated reduced road traffic, will result in locally improved air quality.	-			-	13,671	
	Greenhouse gases		Change in non-traded carbon over 60y (CO2e)			-	43,214	
			Change in traded carbon over 60y (CO2e)					
	Landscape	The landscape along the route is characterised by agricultural land with fragmented hedgerow boundaries and small scattered woodlands. The scheme	-			Neutral to Slight Beneficial		
	Townscape	Not assessed	-			Not assessed		
	Historic Environment	Impacts on the form, survival, condition, complexity, context and period of designated heritage assets including the Scheduled settlement complex north-east of Haslingfield, and Grade II listed buildings in Haslingfield and Grantchester will be neutral. Impacts to the context of Grantchester Conservation Area will however be slight adverse. The impact to non-designated heritage assets and buried heritage assets has not been determined at this stage.	-			Slight adverse		
	Biodiversity	Neutral impacts are also expected for Eversden and Wimpole Woods Special Area of Conservation (SAC) and the barbastelle bats that use the woods, as well as birds, barn owl, reptiles, hedgehog, bat, brown hare and traditional orchards. Slight adverse impacts could affect hedgerows. Slight adverse impacts, as a result of pollution risk from the scheme during construction, could affect the Bin Brook City Wildlife Site. Habitat loss at Barton Orchard County Wildlife Site could have slightly adverse affects on bats, badger, water vole, otter, great created newts, fish and aquatic invertebrates.	-			Slight adverse		
	Water Environment	The scheme is located within Flood Zone 3, with a high risk of flooding. Its fluvial flood risk comes from the River Cam and Bourn Brook. There are numerous land drains and ditches in the area, as well as the Bin Brook in the northern of the scheme, which is classified as a main river. To the east of the scheme is the River Cam which are also classified as main rivers. With standard mitigation, any risks of chemical contamination of ground or surface waterbodies is not considered to be significant.	-			Neutral - slight adverse		
Social	Commuting and Other users	Journey time savings to commuting and other users through mode shift from private car to using active modes, and journey time savings for pedestrians and cyclist using the new facilities	Value of journey time changes(£)			-	382,747	
			Net journey time changes (£)					
			0 to 2min	2 to 5min	> 5min			

	Reliability impact on Commuting and Other users	Through providing continuity of cycling and walking infrastructure, the scheme will improve reliability for those travelling by active modes. For example, the Greenways scheme includes a new cycle path between Barton and Grantchester, which is more direct than the existing route option for cyclists.	-	Slight Beneficial		
	Physical activity	The improvement to cycle facilities will encourage active travel and therefore physical activity. Greater levels of cycling will result in health benefits through reduced health problems including diabetes and high blood pressure. In addition, an increase in walking trips along the greenway route will result in further health benefits which have not been fully quantified within the appraisal (i.e. health impacts as a result of the increase in pedestrians due to the dedicated crossing and improved lighting).	-	-	7,145,458	
	Journey quality	The improvements to the cycling and walking infrastructure along the route will improve the pleasantness of surroundings for users.	-	-	375,962	
	Accidents	As set out for the environmental impacts, the scheme is anticipated to result in a reduction in traffic movements as more people access the station by active modes. The overall reduction in highway-kilometres travelled as a result of the scheme will reduce the number of highway accidents. The scheme interventions such as greater separation between active modes and cars is anticipated to reduce the amount of accidents that occur along the route.	-	-	969,716	
	Security	The improved lighting provision along the route will increase the feeling of safety for pedestrians and cyclists. Solar studs will be used at specific points such as off-road sections where there is currently no lighting provision provided.	-	Moderate Beneficial		
	Access to services	The expansion, and improvement, of existing cycling and pedestrian infrastructure along the route will improve accessibility between settlements and into Cambridge. In addition, the improved paving infrastructure will improve accessibility for both pedestrians and cyclists in terms of pavement evenness and level access.	-	Slight Beneficial		
	Affordability	Those switching to cycling or walking from bus or car will have a lower cost of transport where they no longer pay fares or fuel and non-fuel vehicle operating costs.	-	Slight Beneficial		
	Severance	The introduction of the Barton Greenway will provide an improved cycling facility between Barton and Cambridge, reducing the severance currently created due to the lack of a direct route between these settlements.	-	Slight Beneficial		
	Option and non-use values	Not assessed	-	Neutral		
Public Accounts	Cost to Broad Transport Budget	The scheme requires funding from the Greater Cambridge Partnership.	-	-	6,436,562	
	Indirect Tax Revenues	The scheme will have a negative impact indirect tax revenues	-	-	-49,846	

Appendix D

ENVIRONMENT TAG WORKSHEETS

TAG Water Environment Impacts Worksheet

Description of study area/summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study area: Surface water and groundwater features located within 500m of the Site and/or hydraulically connected to the Site have been identified.	River Cam and Tributaries	Water Supply	Main River. 'Moderate' WFD overall status. Likely to support local water supply.	Local	Low	Limited potential for substitution.	Medium	Negligible	Insignificant
Potential Impacts: • Increase to surface water flood risk due to increased impermeable surface area. • Increase to flood risk due to the installation of culverts and bridges. • Permanent impact that may affect the hydromorphological quality of water features associated with works within or in close proximity to water features such as the installation of culverts and bridges. • Increased pollution risk to surface water features.		Transport and dilution of waste products	Main River. 'Moderate' WFD overall status.	Local	Low	Cannot be substituted.	Medium	Negligible	Insignificant
		Biodiversity	Moderate' WFD ecological status. No known designations.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Aesthetics	Heavily modified.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Cultural Heritage	No known cultural assets.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Recreation	Punting and wild swimming activities.	Local	Medium	Limited potential for substitution.	Medium	Negligible	Insignificant
		Value to Economy	Likely contribution to local economy.	Local	Medium	Limited potential for substitution.	Medium	Negligible	Insignificant
		Conveyance of Flow and Material	Flows in predominantly rural areas near the area of the site.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
	Bin Brook	Water Supply	Main River. 'Moderate' WFD status.	Local	Low	Limited potential for substitution.	Medium	Negligible	Insignificant
		Transport and dilution of waste products	Main River. 'Moderate' WFD status.	Local	Low	Cannot be substituted.	Medium	Negligible	Insignificant
		Biodiversity	Moderate' ecological status. No known designations.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Aesthetics	Heavily modified within the area of the Site.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Cultural Heritage	No known cultural assets.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Recreation	No known recreational uses near site.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Value to Economy	No known economic uses near site.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Conveyance of Flow and Material	Flows in predominantly rural areas within the area of the Site to the west. Then runs parallel to Barton Road and through a residential area downstream when it is heavily modified within the culverts and bypass channel.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
	Land Drains and Ditches	Water Supply	Ordinary watercourses, unlikely to be part of local water supplies.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Transport and dilution of waste products	Ordinary watercourses.	Local	Low	Cannot be substituted.	Low	Negligible	Insignificant
		Biodiversity	Small watercourses, not monitored by WFD. No known fish species or designations.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Aesthetics	Straightened watercourses.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Cultural Heritage	No known cultural assets.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Recreation	No known recreational uses near site.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Value to Economy	No known economic uses near site.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Conveyance of Flow and Material	Flows in predominantly rural areas.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
	Bolton's Pit Lake	Biodiversity	Lake, not designated under WFD. No known designations.	Local	Low	Limited potential for substitution.	Medium	Negligible	Insignificant
		Aesthetics	Heavily modified.	Local	Low	Limited potential for substitution.	Medium	Negligible	Insignificant
		Recreation	Local recreational uses such as walking and fishing.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
• Potential decrease in flood plain storage.	Floodplain	Conveyance of flood flows	Located in Flood Zone 3, flood risk associated with River Cam and the Bin Brook. Areas at High risk of flooding from surface water sources along the route from overland flow paths.	Regional	Low	Limited potential for substitution.	High	Slight Adverse- Proposed scheme may reduce floodplain storage, but impacts can be mitigated through design.	Low Significance
		Biodiversity	'Moderate' ecological status. No known designations.	Local	Low	Limited potential for substitution.	Low	Negligible	Insignificant
		Aesthetics	Site is mostly located in a rural area.	Local	Low	Limited potential for substitution.	Medium	Negligible	Insignificant
• Increased pollution risk to groundwater quality • Changes to groundwater flow regime and increase in groundwater flood risk due to permanent below ground structures creating potential barriers to flow • Increase in groundwater flood risk due to below ground structures creating potential barriers to flow • Temporary changes to groundwater levels and flow during excavations (bridge structures)	Groundwater	Water Supply and quality	Located approximately 450 m away from SPZ Inner Protection Zone 1 from the eastern Site boundary (at Newnham Croft). Superficial deposit aquifers (River Terrace Deposits and Alluvium) designated Secondary A aquifers. High groundwater vulnerability zones are located across the site across	Local	Low	Limited potential for substitution.	Medium	Slight Adverse	Insignificant
			Bedrock aquifer (Melbury Chalk Formation) designated Principal aquifer. Aquifer unlikely to be significantly utilised for water supply due to the thickness of the Chalk. Details of public and private (unlicensed) abstractions (source, type and quantity) not available for Proposed Scheme at this stage.	Regional	Medium	Cannot be substituted.	High	Negligible (limited information on location, type, source and purpose of public and private (unlicensed) abstractions but measurable change on abstractions unlikely to occur.	Insignificant
		WFD Status	Not within a groundwater WFD operation catchment.	Regional	Low	Cannot be substituted.	Low	Negligible	Insignificant
		Value to economy	No known commercial uses.	Local	Low	Cannot be substituted.	Low	Negligible	Insignificant
		GWDTE	Provides baseflow to rivers.	Local	Medium	Cannot be substituted.	High	Negligible	Insignificant
		Groundwater Flood Risk	Permanent structures penetrating below the groundwater table may result in an impediment within the groundwater	Local	Low	Cannot be substituted.	Medium	Slight Adverse (localised impacts expected where	Insignificant

Reference Sources

OS Mapping, MAGIC GIS Portal, British Geological Survey, Environment Agency's online maps for flood risk and Environment Agency's Catchment Data Explorer.

Summary Assessment Score

Neutral - Slight Adverse

Qualitative Comments

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

During construction phase, potential dewatering activities due to intrusive works (bridge structures) are expected to extend below the groundwater table. This may result in localised and temporary impacts on groundwater levels and flow within superficial and bedrocks aquifers (where exposed at surface), and on groundwater quality due to pollutants and sediments discharged at the surface during excavation works. Overall, the effects during construction are likely to be **insignificant.** During the operation phase, the drainage design which includes reinforced grassguards (infiltration to ground) may result in localised changes to groundwater levels and flow. Additionally, permanent below-ground structures may have an impact on the flow regime, where expected to intercept the groundwater table, although the impact is expected to be minor. Overall, the effects during operation are likely to be **Low Significance or Insignificant.**

TAG Townscape Impacts Worksheet

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	The urban fringe of south-west Cambridge is the only townscape within the Proposed Scheme's 1km Study Area. The urban fringe is associated with residential development, large open areas of greenspace, University of Cambridge buildings and the undeveloped floodplains of the River Cam which meanders through the eastern section of the Study Area. The townscape has a small to medium grain of small and medium plot sizes increasing in size towards the west away from the town centre, following a linear main road layout with looped side streets. Large areas of open green space are located to the east and west of the Study Area and are associated with Cambridge University College Sports Grounds as well as the Lammas Land public park. The underlying topography is flat at approximately 10m Above Ordnance Datum (AOD). Towards the west the urban fringe gives rise to small and medium sized agricultural fields.	The layout of the townscape matters on a local scale.	The townscape layout is typical.	The townscape layout is of medium to high importance at a local scale attributed to the local designations of conservation area (West Cambridge Conservation Area).	The built townscape layout is substitutable however development of large areas of open space is not readily reversible.	Changes to the layout and grain without the Proposed Scheme are unlikely.	**Neutral Effect** The Proposed Scheme will integrate into the existing pattern of the townscape, following existing roads. There will be no impact on plot sizes, open spaces or the road layout associated with the Proposed Scheme. Overall, the Proposed Scheme will be a broadly imperceptible change to the townscape pattern.
Density and mix	The townscape is of low density including a mix of large detached residential houses in private plots and terraces of residential properties. University buildings occupy a mix of educational and residential uses in large buildings on very large plots. Large areas of open green space, predominantly as sports pitches, are interspersed within the townscape and particularly towards the south on the urban fringe which give rise to small and medium sized agricultural fields.	The low density matters on a local scale.	The low density buildings is common locally and regionally.	The low density is of local importance.	Loss of low density built form is not readily reversible.	Changes to the density without the Proposed Scheme are unlikely.	**Neutral Effect** The introduction of the Barton Greenway would not impact the density and mix of the townscape and as such would have no impact on the density and mix of the wider townscape character.
Scale	Residential properties are small scale although some large properties are present. They are typically two to three storeys and either terraced or semi-detached. University buildings are large in scale, occupying large areas but remain 3-4 storeys in height.	The scale of buildings matters locally.	The scale of the buildings is common locally.	The small scale of buildings is of medium importance locally.	Loss of townscape scale is of low substitutability.	Changes to the scale of the townscape without the scheme are unlikely.	**Neutral Effect** The introduction of the Proposed Scheme would not impact the scale of the Site and surrounding area.
Appearance	The townscape includes a mixture of architectural styles and periods with the dominant material being brick which is reflective of the gradual mix of urban expansion since the late 1800s. The townscape accommodates a tidy and spacious appearance with brick boundaries in the east while to the west and north are wide tree lined streets with grass verges and hedgerow boundaries. Barton Road adopts a tarmac road and separate subtly burgundy tarmac footway/cycleway on the northern side separated by a wide tree-lined grass verge. Side streets to the north feature Copenhagen crossings.	The townscape appearance matters on a local scale.	Townscape appearance is relatively common locally.	The appearance to the east is important locally.	The mixture of architectural styles is substitutable over time however the historic features and range is not readily substitutable.	Changes to the appearance of the townscape are unlikely.	**Neutral to Slight Adverse Effect** The Proposed Scheme will not change the appearance of built form within the existing townscape. The key change will be the use of red thermoplastic surfacing for the cycle lane. While this change is not large enough to affect the wider townscape appearance, a bright red would be at odds with the historic character and negatively local impact views resulting in a slight adverse effect.
Human interaction	The townscape being predominantly residential has low human interaction with some interactions including bus stops and a shared cycle and pedestrian footway along Barton Road following the route of the Proposed Scheme. Human interaction is higher to the east on Newnham Road which provides some shops, a public house, al fresco dining and views across and access to the River Cam.	The levels of human interaction matter on a local scale.	The levels of human interaction are common locally.	Provision of footways/cycleways are of high importance locally. Low levels of human activity are important to the quiet character.	Human interaction has a high potential for substitution.	Levels of human activity along Barton Road may increase as a result of the Proposed Scheme.	**Neutral Effect** The existing human activity including pedestrians and cyclists will likely be increased along Barton Road by the Proposed Scheme, however this will be along an already busy route and will likely be used as a thoroughfare rather than for human interaction with other townscape features.
Cultural	The townscape comprises numerous period buildings and sympathetic architecture that positively contribute to the cultural value of the townscape. They are locally designated by Conservation Areas. The cultural contribution is situated in the east. The relatively modern architecture (post 1960s) of Wolfson College is more notable in scale within the area but as they are generally set back from the roads and hidden from view they do not feature strongly within the visual townscape envelope. The University of Cambridge Queens' College is situated approximately 400m to the north is a Registered Park and Garden.	The cultural contribution is important locally.	The cultural contribution is common locally.	The cultural contribution is of high importance locally.	The cultural contribution is not readily substitutable.	Changes to the cultural contribution of the townscape are low without the Proposed Scheme.	**Neutral Effect** Given that no features of cultural value would be altered as a result of the Proposed Scheme, the cultural contribution of the townscape will not change.
Land use	The Proposed Scheme is situated within urban fringe, occupied by residential properties and University buildings. University sports grounds punctuate the buildings within the Study Area but are particularly abundant to the southern urban fringe which then give rise to agricultural fields. The open space is designated as Green Belt. Public parkland and nature reserves form the floodplains to the meandering River Cam in the east. The Site itself is occupied by footways and carriageways.	The land use matters locally.	The land use is common locally.	The combination of land use is important locally.	Change of use of buildings is relatively easily reversed however this form of change is uncommon. Open space is irreplaceable. Land use of roads and cycleways is readily substitutable.	Changes to the land use of the site are unlikely without the Proposed Scheme.	**Neutral Effect** The change of land use would be in character with the existing which already includes a designated cycle lane separated from traffic by a tree lined verge.
Summary of character	The townscape is of low scale residential urban fringe reducing in density towards the west, away from the town centre. The road layout follows the main east to west route of Barton Road with tributary side streets which mainly loop back onto Barton Road. The area features buildings in the central to eastern section of the townscape area that contribute to the cultural value and provide an attractive, spacious appearance. There is a quiet character off the main route, particularly to the south where housing gives rise to Sports Grounds and agricultural fields protected under Green Belt. The lack of commercial buildings within the area has resulted in low levels of human interaction that create a generally quiet character off Barton Road. University of Cambridge buildings are present within the townscape but at much lower density than elsewhere across the city. The university buildings are some of the most modern within Cambridge and have less influence on the overall townscape character than elsewhere in the city.	Overall the townscape character in the east matters locally where the townscape is designated locally by Conservation Areas. The open character to the south matters regionally and is protected as Green Belt.	Overall the townscape is relatively common.	Overall the townscape to the east is important locally and open nature of the townscape to the south important regionally.	Overall the site and surrounding area is generally substitutable with the low density and areas of open space being not readily substitutable.	Overall, changes to the Site and surrounding area without the Proposed Scheme are unlikely.	**Neutral Effect** The Proposed Scheme will be notable at construction but would be short term and temporary in effect. Construction related activity is not out of character with a built-up area. During operation, changes will be largely imperceptible in the wider townscape causing no effect to layout, density, scale and cultural contribution. However the impact of red thermoplastic surfacing should be carefully considered in the designated locality of West Cambridge Conservation Area to ensure the shade does not impact on the appearance of the culturally rich townscape. A bright red would result in a slight adverse effect. Overall, the changes are minor and do not impact wider townscape character and offer only minor changes to localised visual receptors.

Reference Sources

National Character Area Profile 88. Bedfordshire and Cambridgeshire Claylands (NCA 88) – Prepared by Natural England
Ordnance Survey Mapping - 1:25,000
Google Maps Satellite Imagery
Magic Maps

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The Proposed Scheme will be notable at construction but would be short term and temporary in effect. Construction activities are not out of character with a built-up area.
During operation, changes will be largely imperceptible in the wider townscape causing no effect to layout, density, scale and cultural contribution. However the impact of red thermoplastic surfacing should be carefully considered in the designated locality of West Cambridge Conservation Area to ensure the shade does not impact on the appearance of the culturally rich townscape. A bright red would result in a slight adverse effect. Overall, the changes are minor and do not impact wider townscape character and offer only minor changes to localised visual receptors. The impact of the Proposed Scheme is therefore considered to be **Neutral.**

TAG Landscape Impacts Worksheet

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	The pattern of landscape within the wider 1km Study Area is of low-lying, gently undulating land rising to the west. The land is lowest within Cambridge in the floodplains of the River Cam and it rises gently to the west. The landscape pattern is of irregular, generally rectilinear arable fields defined by mature hedgerows and interspersed by small, scattered woodlands. Roads follow linear routes with low density village settlements along the main roads. Smaller scale pastoral fields are situated near villages.	The pattern of the landscape is typical of the local area.	The landscape pattern is common at all scales.	The landscape pattern is of medium importance at the local level.	Loss of field margin or roadside vegetation can be substituted. Loss of mature trees could be replaced in the medium to long term.	**Slight beneficial** The Proposed Scheme will integrate into the existing pattern of the landscape, following existing field boundaries and routes. There will likely be a minor impact on hedgerows and trees associated with the Proposed Scheme, however there will be the opportunity for strengthening existing hedgerows and to provide additional tree planting. Overall, the Proposed Scheme will be a broadly imperceptible change to the landscape pattern.
Tranquillity	The rural landscape comprises of arable fields, interspersed villages, and rural roads provides a medium level of tranquillity. The M11 corridor which runs through the Study Area and the A603 which runs alongside the Proposed Scheme limit tranquillity in surrounding localised areas but tranquillity levels remain between Grantchester and Cambridge.	Tranquillity in the Study Area matters at the local level.	Available levels of tranquillity in the Study Area are locally common.	Levels of tranquillity within the Study Area are of medium importance at the local level.	Tranquillity cannot be substituted.	**Neutral** The Proposed Scheme is likely to reduce traffic on local roads by encouraging vehicle users to instead cycle along the Greenway. The potential reduction in traffic, could result in a slight beneficial effect on local tranquillity. However, the increased presence of movement from users of the Proposed Scheme will be visible within and around the study area. Screening vegetation planting such as hedgerows and cyclist speed reduction measures such as seating areas, surface changes and pinch points would reduce top speeds of cyclists.
Cultural	There are no nationally designated landscape sites such as National Parks or Areas of Outstanding Natural Beauty within the 1km Study Area. The American Military Cemetery situated approximately 3km to the north-west is a Registered Park and Garden. Villages along the route of the Proposed Scheme are locally designated as Conservation Areas (Barton, Grantchester, Western Cambridge and Newnham Croft) and include numerous Listed Buildings. The historic layout of villages follows the routes of roads. The expansion of villages has included conversion of local fields into more dense housing with minor access roads that contrast in architectural style with the historic core of the settlements. Historic field boundaries and patterns remain but many smaller fields have been merged involving removal of hedgerows.	The Conservation Areas, settlement layout and field pattern matter at the local level. The American Military Cemetery Registered Park and Garden matters at a national scale but is outside of the Study Area.	A landscape with cultural linkages as found in the Study Area is common at the regional and local level. Areas identified as Conservation Areas are not rare nationally but locally noteworthy.	Cultural landscapes in the Study Area are important at a regional, local and site scale.	Cultural landscapes cannot be substituted.	**Neutral to Slight Adverse Effect** The Proposed Scheme would follow existing field boundaries and roads and would pass through Conservation Areas. The impact of red thermoplastic surfacing should be carefully considered in the designated locality of Grantchester Conservation Area to ensure the shade does not impact on the appearance of the culturally rich townscape. A bright red would result in a slight adverse effect. Degradation to existing field boundaries and layout surrounding the Proposed Scheme is unlikely.
Landcover	Landcover surrounding the 1km study area is a mixture of village settlements and agricultural land comprised of medium to large, rectilinear arable fields with smaller pastoral fields close to villages. Field boundaries consist of hedgerows. Scattered woodlands are prevalent within the Study Area, particularly at the edges of settlements which are comprised of historic villages along roads that have seen modern expansion to surrounding fields. The River Cam runs north to south within the eastern end of the Study Area which is bound by a corridor of pastures that follow the meandering nature of the river.	Landcover within the study area matters at the local level.	Landcover within the study area is locally common.	Landcover in the study area is of moderate importance at a local level.	Field margins across the study area are replaceable. Woodland and mature tree cover would be replaceable in the medium to long term.	**Neutral to slight beneficial** As the Proposed Scheme follows existing field boundaries, lanes and roads, losses associated with the Proposed Scheme to the existing landcover are generally limited to field margins which will be nominable and broadly imperceptible in the context of the local land cover. There is the opportunity for the Proposed Scheme to strengthen landcover by re-establishing/strengthening sections of fragmented hedgerows along field boundaries.
Summary of character	Overall, the landscape character within the Study Area is that of an arable rural landscape with a small to large, regular shaped fields, hedgerow field boundaries, village settlements along country roads with scattered woodlands and small pastoral fields at the village edges. The M11, which runs through the Study Area, limits localised levels of tranquillity. Vegetation clearance to accommodate the Proposed Scheme would be minimal and there is an opportunity for hedgerow and tree planting to restore some of the characteristics of the landscape. Changes to views would be minimal and not out of context with the baseline. Numerous residential receptors are adjacent to the Proposed Scheme however the changes proposed are typical of a road environment and are similar to the baseline.	Overall the landscape character matters at the local level.	Overall the landscape character of the Study Area is nationally, regionally, and locally common.	Overall the landscape character of the Study Area is of low importance at a national and regional level. At local level the landscape character is of moderate importance.	Overall the landscape character across the Study Area is replaceable in the medium to long term.	**Neutral** The Proposed Scheme will be notable at construction but would be short term and temporary in effect. The minor vegetation losses associated with the Proposed Scheme will not be significant when considered in the context of the overall character of the area and there is an opportunity to introduce additional planting and restore/ enhance fragmented hedgerows along the route of the Proposed Scheme. During operation, changes to the overall landscape character would be largely imperceptible as the Proposed Scheme follows existing landscape patterns with the potential to increase tranquillity. To prevent cyclists reaching high speeds near settlements, suggested speed reduction measures should be embedded in the design. There are potential changes to the landscape character of Grantchester Conservation Area as a result of the red thermoplastic surfacing which conflicts with the historic character and may result in a slight adverse effect. Visual effects can be mitigated with good quality design to a level that is not considered to result in the potential for significant adverse effects. The Proposed Scheme is not significantly different to the baseline views and will represent only a slight change to those experienced by close residential receptors.

Reference Sources

National Character Area Profile 88. Bedfordshire and Cambridgeshire Claylands (NCA 88) – Prepared by Natural England
Greater Cambridge Landscape Character Assessment (2021) - Prepared by Chris Blandford Associates
Extrium England Noise and Air Quality Viewer (2019) Available at: http://www.extrium.co.uk/noiseviewer.html
Ordnance Survey Mapping - 1:25,000
Google Maps Satellite Imagery
Magic Maps

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

Although the Proposed Scheme will be notable during construction, this would be short-term and temporary in effect. The existing adjacent landscape consists of agricultural land with hedgerow boundaries and small scattered woodlands. The minor losses associated with the Proposed Scheme will not be significant when considered in the context of the overall character of the area. There is an opportunity for mitigation and additional planting, with which most of the visual effects can be mitigated to a level which is not considered to result in the potential for significant effects within a period of 15 years. As the Proposed Scheme is not significantly different to the baseline views and will represent only a slight change to those experienced by site users currently, the impact of the Proposed Scheme is therefore considered to be **Neutral.**

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	**Designated heritage assets (possibly physically affected by the Proposed Scheme) in the 50m study area** 1. Grade II listed early/mid 19th century gates to No. 78 Barton Street (NHLE: 1126246) 2. Four Conservations Areas (West Cambridge, Newnham Croft, Grantchester and Barton) **Designated heritage assets (possibly setting impact) in the 50m study area** 3. Three Grade II listed buildings within the West Cambridge Conservation Area. 4. One Grade II listed building outside of the West Cambridge Conservation Area. 5. One Grade II listed building within the Newnham Croft Conservation Area. 6. Five Grade II listed buildings within the Barton Conservation Area. 7. One Grade II* listed building within the Barton Conservation Area. 8. Two Grade II listed buildings outside of the Barton Conservation Area. 9. Six Grade II listed buildings within the Grantchester Conservation Area. **Potential Known and Unknown Non-designated Archaeological Remains** 10. The potential, and therefore the form of archaeological remains, is unknown at this time.	1-9. The protection of Listed Building and Conservation Areas is a national concern (Planning (Listed Buildings and Conservation Areas) Act 1990). 10. The form of currently unknown buried archaeological remains are of indeterminate importance. However, archaeological remains could be of local to national importance.	2. The conservation areas are of High significance, 1,3-6,8-9 Grade II listed buildings are of medium significance 7. Grade II* listed buildings of high significance 10. The significance of the form of currently unknown buried archaeological remains and could be of low to high significance.	2. There are nearly 10,000 conservation areas in England. Although not rare, they are identified by the local authority as having definite architectural quality or historic interest to merit designation. 1,3-6,8-9. Nationally, 92% of listed buildings are Grade II, making them less rare but still of national importance. 7. Nationally, 5.8% of listed buildings are Grade II*, making them rare and of 'more than special interest.' 10. The form of currently unknown buried archaeological remains are of indeterminate rarity. However, the form of archaeological remains could be of common locally to rare internationally	The proposed Barton Greenway links west Cambridge to the villages of Barton and Grantchester. The proposed route principally utilises existing A roads, unclassified country roads, as well as off-road footpaths and existing bridleways. The changes within the Conservations Areas relate to modification to the public realm, comprising planting areas, signage, relining works and re-surfacing works. **Designated heritage assets (possibly physically affected by the scheme)** 1. As currently proposed (General Arrangement drawing no. 70088647-WSP-P01-X-DR-HI-0100-03-P02) a new surface of asphalt footway will run directly up against a Grade II listed gateway for No. 78 Barton Road (NHLE: 1126246). There is a possibility of a slight adverse effect upon the form of this asset from the Proposed Scheme dependant upon the nature and precise location of the proposed resurfacing which could potentially abut the listed structure. 2. There will be direct impacts to the form of four Conservation Areas from new signage, footways, proposed red thermoplastic surfacing and high buff friction surfacing, particularly this will have likely have a slight adverse effect to the form of West Cambridge and Newnham Croft conservation. It anticipated that there will be a neutral effect to the form of the Barton and Grantchester Conservation Areas from the introduction of high buff friction surfacing and new signage. **Designated heritage assets (possible setting impact)** 3-9 The small-scale nature of the proposals means there is likely to be a neutral effect on the significance of the Grade II and II* listed buildings and conservation areas through changes to their setting. **Potential Archaeological Remains (possible physical and setting impact)** 10. Impact on the form of unknown archaeology is unknown at this time.
Survival	1, 3-9. The listed buildings are likely to have a good level of survival. 2. The Conservation Areas are likely to have good levels of survival. 10. The survival of any unknown archaeological remains is unknown at this time.	1, 3-9. The survival of designated heritage assets matters on a national scale. 2. The survival of Conservation Areas matters on a national scale. 10. The survival of currently unknown buried archaeological remains matters on an indeterminate scale but could vary from a local to international scale.	1-9. The significance of the survival of designated elements of the historic environment is high. 10. The significance of survival of currently unknown buried remains is unknown at this time.	1-9. The survival of the designated elements of the historic environment is common locally but rare nationally. 10. The rarity of the survival of currently unknown buried archaeological remains is indeterminate at this stage, but could be from common locally to rare internationally.	1. As currently designed, the Proposed Scheme is not anticipated to require physical alterations to the Grade II listed gateway, although its setting may be altered. It is therefore anticipated that there will be no change to the survival of this asset resulting in a neutral effect. 2-9. It is anticipated that there will be a neutral effect upon the survival of these designated heritage assets or their relationship with their setting. 10. Impacts on the survival of unknown archaeology is unknown at this time.
Condition	1,3-9 The condition of the listed buildings is unknown. 2 The condition of the Conservation Areas is unknown. 10 The condition of currently unknown buried archaeological remains is indeterminate at this stage, but could range from poor to good.	1-9 The condition of designated heritage assets matters on a national scale. 10. The scale at which the condition of currently unknown buried archaeological remains matter is currently indeterminate, but could be of a local to international importance.	1-9. The significance of the condition of the designated heritage assets is expected to vary from low to high due to the number and nature of designated historic environment resources. 10. The significance of the condition of currently unknown buried archaeological remains is indeterminate at this time.	1-9. The rarity of the condition of the designated heritage assets varies from common locally to rare nationally. 10. The rarity of the condition of currently unknown buried archaeological remains is indeterminate, but could be from common locally to rare internationally.	1. As currently designed, the Proposed Scheme is not anticipated to require physical alterations to the Grade II listed gateway, although its setting may be altered. There is the potential that the resurfacing works could impact upon the condition dependant upon the proposed interface between these works and the listed gate piers. It is therefore anticipated that there may be a slight adverse effect upon the condition of the Grade II listed gateway. 2-9. It anticipated there will be neutral effect upon the condition of these designated heritage assets. 10. Impacts on the condition of potential archaeological remains is unknown at this time.
Complexity	1,3-9. The complexity of the listed buildings is unknown. 2. The complexity of the Conservation Areas is unknown 10. The complexity of any potential archaeological remains is unknown at this time.	1-9 The scale at which the complexity of designated heritage assets matters is considered to be national. 10 The scale at which the complexity of currently unknown buried archaeological remains matter is indeterminate, but could be from local to international.	1-9. The significance of the complexity of the designated elements of the historic environment is low to high. 10.The significance of the complexity of currently unknown buried archaeological remains is indeterminate at this time.	1-9. The rarity of the complexity of designated heritage assets is common locally and rare nationally. 10.The rarity of the context of currently unknown buried archaeological remains is indeterminate, but could be from common locally to rare internationally.	1. As currently designed, the Proposed Scheme is not anticipated to require physical alterations to the Grade II listed gateway, although its setting may be altered. It is therefore anticipated that there will be no change to the complexity of this asset resulting in neutral effect. 2-9 It is anticipated that there will be a neutral effect upon the complexity of these designated assets. 10 Impacts on the complexity of potential archaeological remains is unknown at this time.
Context	1. Urban 2. Rural and Urban 3. Urban 4. Urban 5. Urban 6. Rural (within Barton village) 7. Rural (within Barton village) 8. Rural (within Barton village) 9. Rural (within Grantchester village) 10. The context of any potential archaeological remains is unknown at this time.	1-9. The context of designated heritage assets matters on a local to national scale. 10.The context of currently unknown buried archaeological remains is indeterminate.	1-9. The significance of the context of the designated heritage assets is low to high. 10.The significance of the context of currently unknown buried archaeological is indeterminate at this time.	1-9. The rarity of the context of the designated heritage assets is common locally but rare nationally. 10.The rarity of the context of currently unknown buried archaeological remains is indeterminate at this time, but could be from common locally to rare internationally.	1 There will be a change to the context of the West Cambridge Conservation Area in which the Grade II listed gateway resides, due to the close proximity of the proposed change to the footway asphalt abutting against the list gate piers, which may result in a slight adverse effect. 2-9 The small-scale nature of the proposals means that there is likely to be a neutral effect to designated heritage assets. 10 The impact on the context of potential archaeology is unknown at this time.
Period	1-9. Post Medieval 10. Data relating to potential archaeological remains is unavailable at this time.	1-9. The period of the designated heritage assets is considered to matter on a regional to national scale. 10. The scale at which the periods represented by currently unknown buried archaeological remains matters are indeterminate at this stage.	1-9. The period of the heritage assets does not necessarily affect their heritage significance. 10. The significance of the periods represented by currently unknown buried archaeological remains is unknown at this time.	1-9.The rarity of the periods represented by the designated heritage assets is common to townscapes and villages nationally. 10. The rarity of the period of currently unknown buried archaeological remains is indeterminate at this stage, but could be from common locally to rare internationally.	1-10. The Proposed Scheme will have a neutral effect on the period of the heritage assets.

Reference Sources

National Heritage List for England - List of statutorily designated heritage assets
Local Planning Authority website - Conservation Area data
A site walkover was not undertaken

Step 5 - Summary Assessment Score

Slight Adverse Effect

Qualitative Comments

There are nineteen Grade II listed buildings and monuments, one Grade II* listed building and four conservations areas within the 50m study area. The Proposed Scheme includes resurfacing works immediately adjacent to Grade II listed gateway for No. 78 Barton Road (NHLE: 1126246) with the potential for direct and indirect impacts to the form and setting of the asset.
The Proposed Scheme passes through the western edge of the Newnham Croft Conservation Area and along the southern boundary of the West Cambridge Conservation area. There will be a direct impact on the four Conservation Areas resulting from small-scale changes.
The Proposed Scheme, as currently designed, would have a neutral effect on the designated heritage assets (excluding the Grade II listed gateway, Newnham Croft Conservation Area and West Cambridge Conservation Area) within 50m of the proposed route through changes to the setting.
An assessment of the non-designated assets has not been completed at this stage. The Proposed Scheme has the potential to result in the partial or complete loss of buried heritage assets in areas where ground disturbance is proposed outside of the existing highway, principally relating to the construction of the bridleway between Barton and Grantchester villages. Within agricultural fields any archaeological remains present will be found immediately below the topsoil. The potential to impact upon buried archaeological remains would be dependent upon the nature of any ground disturbance proposed.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	Description of feature/ attribute	Scale (at which attribute matters)	Importance (of attribute)	Trend (in relation to target)	Biodiversity and earth heritage value	Magnitude of impact	Assessment Score
Eversden and Wimpole Woods Special Area of Conservation (SAC)	Ancient coppice woodland (Eversden Wood) and high forest woods likely to be of more recent origin (Wimpole Woods). Designated for Annex II species that are a primary reason for selection of this site: - Barbastelle *Barbastella barbastellus*	**International**	**High -** Primary species of importance is barbastelle, a species of bat. A colony is associated with trees in Wimpole Woods. The colony uses trees as a summer maternity roost and the wider area for foraging. Flight paths such as hedgerows and other parts of woodland may be used when bats forage outside the SAC.	**Unknown** - The population trend of the colony is unknown as is the extent and availability of offsite habitat. The following document has been published that includes specific restoration targets for the qualifying features of the SAC: *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features (Natural England 2019).*	**Very high -** Internationally important site with limited potential for substitution.	**Neutral** - The Proposed Scheme will not impose any direct or indirect impact on the SAC. The Proposed Scheme is 6.10km north west of the SAC which is out side the Core Sustenance Zone (CSZ; a measure of the area on which the bat colony depends for feeding) of the SAC and it is considered unlikely that barbastelle roost on Site. Commuting and foraging features, such as lines of trees and hedgerows, will not be severed and therefore the Proposed Scheme is unlikely to negatively affect commuting and foraging bats.	**Neutral**
Bin Brook City Wildlife Site (CiWS)	A brook which supports breeding populations of a mammal species (water vole) protected by the Wildlife and Countryside Act 1981. The CiWS also qualifies for its group of at least five mature pollard willows in association with other semi-natural habitat.	**Local**	**Medium-** A CiWS designated for its mammal populations and mature pollard willows.	**Unknown** - A trend in relation to the target feature is not known.	**Medium -** non-statutory designated site	**Minor Negative -** The Proposed Scheme enters the CiWS. Surveys will be required to assess potential impacts to water vole population. It is not anticipated that any of the willow trees will be lost. Aquatic ecology surveys will be undertaken and appropriate pollution controls measures will be put in place as mitigation during construction.	**Slight Adverse**
Barton Orchard County Wildlife Site (CWS)	An orchard with at least 20% ancient fruit trees with a semi-natural ground flora. The orchard is managed through traditional practices.	**Local**	**Medium-** A CWS designated for its ancient fruit trees and traditional management practices.	**Declining** - Cambridgeshire has over 1000 possible traditional orchard sites however research by CPERC in 2014, on traditional orchards suggests that many of these sites which were previously traditional orchard have been lost or abandoned. This habitat is therefore declining in Cambridgeshire.	**Medium -** non-statutory designated site	**Minor Negative -** the Proposed Scheme will have the potential to impact a section of this CWS as a result of habitat loss. Approximately 5% of the CWS falls within the footprint of the Proposed Scheme.	**Slight Adverse**
Hedgerows (including potential Important hedgerows)	There are many hedgerows within the footprint of the Proposed Scheme. Surveys would need to be undertaken to determine if any of the hedgerows on Site are considered Important Hedgerows under the Hedgerows Regulations 1997.	**Local**	**High -** Review of satellite imagery has identified a number of hedgerows within the footprint of the Proposed Scheme. Hedgerows are an important landscape feature and provide habitat connectivity and high value to a range of wildlife.	**Declining** - The lengths of managed hedgerow decreased by 6.1% in the UK between 1998 and 2007. Abundance and distribution of hedgerow trees is declining, as recognised by the Countryside Survey 2000. Old and mature hedgerows are uncommon in Cambridge. Hedgerows are listed as a Priority Habitat within Cambridge.	**Medium** - A Local value habitat with limited potential for substitution.	**Minor Negative -** The Proposed Scheme has the potential to remove sections of hedgerows. It is unknown the extent at which these will be impacted, however it is anticipated that due to the nature of the Proposed Development this will be minor.	**Slight Adverse**
Traditional Orchard HPI	Barton Orchard is an area of traditional orchard with top fruit trees at least 20% of which are ancient. The ground flora is semi-natural and managed with traditional orchard management practices. This habitat type is a Habitat of Principal Importance	**Regional**	**Medium** - a non-statutory designated site with Habitat of Principal Importance under the NERC Act (2006).	**Declining** - Cambridgeshire has over 1000 possible traditional orchard sites however research by CPERC in 2014, on traditional orchards suggests that many of these sites which were previously traditional orchard have been lost or abandoned. This habitat is therefore declining in Cambridgeshire.	**Medium -** Regional value habitat with limited potential for substitution.	**Neutral -** the Proposed Scheme is adjacent to this HPI. There is potential for the Proposed Scheme to result in pollution of the HPI, and pollution control measures will need to be in place. With pollution control impacts to the HPI will be neutral.	**Neutral**
Bats (Barbastelle)	Barbastelle bats *Barbastella barbastellus* are a rare bat species which is known to be present in the local area. Barbastelle were reported in the biodiversity records search within 2km of the Proposed Scheme. Additionally the Proposed Scheme falls within the impact risk zone of Eversdon and Wimpole Woods, a SAC which is designated for supporting a maternity roost of barbastelle bats. Barbastelle are offered specific protection under: Annex II and IV of the Habitats Directive Wildlife and Countryside Act 1981 (Schedule 5) Species of Principal Importance (SPI) under section 41 of the NERC act (2006).	**International**	**Medium -** barbastelle are protected under Schedule 5 of the Wildlife and Countryside Act (1981) and Conservation of Habitat and Species Regulations 2017. Hedgerows intersecting the Proposed Scheme may be used by commuting and foraging bats. Standing trees and woodland could be suitable for roosting bats.	**Unknown** - A trend in relation to the target species is not known.	**High** - Bats are protected under the Conservation of Habitat and Species Regulations 2017. Barbastelle is an Annex II species of European importance.	**Neutral -** Barbastelle bats are unlikely to be roosting on the habitats on Site. Commuting and foraging features, such as lines of trees and hedgerows, will not be completely severed and therefore this is unlikely to result in a negative impact to bats.	**Neutral**
Bats (General)	Habitats present within the footprint of the Proposed Scheme, including woodlands, hedgerows, mature trees and scrub provide suitable habitat for foraging, commuting and roosting bats. A desk study returned records for nine bat species, including brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, Nathusius' pipistrelle *Pipistrellus nathusii*, noctule bat *Nyctalus noctule*, serotine *Eptesicus serotinus*, soprano pipistrelle *Pipistrellus pygmaeus*, whiskered bat *Myotis mystacinus* and barbastelle. Further survey is required to determine whether roosting bats are present within suitable roosting habitat within and adjacent to the Proposed Scheme.	**National**	**Medium -** hedgerows intersecting the Proposed Scheme may be used by commuting and foraging bats. Standing trees and woodland could be suitable for roosting bats.	**Varying** - Species dependant- Some bat species have decreased in England and some have increased. Of the species identified in the biological records, brown long-eared bat, Daubentons bat, noctule bat, serotine, and soprano pipistrelle have remained stable in England, and common pipistrelle and Nathusius' pipistrelle have increased in population in England since 1999.	**High** - All bats are protected under the Conservation of Habitat and Species Regulations 2017.	**Minor Negative -** Whilst barbastelle are unlikely to be roosting within habitats present in the footprint of the Proposed Scheme, other more common species could roost within habitats on Site. Further survey will determine whether any roosting habitat will be impacted, and if all potential bat tree roosts are being avoided then bats could be downgraded to neutral impact with a neutral assessment score. Commuting and foraging features, such as lines of trees and hedgerows, will not be completely severed and therefore this commuting and foraging habitat within the Proposed Scheme will be maintained.	**Slight Adverse**
Badgers *Meles meles*	Badgers are offered protection under the Protection of Badgers Act 1992. Woodlands, hedgerows and grassland provide suitable habitat for foraging badgers, and suitable locations for sett construction. Badgers have been recorded within 2km of the Proposed Scheme in the biological records search, including a badger within the Proposed Scheme.	**Local**	**Low -** suitable habitat is present within the footprint of the Proposed Scheme based on satellite imagery. A badger survey of the Proposed Scheme has not yet been undertaken.	**Unknown** - The county trend for this species is not known within Cambridgeshire, however nationally badgers have shown a significant increase in numbers (c.88% since the 1980s).	**Low** - badger are a species of medium biodiversity value on a national and local level.	**Minor Negative-** A badger survey has not been undertaken, and further surveys have been recommended, due to suitable sett building habitat for badgers being present on Site.	**Slight Adverse**
Water vole *Arvicola amphibius*	Water voles are protected under Schedule 5 of the Wildlife and Countryside Act (1981) and the Conservation of Habitats and Species Regulations (2017). A desk study returned records for water vole including in the Bin Brook CiWS which the Proposed Scheme crosses. Open Source maps indicates that there are a number of water bodies which the Proposed Scheme crosses such as drainage ditches. At this stage a survey has not been undertaken and it is unknown whether they provide suitable habitat for water vole. The Proposed Scheme crosses the Bin Brook CiWS, which is partly designated for its water vole population.	**Regional**	**Medium** - The Proposed Scheme crosses multiple water bodies and it is unknown whether they provide suitable habitat for water vole.	**Declining** - According to the National Water Vole Database and Mapping Project (McGuire and Whitfield, 2017) water vole are declining in the UK.	**High -** Water vole is a species of high biodiversity value.	**Minor Negative -** the Proposed Scheme will be directly impacting the water courses with unknown potential for water voles. The scheme crosses ditches and also runs adjacent to ditches and could impact their banks where watervoles build their burrows. Water vole surveys will be undertaken, and a mitigation strategy for the Proposed Scheme based on the findings of these surveys will be required.	**Slight Adverse**
Otter *Lutra lutra*	Otters are protected under Schedule 5 of the Wildlife and Countryside Act (1981) and the Conservation of Habitats and Species Regulations (2017). A desk study returned records for otter including in the Bin Brook CiWS which the Proposed Scheme crosses. Open Source maps indicates that there are a number of water bodies which the Proposed Scheme crosses such as drainage ditches. At this stage a survey has not been undertaken and it unknown whether they provide suitable habitat for otter.	**Regional**	**Medium** - Multiple water bodies cross the Proposed Scheme and it is unknown whether they provide suitable habitat for otter.	**Increasing** - According to research by the Wildlife Trust and the Cambridgeshire Mammal Group in 2022 otter populations are increasing nationally and have been increasing in Cambridgeshire since 1990.	**High** - Otter is a species of high biodiversity value.	**Minor Negative** - the Proposed Scheme will be directly impacting the water courses with unknown potential for otters. The scheme crosses ditches and also runs adjacent to ditches and could impact their banks which provide terrestrial habitat for otters. Otter surveys will be undertaken, and a mitigation strategy for the Proposed Scheme based on the findings of these surveys will be required.	**Slight Adverse**
Birds	Habitats present, such as scrub, arable crops and grassland are suitable for use by common and widespread nesting birds. All wild birds, and their nests whilst in use, are protected under the Wildlife and Countryside Act (1981).	**Local**	**Low -** impacts to breeding birds are anticipated to be minimal due to the limited habitat loss required to facilitate the Proposed Scheme.	**Varying** - Species dependent - some bird species are in significant decline nationally and locally within Cambridgeshire.	**Low -** The Proposed Scheme is likely to support a diverse range of breeding and wintering bird species of local importance.	**Neutral -** Following the implementation of suitable precautionary measures during construction works, the Proposed Scheme should result in negligible impacts to breeding birds because of negligible habitat loss anticipated. There would be no operational impacts on birds upon completion of the works.	**Neutral**
Barn owl *Tyto alba*	Barn owl is a Schedule 1 species under the Wildlife and Countryside Act (1981) and protected from disturbance during nesting. A desk study returned records for this species within 2km of the Proposed Scheme. Further survey is required to determine whether trees within and adjacent to the Proposed Scheme are suitable for nesting barn owl.	**Regional**	**High -** The barn owl is a Schedule 1 species. Further survey is required to determine whether any trees lost to the Proposed Scheme are suitable for nesting barn owl.	**Increasing**- The '*State of the UK Barn Owl population - 2021*' report suggests an overall rise in nesting occupancy of known barn owl nest locations across the UK. Cambridgeshire has a significant local population.	**Medium** - Barn owl are of medium biodiversity value on a National and Local level.	**Neutral -** Anticipated that minimal trees will be removed and further survey will determine whether barn owls are present and should they be found to be present mitigation will be focused on avoidance strategies. No collision risk to barn owls is anticipated once the Proposed Scheme is operational as the Proposed Scheme will be designed to support non-motorised users only.	**Neutral**
Reptiles (common and widespread species)	Native widespread reptile species (adder *Vipera berus*, common lizard *zootoca vivipara*, grass snake *Natrix helvetica* and slow worm *Anguis fragilis*) are protected from killing and injury under Schedule 5 of the Wildlife and Countryside Act (1981). Reptiles, such as grass snake and slow worm and common lizard, may be present in low numbers in suitable habitat such as rough grassland, hedgerow margins and scrub. There is no suitable habitat for adder within the footprint of the Proposed Scheme.	**Local**	**Low** - reptiles are likely to be present in low numbers in habitats adjacent to the Proposed Scheme. With minimal habitat to be removed for the Proposed Scheme, it is unlikely to impact reptiles at more than a local level.	**Varying -** Species dependent - numbers of grass snake and slow worm are in general decline nationally, but fairly common in Cambridgeshire.	**Medium** - reptiles are a species of medium biodiversity value on a national and local level.	**Neutral -** minimal habitat is due to be removed for the Proposed Scheme. Following the implementation of precautionary works during the construction phase, the Proposed Scheme would have only negligible impacts on reptiles. The potential killing/ injury of any reptiles on Site will be avoided.	**Neutral**
Amphibians (Great Crested Newt) *Triturus cristatus*	Great crested newts (GCN) are protected under the following legislation: - Annexe II and IV of the Habitats Directive - Conservation of Habitats and Species Regulations (Schedule 2) - Wildlife and Countryside Act (1981) (Schedule 5). Great crested newts are also listed as SPI in accordance with Section 41 of the NERC Act 2006. There are five ponds within 250m of the Proposed Scheme, with one on within the footprint of the Proposed Scheme. It is unknown whether these ponds are suitable for great crested newts. It is likely that there is suitable terrestrial habitat for great crested newts within the Proposed Scheme.	**Local**	**Medium** - five ponds within 250m of the Proposed Scheme which may be suitable for breeding great crested newt.	**Declining -** GCN population has declined over much of European range (Froglife 2001), however is widespread across England and Wales. Significant proportion of national population within Cambridgeshire and Peterborough, with the largest UK (possibly largest European) population near Peterborough.	**High** - GCN are of high biodiversity value on a local and national level.	**Minor negative -** minimal habitat is due to be removed for the Proposed Scheme. Impacts should be neutral on completion of the Proposed Scheme, but there is a low level of risk through the construction phase. Further survey will be required of the ponds to assess whether they support breeding populations of great crested newts and the level of mitigation required.	**Slight Adverse**
Amphibians (Other amphibians)	There is likely suitable terrestrial habitat on Site for other common amphibian species additionally to GCN including the common toad, which is a SPI in accordance with Section 41 of the NERC Act 2006. There are five ponds within 250m of the Site, with one on the Site. There is likely suitable terrestrial habitat on Site within 250m of these ponds. Additionally, ponds are not separated from the Site by a major barrier such as a dual carriageway or major water course. Potential terrestrial habitat includes hedgerows, tree lines and grassland with a long or tussocky sward.	**Local**	**Low -** amphibians are likely to be present in low numbers in habitats adjacent to the Site. With minimal habitat to be removed for the Proposed Scheme, it is unlikely to affect amphibians at more than a local level.	**Varying -** Species dependent	**Low -** Amphibians (with exception of great crested newts) are of low biodiversity value.	**Neutral -** minimal habitat is due to be removed for the Proposed Scheme. Following the implementation of precautionary works during the construction phase, potential impact of the Proposed Scheme on amphibians would be negligible.	**Neutral**
Aquatic species - freshwater invertebrates and fish	Aquatic habitats within the footprint of the Proposed Scheme, including the Bin Brook CiWS will support fish species as well as aquatic invertebrates. Certain freshwater fish are SPI under Section 41 of the NERC act. White-clawed Crayfish are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Further survey would be required to determine its suitability for protected and notable species.	**Regional**	**Medium** - Detailed surveys have not been undertaken.	**Varying -** Species dependent and dependent on further survey	**Medium** - The aquatic habitats within the footprint of the Proposed Scheme are of medium biodiversity value	**Minor Negative -** There is potential for pollution to water bodies. A mitigation strategy would be implemented in accordance to the findings of the aquatic surveys.	**Slight Adverse**
Hedgehog (*Erinaceus europaeus*)	Habitats within the footprint of the Proposed Scheme include hedgerows, which offer valuable habitat to West European hedgehogs. A habitat survey has not yet taken place, so other hedgehog habitat such as scrub may also be present on Site. This species is a SPI.	**Local**	**Low** - Minimal habitat will be lost.	**Declining** - According to the State of Britain's Hedgehogs 2022 report by the Peoples Trust For Endangered Animals and the British Hedgehog Preservation Society Hedgehogs are declining nationally.	**Low** - Hedgehog are a species of low biodiversity value on a national and local level.	**Neutral -** The Proposed Scheme comprises a narrow, linear site which will impact small areas of scrub and hedgerow habitat potentially used by hedgehog.	**Neutral**
Brown hare *Lepus europeaus*	Habitats within the footprint of the Proposed Scheme include open arable farmland and fields, which offer valuable habitat to brown hare. This species is a SPI.	**Local**	**Low** - brown hare are relatively widespread within the UK.	**Declining** - brown hare have been in decline for the last 100 years, by 80% according to the Hare Preservation Trust, 2022. The species is however common and widespread in Cambridgeshire (Cambridgeshire Mammal Group, 2016).	**Low** - brown hare are a species of low biodiversity value on a national and local level.	**Neutral -** The Proposed Scheme comprises a narrow, linear site which will impact negligible areas of potentially suitable arable and grassland habitat.	**Neutral**

Reference Sources

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Summary Assessment Score

Slight Adverse

Qualitative Comments

Overall the Assessment Score is "Slight Adverse" due to the potential impacts affecting Barton Orchard CWS and Bin Brook CiWS, hedgerows, badgers, bats, otter, water vole, great crested newt and aquatic species, largely due to small areas of habitat removed to facilitate the Proposed Scheme, and impacts on watercourses. A redesign of the Proposed Scheme to avoid HPIs is recommended, as well as a Preliminary Ecological Appraisal of the Site. Mitigation proposals should developed which may include the following enhancement measures:

- Wildlife planting, to include areas with wildflowers;
- Woodland understory planting to improve species richness and condition of retained woodlands;
- Log piles and hibernacula for wildlife, in particular reptiles, particularly in the rural areas of the Site including within hedgerow margins and woodland;
- Bird and bat boxes; and
- Invertebrate hotels.

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