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West Cheltenham Walking and Cycling Improvements (WCWCI)

Full Business Case

Gloucestershire County Council (GCC)

06 May 2020

Notice

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This document has 103 pages including the cover.

Document history

Revision	Purpose description	Origin-ated	Checked	Reviewed	Author-ised	Date
Rev 1.0	First draft for AECOM	JD/JB/IS	AD	TP	RS	22/03/2020
Rev 2.0	Second draft updated	JB	IS	RS	RS	22/04/2020
Rev 3.0	Final	JB	CB	IS	RS	06/05/2020

Client signoff

Client	Gloucestershire County Council (GCC)
Project	West Cheltenham Walking and Cycling Improvements (WCWCI)
Job number	5194100
Client signature / date	

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Executive Summary

This report represents the Full Business Case (FBC) for the West Cheltenham Walking and Cycling Improvement (WCWCI) scheme. The scheme proposed is a series of interlinking cycle and pedestrian routes. The package of transport improvements is considered to be appropriate to achieve the policy aims and objectives of the GFirst Local Enterprise Partnership (LEP). The overall budget for the scheme is approximately £1.6m.

The scheme has been developed with the aim of encouraging walking and cycling usage in West Cheltenham, thereby reducing car journeys, promoting health and well-being and conserving the environment. The scheme will create a pleasant, safe and accessible network of pathways, linking together GCHQ, residential developments in St Marks', Gloucestershire College and Cheltenham Spa Railway Station. The scheme has also been developed to link with the Highways England (HE) cycle way between Gloucester and Cheltenham and the proposed new access ramp proposed by Great Western Rail (GWR) offering alternative access for cyclists and pedestrians to Cheltenham Spa Railway Station.

GCC are committed to promoting and completing transport schemes that benefit all users, not just for the private motorist. This is driven by GCC's declaration of a Climate Change Emergency and associated Climate Change Strategy, with a commitment to deliver a carbon neutral County by 2050 and working with partners to deliver an 80% reduction in carbon emissions by 2030. It is intended that this scheme can demonstrate good practice in terms of walking and cycling schemes for Gloucestershire, and the principles be applied to other areas of the County.

The FBC explains the process of identifying the final scheme and through the defined processes demonstrates that the proposal offers high value for money according to the Department for Transport (DfT) criteria and therefore a sound and justified spend of public funds. It is considered that the scheme represents a significant and material improvement when compared to current infrastructure (particularly for cycling) in Cheltenham.

The most significant gain for the scheme is derived from the increase in predicted walking and cycling trips, and the associated health benefits for users. The level of measurable economic benefit for the proposed scheme far exceeds the cost of the scheme. It is important to note that the Economic Case produces a Benefit-Cost Ratio (BCR) of 2.66.

It is therefore concluded that there is a sound justification for the scheme, both from a policy and economic perspective.

It is recognised that the proposal does not address traffic issues specifically, particularly on the busy and congested A40. This will be the subject of a separate scheme, West Cheltenham Transport Improvement Scheme (WCTIS) Phases 3 and 4. Due to the location and proposed construction programmes for WCWCI and the WCTIS Phase 3 and 4, it is proposed that both WCWCI and WCTIS Phases 3 and 4 be combined for construction. This avoids an extended works programme and provides opportunity for cost savings from economies of scale and the sharing of overhead facilities such as site compounds and site supervision.

1. Introduction

This document presents the Full Business Case (FBC) for cycle and pedestrian improvements in West Cheltenham. The scheme is consistent with the core aims of Gloucestershire County Council (GCC) by supporting a greener, healthier county that promotes sustainable economic growth, community connectivity, community health and wellbeing and conservation of the environment. This package strongly complements the WCTIS business case[1].

The West of Cheltenham Walking and Cycling Improvement (WCWCI) scheme provides for upgraded infrastructure to increase the uptake of walking and cycling for commuting, leisure purposes and business in Cheltenham, along the A40 corridor. The scheme will create a mix of segregated and shared use cycling and walking routes along the A40 from Arle Court roundabout to TGI Fridays Junction (A40/B4633), providing a direct route for users to access Cheltenham Spa Railway Station and the town centre. Secondary routes are included to provide alternative routes and choice for less experienced or confident cycle users. These routes are located in close proximity to the A40, in the St Mark's district of West Cheltenham and along Princess Elizabeth Way (A4013), providing residents with accessible and usable cycle links to employment, retail and transport hubs along the A40 transport corridor.

This business case is based on the preferred design options and aims to provide the required detail for direct cycle and walking routes that tie into wider planned transport improvements linked to pinch point and designated funds applications submitted by GCC, as well as already funded schemes such as the LEP-funded Cheltenham Spa Railway Station improvements and the HE Gloucester to Cheltenham cycleway.

The evidence gathered as part of the business case process has been prepared using the tools and guidance provided by the DfT and set out in the WebTAG transport appraisal guidance[2]. This approach ensures that the evidence produced is robust and is aligned with best practice, whilst being proportionate to the scheme size.

1.1. Background to Business Case

The 2014 Strategic Economic Plan (SEP) originally allocated £1.6m to identify potential capacity improvements at the B4063 Staverton Junction. Since the 2014 SEP was published, HE approved funding of £3.6m as part of designated funds for a cycleway connecting Gloucester and Cheltenham, located along the B4063 and passing through Staverton Junction. As part of an overall scheme review in 2017, GFirst LEP recognised the benefits of working in conjunction with the HE investment and agreed that the Staverton scheme could proceed with a strong focus on cycling provision.

In 2018, the funding context for the A40/B4063 corridor changed further when GCC agreed to take on the role of scheme promoter of the £22m West Cheltenham Transport Improvement Scheme (WCTIS). Works were split across four phases on the A40 from M5 Junction 11 to the TGI Fridays Junction, near Cheltenham Spa Railway Station. This significant investment contributes to the original 2014 SEP ambitions for the A40 in improving resilience and connectivity but was also judged to have an impact on the HE cycleway scheme, particularly the section on the A40 between Arle Court roundabout and Benhall roundabout (WCTIS Phases 1 and 3). The WCTIS proposals include widening the carriageway for an additional eastbound traffic lane along the same lengths where HE would install new cycleway lanes.

In October 2019[3], a proposal was tabled at a LEP board meeting to divert £1.6m of LEP funds from Staverton to Phase 3 of the WCTIS, ring-fenced solely for use on the cycleway and associated works. It was agreed that a separate business case would be prepared for this £1.6m investment to enable the delivery of a combined cycleway and footway along the A40, linking the HE scheme along the B4063 to both the WCTIS Phases 1 – 4 (focusing on the section between Arle Court and Benhall roundabouts) and to improvements at Cheltenham Spa Railway Station. The latter scheme is being progressed by Great Western Rail (GWR) and includes an additional walking and cycling link to Lansdown Road.

The provisional funding allocation of £1.6m from the GFirst LEP is dependent on the completion and approval of the WCWCI Full Business Case (FBC) by the LEP investment panel. The LEP and GCC fully support the principal of funding a comprehensive scheme for walking and cycling in Cheltenham, particularly given the link with the £22m WCTIS that is also funded by the LEP.

[1] WCTIS Phase 1: Arle Court roundabout, WCTIS Phase 2: M5 J11 to Arle Court, WCTIS Phases 3 and 4: Arle Court to the TGI Fridays Lights (A40/B4633)
[2] DfT (2019) Transport Appraisal Guidance (TAG), https://www.gov.uk/guidance/transport-analysis-guidance-webtag
[3] https://www.gfirstlep.com/downloads/library/325-item_6_b4063-a40_corridor_october_2019.pdf

The WCWCI Full Business Case (FBC) has been agreed and developed in conjunction with AECOM, GFirst LEP's business case reviewer, whereby the FBC can be approved with preliminary designs and cost estimates.

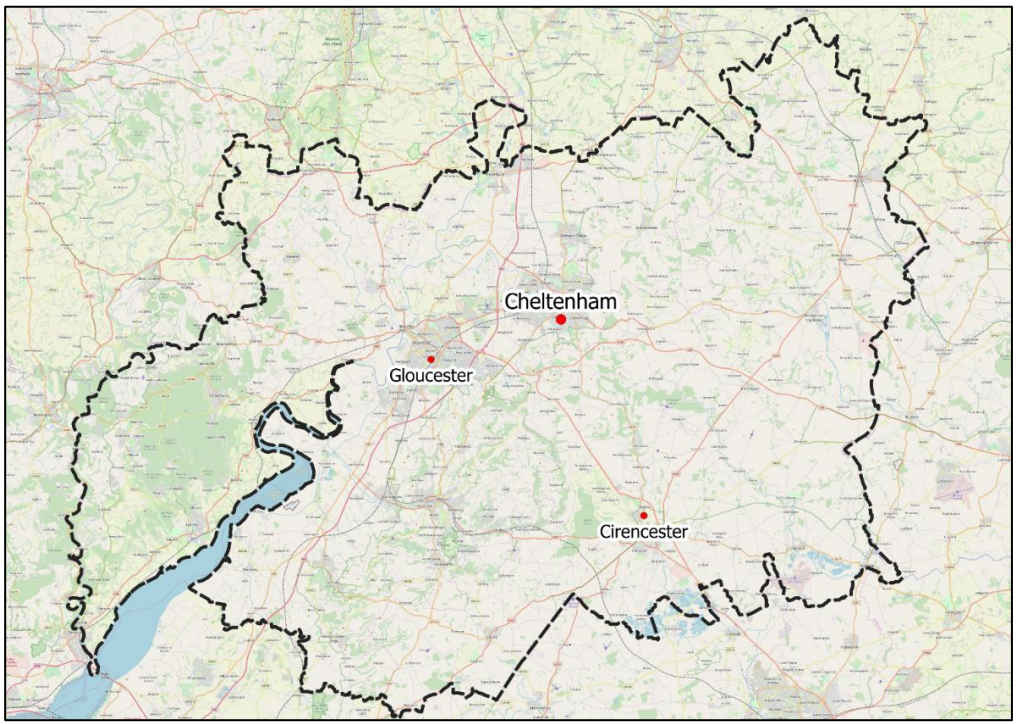
1.2. Study Area

Cheltenham is a large spa town and borough on the edge of the Cotswolds in the county of Gloucestershire, as shown in the map in Figure 1-1. Cheltenham stands on the small River Chelt, which runs through the town on its way to the Severn and is located approximately 8 miles to the North East of the County Town of Gloucester. The town is known for its mineral spas and easy access to the Cotswolds, an Area of Outstanding Natural Beauty (AONB) located to its south east. The town hosts several festivals of culture, often featuring nationally and internationally famous contributors and attendees, including the Cheltenham Music Festival, the Cheltenham Food & Drink Festival and the Gold Cup, with the steeplechase horse racing being the main event of the Cheltenham Festival held every March.

GCHQ is a major employer in the area, with approximately 5,200 staff situated at the Benhall site. Journey to work by mode results from a 2018 GCHQ travel survey[4] show that 59% out of 2,071 respondents drive a car (assumed alone) to work, with 8% of respondents using public transport, with the majority of these using the GCHQ shuttle bus. 9% work or run to work and 12% cycle, which may reflect the high number of staff living within walking or cycling distance of their place of work. The survey found that the overall share for sustainable modes (walking, cycling and public transport) was approximately 29%.

Cheltenham Spa railway station serves Cheltenham in Gloucestershire. Situated on the Birmingham-Bristol mainline, it is managed by Great Western Rail (GWR) and is about one mile from Cheltenham town centre. Cheltenham Spa station is served by approximately 8 to 12 trains every hour during the daytime on Mondays to Saturday. Great Western Rail operate an hourly service from Cheltenham Spa to Swindon via Gloucester that extends through to Reading and London Paddington.

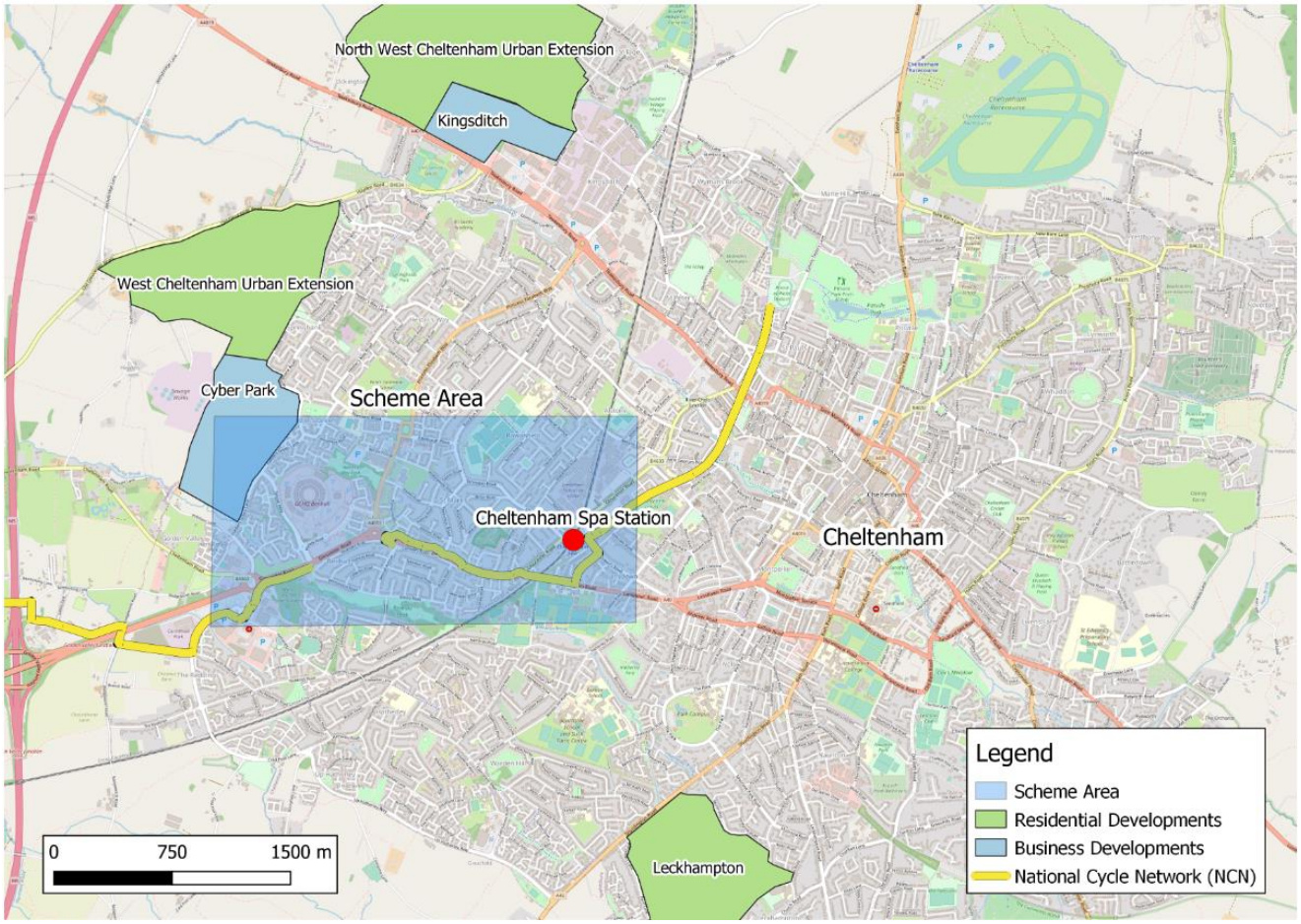
Figure 1-1 - Location of Cheltenham within Gloucestershire



The scheme area shown in Figure 1-2 is on the west side of Cheltenham, focusing on the A40 section of the National Cycle Network (NCN) route and potential feeder routes that incorporate Princess Elizabeth Way, GCHQ and the future Cyber Central developments to the west, and Cheltenham Spa Railway Station to the east. There are four main junctions separating the links of this section of the A40, with Arle Court roundabout to the west, Telstar Way Junction, Benhall roundabout and TGI Fridays (A40/B4633) Junction to the east of the scheme area.

[4] AECOM (2019) GCHQ Travel Survey Summary, draft for discussion purposes only, March 2019

Figure 1-2 - Scheme Area



1.3. WCWCI Scheme Proposals

A summary of the six links selected for preliminary and detailed design are illustrated in Figure 1-3. The Great Western Rail (GWR) scheme from Cheltenham Spa Railway Station to Lansdown Road is not part of the WCWCI bid but is included to highlight the potential for linkages and cooperation with other cycling and walking schemes.

Figure 1-3 - Proposed Cyclist and Pedestrian Links

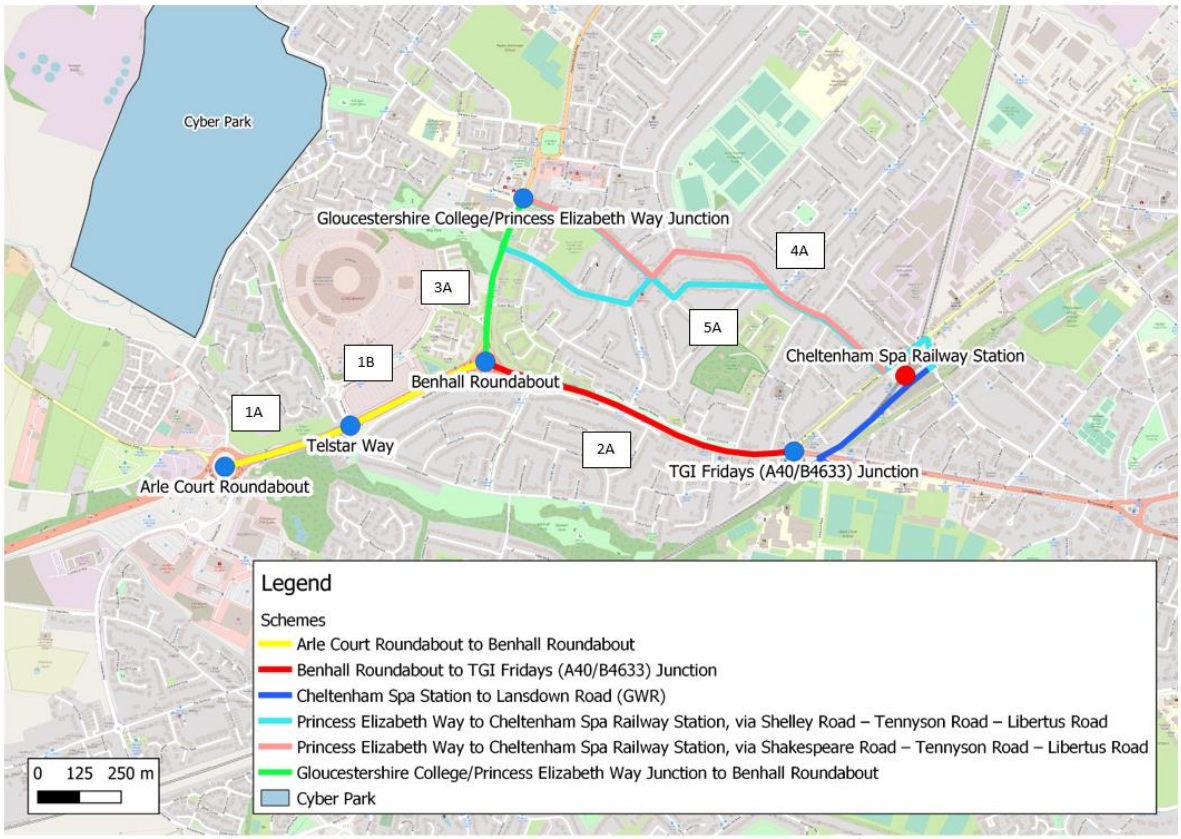


Table 1-1 summarises the links proposed for the WCWCI scheme including the total length and the proportion of the route catered for by on-carriageway, off-carriageway and improvements on recreation grounds.

Table 1-1 - Summary of Links Proposed

Ref	Location	Total Length (m)			On-carriageway (m)	Off-carriageway (m)	Through-Recreation Grounds (m)
		Walking	Cycling	Total			
1A	Arle Court roundabout to Telstar Way Junction	340	340	340	0	70	270
1B	Telstar Way Junction to Benhall roundabout	455	455	455	0	455	0
2A	Benhall Roundabout to TGI Fridays Junction (A40/B4633)	1,100	1,100	1,100	0	1,100	0
3A	Gloucestershire College/Princess Elizabeth Way Junction to Benhall Roundabout	300	300	300	0	300	0
4A	Princess Elizabeth Way to Cheltenham Spa Railway Station, via Shakespeare Road	600	520	1540	520	0	0
5A	Princess Elizabeth Way to Cheltenham Spa Railway Station, via Shelley Road	150	0	500	0	0	0
Total (metres)		**2,945**	**2,715**	**4,235**	**520**	**1,925**	**270**

1.4. Scope of the Scheme

This section provides details of the six links being progressed and the route they will take. Appendix A provides more detailed conceptual design and preliminary design drawings for all six links that make up the WCWCI scheme.

A high-level assessment of current and future link attributes has been undertaken across the six-component links of the WCWCI scheme. An on-site audit was conducted on 26th February 2020 to assess the existing quality of pedestrian and cycle links, assigning qualitative scores across a number of parameters. Performance bands from +3 to -3 were used to record a measure of each parameter on-site and for each parameter based on potential future improvements drawn from future design proposals. The outcome of this qualitative assessment is presented in Appendix F and provides an assessment of the current problems with existing routes and likely improvements.

1.4.1. Link 1A: Arle Court roundabout to Telstar Way Junction

Link 1A begins at Arle Court roundabout and heads east to Telstar Way Junction, providing an improved shared use path for walkers and cyclists, that is re-positioned, offering greater segregation from the A40 carriageway. The new 3m shared-use path for cyclists and pedestrians passes alongside Hatherley brook culvert away from the 3-lane A40 carriageway.

The existing shared use path alongside the A40 carriageway will be retained as a pedestrian footway. The footway width will be retained for the majority of eastbound movements from Arle Court roundabout to Telstar Way Junction. A fourth (turning) lane along the A40 eastbound will require widening the highway which will narrow the existing footway on the approach to Telstar Way Junction. The new shared use path will join the footway near the junction and will tie in with new arrangements for toucan crossings and better pedestrian and cycle priority at the junction. The preliminary design drawing for Link 1A is shown in Figure 1-4.

The scheme will address the following limitations and problems of the existing cycle and walking infrastructure.

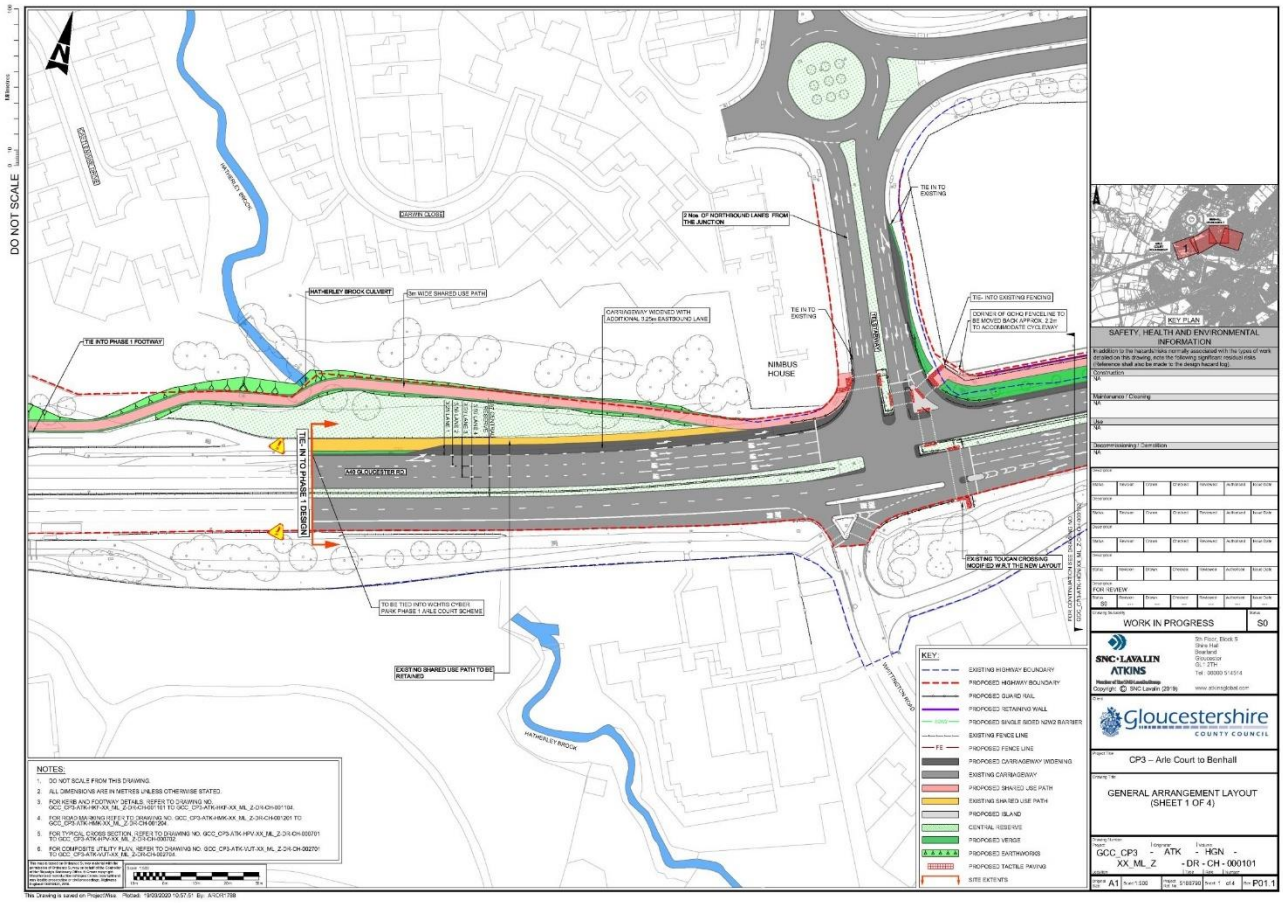
Limitations with existing route

- The existing cycleway markings upon the exit from Arle Court roundabout subway to Telstar Way Junction;
- User conflict between pedestrians and cyclists on the existing shared use path; and
- User conflict and crowding at A40 crossing points, particularly on the approach to Telstar Way Junction.

Link benefits

- Improve crossing safety and visibility for pedestrians and cyclists at Telstar Way Junction;
- Provide an off-carriageway, direct route between Arle Court roundabout and Telstar Way that will sit alongside the existing footpath as an alternative route for cyclists and pedestrians. It is understood that this will reduce user conflict between pedestrians and cyclists; and
- The existing shared use path will be narrowed on the approach to Telstar Way Junction to accommodate carriageway widening and a dedicated left turn lane for traffic as part of the WCTIS Phases 3 and 4. The existing shared use path will be converted to pedestrian-use only to take account of the narrower width. The new shared use path, set back from the A40 carriageway, will be utilised by cyclists and provides additional flexibility for pedestrians to use either the pedestrian-only footpath or the new shared use path, depending on crowding or whether users are less able or confident walking close to fast-moving traffic along the A40.

Figure 1-4 - Link 1A: Preliminary Designs – Arle Court Roundabout to Telstar Way Junction



1.4.2. Link 1B: Telstar Way Junction to Benhall roundabout

Link 1B begins at Telstar Way and heads east to Benhalll roundabout, providing an improved shared use path for walkers and cyclists, that is repositioned away from the carriageway and behind the trees. The scheme will better utilize space on the carriageway verge so that the path will border the GCHQ property fencing demarcation. The shared use path will be 3m wide and positioned off the carriageway, joining the existing shared use path adjacent to the Bentley Court residential development. The tree corridor will be retained and a proposed 2.4m wide pedestrian crossing will be developed on the west-side of Benhall roundabout to provide more formal crossing opportunities for those travelling on foot. This will provide pedestrian access to the other side of the carriageway and reduce severance.

Preliminary design drawings for Link 1B are shown in Figure 1-5. The scheme will address the following current limitations and problems of the existing route for pedestrians and cyclists.

Limitations with existing route

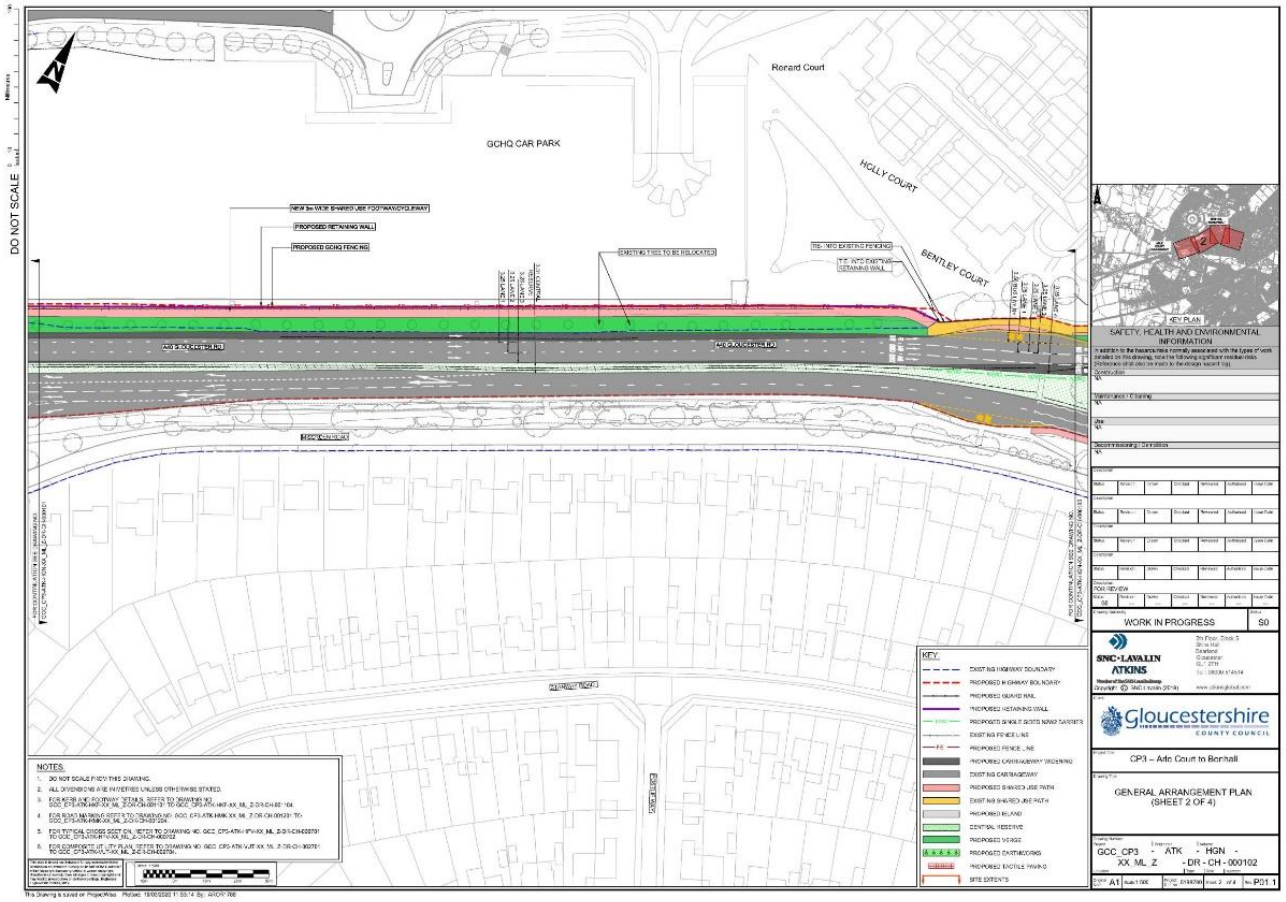
- The existing footway is in poor condition, with potholes, undulation and debris;
- There are a number of obstructions on the footway (e.g. lampposts for street lighting and a bus stop); and
- The existing footpath is very narrow. Groups advise that they feel highly vulnerable where widths are insufficient to deal with both pedestrians and cyclists. Existing signs prohibit cyclists from using the path, however, the signs are located at the corner of the Telstar Way Junction and are not easily visible. Count data (see section 2.4.2) suggests that the path is still being used by cyclists as a direct route to Benhall roundabout and to access Cheltenham town centre, rather than the National Cycle Network (NCN) route through Miserden Road which runs parallel to the A40 on the other side of the carriageway.

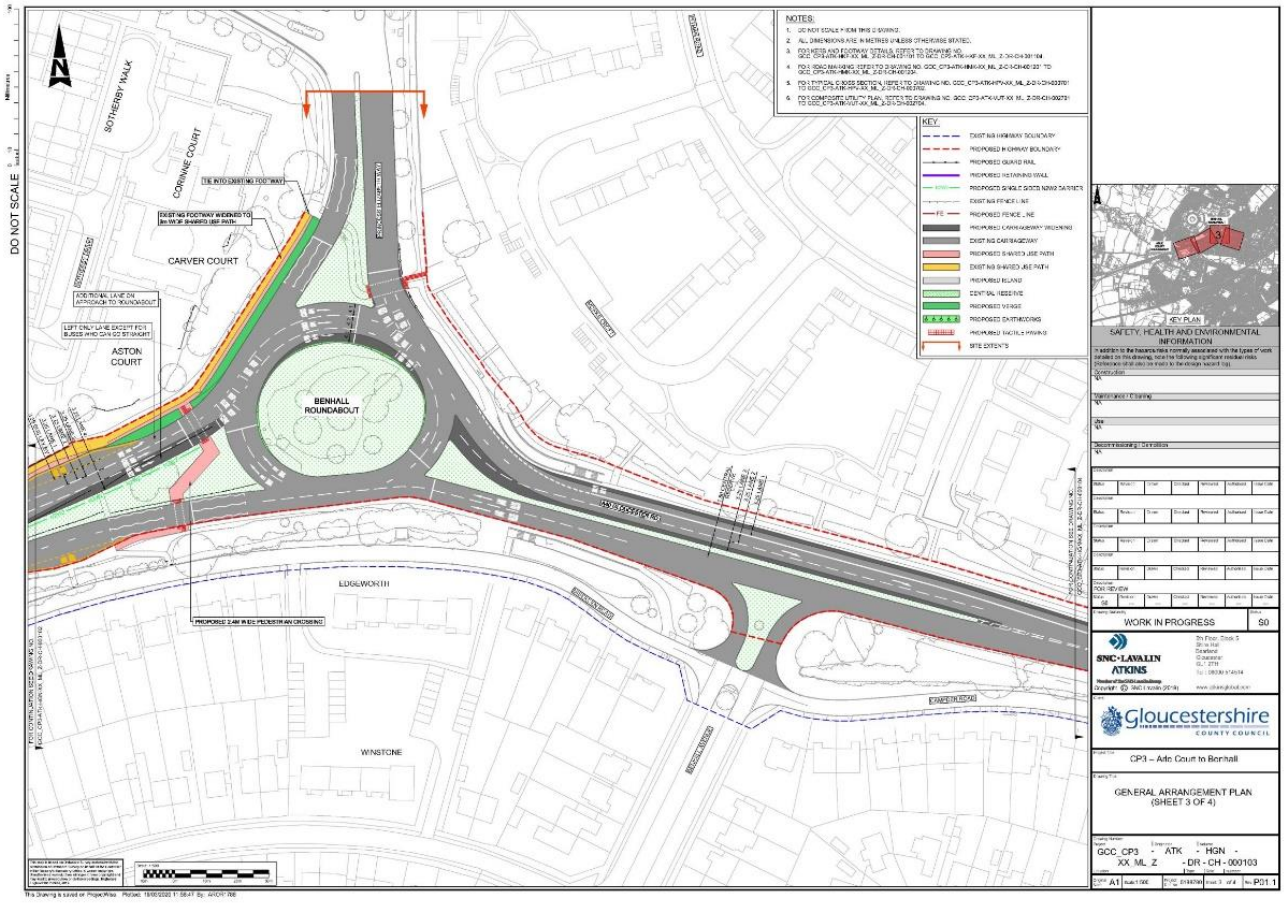
Link benefits

- Improves access to Benhall roundabout and further afield destinations towards Cheltenham town centre;

- Provides a continuous link for pedestrians and cyclists that fits into wider improvements to walking and cycling in West Cheltenham;
- Improves surface quality, signage and retains tree corridor as a buffer between the A40 and the proposed walking and cycling link, reducing safety concerns; and
- Provides formal crossing opportunities for pedestrians to the other side of the A40 carriageway, near Benhall roundabout.

Figure 1-5 – Link 1B: Preliminary Designs – Telstar Way Junction to Benhall Roundabout





1.4.3. Link 2A: Benhall roundabout to TGI Fridays Junction (A40/B4633)

Link 2A begins at Benhall roundabout and heads south to TGI Fridays (A40/B4633) Junction and Lansdown Road railway overbridge, providing a segregated cycleway and footway, with cycle improvements to the A40/B4633 Junction. A segregated, off-carriageway cycle track (3m wide) will be constructed and will cater for cyclists travelling in both directions along the A40 from Benhall to the TGI Fridays Junction (A40/B4633). A 2m wide segregated footway will also be provided next to the highway.

The preliminary design drawing for Link 2A are shown in Figure 1-6. The scheme will address the following current limitations and problems of the existing route for pedestrians and cyclists.

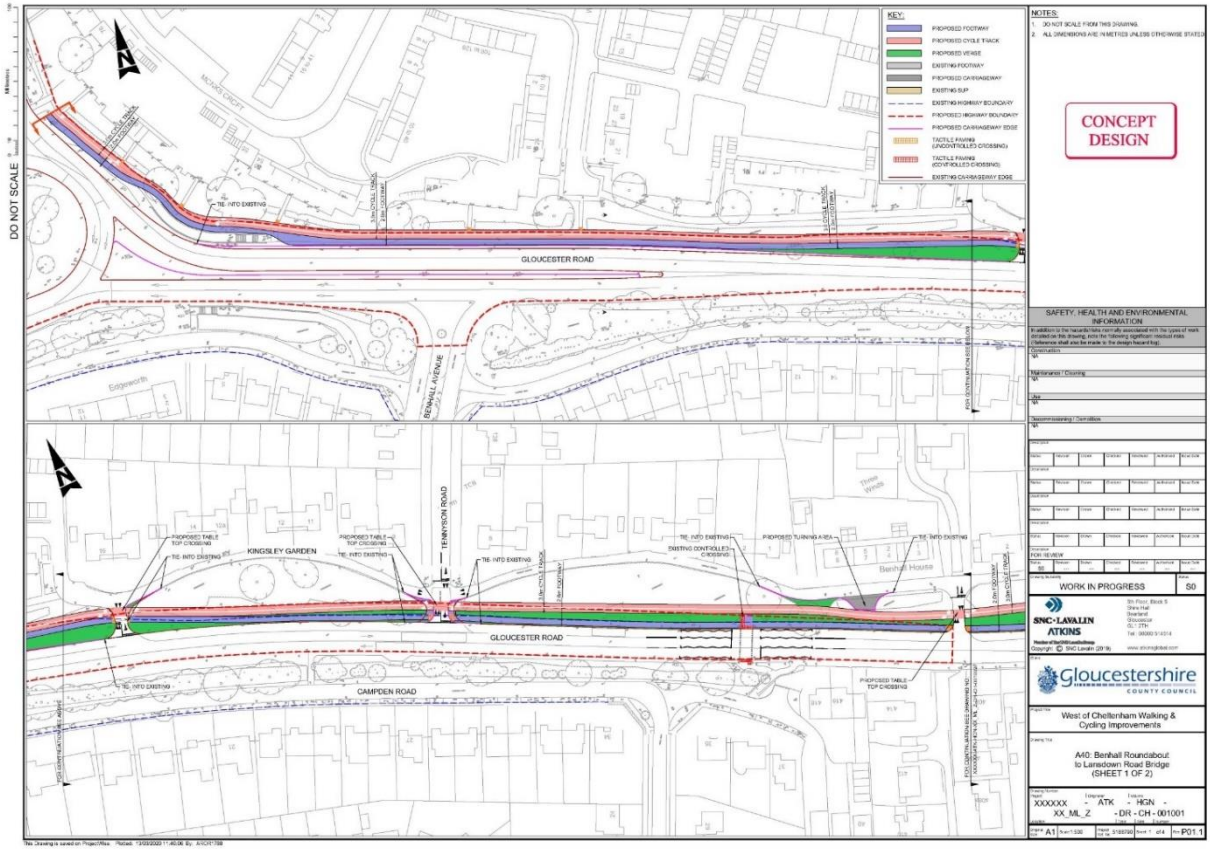
Limitations with existing route

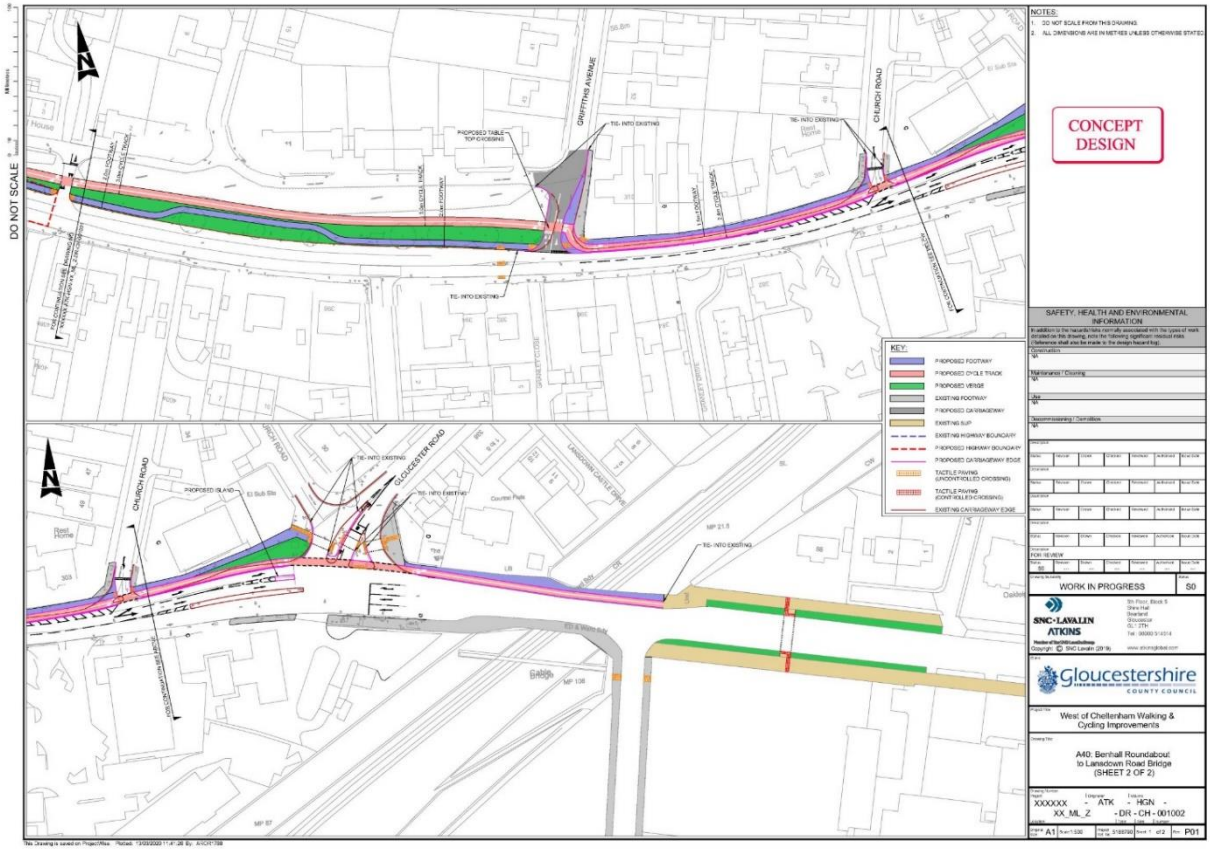
- The A40 offers a more direct route alternative than the current on-road cycle lanes through Benhall Gardens, Kingsley Gardens and Oldfield Crescent which are currently designated for cycle use; and
- User conflict is an issue for cyclists diverted onto on-road cycle lanes through Benhall Gardens, Kingsley Gardens and Oldfield Crescent. There are also safety risks for residents backing out onto these quieter roads. The existing shared use path is wide enough to accommodate both pedestrians and cyclists, but the lack of segregation may divert more confident cyclists onto on-road routes, raising safety concerns.

Link benefits

- Priority given to pedestrians and cyclists on the new segregated cycleway and footway;
- More direct route alternative for cyclists along the A40, rather than through adjacent roads at Benhall Gardens, Kingsley Gardens and Oldfield Crescent; and
- Improvements to cycle priority at A40 junctions with side roads through table top crossing and narrowing of the carriageway at specified points.

Figure 1-6 – Link 2A: Preliminary Designs – Benhall Roundabout to TGI Fridays Junction (A40/B4633)





1.4.4. Link 3A: Gloucestershire College/Princess Elizabeth Way Junction to Benhall roundabout

Link 3A begins at Gloucestershire College/Princess Elizabeth Way Junction and heads south to Benhall roundabout. Scheme plans include upgrades to the existing shared use path near the A4013 carriageway to provide more segregation between walkers and cyclists and to improve pedestrian and cyclist priority at formal junctions. There is very little in the way of informal crossing opportunities along Princess Elizabeth Way (A4013), so formal junctions and crossing points will be adjusted to provide walkers and cyclists more priority at junctions. The preliminary design drawings for Link 3A are shown in Figure 1-7. The scheme will address the following current limitations and problems of the existing route for pedestrians and cyclists.

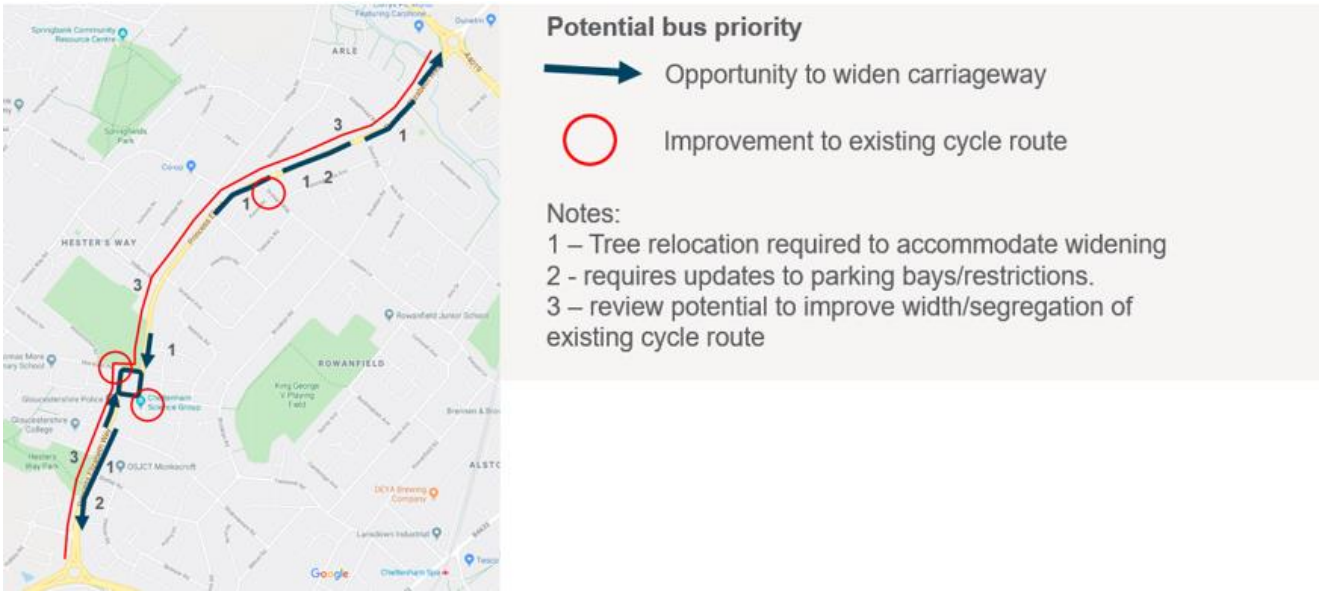
Limitations with existing route

- High volumes of pedestrians and cyclists on the shared-use path, means that existing user conflict is quite high, although wide carriageway provision reduces this conflict somewhat;
- Busy carriageway means that there are very few informal crossing points for cyclists and pedestrians; and
- Not easy to access Gloucestershire College for cyclists moving in southerly direction down Princess Elizabeth Way.

Link benefits

- Improving the existing cycle route and ensuring proper segregation to accommodate high volumes of pedestrian and cycle movements in both directions on Princess Elizabeth Way; and
- Improvements to cyclist and pedestrian priority at formal crossing points (Toucan crossing before Benhall roundabout).

Figure 1-7 – Link 3A: Conceptual Design – Gloucestershire College/Princess Elizabeth Way Junction to Benhall Roundabout



1.4.5. Link 4A: Gloucestershire College/Princess Elizabeth Way Junction to Cheltenham Spa Railway Station, via Shakespeare Road

Link 4A connects Gloucestershire College/Princess Elizabeth Way Junction to the Cheltenham Spa Railway Station through residential streets on Shakespeare Road, Tennyson Road and Libertus Road. These are referred to as 'quiet streets' given their residential location off the main A40 transport corridor. Improvements to this link involve a mix of interventions with the aim of creating a safer and better-quality cycling and walking route between Cheltenham Spa Railway Station and other residential, school and employment sites, including GCHQ.

Adjustments will be made to side road junctions with Shakespeare Road to improve cycle priority (give way signs at 'table top' junctions and tactile paving) which will be complemented by the creation of advisory cycle

lanes to prevent user conflict between pedestrians, cyclists and motor vehicles on what is a narrow carriageway. Improvements to this link will also involve the re-surfacing of some sections of the existing footways that have fallen into disrepair.

The preliminary design drawings for Link 4A are shown in Figure 1-8. The scheme will address the following current limitations and problems of the existing route for pedestrians and cyclists.

Limitations with existing route

- Narrow carriageway that caters for walkers, cyclists and vehicle traffic. No priority access for any one group over the other;
- Multiple obstructions along the footway – parked cars, street lighting, trees and other street furniture (post boxes);
- Some sections of footway along the route in poor condition; and
- Length of carriageway linking Shakespeare Road to Libertus Road is narrow and not cycle-friendly.

Link benefits

- Provides alternative routes for cyclists and pedestrians to access Cheltenham Spa Railway Station;
- Pleasant, safe environment for pedestrians and cyclists provides opportunities for higher uptake for leisure purposes;
- Cycle links to Cheltenham Spa Railway Station in the south and Gloucestershire College on Princess Elizabeth Way to the north, including improvements in access to schools and playing fields near Tennyson Road;
- Alternative route through residential area for cyclists and pedestrians looking to access important employment (GCHQ), retail (Kingsditch trading estate) and residential sites; and
- Link to be made more cycle-friendly for less confident users, along quiet residential streets through design solutions that include the use of advisory, on road cycle lanes and table top crossing at side road junctions.

1.4.6. Link 5A: Gloucestershire College/Princess Elizabeth Way Junction to Cheltenham Spa Railway Station, via Shelley Road

Link 5A connects Princess Elizabeth Way (A4013) to the Cheltenham Spa Railway Station through residential streets on Shelley Road, Tennyson Road and Libertus Road. These are referred to as ‘quiet streets’ given their residential location off the main A40 transport corridor. Improvements to this link only involve interventions to improve footways and pedestrian links, with no improvements made to existing cycling provision. This includes adjustments to side road junctions to improve pedestrian priority at uncontrolled crossing points. The scheme also involves the re-surfacing of some sections of the existing footway to provide a better-quality walking environment for commuters, leisure and business users.

The preliminary design drawings for Link 5A are shown in Figure 1-8. The scheme will address the following current limitations and problems of the existing route for pedestrians and cyclists.

Limitations with existing route

- Narrow carriageway that caters for walkers, cyclists and vehicle traffic. No priority access for any one group over the other;
- Multiple obstructions along the footway – parked cars, street lighting, trees and other street furniture (post boxes); and
- Some sections of footway along the route in poor condition;

Link benefits

- Opportunities for utility and leisure walking through better pedestrian priority;
- Cycle links to Cheltenham Spa Railway Station in the south and Gloucestershire College on Princess Elizabeth Way to the north, including improvements in access to schools and playing fields near Tennyson Road; and

- Alternative route through residential area for pedestrians looking to access important employment (GCHQ), retail (Kingsditch trading estate) and residential sites.

Figure 1-8 – Link 4A and Link 5A: Preliminary Designs – Quiet Streets

1.5. Objectives of the Scheme

Funding to reduce congestion and to improve access to skills, jobs, goods and services along the A40 corridor was first allocated in the GFirst LEP 2014 Strategic Economic Plan (SEP). Following scheme reviews in 2017 and 2019, it became clear that the scheme needed a strong focus on walking and cycling provision, while still delivering towards the objectives outlined in the original SEP allocation.

Table 1-2 shows how the original GFirst LEP objectives map across to the WCWCI scheme, which was separated out from the package of measures originally designated under WCTIS Phases 3 and 4.

Table 1-2 - Alignment between GFirst LEP and WCWCI objectives

	LEP objective	How the objective applies to the WCWCI scheme
1	Reduce congestion on the A40 corridor and key linkages to it between Cheltenham and the Forest of Dean	Provides improved cycleway facilities which will promote alternative travel options and enable modal shift
2	Alleviating congestion via addressing congestion hotspots on and in association with the A40 corridor between Cheltenham and the Forest of Dean	Modal shift will remove traffic from the network and reduce the stress on congestion hotspots along the A40 in West Cheltenham
3	Maximise economic productivity and efficiency	Provide improved cycleway and pedestrian facilities and thereby promote healthy travel choices that lead to improved physical and mental health and wellbeing. This could improve personal motivation and thereby assist with business productivity and efficiency through, for example, a reduction in absenteeism.
4	Provide improved traffic flow, faster journey times and overall transport network efficiency on the A40 (west) corridor, and the areas of regeneration that connect to it	As per 1.
5	Address bottlenecks within the transport network, particularly where these are predicted to worsen and put a brake on economic recovery	As per 2.
6	Improve access to skills, jobs, goods and services	As 3, plus the scheme will link critical housing and employment sites in both Cheltenham and Gloucester. This will provide an opportunity for residents to live and work within a commutable walking/cycling radius.

The overarching goal of the WCWCI scheme is to contribute to a number of wider strategic outcomes, including:

Strategic outcomes

- Providing a continuous and connected cycling and walking route between Gloucester and Cheltenham Spa Railway Station, meeting the objectives set out in the Gloucestershire Local Transport Plan (LTP);
- Contributing and accelerating the release of employment land associated with the West Cheltenham strategic allocation, which includes the nationally important Cyber Central development;
- Contribute towards the GCC climate change strategy to deliver a carbon neutral County by 2050 and achieve an 80% reduction in carbon emissions by 2030; and
- Demonstrating Value for Money (VfM).

A number of proposed transport objectives for the WCWCI scheme have been developed to complement and facilitate wider strategic outcomes identified above, including:

Proposed transport objectives

- Provide a continuous cycling and walking network from Arle Court roundabout to TGI Fridays Junction (A40/B4633);
- Provide a significant and measurable improvement to the current set of cycle and walking routes in West Cheltenham, by providing more direct and better-quality routes for commuters and leisure users;
- Set improved design standards for cycling and walking routes in West Cheltenham;
- Increase cycling and walking trips from Arle Court towards Cheltenham, by providing a real alternative to car travel for less able/confident cycle users;
- Encourage active and healthy lifestyles through the provision of transport infrastructure;
- Deliver collaborative and innovative working practices that promotes sustainable development and contributes toward GCC objectives on climate change; and
- Maximise the value achieved through the £1.6m GFirst LEP transport investment, ringfenced solely for the provision of cycleway and associated infrastructure as part of the wider WCTIS.

1.6. Document Structure

The remainder of this report is structured as follows:

- Strategic Case (Section 2) sets out a rationale for the scheme, the need for investment in this location, options considered and anticipated benefits of the scheme;
- Economic Case (Section 3) identifies the key economic, environmental and social impacts of the scheme and its overall value for money;
- Financial Case (Section 4) presents evidence of the scheme's affordability both initially (for the construction phase) and in terms of ongoing operations, maintenance and renewal;
- Commercial Case (Section 5) summarises the approach to scheme procurement and justifying the commercial and legal viability of the approach; and
- Management Case (Section 6) sets out how GCC will ensure that the scheme is delivered successfully – on time and to budget, with suitable governance and risk management processes in place.

2. Strategic Case

2.1. Overview

This section of the report sets out the 'case for change', by explaining the rationale for investment and presenting evidence on the strategic policy fit of the proposed scheme at a national, regional and local level. This chapter also sets out the scheme options under consideration, measures for success and scheme objectives. The Strategic Case establishes the:

- Context for the business case, setting the design principles for walking and cycling infrastructure and outlining the strategic aims and responsibilities of Gloucestershire County Council (GCC);
- Transport-related problems that have been identified, using evidence to justify intervention and examining the impact of not making the investment;
- Specific, measurable, achievable, realistic and time-bound (SMART) objectives that solve the problem, identified through alignment with GCC's strategic aims and responsibilities;
- Measures for determining successful delivery of the objectives;
- Analysis of constraints and opportunities for investment; and
- Breakdown of interdependencies on which the successful delivery of the scheme depends.

2.2. Design Principles for Walking and Cycling Infrastructure

The WCWCI transport package has been informed by design principles from Cyclenation (2014)[5] for the development of new walking and cycling infrastructure. These design principles focus on the needs of cyclists which include the following elements:

- Directness. Direct cycle routes between housing areas and major destinations make cycling the most pleasant and easy way to travel around;
- Convenience. Convenient cycle infrastructure means avoiding stop-start travel caused by obstructions, lack of priority and narrow pavements shared with pedestrians. Good cycle parking completes the journey; and
- Speed. Speed of travel on a bicycle can be quicker than by car through an urban area if cycling infrastructure is made integral to newly designed streets.

The WCWCI scheme (see Figure 1-3) covers a number of primary and secondary road links on busy arterial routes and quieter residential streets. The proposals include a mixture of off-road and on-road walking and cycling infrastructure along its length. Cycling, walking and driving need different networks with different design requirements. Main primary roads through an area will need proper cycle infrastructure, whereas local residential streets should be designed so that cyclists, drivers and pedestrians can mix safely. Design principles have been developed for major roads between urban areas (i.e. the A40), primary routes and secondary routes.

Design principles for major roads between urban areas (Arle Court roundabout to Benhall roundabout, A40)

Major roads will normally follow the fastest route between two urban areas. The A40 is the main primary link between Gloucester and Cheltenham. Cycle tracks along major roads must always be fully segregated with a distance of between 4 and 8 metres from the main carriageway. Paths need to be designed to a high standard and should be smooth and uninterrupted and designed to avoid the need for maintenance. They should be a minimum of 5 metres wide and have a marked centre line to allow for overtaking.

Design principles for primary streets

The primary requirement for cycling on main roads, which will give people the choice to be able to cycle, is to provide a dedicated space for cycling on streets carrying high volumes of traffic. Infrastructure must be suitable for people cycling fast or slowly. Design principles for primary streets have been considered for most of the component links of the WCWCI scheme, particularly the A40 section from Benhall roundabout to the TGI Fridays (A40/B4633) Junction.

[5] Making space for cycling: a guide for new developments and street renewals (2014), http://www.makingspaceforcycling.org/MakingSpaceForCycling.pdf

At least 2.1m of space must be provided on both sides of the road, with some degree of protection from traffic. The key aspects of this provision are:

- Space away from traffic;
- Not mixed with pedestrians;
- Careful layout of parking;
- Continuity around bus stops;
- Layer separation; and
- Speed limits of up to 30mph.

Cyclenation (2014) proposes two design solutions to achieve space for cycling on primary streets/roads. The first option is the use of fully segregated cycle tracks. These need to be 2.5m wide (minimum 2.1m) on both sides of the road and separated from the main carriageway by at least one metre of green. Kerbing needs to be shallow or angled to allow the maximum width of the track to be used.

The second option is a hybrid cycle lane that has some kind of physical demarcation to provide the feeling of safety that less confident cyclists want. These 2.5m (2.1m minimum) cycle lanes are smooth and raised slightly above the level of the road surface. Footpaths to the side should be a separate construction and raised slightly above the level of the cycle lane.

Design principles for secondary streets

Secondary, more residential streets, such as along Libertus, Tennyson, Shakespeare and Shelley Road are classified as local streets where people live or work, shop or enjoy themselves. A set of design principles have been considered for local, secondary road links at these locations. These principles include:

- Low speeds. Speeds should be kept low through design. A key way to achieve this is to avoid excessive forward visibility. If traffic calming measures are required e.g. speed humps, then these should always include a cycle bypass to the side;
- Car parking. Parking of cars should be discouraged from local streets, along routes that have significant off-street parking facilities within the curtilage of the property;
- Point closures or cut-throughs; and
- One way and/or cycle streets. If one-way streets are used, these should always exempt cyclists by the provision of a contraflow. Such permeability can be achieved through the use of signage i.e. ‘no entry except cyclists’. Some local streets can have all motorised traffic removed, leaving just a wide footpath and a 5m wide, central two-way cycle track.

2.3. Policy Context

2.3.1. National Planning Policy Framework

The National Planning Policy Framework[6] (NPPF) sets out the Government’s planning policies for England and how these should be applied. The Framework must be considered when preparing a development plan and the purpose of the planning system is the achievement of sustainable developments.

NPPF Section 9, Promoting Sustainable Transport outlines a set of principles for development and provision of walking and cycling infrastructure. These include:

- Give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas;
- So far as is possible, facilitate access to high quality public transport, with layouts that maximize the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;
- Create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter and respond to local character and design standards; and

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

- Allow for the efficient delivery of goods, and access by service and emergency vehicles.

The framework states that Local Planning Authorities should adopt proactive strategies to promote sustainable transport solutions which support reductions in greenhouse gas emissions and reduce congestion. Pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, including quality of life.

This Full Business Case sets out a proposal to improve local connections, particularly the sustainable transport links, in the town of Cheltenham. This approach is consistent with the National Planning Policy Framework.

2.3.2. Joint Core Strategy (JCS) for Gloucester, Cheltenham and Tewkesbury

The Joint Core Strategy (JCS) for Gloucester, Cheltenham and Tewkesbury was adopted by the three local authorities in December 2017 and is the principal planning document for Cheltenham Borough Council (CBC), providing the strategy to deliver sustainable growth to the year 2031. The JCS identifies how much housing, employment and retail land is needed and where this should be located. Overall, the JCS identifies a need for approximately 35,175 new homes and 192 hectares of B-class employment land to support 39,500 new jobs. The housing requirement (based on Objectively Assessed Need, OAN) for each local authority to 2031 is as follows.

- Gloucester: At least 14,359 new homes;
- Cheltenham: At least 10,917 new homes; and
- Tewkesbury: At least 9,899 new homes.

The distribution of new development within Cheltenham Borough is contained within Policy SP2 of the JCS[7]. New homes over the plan period (2015 – 2031) will be provided within the Cheltenham Borough administrative boundary and cross-boundary urban extensions at North West Cheltenham and West Cheltenham. Both of these urban extensions are partly within Tewkesbury Borough and located in close proximity to the A40 corridor. Commitments between the two local authorities are covered in a Memoranda of Agreement that outlines how local authorities in Gloucestershire will deliver housing needs detailed in the JCS.

2.3.3. Cheltenham Plan 2011 – 2031

The emerging Cheltenham Plan 2011 – 2031[8] outlines a number of vision themes and objectives that should be viewed within the context of the JCS's visions and objectives and the Council's own corporate vision. Figure 2-1 extracts the most relevant objectives for active modes (walking and cycling) under each of the three vision themes identified in the local plan.

[7] https://www.jointcorestrategy.org/examination, see page 21
[8] https://www.cheltenham.gov.uk/downloads/file/6532/sd001_-_cheltenham_plan_pre-submission_reg_19

Figure 2-1 - Cheltenham Plan 2011 - 2031, Vision and Objectives

Vision Theme A: Cheltenham is a place where people live in strong, safe, healthy, well-served and well-connected communities which are successful and sustainable places in which to live and work and which contain the necessary infrastructure to support social and cultural life together with space for people and places to evolve in future.

- Design places, with a focus on connectivity, that are accessible to all and where barriers to walking and cycling are removed so that active travel and public transport are the default choices;
- Improve health outcomes by promoting and prioritising active travel; and
- Ensure provision of sufficient housing land and other opportunities for residential development to meet the needs of the current and future population of the Borough

Vision Theme B: Cheltenham is a place with a prosperous and enterprising economy where education, skills and employment opportunities are increasing and diversifying, where businesses choose to invest and deliver increased value of economic output, and where the benefits are felt by all.

- Deliver a range of sustainable transport choices through appropriate infrastructure improvement including better cross-town and local links, prioritised junctions, and improved public transport; and
- Encourage knowledge-intensive services businesses in high-value sectors

Vision Theme C: Cheltenham is a place where the quality and sustainability of our cultural assets and natural and built environment are valued and recognised locally, nationally and internationally and where tourists choose to visit and return.

- Improve pedestrian and cycle connectivity and permeability throughout the town by creating a network of convenient routes which include multifunctional green spaces that link with the wider countryside, attractive and safe streets and spaces, and measures which reduce the visual and environmental impact of vehicular traffic.

2.3.4. Local Transport Priorities

Context

There is a strong cycle-to-work culture that already exists in Cheltenham, with cycle to work figures accounting for 7.2% of all journeys taken[9], in comparison to 2.8% for the national average in England. A recent DfT investigation into the value of cycling also found health, economic and environmental benefits including:

- Cycle friendly environments promote more physical activity in later life;
- Children who cycle are more attentive and achieve better results in their education;
- Well-designed infrastructure results in more cycling by a wide section of the community, including more women and people with disabilities;
- A typical cycling city could be worth £377 million in healthcare cost savings;
- Cycle parking delivers 5 times higher retail spend than the same area of car parking; and
- Compact town centres that are optimised for walking and cycling have 2.5 times higher retail spend per unit area than traditional towns.

GFirst LEP Strategic Economic Plan (SEP)

GFirst LEP has the aim to help Gloucestershire realise its economic potential and promote developments and business growth across the County. The SEP for Gloucestershire, submitted to the government in March 2014 in order to obtain Growth Deal funding, outlines how the LEP aims to achieve average economic growth of 4.8% GVA per annum by 2022. It enables the LEP to support local businesses, develop the skills of workers in high-growth sectors, and maximise the connections and opportunities of the M5 corridor. From this Growth Deal funding, £1.6m was allocated to identify potential capacity improvements at the B4063 Staverton Bridge Junction and to reduce traffic congestion under the 'A40 Regeneration Areas – Improving Connectivity and Resilience' theme with the following objectives (also outlined in Section 1.5).

[9] https://www.gloucestershire.gov.uk/media/2093897/full-draft-local-transport-plan-draft-for-consultation-171219-a.pdf

1. Reduce congestion on the A40 corridor and key linkages to it between Cheltenham and the Forest of Dean;
2. Alleviating congestion via addressing congestion hotspots on and in association with the A40 corridor between Cheltenham and the Forest of Dean;
3. Maximise economic productivity and efficiency;
4. Provide improved traffic flow, faster journey times and overall transport network efficiency on the A40 (west) corridor, and the areas of regeneration that connect to it;
5. Address bottlenecks within the transport network, particularly where these are predicted to worsen and put a brake on economic recovery; and
6. Improve access to skills, jobs, goods and services

Published in 2018, GFirst LEP Strategic Economic Plan 2.0[10] builds on the successful first Strategic Economic Plan published in 2014, expanding on the three main focal points.

- Business Environment. Attracting and retaining successful businesses in high value sectors and the next generation of talented workers.
- Skills. Providing and nurturing the next generation of talented, highly employable, and productive individuals to meet the needs of local business, especially those in sectors with high growth potential.
- Connectivity. Delivering digital and integrated transport connectivity to stimulate business growth, ensuring infrastructure, regeneration and housing meet the future needs of the business and people of Gloucestershire.

Within the Gfirst LEP Strategic Economic Plan 2.0, a 'Growth Zone' plan has been developed, looking to make available high-quality employment land in close proximity to the M5 motorway, with excellent connectivity throughout Gloucestershire and the rest of the UK. This has led to £22m of funding through the Local Growth Fund being allocated to delivering the enabling infrastructure necessary for the development of 45ha of employment land close to the M5 Junction 11 and the GCHQ, forming the Cheltenham Cyber Central development. This project has the potential to deliver 7,500 jobs to the region in its first phase, with further potential in the future.

GFirst LEP Local Industrial Strategy

The emerging Local Industrial Strategy (LIS) for Gloucestershire[11] sets out an ambition for the County to be fully connected through innovative transport solutions and digital connectivity. Part of this ambition is to create real alternatives to travel by car in Gloucestershire and identify priorities for investment in better cycle links to improve health, reduce congestion and protect the environment. The LIS suggests that whilst there are some cycle connections in the County's urban areas, these are currently 'insufficient to enable Gloucestershire to promote cycling as an alternative form of transport' and that 'transport decisions must include the creation of dedicated cycle links'[12].

Gloucestershire's Climate Change Strategy

All Gloucestershire councils have now declared a climate emergency with a declaration in May 2019 to be net zero by 2030 and be carbon neutral by 2050. Gloucestershire's Climate Change Strategy[13] (December 2019) highlights that 34% of Gloucestershire's carbon emissions come from the transportation sector. The county's long-term strategy consists of eight key themes, including 'Carbon busting options for all transport' and encouraging a significant shift in travel behaviour to reduce vehicle emissions. The document cites improvements to the Gloucestershire Local Transport Plan (LTP) during its review period until January 2020, including separate policies for walking and cycling in the county to help address the climate change emergency. From the Climate Change working group, there are a number of actions that are applicable to WCWCI, including:

- The maintenance of roads will encourage green travel;
- Recycling and re-using materials from carriageway changes will provide savings;

[10] https://www.gfirstlep.com/downloads/2018/sep-2-update2018v3.pdf
[11] https://www.gfirstlep.com/downloads/2020/gloucestershire_draft_local-industrial-strategy_2019-updated.pdf
[12] GFirst LEP (2019) Gloucestershire Local Industrial Strategy, Draft, page 69, https://www.gfirstlep.com/downloads/2020/gloucestershire_draft_local-industrial-strategy_2019-updated.pdf
[13] https://glostext.gloucestershire.gov.uk/documents/s57483/Item%208%20Annex%201%20Glos%20Climate%20Change%20Strategy.pdf

- Measures to mitigate congestion impacts on the environment and economy, modal shift, are encouraged;
- There are available options for bus incentives – green staff travel, staff free car parking, seen to promote buses instead of the use of cars for travel; and
- The development of strategies that encourage people to cycle and to share vehicles.

Gloucestershire Local Transport Plan 2015 - 2031

The Gloucestershire Local Transport Plan (LTP) sets out the long-term transport strategy for Gloucestershire up to 2031. The aim for GCC is to influence how and when people choose to travel so that individual travel decisions do not cumulatively impact on the attractiveness of Gloucestershire as a place to live, work and invest. Policy Document (PD) 2 of Gloucestershire's Local Transport Plan (2015 – 2031)[14] outlines the overarching LTP objectives and the links to expected outcomes documented as part of the cycling policy document (Table 2-1).

Table 2-1 - Expected Outcomes from GCC LTP Walking and Cycling Policies

LTP Objective	Expected Outcomes
Support and sustainable economic growth	• Gloucestershire is a place to do business and attract investment; • The transport network is reliable, fit for purpose and demonstrates value for money; • Increased journey time reliability; • A transport network resilient to extreme weather events; • A thriving tourist industry which benefits from ease of access to the county's natural, built, historic and environmental assets; and • Increased footfall in retail areas.
Enable community connectivity	• Individuals benefit from economic prosperity and social benefits, such as access to employment, education and training; • An integrated transport network which provides genuine transport choices for people of all ages and abilities; and • A transport network which provides individuals with the confidence that they are safe.
Conserve the environment	• Reduced transport derived carbon emissions; • A reduction in solo car use, and an increased uptake of sustainable transport modes (walking, cycling and public transport); and • Transport schemes are designed to reduce the adverse impact of transport on Gloucestershire's high quality natural, built and historic environments
Improve community health and wellbeing and promote equality of opportunity	• Less car trips resulting in fewer journey delays; • Increased number of walking and cycling trips; • Improved air quality; • A healthy more active population (addressing obesity and associated conditions); and • Inclusive form of transport.

GCC will achieve these objectives by implementing the following policy proposals:

[14] https://www.gloucestershire.gov.uk/media/2223/9-pd-2-cycle-nov-2017.pdf

- To improve cycle linkages between and within settlements throughout Gloucestershire by working with delivery partners, other agencies, the community and stakeholders to remove barriers to cycling and consolidate the network;
- To focus investment in cycling in more developed areas and especially where new development is planned;
- To recognise the role and function of the existing quiet lane network and seek to expand this where possible to provide safe cycle linkages;
- To ensure developers assess the needs of all pedestrians and cyclists within their development design and any improvements associated with the development. All cycle infrastructure provided within the county will be in accordance with Manual for Gloucestershire Streets (MfGS) and Cycle Facility Guidelines;
- To ensure all schemes on the local highway network will be subject to appropriate context reports and audits (including Road Safety, Non-Motorised Users, Walking, Cycling and Quality Audits) before design approval;
- To support the development and promotion of the leisure cycle network, and Public Rights of Way Network to encourage greater use linking centres of population;
- To work in partnership with communities in identifying local transport needs and solutions (through e.g. Parish and Neighbourhood Plans); and
- To work with district / borough councils to ensure that new development is well connected to the existing transport network.

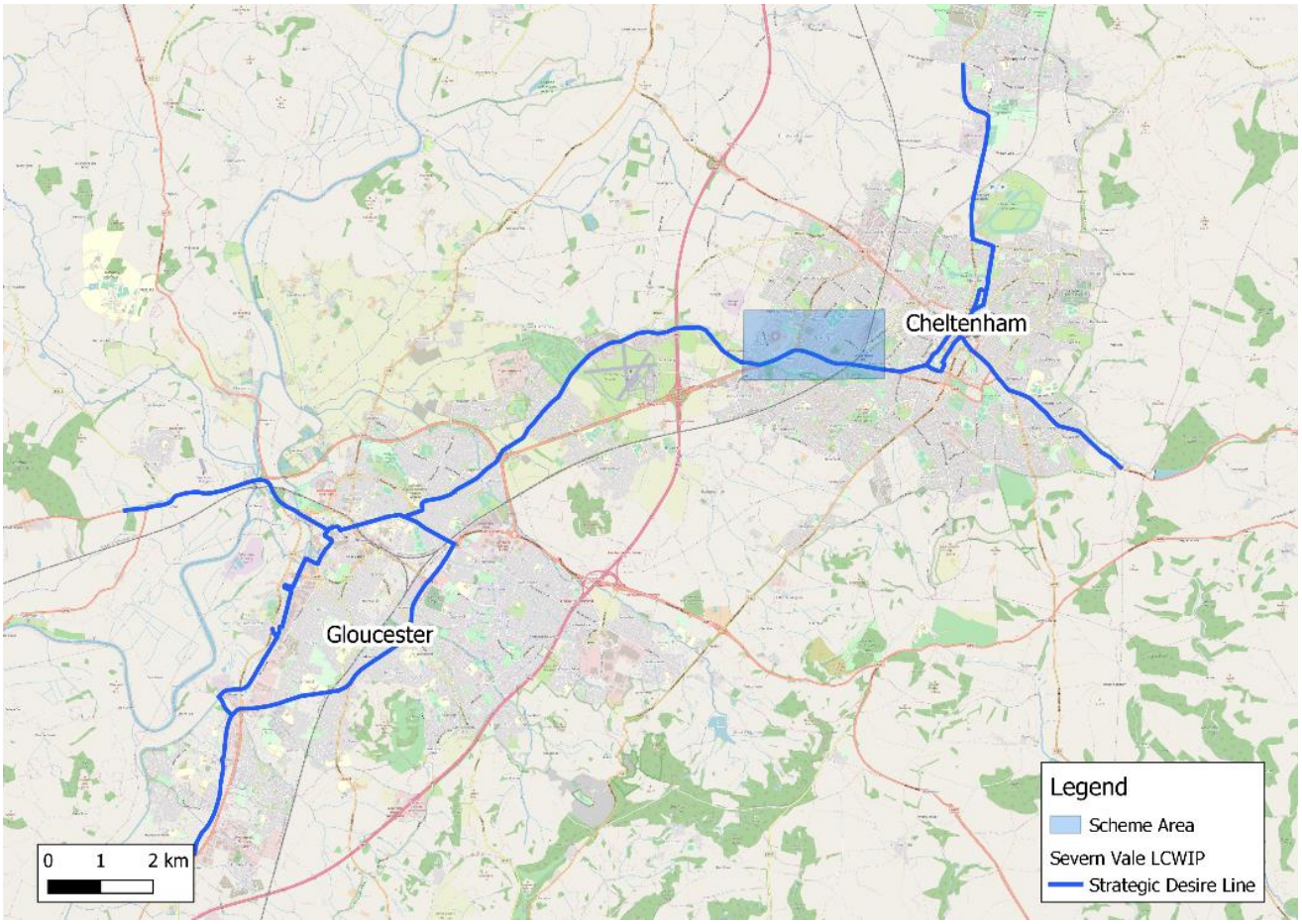
Local Cycling and Walking Infrastructure Plans (LCWIP)

The DfT's Cycle and Walking Investment Strategy outlines the government's ambition 'to make cycling and walking the natural choices for shorter journeys or as part of a longer journey' through Local Cycling and Walking Infrastructure Plans (LCWIP). LCWIPs make the case for future investment in long term walking and cycling improvement projects.

The Gloucestershire LCWIP for the Central Severn Vale[15] identifies cycling and walking infrastructure improvements in and around the Bishops Cleve, Cheltenham and Gloucester areas. The report makes the case for future funding for walking and cycling infrastructure through a combination of forecast modelling and stakeholder engagement. Suggestions from the stakeholder workshops and the outputs from the Propensity to Cycle Tool (PCT)[16] has led to the creation of the network plan for cycling within the Severn Vale area. The LCWIP creates a county wide cycleway joining Bishops Cleeve in the north to the Sharpness Canal towpath in the west (Figure 2-2).

[15] https://www.gloucestershire.gov.uk/media/2090454/s-transportplanningprojects-strategy-planning-cwis-csv-cwip-2018-combined-report-20190701-ii.pdf
[16] Propensity to Cycle Tool (PCT), http://pct.bike/

Figure 2-2 - LCWIP Strategic Desire Lines



This alignment includes three cycle schemes already under development in the county, incorporating the Bishops Cleeve to Cheltenham cycleway beside the A435, the HE cycleway running along the B4063 between Cheltenham and Gloucester and the Canal and Rivers Trust upgrade of the Sharpness Canal Towpath between Gloucester and The Pilot Inn to a shared pedestrian and cyclist path.

Cheltenham Air Quality Management Area

Nitrogen dioxide levels have exceeded national air quality limits since 2008 in areas of Cheltenham. Therefore, an Air Quality Management Area (AQMA) has been established to cover the whole of Cheltenham Borough and an Action Plan[17] has been developed to address the problem areas. The broad view of the action plan is to reduce the number of trips taken by private motor vehicles in Cheltenham. Two of the proposed measures put forward by the action plan are to 'encourage walking and cycling trips to school' and to 'improve road layouts and associated infrastructure to improve the safety of cyclists in Cheltenham and reduce the potential conflicts between cyclists and other road users'. This would increase the uptake of cycle trips, reducing the trips taken by motor vehicle and consequently improve the air quality within the AQMA.

2.4. Existing travel demand and level of service

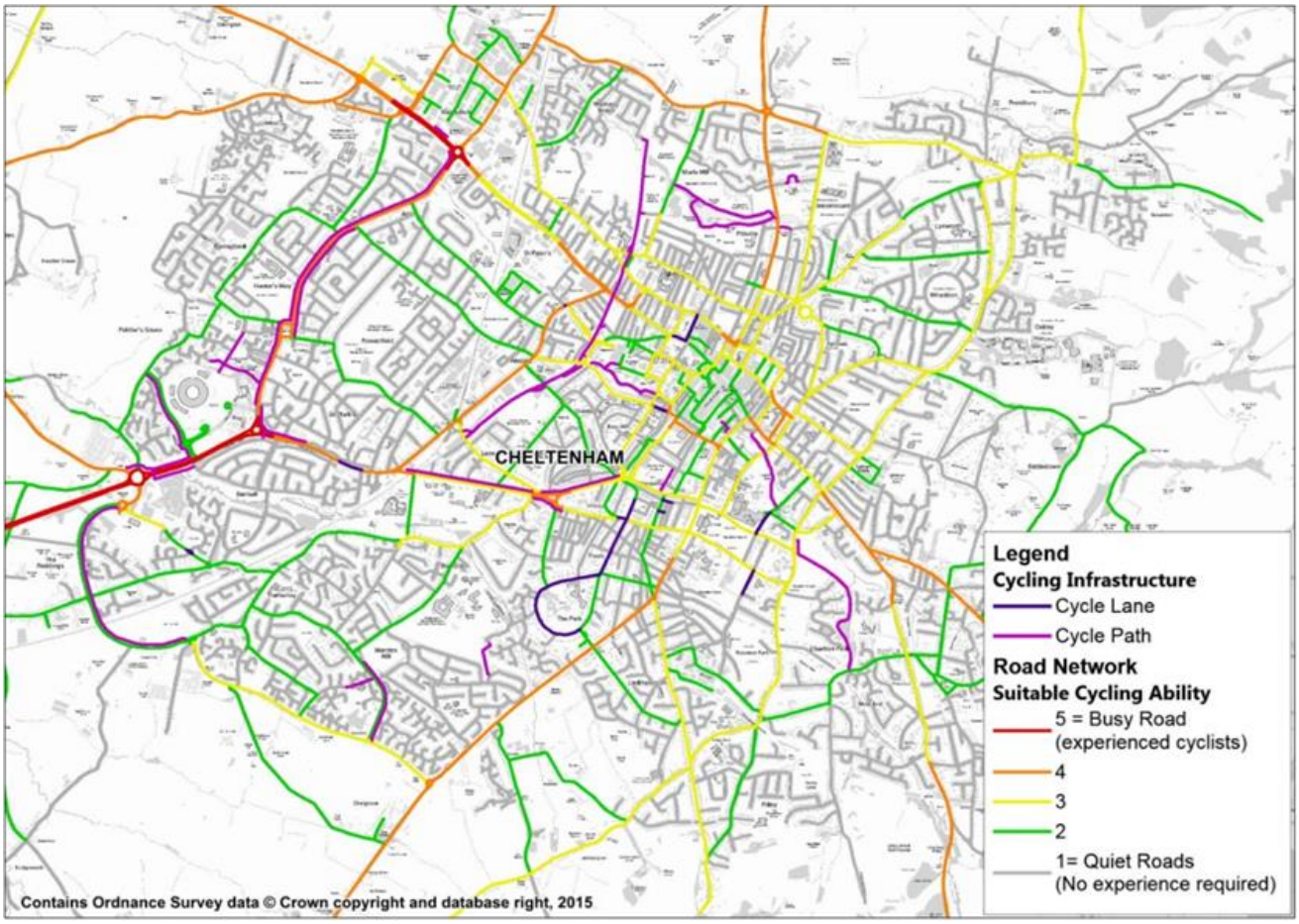
2.4.1. Current Cycling and Walking Infrastructure

Gloucestershire's Local Transport Plan (2015 - 2031) mapped the existing cycling network in Cheltenham, consisting of a mix of cycle lanes and cycle paths, against the flow along links, indicating the level of experience needed for cyclists to traverse the link (Figure 2-3). The cycle network is disjointed, especially along the west side of the A40, representing the main route taken through Cheltenham by the LCWIP county cycleway proposed in the previous section. This A40 link also represents the busiest road in the area, requiring the highest levels of cycling experience to be able to navigate safely, as does the feeder routes of Princess Elizabeth Way and Gloucester Road down to Cheltenham Spa Railway Station. This currently causes

[17] https://www.cheltenham.gov.uk/downloads/file/3780/air_quality_action_plan_2014

severance for cyclists who may not feel like they have enough cycling experience to adopt cycling as the mode of choice. This therefore represents a significant barrier to cycling uptake due to safety concerns and/or physical barriers linked to shared use between pedestrians, cyclists and motor vehicles.

Figure 2-3 - Current Cycling Provision in Cheltenham



Source: Gloucestershire Local Transport Plan: Policy Document 2 – Cycle

2.4.2. Current Cycling and Walking Numbers

Cheltenham versus National Trends

The walking and cycling statistics database[18] (2018) has been used to compare the proportions of walkers and cyclists in Cheltenham to regional and national trends (Table 2-2). The Cheltenham, regional and national datasets have been presented to compare the reasons people walk or cycle and at what frequency they make these trips, representing either once a month, once per week, three times per week, or five times per week.

[18] https://www.gov.uk/government/statistics/walking-and-cycling-statistics-england-2018

Table 2-2 - Proportion of Adults that Cycle at Least Once per Month (2017/18)

Location	% Walking	% Cycling
Cheltenham	83.3	18.7
Gloucestershire	81.3	18.7
South West	80.7	18
England	78.2	16.1

Table 2-3 - Proportion of Adults that Walk or Cycle, for any reason (2017/18)

Location	% Walking				% Cycling			
	1 x per month	1 x per week	3 x per week	5 x per week	1 x per month	1 x per week	3 x per week	5 x per week
Cheltenham	83.3	74.4	47.1	38.2	18.7	13.5	8.0	5.6
Gloucestershire	81.3	73.4	45.4	34.8	18.7	13.6	6.7	3.6
South West	80.7	72.2	46.5	34.7	18.0	13.1	6.3	3.8
England	78.2	69.5	43.6	32.4	16.1	11.5	5.5	3.3

Table 2-4 - Proportion of Adults that Walk or Cycle, for Leisure Reasons (2017/18)

Location	% Walking				% Cycling			
	1 x per month	1 x per week	3 x per week	5 x per week	1 x per month	1 x per week	3 x per week	5 x per week
Cheltenham	64.7	50.8	25.3	19.6	12.4	7.3	2.8	1.3
Gloucestershire	69.2	57.1	29.4	21.5	15.1	9.8	3.7	1.4
South West	68.5	55.5	26.9	19.9	14.8	9.1	2.7	1.4
England	61.1	48.5	22.2	15.9	13.0	7.7	2.3	1.1

Table 2-5 - Proportion of Adults that Walk or Cycle, for Travel Reasons (2017/18)

Location	% Walking				% Cycling			
	1 x per month	1 x per week	3 x per week	5 x per week	1 x per month	1 x per week	3 x per week	5 x per week
Cheltenham	55.6	48.7	25.9	19.9	14.0	10.5	5.7	4.1
Gloucestershire	44.4	37.8	18.3	12.6	9.1	6.1	2.9	1.8
South West	45.5	39.4	21.1	15.2	8.7	6.9	3.5	2.1
England	49.2	42.2	23.1	16.9	7.7	6.1	3.2	2.0

Levels of cycling are relatively high in Cheltenham but there is scope for further growth. The proportion of adults that walk or cycle at least once a month and all the way up to 5 times per week is higher than the regional and national average in Cheltenham. This is particularly evident for adults that cycle for travel[19]

[19] "Travel" here refers to walking or cycling just to get from A to B (commuting to work etc)

reasons with nearly twice the number of adults, at any of the four frequencies, cycling for travel reasons in comparison to the regional or national averages.

There is scope to promote leisure cycling which is relatively low in Cheltenham. Adults cycling for leisure[20] reasons are actually lower for the majority of frequencies in Cheltenham than both the regional and national averages but walking for leisure is still higher in Cheltenham in comparison. This highlights that even though Cheltenham has a higher-than-average walking and cycling active population, it is due to the disproportionately high number of trips undertaken for travel reasons such as commuting to work and not solely for leisure reasons such as health, training and recreation.

Count Data

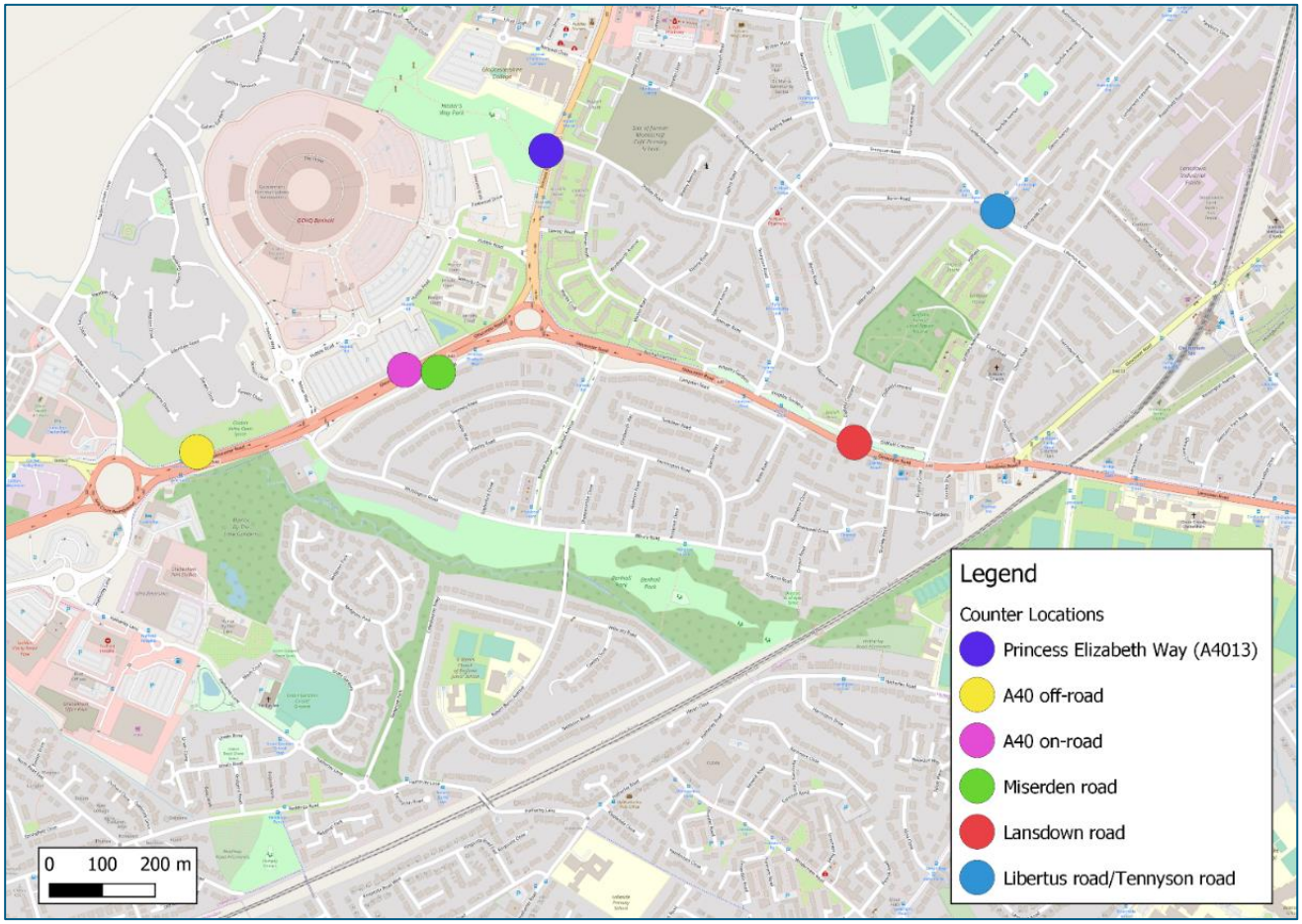
Route specific counts were taken to investigate walking and cycling flows at six locations within the scheme area. Counts were carried out on Tuesday 11th February, Wednesday 12th February and Thursday 13th February 2020. Table 2-6 shows the location of these count sites and a description of the data collected on site. The surveys were completed between 07:00 and 19:00 and the day was considered representative in terms of weather and timings. To guard against variations in walking and cycling counts on specific days, an average has been taken across the three total days of data collected at each of the count sites. Counts were also split by total daily trips (07:00 – 19:00), AM peak period trips (07:00 – 10:00) and PM peak period trips (16:00 – 19:00).

Table 2-6 - Walking and Cycling Count Locations in West Cheltenham

Count locations	Count description	Pedestrian	Cycling
A40, on-road and off-road counts	Both directions (separate numbers for each direction)	✓	✓
Miserden Road, on-road counts	Both directions (separate numbers for each direction)	✓	✓
Lansdown Road, on-road and off-road counts	Both directions (separate numbers for each direction)	✓	✓
Libertus Road/Tennyson Road, on road and off-road counts	Both directions (separate numbers for each direction)	✓	✓
Princess Elizabeth Way (A4013), on-road and off-road counts	Both directions (separate numbers for each direction)	✓	✓

[20] "Leisure" here refers to walking or cycling for the purpose of health, recreation, training or competition, not to get from place to place.

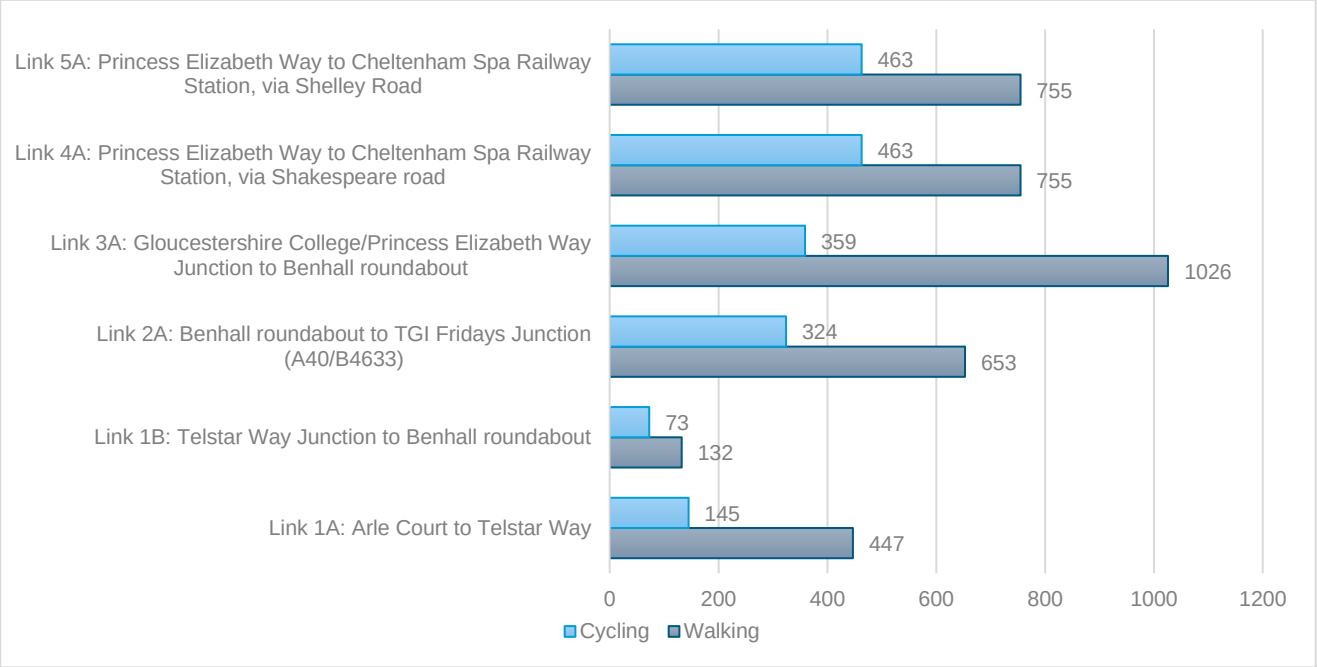
Figure 2-4 - Walking and Cycling Count Locations in West Cheltenham



12-hour daily totals

The average number of 12-hour daily trips for walking and cycling at the six locations within the scheme area of investigation is presented in Figure 2-5. The data shows high volumes of walking and cycling on Princess Elizabeth Way, at the crossroads between Tennyson Road and Libertus Road and on the A40 between Benhall roundabout and TGI Fridays Junction (A40/B4633).

Figure 2-5 – Average Weekday Pedestrian and Cycling Counts in West Cheltenham, February 2020



AM & PM Peak periods

The average number of walkers and cyclists during the AM and PM peak period are presented in Figure 2-6 and Figure 2-7. The majority of cycling trips at the six locations take place during the AM and PM peak periods. AM and PM peak period cycle trips account for 75% of total daily trips between Arle Court and Telstar Way, 68% between Telstar Way and Benhall roundabout, 74% on the link between Benhall roundabout and the TGI Fridays Junction (A40/B4633), 73% on quiet streets linked to Tennyson Road/Libertus Road and 81% on the link between Gloucestershire College/Princess Elizabeth Way Junction to Benhall roundabout.

Table 2-7 - % Daily Walking and Cycling Trips, AM and PM Peak, West Cheltenham

% of daily trips	Link 1A		Link 1B		Link 2A		Link 3A		Link 4A/5A	
	Walking	Cycling	Walking	Cycling	Walking	Cycling	Walking	Cycling	Walking	Cycling
Inter peak	36%	25%	44%	32%	30%	26%	45%	19%	39%	27%
AM + PM Peak	64%	75%	56%	68%	70%	74%	55%	81%	61%	73%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

A higher proportion of cycling trips are undertaken during commuting hours (AM and PM peak periods). We assume that those trips undertaken during the AM and PM peak are for commuting purposes only, with walking and cycling trips taken during the inter-peak period (10:00 – 16:00) assumed to be for leisure purposes. A smaller number of trips are taken during the day for leisure purposes at between 19% – 32% across all six locations.

Figure 2-6 - Pedestrian and Cycling Counts in West Cheltenham, AM Peak Period, February 2020

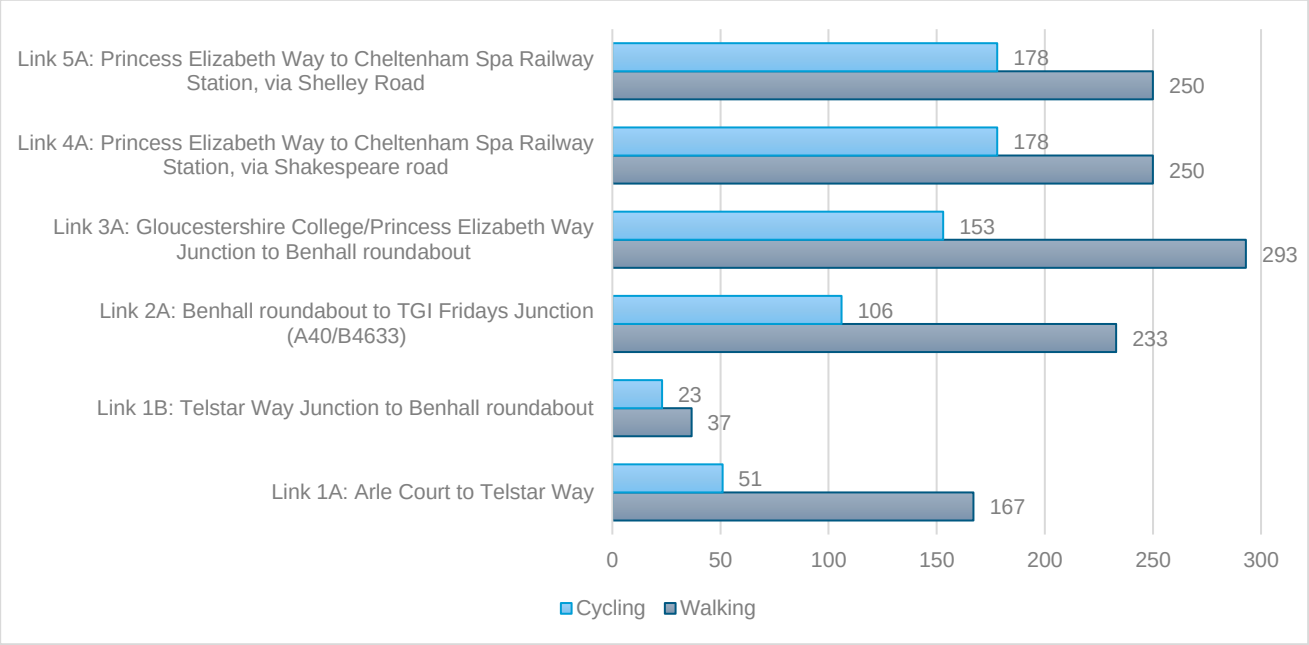
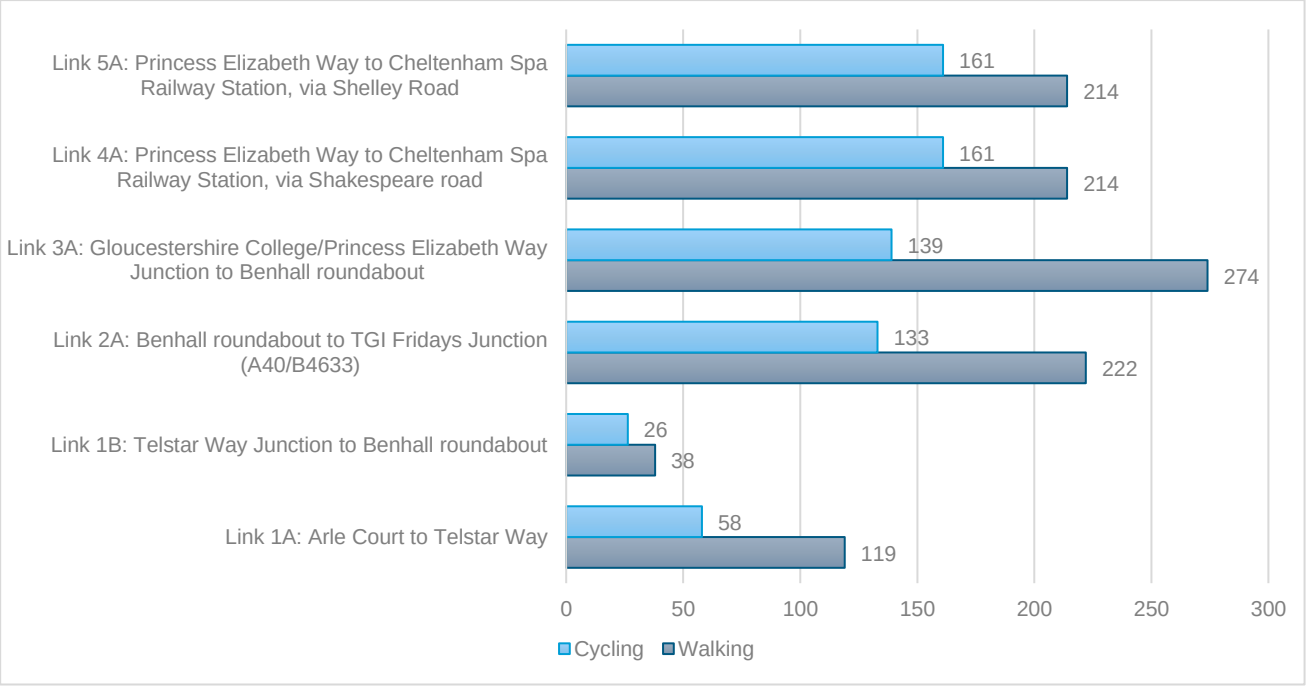


Figure 2-7 - Pedestrian and Cycling Counts in West Cheltenham, PM Peak Period, February 2020



2.4.3. Accidents

As the previous two sections (2.4.1 and 2.4.2) have shown, Cheltenham has a high percentage of cyclist and pedestrian trips in comparison to the national average, but these trips currently have to navigate some very busy routes, particularly along the A40 and Princess Elizabeth Way. Table 2-8 compares the casualties from collisions along the component links of the WCWCI scheme to the national average for pedestrians and cyclists in particular. It then breaks down the casualties by severity. Figure 2-8 and Figure 2-9 spatially maps the location of these collisions. The percentage of pedestrians involved in collisions (10.8%) is in line with the national average (12.2%). Cyclists however experience a much higher casualty rate along the links (23.3%) than the national average of 6.7%. This highlights the risks faced by cyclists that currently use the links for

commuting or recreational trips and will represent a barrier to any desired increase in walking and cycling trips undertaken by the local population.

Table 2-8 - Cyclist and Pedestrian Casualties (5-years from 2014-2018)

	National Casualties		Cheltenham Walking and Cycling Improvement Scheme Links		Casualty Severity		
Casualty Type	Total	%	Total	%	Fatal	Severe	Slight
Pedestrians	149,823	12.2%	4	10.8%	1	1	2
Cyclists	82,313	6.7%	10	23.3%	0	3	7
Total Casualties	941,477		43		1	4	10

Source: DfT Accident Database

Figure 2-8 - Cyclist Casualties (5-years from 2014-2018)

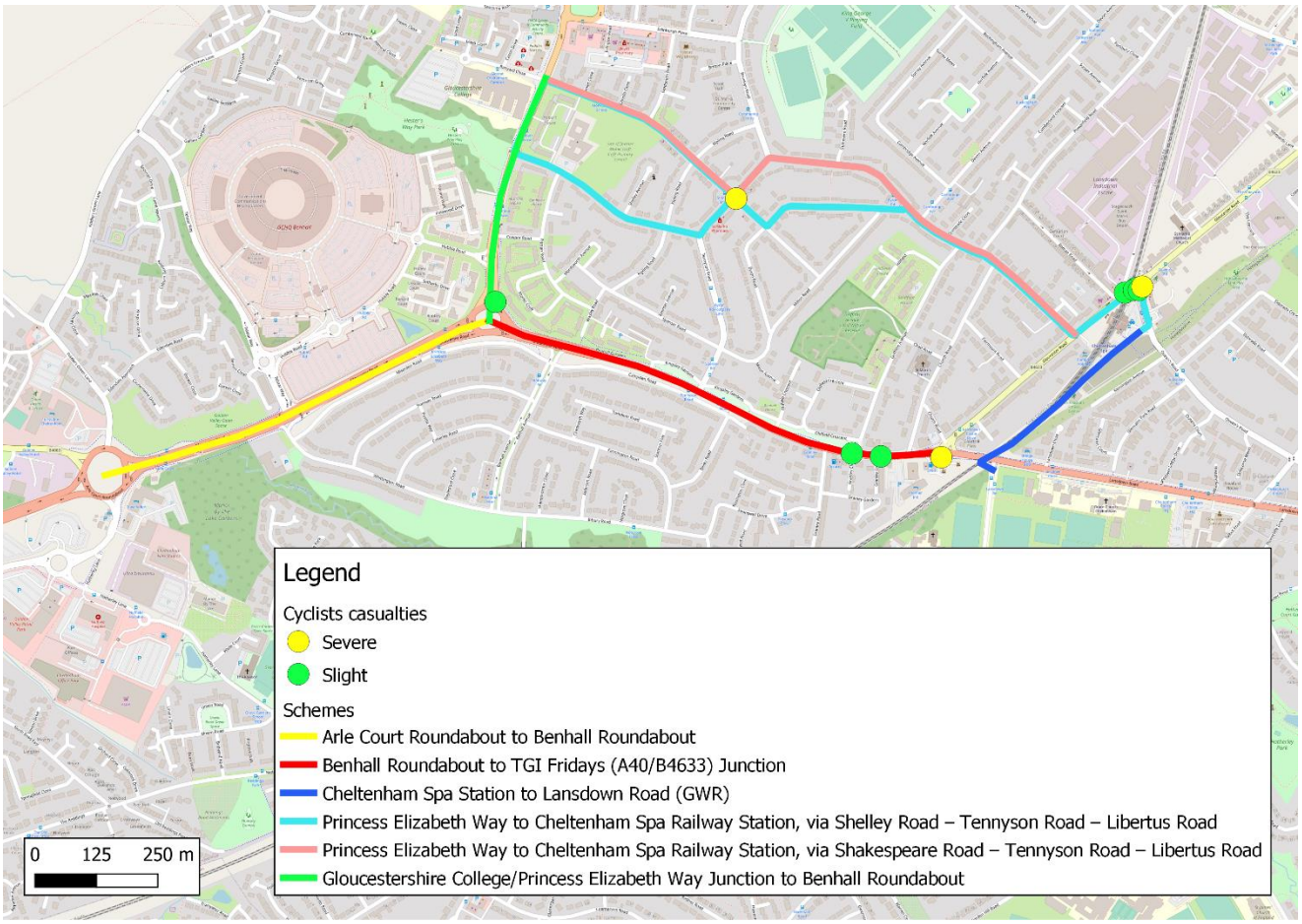
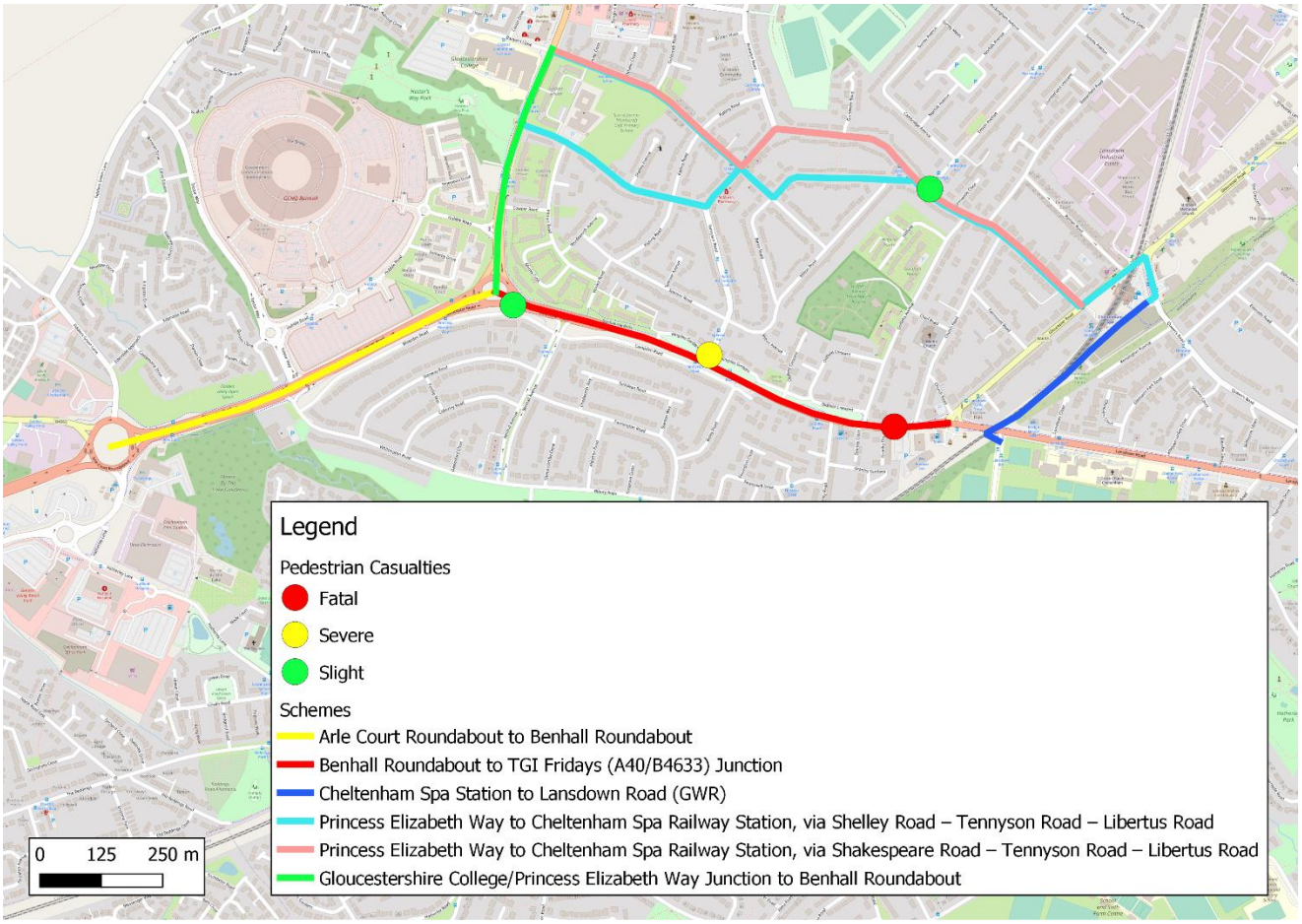


Figure 2-9 - Pedestrian Casualties (5-years from 2014-2018)



2.5. Future challenges

2.5.1. Population and employment growth

As of mid-2017, the population of Cheltenham was estimated to be 117,128[21]. The population is expected to grow and is projected to reach 121,600 by 2026 and 128,000 by 2041, representing population growth of 9.3% over 25 years[22]. While the population in Gloucestershire is forecast to increase in all age groups, the largest increases are expected among those aged at least 65, reflecting an ageing population. Indeed, those aged 65+ accounted for 20.8% of the population in 2016 yet they are expected to reach 28.9% by 2040. An ageing population will present financial and resource implications for Gloucestershire in the future. By investing in infrastructure that can contribute to sustainable growth, Gloucestershire can mitigate these challenges by attracting the businesses, jobs and working age population that it needs to prosper.

In 2018, 82.7% of working-age residents in Cheltenham were in employment, compared to 78.5% in Great Britain as a whole[23]. In the 2011 census, 29,462 residents of Cheltenham commuted to work within Cheltenham itself and 14,037 commuted to the wider Gloucestershire area, predominantly Tewkesbury and Gloucester[24].

To meet the needs of this growing population, the Joint Core Strategy (JCS) identifies a need for 35,175 houses across Cheltenham, Gloucester and Tewkesbury between 2011 and 2031. GFirst LEP's Strategic Economic Plan also states that over the period 2014-2022, they aim to create 33,909 jobs in Gloucestershire.

[21] https://inform.gloucestershire.gov.uk/media/2082290/current-population-of-gloucestershire-overview-2017.pdf
[22] https://inform.gloucestershire.gov.uk/media/2082298/overview_-_population_projections_for_gloucestershire_2016-41-2.pdf
[23] https://www.nomisweb.co.uk/reports/lmp/la/1946157372/report.aspx
[24] https://www.nomisweb.co.uk/reports/lmp/la/1946157372/report.aspx

With an already congested road network, it is therefore clear that in order to deliver the aims of the Joint Core Strategy and Strategic Economic Plan, investment to increase the capacity for growth is required.

2.5.2. Joint Core Strategy for Cheltenham, Gloucester and Cheltenham

The adopted JCS[25] identified strategic allocations for housing and employment land in the north-west and west of Cheltenham. This major development of new housing (c.9,000 homes) and employment land (c. 100 hectares) accounts for just over half of all homes required between 2015 and 2031 for Cheltenham and nearly a quarter of all JCS housing needed by 2041.

Table 2-9 – North-West & West Cheltenham Housing and Employment Sites

Site	Housing Units	Employment, ha	Type
NW Cheltenham	4,285	23.8	JCS strategic allocation
NW Cheltenham	2,258	30.0	Safeguarded land
W Cheltenham/Cyber Central	1,100	45.0	JCS strategic allocation
W Cheltenham	1,324	5.0	Safeguarded land
Total	8,967	103.8	

Supporting transport infrastructure to enable housing and employment land delivery is currently the subject of an M5 Junction 10 improvement scheme that includes an all movements junction at M5 J10, junction improvements at Coombe Hill, a new link road from M5 J10 to the West Cheltenham Cyber Central development and the dualling of the A4019 (Tewkesbury Road) to the east of the link road. Some of these sites are in close proximity to the WCWCI scheme with the new trips generated by them having a direct impact on the current highway network.

Figure 2-10 - JCS Strategic Allocations and Safeguarded Land, Cheltenham and Gloucester

2.5.3. Future travel demand

TEMPro forecasts for the AM peak in the Cheltenham area indicate greater growth in trips, for all modes and purposes, originating in Cheltenham than for trips ending there. TEMPro takes account of local planning data to provide factors which when used in conjunction with regional and national forecasts can provide a very localised picture in terms of future growth projections.

[25] https://www.jointcorestrategy.org/

Table 2-10 shows the increase in origin and destination trip ends from 2017 to 2031, along with annual growth factors in the forecast years under investigation – 2021 (opening year of the scheme) and 2031. This data shows a large increase in growth factors from 2021 to 2031, potentially reflecting the build out of JCS strategic allocations and trips generated from within and outside of Cheltenham itself. In terms of cycling and walking, even a small shift in travel behaviour toward active modes could reduce the growth in future traffic and vehicle movements to prevent high levels of congestion and capacity issues on the existing transport network.

Table 2-10 - TEMPro Trip End Forecasts and Growth Factors for Cheltenham, 2017 - 2031 (AM Peak)

		2017	2021	2031
Growth factor	Origins	-	1.0278	1.0823
	Destinations	-	1.0183	1.0635
Trip ends	Origins	69,403	71,333	75,118
	Destinations	76,562	77,961	81,462

Source: TEMPro 7.2 – all modes and purposes

2.6. Summary of Identified Problems and Impact of not changing

Based on evidence presented in the strategic case, the key transport problems and current challenges experienced in West Cheltenham are summarised in Table 2-11, along with identified impacts.

Table 2-11 - Current Challenges and their Future Impacts

Challenge	Impact identified
High levels of traffic congestion along the A40	Increase in trips and congestion levels due to future development resulting in an increase in journey times for all transport users.
Higher percentage of collisions involving cyclists in the scheme area compared to the national average.	Potential for an increase in collisions involving vulnerable groups such as pedestrians and cyclists as the number of motorised vehicles on the road increase.
Deterioration of Air Quality	An Air Quality Management Area (AQMA) has been declared to cover the whole of Cheltenham Borough and an Action Plan has been developed to address problem areas. A continuing increase in trips taken by motor vehicle due to future land development will exacerbate the situation and nullify the desired impacts of the action plan.
Lack of connectivity	A more congested A40 would result in residential areas south of Cheltenham being further cut off from attractors such as the GCHQ employment area and the new Cyber Central development to the west.
Severance for pedestrians and cyclists	Increased traffic volumes are likely to discourage cyclists and pedestrians due to safety fears. The A40 is an urban road with a speed limit of 40mph, already posing severance issues for cyclists and pedestrians. It is anticipated that overly congested junctions at Arle Court and Benhall Roundabouts and the A40 are likely to act as barriers for those wishing to travel more sustainably.

2.7. Objectives

The objectives for the WCWCI scheme have been defined to directly address the problems and issues identified in the preceding sections. A number of strategic outcomes and accompanying transport objectives are outlined in Table 2-12.

Table 2-12 - Objectives of the WCWCI Scheme

Strategic Outcome	Transport objectives
Providing a continuous and connected cycling and walking route between Gloucester and Cheltenham Spa Railway Station, meeting the objectives set out in the Gloucestershire Local Transport Plan (LTP).	Provide a continuous cycling and walking network from Arle Court roundabout to TGI Fridays Junction (A40/B4633).
	Provide a significant and measurable improvement to the current set of cycle and walking routes in West Cheltenham, by providing more direct and better-quality routes for commuters and leisure users.
	Set improved design standards for cycling and walking routes in West Cheltenham.
	Encourage active and healthy lifestyles through the provision of transport infrastructure
Contributing and accelerating the release of employment land associated with the West Cheltenham strategic allocation, which includes the nationally important Cyber Central.	Increase cycling and walking trips from Arle Court towards Cheltenham, by providing a real alternative to car travel for less able/confident cycle users.
Contribute towards the GCC climate change strategy and a reduction in carbon emissions by 2030	Deliver collaborative and innovative working practices that promotes sustainable development and contributes toward GCC objectives on climate change
Demonstrate Value for Money (VfM)	Maximize the social value achieved through the £1.6m GFirst LEP transport investment, ringfenced solely for the provision of cycleway and associated infrastructure as part of the wider WCTIS.

2.8. Scheme Constraints and Dependencies

2.8.1. Planning Dependencies

The WCWCI scheme is inextricably linked to A40 highway improvements and the re-modelling of existing junctions at Benhall roundabout, Telstar Way and TGI Fridays Junction (A40/B4633). These highway improvements are being progressed as part of the WCTIS Phases 3 and 4 and are subject to a separate Full Business Case (FBC). Despite this, works for both schemes will have to be undertaken in parallel, given that both schemes involve alterations to the carriageway and at junctions along the A40.

The proposed WCWCI works would fall within the definitions of permitted development. Works carried out by the highway authority required for the improvement of the road either on land within the boundaries of the road or on land outside but adjoining the boundary of an existing highway under Section 55(2)(b) of the Town and Country Planning Act 1990 and Part 9, Class A of the Town and Country Planning (General Permitted Development)(England) Order 2015.

2.8.2. Environment Dependencies

Screening and scoping assessments have been carried out to determine whether the WCTIS Phases 1-4 is likely to have adverse effects on the environment, requiring an Environmental Impact Assessment (EIA). A proportionate assessment of environmental risks from the WCTIS have been identified in relation to air quality, noise and arboriculture.

Table 2-13 – WCTIS Evidence to Assess Impacts on Noise, Air Quality and Arboriculture

Impact	Evidence
Noise	A detailed noise impact assessment may be required but this will incorporate all phases (Phases 1 -4) and so constitutes a separate assessment not linked to the business case for Phases 3 and 4. Quantitative modelling following WebTAG Unit A3 in relation to the appraisal of noise impacts will be completed.
Air Quality	A detailed air quality impact assessment may be required but this will incorporate all phases (Phases 1 -4) and so constitutes a separate assessment not linked to the business case for Phases 3 and 4. Quantitative modelling following WebTAG Unit A3 in relation to the appraisal of AQ impacts will be completed.
Arboriculture	An arboriculture survey has been conducted and a report completed for all four phases of the scheme including options regarding the relocation of trees in Phase 3 and the condition of any trees along the route.

2.8.3. Transport Dependencies

West Cheltenham Transport Improvement Scheme (WCTIS) Phases 1 - 4

The sections of the A40 between Arle Court roundabout and TGI Fridays Junction (A40/B4633) currently creates significant delays and congestion for traffic travelling into and out of Cheltenham, particularly in the morning and evening peak periods. This congestion would be increased with the significant additional development planned for the area and is the subject of ongoing planning discussions between developers', promoters and planning authorities.

WCTIS Phases 3 and 4, includes eastbound widening of the A40 carriageway between Arle Court roundabout and Telstar Way, Benhall Roundabout improvements and the signalised junction at TGI Fridays (A40/B4633). The Benhall roundabout re-modelling includes plans to improve the layout of the bus lanes that utilise the roundabout, and then continue on the A40 eastbound towards Cheltenham with an extra highway lane in addition to the bus lane.

The WCTIS will progress in phases, with each phase needing to stand on its own merit in terms of aligning to and delivering the objectives. Phases 3 and 4 have been combined into one scheme for the purposes of business case development and follow on from the proposals for Phases 1 and 2.

Table 2-14 - West Cheltenham Transport Improvement Scheme (WCTIS)

Phase	Scope
1	Capacity improvements to Arle Court roundabout
2	Widening of the existing A40 carriageway eastbound from M5 J11 to Arle Court roundabout
3 4	• A40 eastbound widening from Benhall roundabout • Benhall roundabout remodelling • Telstar Way Junction re-modelling • TGI Friday Signal Improvements (A40/B4633)
WCWCI	Walking and Cycling proposals, planned in conjunction with Phases 1 to 4 of WCTIS.

Great Western Rail (GWR) Scheme

GWR are planning a major upgrade to Cheltenham Spa Railway Station. As well as increasing car parking capacity, the upgrade of facilities will include extra bike storage, a more accessible bus interchange and a safer pedestrian environment through a link to the Queens Road entrance to the station. A new bridge structure or on-ramp at Lansdown Road is also planned and will be designed to accommodate all users, both cyclists and pedestrians.

The proposal is designed to provide an access link ramp from Lansdown Road to land located to the south-west of the existing station, currently used by Network Rail as a storage compound. The proposal will necessitate a new opening on the road bridge, traversing the railway line, with the ramp extending from this

new opening to what is currently an existing gymnasium, with access to the station through existing car parks adjacent to the Railway Station facility.

Figure 2-11 – Site of Lansdown Road Ramp Scheme, GWR

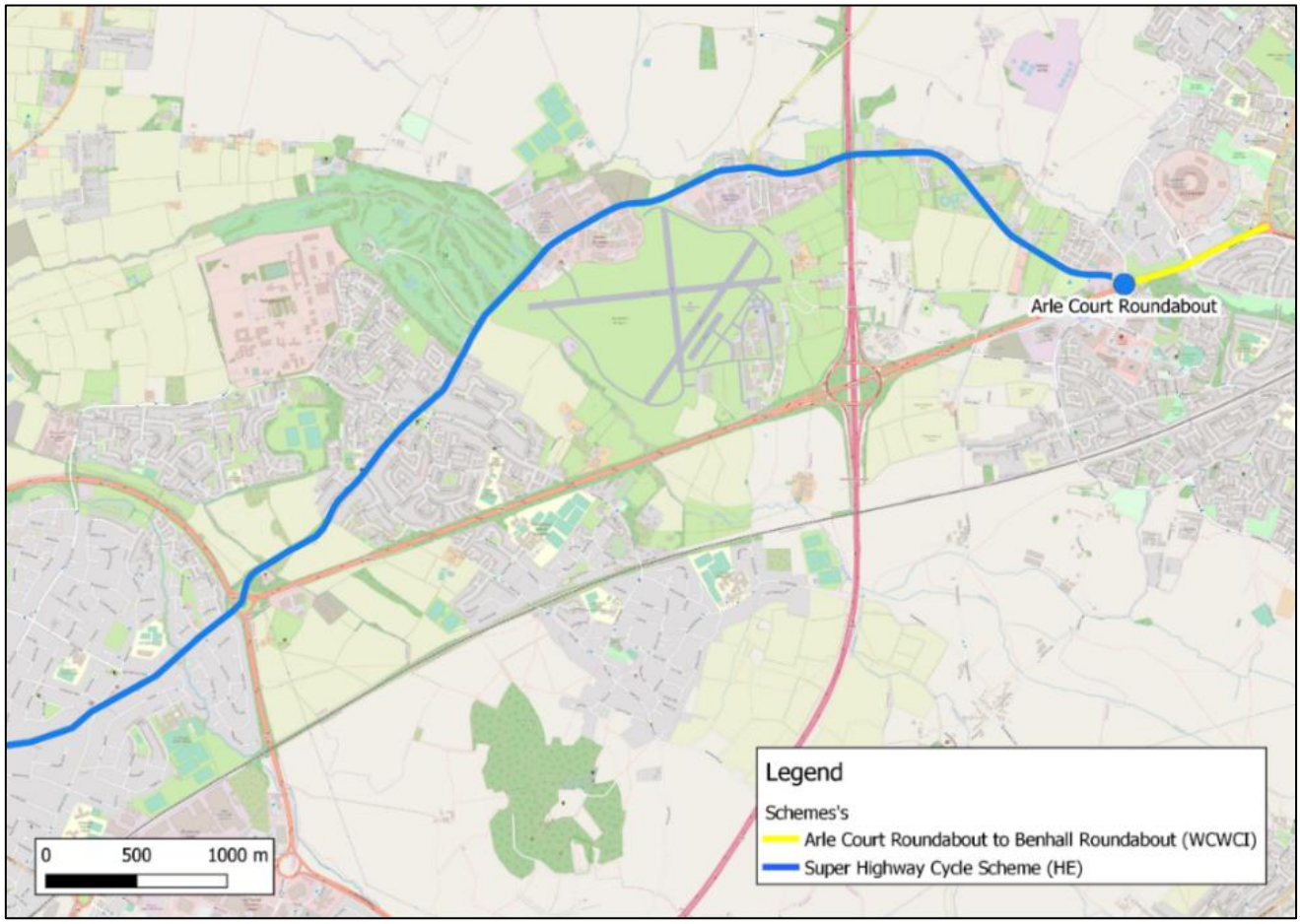
Highways England Cycleway

HE has secured £3.6m as part of the designated funds for a cycleway scheme that connects the important towns of Cheltenham and Gloucester. The scheme is located along the B4063 over a distance of approximately 5miles extending from the centre of Gloucester to Arle Court roundabout through Staverton Junction.

HE's initial aspiration for the route was to provide a straight continuous cycleway to the latest Highways England standards along the A40 trunk road. Initial studies showed that this would encounter significant obstacles and constraints which would result in extremely high costs and/or a reduced quality of the route. This aspiration was subsequently revised to provide a route along the B4063, with changes to junctions between the main A40 trunk road and the B4063.

The HE cycleway scheme will run 5.1 miles along the B4063, extending from the western outskirts of Cheltenham to the centre of Gloucester. The route will feed into the north-west arm of Arle Court roundabout in west Cheltenham, connecting directly to the proposed WCWCI scheme's Arle Court roundabout to Benhall roundabout route.

Figure 2-12 - HE Cycleway Scheme



Planned local cycling schemes, Gloucester and Cheltenham

There are several planned changes to the cycling route network in Gloucester and Cheltenham, either currently under consideration or planned.

Table 2-15 - Planned local cycling routes, Gloucester and Cheltenham

Scheme	Location	Description
Pittville to The Park Student Cycling Route	Cheltenham	Cycle signing improvements route investigation undertaken. Detailed design now underway. Design continuing along with TRO work.
Longford Cycle improvements	Gloucester	Early stage review of route options. Design and construct facilities between Longford and Gloucester city centre. £111k of developer funding available.
Cheltenham Station cycle link	Cheltenham	Cycle link being developed between Cheltenham Railway Station and Lansdown Road being developed by GWR and White Young Green.
Pedestrian and Cycle linkages between Cold Play Lane to Morrison's	Cheltenham	Early stage design development to extend the recently installed Shared Use Footway/Cycleway to the A46 Shurdington Road.
A435 Bishop's Cleeve to Cheltenham cycle improvements	Cheltenham	Provision of new shared use cycleway parallel to the A435. To be constructed on 3rd party land that will be purchased.

2.8.4. Summary

In terms of the strategic approach to development of the WCWCI scheme, there is a clear justification to undertake walking and cycling improvements along the A40 and in the wider West Cheltenham area as quickly as possible. The reasons for this include:

- WCTIS Phase 1 and 2 is due to begin construction in May 2020. The development and construction programme for WCTIS Phases 3 and 4 and the WCWCI scheme will be developed so that the beginning of construction will coincide with the end of construction for Phases 1 and 2;
- The WCWCI scheme will need to be constructed in parallel with WCTIS Phases 3 and 4, given that both essentially require multiple changes to the A40 and to land next to the carriageway within the highway boundary;
- Cost savings from the use of the same works compound for all improvements to the area, including the WCWCI scheme and the WCTIS Phases 1 – 4; and
- Delays and disruption will be minimised by the co-ordination of WCWCI with the WCTIS Phases 3 and 4.

2.9. Scheme Selection and Option Identification

The use of the LEP monies has been assessed in terms of alternative schemes and was reallocated to WCWCI instead of a less viable scheme that was previously on the LEP draft scheme list (Staverton Crossroads).

The scheme selection has two main aspects; the route and the design. Regarding the route, the key constraints for the proposed scheme are the start-point and end-point. The start point is to the west, where the HE cycleway from Gloucester to Cheltenham terminates at Arle Court roundabout. From here, the route needs to link with GCHQ and major employees and residential areas and finish close to the Railway Station. To meet the two start/end locations and include the waypoints, the only logical fast and direct route is along the A40.

For the design, there is the key choice of north or south (or both) on the A40, and whether a direct or more circuitous route. The criteria of the scheme includes the aim of being visible and providing a shorter, quicker route for cyclists and therefore directly along the A40 is the clear preferred option. For the further choice of north or south of the A40, due to the required reallocation of road space, it is not feasible to provide segregated walking and cycling links on both sides of the carriageway. Therefore, the logical choice is on the north side of the A40, to link in with the existing facilities and routes and also to pass the key waypoints including GCHQ.

Scheme selection and option identification has taken account of the transport objectives for the WCWCI scheme, in order to establish a set of criteria to assess how the preferred design options perform.

Table 2-16 - Strategic Objectives and Priorities for WCWCI scheme

Transport Objectives	Options
Provide a continuous cycling and walking network from Arle Court roundabout to TGI Fridays Junction (A40/B4633).	✓✓✓ - The WCWCI scheme scope ties into wider developments of walking and cycling infrastructure proposed as part of the HE cycleway scheme between Gloucester and Cheltenham. The link to TGI Fridays (A40/B4633) Junction is in close proximity to the GWR plans to provide an access link ramp from Lansdown Road to Cheltenham Spa Railway Station.
Provide a significant and measurable improvement to the current set of cycle and walking routes in West Cheltenham, by providing more direct and better-quality routes for commuters and leisure users.	✓✓✓ - The links that make up the WCWCI scheme provide a more direct route into and out of Cheltenham town centre, by focusing the development of walking and cycling infrastructure alongside existing highways, such as the A40. The implementation of new, segregated links along some sections will provide a significant improvement to the current set of cycle ways which are disjointed and incomplete (see section 2.4.1).
Set improved design standards for cycling and walking routes in West Cheltenham.	✓✓✓ - Design standards will follow best practice and guidance contained in the Manual for Gloucestershire Streets (MfGS) and London Cycle Design Standards from TfL.

Encourage active and healthy lifestyles through the provision of transport infrastructure	✓✓✓ - Access to the walking and cycling infrastructure is important, in order to increase uptake. Options identified are located in areas where there is large catchment of residential (St Marks), employment (GCHQ) and retail sites (Kingsditch trading estate) in close proximity.
Increase cycling and walking trips from Arle Court towards Cheltenham, by providing a real alternative to car travel for less able/confident cycle users.	✓✓✓ - the inclusion of 'quiet streets', located in predominantly residential areas will provide an alternative cycling route to sites of interest. This will provide a real alternative to car use for short journeys in the immediate vicinity and for longer journeys to other residential, employment and retail sites.
Deliver collaborative and innovative working practices that promotes sustainable development and contributes toward GCC objectives on climate change	✓✓✓ - Gloucestershire's Climate Change Strategy (December 2019) highlights that 34% of Gloucestershire's carbon emissions come from the transportation sector. Walking and cycling will contribute to GCC objectives on climate change.
Maximize the social value achieved through the £1.6m GFirst LEP transport investment, ringfenced solely for the provision of cycleway and associated infrastructure as part of the wider WCTIS.	✓✓✓ - The WCWCI scheme will complement a strong cycle to work culture that already exists in Cheltenham and the longer-term welfare impacts that accrue from improvements to health are expected to far outweigh the initial costs and upkeep of walking and cycling infrastructure.

NB: A seven-point scale is used for the assessment of scheme alignment with objectives - ✓✓✓ to ×××

3. Economic Case

3.1. Overview

The WCWCI scheme aims to increase walking and cycling uptake, by offering a real alternative to car use in West Cheltenham. The scheme will increase physical activity by providing access and promoting sustainable modes of transport in Gloucestershire and in so doing, support GCC's climate change objectives. The scheme will relieve pressure on the existing highway network and improve air quality, reduce noise and facilitate decongestion impacts.

The scheme is expected to produce a Present Value Benefit (PVB) of £3.51m (2010 prices, discounted to 2010) over the 20-year appraisal period, principally as a result of an increase in physical activity that facilitates health benefits.

The total scheme construction costs expressed as a Present Value of Costs (PVC) figure is £1.32m, which includes costs to maintain the walkways and cycleways post-construction.

The overall assessment of the costs and benefits generated by the WCWCI project shows that the scheme achieves a **Benefit-Cost Ratio (BCR) of 2.66** with a Net Present Value (NPV) of approximately £2.19m. The scheme is therefore categorised as **High Value for Money** in the classification provided by the DfT.

3.2. Economic narrative

3.2.1. Rationale for Intervention

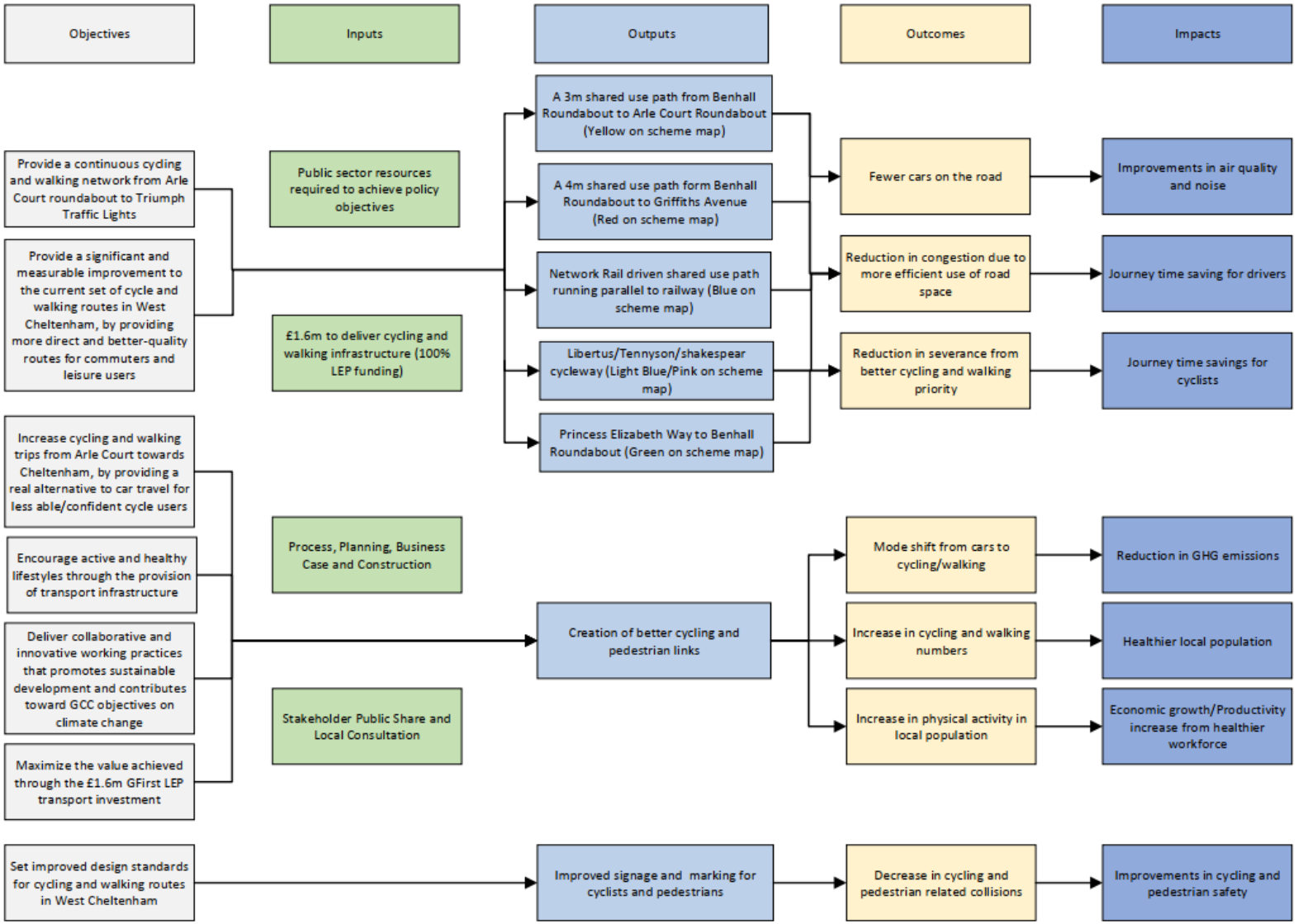
Active modes, such as cycling and walking, generate positive external benefits to society that are not directly priced into the free market. The provision of new and improved cycling and walking infrastructure generates direct benefits to transport users, such as improved health from higher levels of physical activity and journey quality.

There are also a number of indirect benefits to society that are difficult to value or are not priced into the market, influencing travel behaviour and leading to sub-optimal decisions for investment in walking and cycling infrastructure. Positive external benefits from a healthier population include greater productivity and reduced absenteeism[26], with increased walking and cycling generating wider benefits to society in the form of improved air quality, a reduction in noise and de-congestion impacts associated with mode substitution. In general, transport investment in walking and cycling infrastructure is under-provided by the free market because of the difficulties that arise from monetising and attributing the value of the investment to these wider beneficial impacts to society.

Logic maps are widely used in the field of transport as part of the appraisal process for new interventions. Figure 3-1 describes the theory of change from the new intervention and links between the schemes stated objectives, the inputs required to deliver the objectives, the outputs from the scheme, and the desired outcomes and impacts.

[26] A report by TfL (2015) *Walking and Cycling: The Economic Benefits*, find that people who are more physically active take 27% fewer sick days each year than their colleagues. Hendriksen et al (2010) *The association between commuter cycling and sickness absence* find that employees who cycle regularly take 1.3 fewer sick days each year than those who don't. Grous (2011) finds this to be worth approximately £128million every year to the national economy.

Figure 3-1 – Logic Map



3.3. Approach to Assessing Value for Money

Scheme value for money has been assessed within a WebTAG-compliant framework outlined in Figure 3-2.

Figure 3-2 – Approach to Economic Appraisal and Value for Money (VfM) Assessment

Type of economic impact			Description	Approach to Monetisation		Case making	VfM Framework
				Cycling	Walking		
Costs	A	Impact on Government's broad transport budget	Public sector cost of scheme delivery, maintenance and operation	✓	✓	Level 1 - Initial BCR & VfM categorisation	Established Monetised Impacts
			Changes in revenue to the Exchequer	✓	✓		
			Infrastructure benefits (reduction in damage done to road surfaces)	✓	✓		
Monetised Impacts	B	User	Increase physical activity and health benefits	✓	✓	B/A	↓
		Non-user	Greenhouse gases, air quality and noise	✓	✓		
			Accidents	✓	✓		
			Increased productivity from a reduction in absenteeism	✓	✓		
	C	Additional impacts on transport network	(De)Congestion benefits	✓	✓	(B + C)/A	Evolving Monetised Impacts
Non-monetised impacts	E	Environmental	landscape, townscape, heritage, natural habitats, water, noise and air quality impacts	Qualitative	Qualitative	Overall appraisal summary & VfM	↓
		Social	Option value, improved security, reduced severance, access to services, distribution across social groups	Qualitative	Qualitative	(B+C+E)/A	Non-Monetised Impacts

NB: Alll monetised costs and benefits are estimated using the Active Mode Appraisal Toolkit (AMAT)

The appraisal framework for this business case comprises:

- Selection of appropriate economic modelling tools and processes, including the Active Mode Appraisal Toolkit (AMAT) showing the key indicators that govern the monetised costs and benefits for the appraisal of cycling and pedestrian transport schemes;
- Derivation of scheme costs adjusted for inflation, risk and optimism bias;
- Assessment of non-monetised impacts with regards to wider economic impacts, environmental impacts and social and distributional impacts;
- Collation of the Appraisal Summary Table (AST), Annual Monetised Costs and Benefit (AMCB), Transport Economic Efficiency (TEE) and Public Accounts (PA) tables; and
- Sensitivity and risk analysis of the overall value for money assessment and categorisation.

3.4. Costs

3.4.1. Capital Costs

The scheme capital costs have been estimated at approximately £1.6m (2020 prices), as shown in Table 3-1. An appropriate contingency has been added to account for potential risks associated with the scheme which are outlined in more detail in Appendix C. The risk-adjusted cost has been separated out across the different links (Links 1A – 5A) based on preliminary designs and a high-level bill of quantities. Costs were factored up, pro-rata according to the available budget and are presented in Table 3-2.

Table 3-1 - Scheme Capital Costs, 2020 prices

Project cost components	Capital cost items	Cost Estimate status*	Costs by year (£)				Totals
			2018/19	2019/20	2020/21	2021/22	
Design & Management	Design fees, Surveys and trial holes, Land Purchase	P	£0	£50,000	£150,000	£100,000	£300,000
Construction including Traffic-Related Maintenance	Non-Routine Re-construction Site clearance, Diversions of Statutory services. Widening and re-surfacing of carriageway.	P	-	-	£200,000	£820,000	£1,020,000
Contingency	Risk Adjustment	P	-	-	£80,000	£200,000	£280,000
Indirect Tax	Non-Recoverable VAT (if applicable)	-	-	-	-	-	-
Total Cost	**(NB – Not base cost with real cost adjustment)**	**P**	**£0**	**£50,000**	**£430,000**	**£1,120,000**	**£1,600,000**

Table 3-2 – Scheme Capital Costs Breakdown: Links 1A – 5A, 2020 prices

Ref	Location	Works description	Costs
1A	Arle Court Roundabout to Telstar Way Junction	Retaining wall & new cycleway over full length	£240,000
1B	Telstar Way Junction to Benhall Roundabout	Retaining wall full length between Telstar Way and Benhall Roundabout – Tree protection construction techniques for new cycleway alongside Oak Trees. Realignment of GCHQ fencing. Temporary accessway provisions across GCHQ car park required for construction of cycleway.	£560,000
2A	Benhall Roundabout to TGI Fridays Junction (A40/B4633)	New Cycleway over much of length – Kerb realignments and vegetation clearance.	£350,000
3A	Gloucestershire College/Princess Elizabeth Way Junction to Benhall Roundabout	Widening of pathway to cycleway over 300m distance	£120,000
4A	Princess Elizabeth Way to Cheltenham Spa Railway Station, via Shakespeare Road – Tennyson Road – Libertus Road, Queens Road.	Kerb realignments, tabletops and numerous junctions- Repairs and resurfacing of footways.	£230,000
5A	Princess Elizabeth Way to Tennyson Road, via Shelley Road	Kerb realignments, tabletops and numerous junctions- Repairs and resurfacing of footways.	£90,000
Total			**£1,590,000**

3.4.2. Whole-life Costs

An estimate of whole-life costs including operation, maintenance and renewals is included in the economic case. Primarily this consists of the maintenance costs of new cycling and walking tracks, but may also include maintaining lighting, signage and other streetscape provisions linked to the scheme. For the purposes of the business case, only the maintenance of new footways and cycleways are included in the whole life costs. Gloucestershire County Council (GCC) will be responsible for the maintenance of the cycleways and footways post construction. Ongoing maintenance costs are informed by the GCC maintenance contract. To cover one surface treatment over the 20-year appraisal period, the cost is estimated at £11.07 per m^2. Over a 20-year design life this would equate to £0.56 per m^2 per year.

Assuming a standard width of 3.0m for cycle lanes (includes segregated and advisory on-road cycle lanes) and 1.8m for a footpath and applying this to the lengths for walking and cycling presented in Table 1-1, provides an approximate annual estimate of the ongoing maintenance costs for the WCWCI scheme as a whole and for each individual link (Link 1A – 5A). This is presented in Table 3-3.

Table 3-3 - Annual Maintenance Costs, 2020 prices

Link	Area (m^2)			Annual Maintenance Cost (£), 2020 prices
	Walking	Cycling	Total	
1A	612m^2	1,020m^2	1,632m^2	£914
1B	819m^2	1,365m^2	2,184m^2	£1,223
2A	1,980m^2	3,300m^2	5,310m^2	£2,974
3A	540m^2	900m^2	1,140m^2	£638
4A	1,080m^2	1,560m^2	2,640m^2	£1,478
5A	270m^2	0m^2	270m^2	£151
Total	5,301m^2	8,145m^2	13,446m^2	£7,379[27]

3.4.3. Present Value Costs (PVC)

Scheme capital (construction, design and management, plus risk adjustments) cost have been estimated by the Atkins Engineering team in 2020 prices at £1.6m. The costs include the results of a quantified risk assessment (QRA), presented in Appendix C and the effects of construction price inflation. These non-economic costs are set out in the Financial Case. To convert these costs to Present Value Costs (PVC), the following adjustments have been applied:

- Values converted to 2010 prices;
- Real inflation added (e.g. Tender Price Index or Retail Price Index depending on the cost type less background inflation);
- Optimism bias at 15%. As scheme costs are based on preliminary design prior to the detailed design, an optimism bias of 15% was applied to total costs, in line with guidance set out in DfT TAG unit A1-2;
- Conversion to market prices (using a factor for the average rate of indirect taxation in the economy of 1.19); and
- Discounting at 3.5% per annum over a 20-year appraisal period.

3.5. Benefits

3.5.1. Active Mode Appraisal Toolkit (AMAT): Walking and Cycling

WebTAG Unit A5.1[28] provides guidance on how to estimate and report impacts on active modes (e.g. walking and cycling). The Active Model Appraisal Toolkit (version May 2019)[29] is used to quantify the economic impacts of the scheme against the baseline or 'do nothing' scenario. Analysis of monetised costs and benefits from

[27] May not sum due to rounding
[28] https://www.gov.uk/government/publications/webtag-tag-unit-a5-1-active-mode-appraisal-may-2018
[29] https://www.gov.uk/government/publications/tag-social-and-distributional-impacts-worksheets, Active Mode Appraisal Toolkit

walking and cycling infrastructure improvements in West Cheltenham is therefore based on a comparison of the current or baseline trips drawn from counts at locations outlined in section 2.4.2, with the estimated future increase in trips attributed to the scheme.

The additional, monetised impact of the scheme in AMAT is based on direct user benefits and wider, indirect benefits linked to the provision of improved routes, new facilities (such as signage, information panels) and softer measures (travel planning) that influence travel behaviour and lead to positive impacts, including:

Direct user benefit

- Improved health from greater physical activity (reduced risk of premature death); and
- Safety benefits of increased segregation from traffic and other users, such as pedestrians.

Indirect, non-user benefits

- Reduction in GHG emissions and an improvement in air quality and noise;
- Increased productivity and a reduction in absenteeism from a healthier workforce;
- Decongestion benefits due to mode shift from private travel to active modes;
- Infrastructure impacts that result from a reduction in highway maintenance costs (reduced vehicle kms lead to a reduction in damage done to road surfaces);
- Reduction in accidents (the effect of reducing vehicle kilometres on road safety, not the direct benefit of increased cycle safety); and
- Improvements in journey quality (improved experience due to better information/signage, better segregation of road-users, reduced crowding).

Indirect, non-user costs

- A reduction in vehicle kilometres that leads to a decrease in tax revenues to the public exchequer e.g. fuel duty.

3.5.2. Baseline Demand for Cycling in West Cheltenham

This section outlines the process of data collection to understand existing travel patterns and demand for cycling in West Cheltenham. The number of journeys without the scheme corresponds to the 'Do Nothing' scenario which has been constructed on the basis of automatic cycle counts undertaken at a number of locations on links designated for improvements as part of the WCWCI scheme. This is compared with the projected uplift in cycle journeys under the 'Do Something' scenario which requires a projection of the number of scheme users with scheme infrastructure.

'Do Nothing' (DN) scenario

Existing baseline data for cycle journeys was collected on 11th, 12th and 13th February 2020 at a number of locations designated for improvement. Counts were taken between 07:00 and 19:00 (12 hrs) on weekdays (Tuesday, Wednesday and Thursday) and an average taken over the three days to establish bi-directional movements along the links. More information on the location of count sites is provided in section 2.4.2. The count data includes all cycle movements on and off-road and the sample was considered representative in terms of weather conditions and timings, with no seasonal adjustments made.

Table 3-4 – Observed Cycle Movements in West Cheltenham, Links 1A – 5A

Ref	Link	Average Weekday Cycle Movements
1A	Arle Court roundabout to Telstar Way Junction	145
1B	Telstar Way Junction to Benhall roundabout	73
2A	Benhall roundabout to TGI Fridays Junction (A40/B4633)	324
3A	Gloucestershire College/ Princess Elizabeth Way Junction to Benhall roundabout	359
4A	Gloucestershire College/Princess Elizabeth Way Junction to Cheltenham Spa Railway Station, via Shakespeare Road	463
5A	Princess Elizabeth Way to Cheltenham Spa Railway Station, via Shelley Road	463

3.5.3. Future Demand for Cycling in West Cheltenham

Forecasts of future cycle journeys attributed to the WCWCI scheme, along those links specified, is based on an approach outlined in WebTAG Unit A5.1, with evaluation evidence of similar case-studies used to sense check the results and provide a robust assessment of estimates relating to the uplift in cycle journeys expected in West Cheltenham from the provision of proposed cycle infrastructure improvements.

'Do Something' (DS) scenario

Wardman, Tight and Page (2007) derived a model to forecast the impact of improvements in the attractiveness of cycling for trips of 7.5 miles of less. The model gives an expression of the forecast market share of cycling given changes in the utility of different transport modes. A bespoke spreadsheet tool, following the approach advocated by Wardman, Tight and Page (2007) has been set up to estimate the uplift in cycle trips in West Cheltenham, assuming no change in utility and no change in generalized costs for other modes. As a result, the approach for estimating the uplift in cycling trips from new cycling infrastructure is based on the change in utility for existing users and the number of new trips generated by the change in utility from cycling compared to other modes.

Changes in utility are calculated using the equation below and a set of empirically based coefficients derived in the study by Wardman, Tight and Page (2007), shown in Table 3-5.

Change in Utility

$$\Delta U = t(c_w - c_n)$$

Where:

- ΔU is the change in utility of the cycling mode;
- t is the travel time
- c_w is the coefficient of utility on routes with facilities (i.e. the Do-Something (DS), with-intervention case)
- c_n is the coefficient of utility on routes without facilities (i.e. the Do-Nothing (DN), without-intervention case)

Table 3-5 - Utility of Changes to Cycle Facilities (Wardman et al, 2007)

Change	Interpretation	Co-efficient
Change in time on off-road cycle track	Minutes	-0.033
Change in time on segregated on road cycle lane	Minutes	-0.036
Change in time on non-segregated on-road cycle lane	Minutes	-0.055
Change in time on no facilities	Minutes	-0.115
Outdoor parking facilities	Present/not present	0.291
Indoor cycle parking	Present/not present	0.499
Shower/changing facilities plus indoor cycle parking	Present/not present	0.699
Payment to cycle	Not assessed	0.013

Source: TAG Unit A5.1 Active mode Appraisal, page 4

The most favourable cycling conditions are assumed to be an 'off-road cycle' track (-0.033 'utlis' per minute) which compares favourably to a road with no facilities which has a higher co-efficient of disutility at -0.115 'utlis' per minute. In the context of the WCWCI scheme there are multiple links with various provisions for cycling that are not consistent with the empirically based coefficients derived in the study by Wardman, Tight and Page (2007). Many of the links in West Cheltenham do not currently provide dedicated cycle provision, in the form of that described in Table 3-5. As a result, the uplift in cycling numbers is based on a current provision of 'no facilities' with future provision for the majority of links described as 'off-road cycle track', with the only exception being Link 4A where the future provision is best described as a 'non-segregated on-road cycle lane' to take account of advisory cycle lanes proposed.

The equation below only applies to the generalized costs of cycling. As such, it implies that the utility of all modes, except cycling, remain unchanged. Given the assumption of no change in the generalized costs of other modes the model simplifies to:

Uplift calculation

$$P_y^f = \frac{P_y^b e^{\Delta Uy}}{P_y^b e^{\Delta Uy} + (1 + P_y^b)}$$

Where:

- ΔUy is the change in utility of the cycling mode in year, y
- P_y^b is the proportion of those choosing to cycle out of the maximum of those where it is viable option, without any intervention in year, y
- P_y^f is the proportion of those choosing to cycle out of the maximum of those where it is viable option. With intervention in year, y

Forecasting the uplift in cycle trips from the scheme has been calculated for each, individual link (Link 1A – 5A), using average 12-hour cycle counts at locations collected over three days in February 2020 to reflect baseline trip demand. Future year 'with scheme' usage has been calculated by applying a post-intervention uplift to the existing cycle counts collected.

The uplift in cycle trips attributed to the scheme has been estimated using a bespoke spreadsheet tool that requires six simple inputs to forecast the increase in cyclists along a given route (Links 1A to 5A). MS Excel spreadsheets used to forecast increases in cycling trips from a change in utility brought about by the scheme are provided in Appendix D.

- Location of scheme (local authority);
- Observed cycle trips per day, drawn from physical cycle surveys conducted;
- Trip purpose of observed cycle trips;
- Pre-scheme cycling provision;

- Post scheme cycling provision; and
- Length of scheme in kms.

Based on the type of intervention (off-road cycle track, segregated on road cycle lane) for the WCWCI scheme across all links, and the location of the scheme (Cheltenham), estimates of the increase in cycle trips from the intervention are provided in Table 3-6. Baseline numbers collected as part of cycle counts for Links 1A – 5A are combined with information on the type of intervention. Forecast changes in utility are calculated using the equation above and the coefficient values in Table 3-5.

Table 3-6 - Cyclists Before and After Intervention

	Link 1A	Link 1B	Link 2A	Link 3A	Link 4A	Link 5A	Total
2020	145	73	324	359	463	463	1,364
2021							
DN	145	73	324	359	463	463	1,364
DS	160	83	441	391	516	463	1,591
Diff	+15	+10	+117	+32	+53	+0[30]	+227
Uplift (%)	10.34%	13.69%	36.11%	8.91%	11.44%	0%	16.64%

Case studies[31]

A number of case studies have been used to sense-check modelled outputs used to forecast the increase in cycling numbers from the WCWCI scheme. Case-studies have been used to provide comparative evidence to assess and sense check future levels of cycling in the West Cheltenham area. It is also recognised that in some cases, socio-economic differences and other differences between the two study areas will mean that comparison of similar investments in cycling infrastructure will manifest themselves in different ways according to local conditions. However, it is acknowledged that the outcomes from similar investment programmes in England can provide at least some indication of the future, projected increase in cycling levels from the proposed investment.

Case Study 1: Reallocation of road space for cyclists, Hull

The project involved the reallocation of road space from motor vehicles to cyclists, by introducing on-road cycle lanes on a large number of roads in Hull. The total length of new cycle lanes covered initially was 24km, over seven separate routes. The schemes are all on major roads, with traffic volumes of around 10,000 to 20,000 vehicles per day and cycle flows between 500 and 900 per day.

Generally, the schemes involve removal of one traffic lane in each direction and replacing this with marked car parking bays and a cycle lane separated from these by a margin strip. Advanced stop lines were also introduced at signalled junctions. The establishment of cycle lanes on major roads in Hull led to an increase in cycle flows. Of the six sites monitored, one increased cycling by 138%, three by between 20-30% and two were unchanged.

Case Study 2: Bristol and Bath railway path, Bristol-Bath

The Bristol & Bath Railway Path is built on disused railway land and links the centres of the two cities. It was originally built over the period 1978-84, partly by volunteers, 2.5 metres wide and surfaced with limestone dust.

The cycle counter at Railway Passage, Bristol, showed cyclist usage rose from 1,022 per day in 2002 to 1,107 in 2003, an increase of 8.32%.

Case Study 3: Skellingthorpe traffic free path, Lincoln

The scheme involved the completion of new 3-mile traffic-free route between Lincoln city centre and the large village of Skellingthorpe, crossing live railway and canal and allowing walkers and cyclists to bypass A46 trunk road roundabout. Bridging the railway and canal, and bypassing the major road, produced a dramatic rise in usage of the traffic-free route. A cycle counter was in place prior to these works, to give baseline data. The new link opened in June 2003, leading to an increase in cycle journeys along this route of over 300%.

Case Study 4: Cambridge Jubilee Cycleway, Cambridge

[30] Link 5A does not involve any provision of new cycling infrastructure
[31] All case-studies are available at DfT (2004) Encouraging walking and cycling: Success stories, National Archives, https://webarchive.nationalarchives.gov.uk/20100402174045/http://www.dft.gov.uk/pgr/sustainable/walking/success/

The scheme included a 2.6 km new traffic-free route and 0.4 km of cycleway on existing estate roads. A 65-metre-long jetty into the river Cam was constructed to allow walkers, cyclists and wheelchair users to pass under the Cambridge to Kings Lynn railway line.3 months after opening in 2002, there were 1,800 cycle trips per day.

Case Study 5: St.Marks' Contraflow Cycleway, Bristol

St Marks Road is a 400m long street, at the centre of a suburban shopping area in Bristol. Contra-flow cycling was introduced on a 100m long section, which forms a key route for cyclists.

The road width varies between 4m and 5m, apart from three build-outs where it narrows to 2.5m. Segregation from motor vehicles is provided for cyclists on entry to the scheme, at a kerbside build-out. Short sections of advisory cycle lane are provided at several locations, otherwise no segregation for cyclists is provided. The road carries 600 to 700 motor vehicles per day, but speeds are very low. Contra flow cycling increased from 26 per day to 51 per day, and with-flow cycling remained at the same level.

Table 3-7 - Overview of Case-Study Locations, Type of Intervention and Outcomes

Location	Type of intervention	Outcome (% increase in cycling, after opening)
Hull	Re-allocation of road space for cyclists, along major roads	Of the six sites monitored, one increased cycling by 138%, three by between 20-30% and two were unchanged
Bristol-Bath	2.5 metres wide segregated cycleway, surfaced with limestone dust	8.32% one year after opening
Lincoln	3-mile traffic-free route between Lincoln city centre and the large village of Skellingthorpe	increase in cycle journeys along this route of over 300%
Cambridge	A 2.6 km new traffic-free route and 0.4 km of cycleway on existing estate roads	3 months after opening in 2002, there were 1,800 cycle trips per day on the new link(s).
Bristol	Contraflow cycleway along 400m stretch of quiet residential street in St. Marks' area of Bristol.	Contraflow movements along the street increased by over 90% and with-flow cycling remained unchanged.

Conclusion

Case-studies used to compare modelled outputs with evaluation evidence of other, similar-scale schemes suggests that the overall increase in cycling levels predicted by the bespoke model (Table 3-6) could be a conservative estimate. However, it is accepted that local conditions vary across different case-studies and as such, estimates are considered accurate taking into account the high propensity to cycle in the Cheltenham area compared to national trends.

3.5.4. Baseline Demand for Walking in West Cheltenham

This section outlines the process of data collection to understand existing travel patterns and demand for walking in West Cheltenham. The number of journeys without the scheme corresponds to the 'Do Nothing' scenario which has been constructed on the basis of pedestrian counts undertaken at a number of locations on links designated for improvements as part of the WCWCI scheme. This is compared with the projected uplift in pedestrian journeys under the 'Do Something' scenario which requires a projection of the uplift in the number of pedestrian journeys in the with scheme case.

'Do Nothing' scenario

Existing baseline data for cycle journeys was collected on 11th, 12th and 13th February 2020 at a number of locations designated for improvement. Counts were taken between 07:00 and 19:00 (12 hrs) on weekdays (Tuesday, Wednesday and Thursday) and an average taken over the three days to establish bi-directional movements along the links. More information on the location of count sites is provided in section 2.4.2. The count data includes all walking movements on and off-road and the sample was considered representative in terms of weather conditions and timings, with no seasonal adjustments made.

Table 3-8 – Observed Pedestrian Movements in West Cheltenham, Links 1A – 5A

Ref	Link	Average Daily Pedestrian Movements
1A	Arle Court roundabout to Telstar Way Junction	447
1B	Telstar Way Junction to Benhall roundabout	132
2A	Benhall roundabout to TGI Fridays Junction (A40/B4633)	653
3A	Gloucestershire College/ Princess Elizabeth Way Junction to Benhall roundabout	1,026
4A	Gloucestershire College/Princess Elizabeth Way Junction to Cheltenham Spa Railway Station, via Shakespeare Road	755
5A	Princess Elizabeth Way to Cheltenham Spa Railway Station, via Shelley Road	755

3.5.5. Future Demand for Walking in West Cheltenham

Future with scheme usage has been calculated by applying a post intervention uplift to the existing 2020 base demand for walking. This section describes the process used to calculate future demand for walking in the West Cheltenham area. The approach to estimating future demand in the 'Do Something', with scheme scenario is based on comparative evidence from similar schemes.

Case studies

The Business Case for WCWCI has assumed a 10% increase in walking as a result of the proposed scheme. It is proposed that 10% is a conservative and robust assumption. A number of case studies can be evidenced, as below, to demonstrate that 10% is a reasonable assumption to apply. It should be noted, that by nature, most of the case studies are for larger schemes across town centres. However, our scheme is also ambitious in nature, and also encompasses other WCTIS-linked improvements such as at the Arle Court Park and Interchange site, improvements for buses and public transport, and future housing and employment land extensions near the GCHQ site.

Case Study 1 – Exeter City Centre[32]

City-wide improvement programme including new retail space, lighting, paving, seating, creation of a boulevard, prioritisation of pedestrians and linking the day and night-time economies. The scheme at Princess Hay developed new retail space, but this was integrated with a network of public spaces and a high-quality public realm. The programme started in 2000 with the development of Queen Street and has received over £4.5 million in public and private investment. Generally, there has been around a 30% increase in pedestrian numbers.

Case Study 2 – Kensington High Street[33]

The total cost of the work at Kensington was circa £5m. The main objective of the scheme was to improve the quality of the public realm in order to maintain and enhance the vitality and viability of the High Street as a major shopping destination. A key aim was to improve pedestrian movement along and across the road whilst also maintaining vehicle traffic flows. Results were as follows:

- Pedestrian numbers increased by 2% to 22%;
- Pedestrian movement at crossings increased by up to 25%;

The street improvements have enhanced the quality of streetscape and the use of high-quality materials has reinforced the image of the High Street as a premier shopping destination. Road safety has improved and collisions reduced. Vehicle speeds have reduced slightly and observations suggest that drivers are more aware of pedestrians. Similarly, pedestrians, able to cross safely at a wider range of places, seem to be more attentive

[32] University of the West of England (UWE) and Cavill Associates (2011) Making the Case for Investment in the Walking Environment: A Review of the Evidence, https://www.livingstreets.org.uk/media/1394/2011-making-the-case-full-report.pdf

[33] University of the West of England (UWE) and Cavill Associates (2011) Making the Case for Investment in the Walking Environment: A Review of the Evidence, https://www.livingstreets.org.uk/media/1394/2011-making-the-case-full-report.pdf

in their use of the street. During the three years after completion traffic collisions in the affected area reduced by more than 40%, with pedestrian casualties reducing by 59%.

Case Study 3 – Eastbourne Town Centre[34]

The total scheme cost was £5m. The scheme centres on continuing greater priority and accessibility for pedestrians along the middle section of the town centre's Terminus Road corridor. It includes;

- New upgrading of an existing pedestrianised areas;
- opening up to two-way traffic configuration at the lower end of two link roads.

Whilst traffic flows are relatively low compared to pedestrian movements in the area, the road through the space still creates a vehicle dominated environment where pedestrians are restricted in their movement. There are only two dropped crossing points for pedestrians, and railings on either side of the road corralling pedestrians to the main crossing point near Debenhams. The street furniture, including bollards, and parked vehicles therefore makes the overall area uninviting and not practically accessible for pedestrians, especially factoring in inclusivity.

(There is a significant body of evidence (which is covered in more detail in the economic appraisal report in Appendix G to suggest that urban realm improvement works have the potential to substantially increase pedestrian visitor numbers. For example, urban realm improvements in Sheffield resulted in a 35% increase in footfall across the Sheffield city centre, and in Coventry, urban realm improvements attracted a 25% increase in weekend pedestrian numbers. We therefore expect an increase in visitor numbers to Eastbourne because of this scheme.

Case Study 4 – Oxford Transport Strategy[35]

The Oxford Transport Strategy was a six-year programme to reduce congestion, improve the urban environment and quality of life. The central aim of the strategy was to shift private car trips to bus, cycle and foot. In June 1999, central area access restrictions were implemented and included:

- Bus priority route around the central area, pushing general traffic further out of the city centre;
- Cornmarket Street (major shopping street): closed to all traffic;
- High Street: daytime access for cyclists, buses and taxis only;
- Broad Street: Closed to through-traffic; and
- Improvements to city cycle route network

Oxford has succeeded in attracting more people into the city, but by more desirable modes:

- central area pedestrian flows increased by 8.5% (6,000/day) between 1998 and 2000, reversing a declining trend;
- use of the three central car parks fell 14% (700 cars per day) in 2000 compared to the three previous years; and
- local bus and Park and Ride usage rose 50% between 1991 and 2000 (2,000/day)

These results were achieved without reducing one of the highest levels of cycling in the UK - 11% of the modal split and 17% of journeys to work. Oxford shows that traffic restraint and promotion of walking, cycling and public transport can increase urban vitality.

Case Study 5 - Halifax Historic Centre[36]

In Halifax, a traffic regulation order was used to designate the historic town centre as a "restricted zone", so as to avoid a proliferation of signs and markings. The restricted zone was subject to a 20 mph speed limit and the "Market Quarter" became a pedestrianised zone between 9.30 am and 4.00 pm. As a result, traffic speeds fell in Market Street from 17 to 15 mph (85th percentile speeds) and in Commercial Street from 22 to 18 mph.

[34] South East LEP (2019) Capital Project Business Case: Eastbourne Town Centre Movement and Access Package, https://consultation.eastsussex.gov.uk/economy-transport-environment/phase-2-eastbourne-town-centre/supporting_documents/EastbourneTownCentreMovementandAccessPackagePhase2BusinessCase1.pdf
[35] DfT (2004) Encouraging walking and cycling: Success stories, National Archives, https://webarchive.nationalarchives.gov.uk/20100402174045/http://www.dft.gov.uk/pgr/sustainable/walking/success/
[36] DfT (2004) Encouraging walking and cycling: Success stories, National Archives, https://webarchive.nationalarchives.gov.uk/20100402174045/http://www.dft.gov.uk/pgr/sustainable/walking/success/

Significantly, pedestrian activity rose 17% on Market Street and 59% on Commercial Street between 1998 and 2002.

Conclusion

Based on the type of intervention, which for the most part includes the re-surfacing of walkways and increased segregation for pedestrians from cyclists and other users, a post intervention uplift of 10% has been applied to walking journeys directly attributed to all component links of the WCWCI scheme. Estimates of the increase in pedestrian movements from the intervention are provided in Table 3-9. Baseline numbers collected as part of pedestrian counts are combined with information on the type of intervention and forecast changes in the number of people using the walkways.

Table 3-9 – Estimates of Pedestrian Movements Before and After Intervention

	Link 1A	Link 1B	Link 2A	Link 3A	Link 4A	Link 5A	Total
2020	447	132	653	1,026	755	755	3,013
2021							
DN	447	132	653	1,026	755	755	3,013
DS	492	145	718	1,131	831	831	3,317
Diff	+45	+13	+65	+105	+76	+76	+304
Uplift (%)	10%	10%	10%	10%	10%	10%	10%

3.6. Analysis of Monetised Costs and Benefits

The economic case has been developed based on a comparison of a without scheme 'Do Nothing' scenario and a with-scheme 'Do Something' scenario. The costs and benefits from the predicted increase in walking and cycling trips from the WCWCI scheme, are based on the following assumptions:

- Scheme costs include all necessary development (preparation) costs, capital and maintenance costs;
- Capital and maintenance costs have been converted to market prices through a market price conversion factor of 1.191;
- Scheme costs have been adjusted for quantified risk to estimate risk adjusted costs and optimism bias has been set at 15%, in accordance with WebTAG A1.2[37];
- Economic costs and benefits are expressed in 2010 market prices, using the May 2019 deflator series to express economic costs and benefits in constant 2010 prices in keeping with WebTAG guidance; and
- An appraisal period of 20 years has been used for the calculation of present value costs and benefits. A discount rate of 3.5% per annum and all values are discounted to 2010 for the purposes of establishing the NPV and the BCR for the scheme.

3.7. BCR calculations

The overall BCR for the scheme has been calculated by comparing the cumulative costs against the benefits of component links of the WCWCI scheme. This can be summarised as follows, in terms of present value costs and benefits, with the overall Initial BCR for the scheme estimated at 2.66. The scheme NPV is calculated at £2.19m as shown in Table 3-10.

[37] https://www.gov.uk/government/publications/webtag-tag-unit-a1-2-scheme-costs-july-2017

Table 3-10 – Benefit-Cost Ratio (BCR), by Link and for WCWCI Scheme

Ref	Present Value Benefit (PVB)	Present Value Cost (PVC)	BCR
Link 1A	£296,055	£198,156	1.49
Link 1B	£167,752	£453,188	0.37
Link 2A	£1,331,376	£302,387	4.40
Link 3A	£665,710	£100,239	6.64
Link 4A	£745,099	£194,424	3.83
Link 5A	£303,212	£72,275	4.20
	£3,509,205	**£1,320,669**	
	Scheme NPV	**£2,188,535**	
	Scheme BCR	**2.66**	

All entries are in 2010 prices and values

Summary tables presenting monetised economic benefits and costs, NPV and the BCRs for all component links of the WCWCI scheme are provided in

Figure 3-3 to Figure 3-8. The primary monetised economic benefits associated with the West Cheltenham Walking and Cycling Improvement (WCWCI) scheme are:

- The physical activity benefits from walking and cycling in terms of reduced mortality and absenteeism;
- A reduction in Greenhouse Gas (GHG) emissions, noise pollution, air quality improvements from the transfer of car trips to cycling and walking;
- Journey quality benefits for users of the route; and
- Decongestion savings and a reduction in accidents.

Figure 3-3 - Analysis of Monetised Costs and Benefits, Link 1A

Analysis of Monetised Costs and Benefits (in £'000s)

Congestion benefit	5.19
Infrastructure	0.05
Accident	1.95
Local Air Quality	0.04
Noise	0.13
Greenhouse Gases	0.25
Reduced risk of premature death	204.52
Absenteeism	61.13
Journey Ambience	23.72
Indirect Taxation	-0.87
Government costs	198.21
Private contribution	0.00
PVB	296.055
PVC	198.156
BCR	**1.49**

Benefits by type:

Mode Shift	6.73	2.3%
Health	265.65	89.7%
Journey Quality	23.72	8.0%

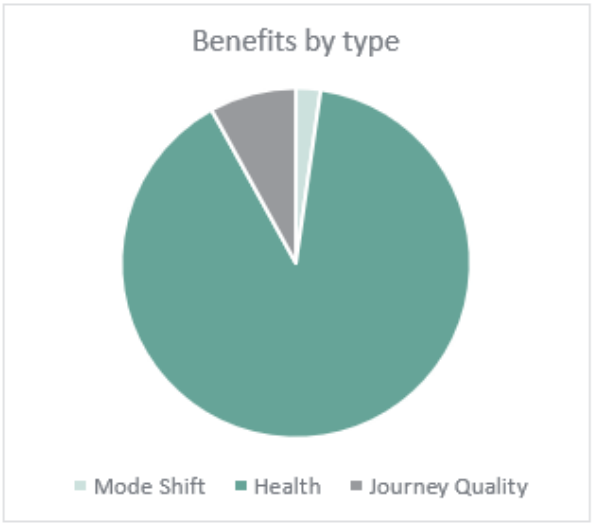


Figure 3-4 - Analysis of Monetised Costs and Benefits, Link 1B

Analysis of Monetised Costs and Benefits (in £'000s)

Congestion benefit	2.71
Infrastructure	0.03
Accident	1.02
Local Air Quality	0.02
Noise	0.07
Greenhouse Gases	0.13
Reduced risk of premature death	94.87
Absenteeism	25.92
Journey Ambience	43.47
Indirect Taxation	-0.45
Government costs	453.21
Private contribution	0.00
PVB	167.752
PVC	453.188
BCR	**0.37**

Benefits by type:

Mode Shift	3.53	2.1%
Health	120.79	72.0%
Journey Quality	43.47	25.9%

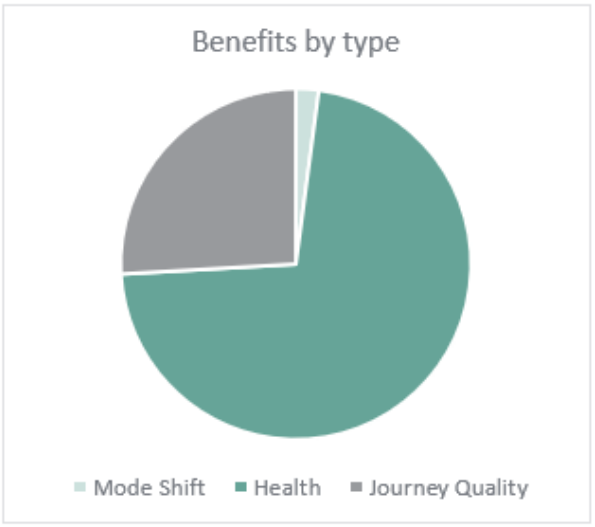


Figure 3-5 - Analysis of Monetised Costs and Benefits, Link 2A

Analysis of Monetised Costs and Benefits (in £'000s)

Congestion benefit	27.77
Infrastructure	0.27
Accident	10.42
Local Air Quality	0.23
Noise	0.69
Greenhouse Gases	1.31
Reduced risk of premature death	887.17
Absenteeism	223.66
Journey Ambience	184.75
Indirect Taxation	-4.64
Government costs	302.65
Private contribution	0.00
PVB	1331.376
PVC	302.387
BCR	**4.40**

Benefits by type:

Mode Shift	36.06	2.7%
Health	1110.83	83.4%
Journey Quality	184.75	13.9%

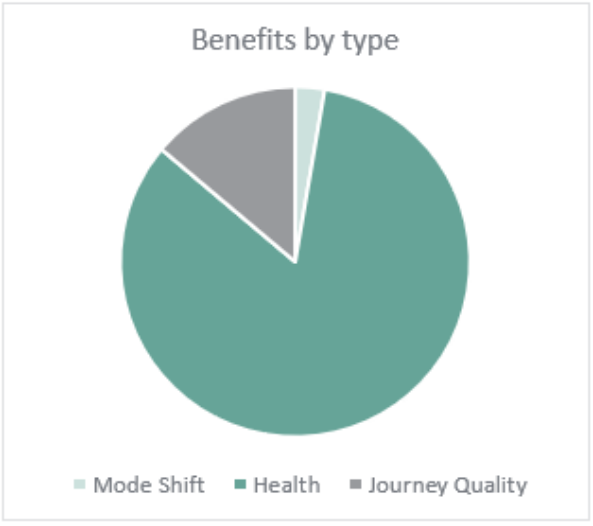


Figure 3-6 - Analysis of Monetised Costs and Benefits, Link 3A

Analysis of Monetised Costs and Benefits (in £'000s)

Congestion benefit	11.40
Infrastructure	0.11
Accident	4.28
Local Air Quality	0.09
Noise	0.29
Greenhouse Gases	0.54
Reduced risk of premature death	454.90
Absenteeism	137.05
Journey Ambience	59.07
Indirect Taxation	-1.90
Government costs	100.35
Private contribution	0.00
PVB	665.710
PVC	100.239
BCR	**6.64**

Benefits by type:

Mode Shift	14.80	2.2%
Health	591.95	88.9%
Journey Quality	59.07	8.9%

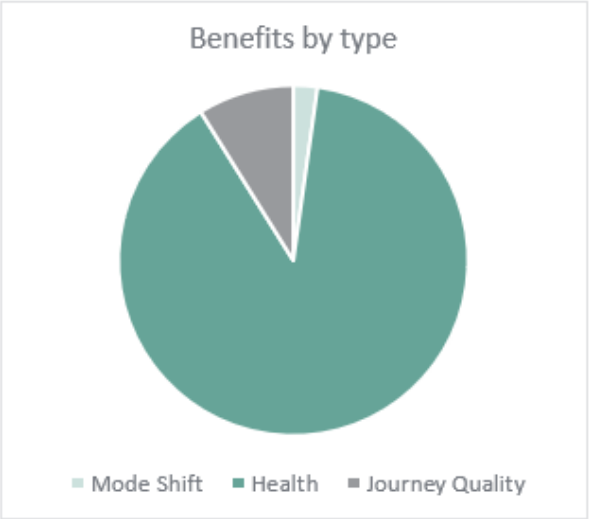


Figure 3-7 - Analysis of Monetised Costs and Benefits, Link 4A

Analysis of Monetised Costs and Benefits (in £'000s)

Congestion benefit	14.64
Infrastructure	0.14
Accident	5.49
Local Air Quality	0.12
Noise	0.37
Greenhouse Gases	0.69
Reduced risk of premature death	516.63
Absenteeism	142.33
Journey Ambience	67.27
Indirect Taxation	-2.44
Government costs	194.57
Private contribution	0.00
PVB	745.099
PVC	194.424
BCR	**3.83**

Benefits by type:

Mode Shift	19.01	2.6%
Health	658.96	88.4%
Journey Quality	67.27	9.0%

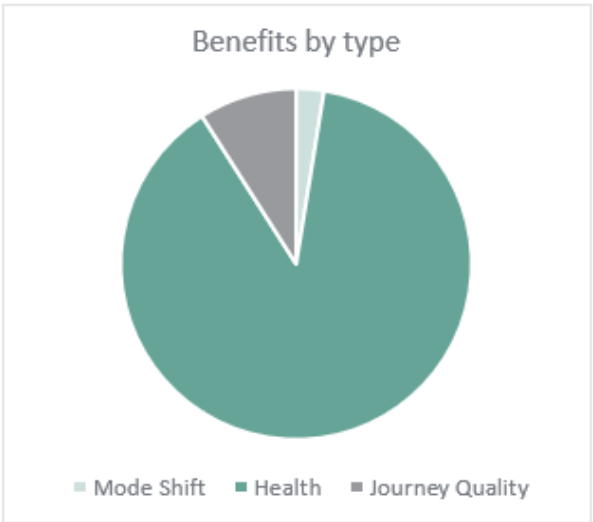


Figure 3-8 - Analysis of Monetised Costs and Benefits, Link 5A

Analysis of Monetised Costs and Benefits (in £'000s)

Congestion benefit	3.38
Infrastructure	0.03
Accident	1.27
Local Air Quality	0.03
Noise	0.08
Greenhouse Gases	0.16
Reduced risk of premature death	188.67
Absenteeism	67.44
Journey Ambience	42.75

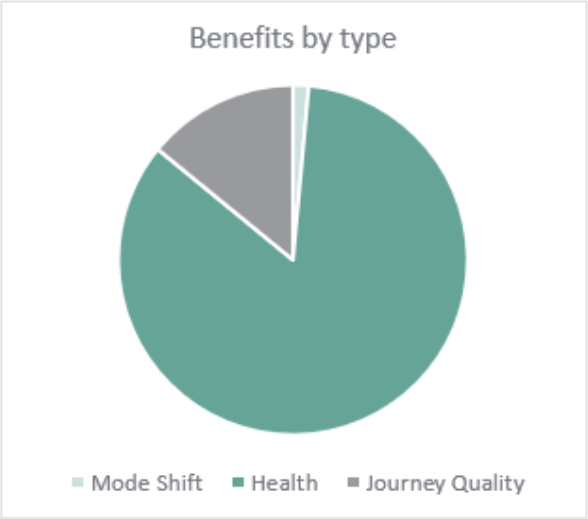
Indirect Taxation	-0.56
Government costs	72.31
Private contribution	0.00

PVB	303.212
PVC	72.275

BCR	**4.20**

Benefits by type:

Mode Shift	4.39	1.4%
Health	256.11	84.5%
Journey Quality	42.75	14.1%



3.8. Analysis of Non-Monetised Costs and Benefits

3.8.1. Economy

Business users and transport providers

As the scheme is not a highway-based scheme, no appraisal has been undertaken on journey time savings using economic software such as TUBA. There will be a small reduction in congestion and a reduction in damage done to road services from modal shift that will benefit all road users, including business users. The impact is qualitatively assessed as **slight beneficial**.

Reliability impacts on business users

The scheme is deemed to result in some element of mode shift from private car travel to active modes (walking and cycling) in West Cheltenham. This will release capacity on the current highway network through the active promotion and provision of walking and cycling infrastructure that will lead to (de)congestion benefits and a reduction in infrastructure maintenance costs from a small decrease in traffic flows. The impact is qualitatively assessed as **slight beneficial**.

Regeneration

No regeneration areas (as specified in WebTAG) are expected to be impacted by the implementation of the scheme. The impact is assessed qualitatively as **neutral.**

Wider impacts

There are not considered to be any significant wider impacts of the scheme, due to the local nature of cycling and pedestrian movements. However, improvements to cycling and walking routes in close proximity to the West Cheltenham strategic allocation will provide some extra capacity to accommodate additional trips generated by the Cyber Central development, which includes 45 hectares of land for a new Cyber Park development and an additional 1,000 housing units adjacent to the current GCHQ site. Therefore, the impact is assessed as qualitatively **slight beneficial**.

3.8.2. Environment

Noise and Vibration

During construction, there is potential for noise effects at local properties whilst new sub-base and surfacing is created for the cycleway. To avoid disturbance, the timing of works and mitigation measures from BS5228 will be required to ensure noise effects at local properties are reduced as far as reasonably practicable. Any construction noise effects will be temporary in nature, and by ensuring works are not undertaken at night, disturbance at local receptors will be minimised.

During Operation, the utilisation of the cycleway will potentially reduce traffic movements on the existing local highway network and therefore increase traffic flow. This change in traffic flow, may reduce noise levels at local properties, however, it is also possible that higher vehicle speeds could increase noise levels at local receptors. The current projections for increases in cycle users are not large enough to lead to any discernible change in traffic flow and therefore noise and vibration levels in the area. Therefore, it is likely that any effects on noise from the scheme are likely to be **neutral** from a noise and vibration perspective.

Air Quality

Air Quality Criteria

The scoping criteria for air quality assessment of road schemes provided in Highways England's Design Manual for Roads and Bridges has been utilised as a reference. As a linear scheme adjacent to an existing highway, this was seen as the most practical methodology to follow in this instance. According to the DMRB an air quality assessment needs to be undertaken where a scheme meets any of the following criteria:

- Road alignment changes by 5m or more;
- Daily traffic flows change by 1,000 AADT or more;
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more;
- Daily average speed will change by 10 km/hr or more; or
- Peak hour speed will change by 20 km/hr or more.

In this instance, the scheme is not likely to trigger any of the above so an air quality assessment is not required.

Baseline Air Quality

Air Quality in the area surrounding the WCWCI scheme is generally poor, with the area lying within the existing Cheltenham wide AQMA. Whilst levels in the near vicinity are currently below the annual Air Quality Objective for NO_2 of 40 ug/m^3, current levels are still close to this objective. These existing air quality problems are one of the drivers for the scheme, as the scheme aims to displace traffic movements with active travel.

Constraints

There are no near-by designated ecological sites and therefore it is not anticipated that the Proposed Scheme will materially affect air quality conditions in proximity to this ecological site.

Construction

During construction, there is potential for air quality effects at local properties from dust emissions from the construction zone. However, the use of best practice dust management methods outlined in the Institute of Air Quality Management (IAQM) guidance should prevent emissions of dust affecting local property. However, to ensure a suitable level of dust mitigation during construction is identified and implemented on site, a Construction Dust assessment should be undertaken prior to construction.

Operation

The operation of the scheme is likely to cause some reduction in traffic movements and therefore increase traffic flows. As above, it is expected that the scheme in its entirety will lead to additional cycle journeys across the scheme. The potential change in traffic flow will allow vehicles to travel more efficiently and could lead to a minor reduction in the emissions of NO_x in the study area. This may have a **slight beneficial** effect, although without modelling of the displacement of traffic, this change is based on professional judgement.

Greenhouse Gases

The construction of the scheme will lead to some greenhouse gas emissions from construction plant and materials used to construct the scheme. However, these embedded carbon costs are likely to be minimal.

As noted above, the scheme is predicted to additional movements by bicycle in the 'Do Something' scenario as well as encouraging a modal shift towards bicycle and active travel movements. This will likely lead to a minor reduction in vehicle movements and therefore have a **slight beneficial** effect on Greenhouse Gas emissions by removing some greenhouse gas emitting vehicles from the highway.

Landscape and Townscape

The section of the A40 is generally bordered by linear blocks of trees, shrubs, hedges and garden vegetation, which provide an attractive character, with some particularly distinctive features such as the mature landscape of amenity shrubs and trees bordering Kingsley Gardens and Oldfield Crescent.

Poets Conservation Area extends into the Scheme over Kingsley Gardens. The trees within the Conservation Area are likely to have TPO status due to their size but in any case, would require a Section 211 notice if work is required.

Between Arle Court Roundabout up to Kingsley Gardens, the main visual receptors are: (1) residential properties of Telstar Way/Gemini Close, which are mainly well screened but some properties have open views over the A40; (2) Miserden Road and Campden Road, with relatively dense intervening vegetation providing good screening, although with views from upper floors; (3) Sotherby Drive, Monks Croft and Benhall Gardens with quite open or filtered views; (4) Kingsley Gardens and Oldfield Crescent which are well screened with intervening garden and amenity planting, but have filtered glimpse and some open views at the ends of each crescent; and (5) the properties along the A40 opposite Oldfield Crescent and east of Griffith Avenue, which have very open views.

Between Benhall Roundabout and Kingsley Gardens, the scheme encroaches into the Root Protection Area (RPA) of 5 trees. It is anticipated that three of these would require removal but the others should have limited impact if care is taken during construction. Of the three for removal, the arboricultural survey has identified one as Category U and is advised to be removed anyway; one is Category C and one Category B. There is also expected to be some minor pruning back of hedges here to accommodate the widening of the existing shared use path. All these trees and hedges contribute to the character of the area and provide amenity value but are not essential for visual screening and their loss is expected to be noticeable but not overly adverse.

At Kingsley Gardens, the scheme encroaches into the RPA of seven trees and of these it is anticipated that five would require removal, all of which are Category B trees. Removal and pruning back of the amenity shrubs would also be required. The use of geotextile surfacing may help to retain some of the trees. All these trees and hedges contribute to the character of the area and provide amenity value, as well as screening for residents of Kingsley Gardens. The loss of such mature vegetation is expected to be obvious and have an adverse impact on the area.

At Oldfield Crescent, the scheme encroaches into the RPA of five trees, a group of horse chestnuts close to Griffith Avenue, four are Category B and one is Category A. The use of geotextile surfacing is considered help to retain most of these trees, but one Category B tree would be required to be removed, although this is slightly set back from the other four. Some pruning back of the amenity shrubs along this section would also be required. All these trees and hedges contribute to the character of the area and provide amenity value, as well as screening for residents of Oldfield Crescent. The loss of one tree which is slightly set back from the main line of trees here is not expected to be obvious although the pruning back of some vegetation would be noticeable.

Further east along the scheme it is assumed that there would not be any impact on the existing garden boundaries, although this needs to be confirmed. The impact of the scheme here is therefore expected to be slight beneficial with a wider shared route path improving amenity for users.

The Scheme seeks to limit vegetation removal to that which is necessary for the Scheme. For the most part, although there would be some loss of trees and amenity shrubs, these are not expected to affect the overall landscape character or visual amenity of the area. However, for the area adjacent to Kingsley Gardens the loss of mature trees and amenity shrubs would have adverse impact in terms of character, amenity and screening value.

Replacement planting of trees and shrubs on a 2 for 1 basis within and just beyond the Scheme would be provided and, once mature, would help to mitigate the initial loss of amenity and screening.

The overall effect of the proposed scheme without mitigation is expected to be **slight adverse** and, once **appropriate mitigation planting has matured the effect is expected to neutral/negligible beneficial**, depending upon the extent of mitigation measures.

Biodiversity

A desktop assessment and extended Phase 1 Habitat Survey were conducted in 2018. The scheme has evolved since then and includes works that may not have previously been considered. Atkins undertook a Preliminary Ecological Appraisal (PEA) of the Scheme in November 2019.

The desktop survey found two statutory sites within 2km of the works required to deliver the Scheme: Badgeworth Site of Special Scientific Interest (approximately 900 m to the South) and Griffith Avenue Local Nature Reserve (approximately 300m north of closest part of the scheme). Three other designations were also identified: Cold Pool Lane Conservation Road Verge, and two 'Unconfirmed Key Wildlife Sites'. There should be no impact from the Phase 3 & 4 Scheme on any statutory or non-statutory sites.

The Scheme is situated within Cheltenham and the 'soft landscaped' habitats are predominantly planted and or managed. Surveys identified the following habitats of potential ecological value within the Scheme area: linear strips of deciduous woodland, scrub, a shallow slow-flowing watercourse (Hatherley Brook), semi-improved neutral grassland (Road verges). The Scheme will impact upon these areas and result in a net loss of soft landscaped areas. Deciduous woodland is identified as a Priority Habitat on the Priority Habitat Inventory. Some loss to deciduous woodland is unavoidable but the Scheme will seek to keep this to the absolute minimum necessary. Impacts on the watercourse will also be kept to a minimum. As well as committed landscape planting within the scheme design, additional opportunities to manage the potential adverse effects of habitat loss through appropriate planting and appropriate, nature conservation sympathetic management of adjacent public green space habitat.

Further ecological surveys have been scheduled for 2020 to inform which ecological constraints remain present.

The field survey identified suitable habitat for roosting, foraging and commuting bats including linear woodlands throughout the site. Four trees within Phase 3 were identified as having either low or medium bat roost potential (See PEA document). Three of these trees had ivy present, and these trees were assessed as having at least low bat roost potential as a precaution. One field maple (found in the north west of the site) was assessed as having medium bat potential with a north facing crack feature 1 m from the ground. Nine trees within Phase 4 were identified as having either low bat potential. All trees had ivy present, these trees were assessed as having at least low bat roost potential as a precaution. The culvert for Hatherley Brook, found in Phase 3, under the A40 had limited access for survey and therefore on a precautionary assessment was assigned moderate bat roost potential until further surveys are conducted in 2020.

Currently (based on the concept design), there is no requirement for the removal of any of the above trees or structures as part of the works although some could be indirectly affected through noise, vibration and light pollution during construction. Further bat surveys and mitigation measures may be necessary prior to scheme commencement to comply with legal requirements regarding the protection of bats and their roosts. Where the chances of impacts on bats are limited, a Precautionary Method of Working (PMW) may be applicable and is likely to include mitigation (for example careful vegetation clearance and ecological clerk of works). More significant works or works close to confirmed bat roosts would likely require a European Protected Species (EPS) Licence issued by Natural England. This may require an appropriate method to clear the site of bats prior to works.

Survey undertaken as part of the PEA and desk study information used to inform a Great crested newts (GCN) technical note have identified six ponds within 500 m of the scheme. GCN can use habitats within 500m of breeding ponds but tend to make greater use of habitat within 250m. A GCN Technical Note has been produced, using desk-based information and assesses the risks relating to GCN for the Scheme. This identified two ponds requiring further surveys, initially comprising Habitat Suitably Index (HSI) assessment and environmental (e) DNA surveys.

Until the ponds have undergone HSI and eDNA assessments, it must be assumed that they have suitability for GCN, and that there is a possibility of impacting GCN or their habitat during the works. Where the chances of impacts on GCN are limited, (either minor works or works in locations distant from a pond) a Precautionary Method of Working (PMW) may be applicable and is likely to include mitigation (for example careful vegetation clearance and ecological clerk of works). More significant works or works close to ponds used by GCN would likely require a European Protected Species (EPS) Licence issued by Natural England. This may require an appropriate method to clear the site of GCN prior to works.

Hatherley Brook offers suitable habitat for otter, water vole and white-clawed crayfish and further surveys will need to determine presence/ likely absence of these species although as no works are required within the watercourse, it is hoped all effects can be easily mitigated.

Surveys have identified potential for hazel dormice and common species of reptile and amphibian within the scheme area. Appropriate mitigation (for example careful vegetation clearance and ecological clerk of works)

will be required during site clearance works and any species of common reptile will need to be re-located to an appropriate place of safety (either within the scheme or at possibly on a separate 'receptor site' which might need to be created or enhanced). More significant works or works close to confirmed hazel dormouse habitat would likely require a European Protected Species (EPS) Licence issued by Natural England. This may require an appropriate method to clear the site of dormice prior to works. There is habitat suitable for nesting birds and appropriate mitigation will be required during site clearance, ideally through the avoidance of the bird nesting season (between February to September).

Further ecological field surveys will identify ecological constraints prior to commencement of works to ensure findings are complete and up to date and mitigation is appropriate.

In summary, habitats in the Scheme area are within the urban landscape and planted or managed. None are considered to be rare or distinctive (in a biodiversity context). The scheme will result in a net loss of some 'soft landscaped' habitats, but others will be retained and areas will be planted to managed for nature conservation benefit. Surveys have identified potential for protected species including bats, hazel dormice, reptiles, otter, water vole, white-clawed crayfish and great crested newts. Pre-works surveys will identify mitigation appropriate to any protected species on the site. Therefore, **the effect of the scheme is considered to be neutral when mitigation is applied.**

Cultural Heritage

The historic environment is recognised as an irreplaceable resource that should be preserved in a manner appropriate to its significance.

No Designated Assets, such as Listed Buildings, Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields or World Heritage Sites will be directly impacted upon by the scheme. None will be indirectly impacted as a result of changes to their settings, during this phase of the scheme.

Large Second World War installations are recorded on the HER (GHER48062) as having been located at Benhall Roundabout, but these remains are very likely to have been removed by the construction of the A40 and development of the Monkscroft estate. Although there is potential for archaeological remains within the wider area, the proposals are confined to the existing highway boundary and works on the original construction of the A40 are likely to have removed or significantly truncated any unknown archaeological remains which existed.

The scheme travels through part of The Poets Conservation Area at Kingsley Gardens. Care will need to be undertaken with the scheme to limit effects upon the conservation area and prevent any effects on its current setting. Further discussions are required with the Heritage Officer to ensure the existing setting is not affected.

The impact of the scheme would therefore be **neutral**, and this topic has been scoped out from further assessment, however the potential for enhancement of these assets, has where possible, been taken into consideration in the scheme design.

Water Environment

Existing Environment

As reported in the WCTIS – Phase 3 and 4 business case, Link 1A of the WCWCI involves construction of a cycleway at the base of the current A40 embankment where Hatherley Brook currently flows culverted under the A40. This is the only watercourse crossing put forward as part of the WCWCI scheme with the project's other linkages with the water environment being integration into the existing drainage of the highway. The scheme does not influence any areas of Flood Zone 2 or 3.

The EA Risk of Flooding from Surface Water (RoFSW) maps show that there are a number of locations at risk of surface water flooding at the Benhall roundabout and along the eastern and western approaches to the roundabout on the A40. The existing surface water flood risk locations identified are:

- Westbound A40 from Benhall roundabout to Telstar Way - Low, Medium and High-Risk zones;
- Eastbound A40 from Telstar Way to Benhall roundabout - Low Risk zone;
- Benhall roundabout circular lanes - Low, Medium and High-Risk zones; and,
- Eastbound and westbound A40 from Benhall roundabout to Kingsley Gardens, including the pedestrian subway that crosses under the carriageway at a location approximately 50m east of the roundabout - Low, Medium and High-Risk zones.

Potential Effects

- Construction;
- During construction, the following potential effects are possible;
- The excavation of materials, and the subsequent deposition of soils, sediment, or other construction materials, for example through the construction of the proposed shared-use cycleway;
- The spillage of fuels or other contaminating liquids from plant used in the construction process;
- The mobilisation of contamination following the disturbance of contaminated ground or groundwater during the construction phases;
- Runoff from construction sites creating contamination sources to the water environment;
- The storage of materials and temporary impermeable areas at site compounds may result in an increase in flood risk to the scheme itself and surrounding land; and
- There are surface water flood extents on the Scheme. Increasing the impermeable area will increase this risk or the scheme and off-site areas;

Operation

The increased surface area will increase runoff in the area. However, the final discharge destination of this runoff is currently uncertain at this stage of design but is likely to be partially discharged into Hatherley Brook. As such, there are potential impacts to surface water quality and flow volumes on Hatherley Brook owing to the increase in impermeable area as a result of the widening works and the additional risks associated with road runoff and pollution. This has the potential to overload the capacity of the drainage system. The increased flow rates can also contribute to larger flood peaks in receiving watercourses.

Whilst pollution events are often increased by increased impermeable areas, potential 'trip generators' using the proposed shared-use cycleway will just be people travelling on foot or by bicycle. The potential operational pollution impact associated with such generators is assumed to be low and would contain negligible concentrations of substances associated with road pollution.

The proposed shared-use cycleway will cross Hatherley Brook. However, it is thought that no culvert extensions or realignments are required and as such no/minimal hydromorphology impacts are anticipated.

There is no change in floodplain storage as a result of the proposed works as the WCWCI scheme does not impinge on the Hatherley Brook floodplain and therefore does not reduce this storage.

Potential Mitigation

Construction

Construction mitigation will include, but not be limited to the following:

- All works to be undertaken with regard to Pollution Prevention Guidelines (PPGs). These detail good practice advice for undertaking works which may have the potential to cause water pollution.
- Areas which may generate contaminated water, such as oil storage areas would need to be bunded and have water discharged to self–contained units with treatment facilities. There would be no discharge to groundwater.
- Tests would be undertaken to ensure contaminated material is identified, isolated and reworked or removed to special landfill to avoid any leachate problems; and
- For construction work which has drainage implications, the proposed drainage system should comply with the National Standards, such as Schedule 3 under the Flood and Water Management Act 2010.

Operation

- The preferred approach is to provide mitigation through the drainage design to treat run-off and provide mitigation for both the quality and attenuation of water. The choice of the system is dependent on the physical environment of the Scheme and needs to consider the availability of land, climate and rainfall characteristics, soil permeability, topography and spillage risk.
- Enhanced drainage can mitigate impacts on surface water floodrisk and consideration will be given to options for reducing surface water flood risk compared to the existing situation.

- The proposed drainage design will incorporate additional capacity to ensure that the runoff from the Scheme is attenuated so there will be no increase in surface water runoff from the Scheme.

Summary

In summary, based on the design assumptions, the key issues are:

1. For surface water quality owing to the discharge of runoff from the cycleway into Hatherley Brook, it is recommended that the drainage design takes this into account to ensure no increase in discharge rates and ensure there is no decrease in water quality as a result of the scheme.
2. The need for a Flood Risk Assessment and Drainage Strategy will be discussed with the Lead Local Flood Authority (Gloucestershire County Council) and Environment Agency. Detailed design will be progressed in consultation with the Lead Local Flood Authority and Environment Agency to discuss any flood management actions/issues under the Flood and Water Management Act 2010.

If the drainage design can suitably factor in the above, the proposed effect of the scheme is likely to be **neutral**.

3.8.3. Social

Commuting and other users

By providing new and improved cycle and walking links in West Cheltenham, it is expected that this will encourage members of the public to utilize the route for commuting and leisure purposes, particularly for less confident cycle users as the existing situation does not allow for a safe and efficient journey between residential and employment sites. AMAT does not disaggregate by commuting and other user groups. As such, there will be a small reduction in congestion from modal shift that will benefit all road users. The economic benefit to road users from the WCWCI scheme is estimated at approximately £0.065m over the appraisal period (2010 prices, discounted to 2010). As such, the impact is quantitively assessed as **slight beneficial.**

Reliability impacts on commuting and other users

The cycle and walking routes are expected to encourage the public to use cycling and/or walking as their primary means of transport or at a minimum consider using the links for recreational activities. By creating a dedicated route for cyclists and pedestrians through the provision of segregated routes this has the potential to encourage modal shift from the private vehicle to the more sustainable modes of travel. Consequently, this is expected to reduce vehicle kilometres and traffic congestion. We do not expect any disruption to the highway network during the construction phase as the majority of improvements are off-carriageway. The impact has been qualitatively assessed as **slight beneficial**.

Physical activity

Dedicated cycle and pedestrian routes are expected to encourage and promote physical activity in West Cheltenham through providing a safe and efficient route for active travel. The dedicated cycle and pedestrian routes are expected to reduce severance for users by providing segregated links that include safe crossing points (through the provision of table top crossing points) that give the public confidence to use as a viable alternative to car travel. The impact has been quantitively assessed as **moderate beneficial**, with health benefits from reduced absenteeism and reduced risk of premature death estimated at approximately £3.00m over the appraisal period (2010 prices, discounted to 2010) across all scheme links.

Journey quality

It is important to note that this scheme proposes almost 2kms of off-carriageway cycle and walking provision being implemented. Increasing lane widths and providing dedicated routes will improve overall journey quality and encourage repeated and return trips. It will also help to reduce user conflict with vehicles on busy stretches of the A40, which is the main entry point into central Cheltenham from the west. The impact is quantitatively assessed as **moderate beneficial**, with benefits from improved journey quality for users estimated at approximately £0.42m over the appraisal period (2010 prices, discounted to 2010).

Accidents

High traffic volumes on the A40, particularly between Benhall roundabout and TGI Fridays Junction (A40/B4633), has led to a number of pedestrian and cyclist accidents in the scheme area of investigation. The percentage of pedestrians involved in collisions (11.6%) is in line with the national average (12.2%). Cyclists however experience a much higher casualty rate along the links (23.3%) than the national average of 6.7%. There were 15 accidents involving pedestrians and cyclists along links making up the WCWCI scheme,

between 2014 and 2018. The majority of these accidents were classed as slight or severe, with one pedestrian fatality near the TGI Fridays (A40/B4633) Junction. The impact of the scheme is to reduce the number of potential conflict points through segregated provision for active travel. The impact is quantitively assessed as **slight beneficial** in relation to an increase in road safety from a reduction in vehicle kilometres estimated at £0.024m over the appraisal period (2010 prices, discounted to 2010).

Security

Moving cyclists off the carriageway away from potential public surveillance on some of the routes could reduce personal security. However, the links where improvements are proposed, in the majority of cases, have a good level of natural surveillance and a number of the proposed routes also run alongside the carriageway so personal security is not thought to be adversely affected. The impact is therefore qualitatively assessed as **neutral**.

Access to services

The scheme does not inherently provide for any change in public transport accessibility as there are no proposed changes in routing or timings of current public transport services. Therefore, the impact regarding access to services is assessed as qualitatively **neutral**.

Affordability

No impact is expected. Therefore, the impact is assessed as qualitatively **neutral**.

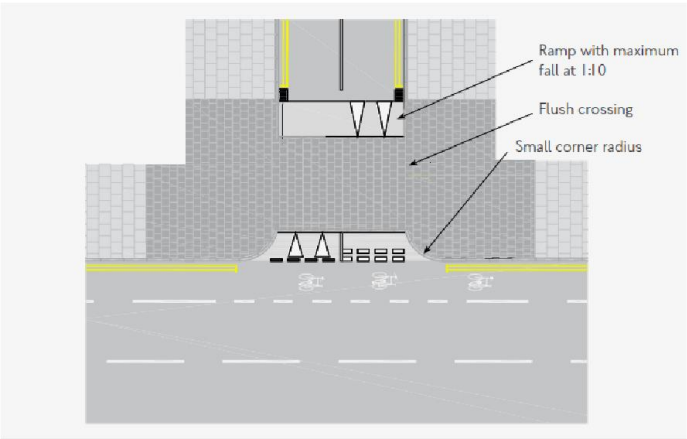
Severance

The introduction of improved and dedicated walking and cycling infrastructure on links that make up the WCWCI scheme will reduce severance for pedestrians and cyclists, alike. The addition of new and improved crossing points will also contribute to reducing severance at the links outlined below. The impact is assessed as **slight beneficial** by increasing both safety and priority for existing and new cyclists and pedestrians.

- Link 2A: Table top crossings at A40 junctions with Tennyson Road and Griffiths Avenue, providing improved priority for cyclists and pedestrians. Improvements to existing informal crossing opportunities will increase visibility and aid users.
- Link 2A: General improvements to the junction arrangements at TGI Fridays Junction (A40/B4633), including adjustments to signalised junction to aid pedestrian and cycle movements e.g. to provide 2 stage crossing.
- Link 4A/5A: Create standard details for side road uncontrolled crossings by tightening junction radii to 2m and providing correct tactile paving arrangements. Adding new advisory cycle lanes to narrow turning radius and give protection to turning cyclists at crossroads. Switch priority at crossroads to Shakespeare Road and provide advisory cycle lanes across junction with Byron Road and Tennyson Road.

Figure 3-9 - Example of Table-Top Crossing Arrangements at Side-Road Junctions

Figure 3-10 - Example of Tactile Paving Arrangements and Narrowing of Side-Road Junctions



Option and non-use values

The scheme will not alter change the availability of public transport services along the scheme corridor. The provision of walking and cycling infrastructure is off-road and improvements to cycle and pedestrian priority at junctions is not expected to materially affect the provision of good quality bus or rail services. The impact has been assessed as **neutral**.

Public Accounts

Cost to the broad transport budget and the effects on wider public finances and indirect tax revenues, from for example, a decrease in fuel duty, are provided at the individual link level in Figure 3-3 to Figure 3-8 and at the scheme level in Table 3-10.

3.9. AMCB, TEE and PA Tables

Analysis of Monetised Costs and Benefits (AMCB)

The Analysis of Monetised Costs and Benefits (AMCB) table is provided in Table 3-11. This table includes costs and benefits which are regularly 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.

Economic Efficiency of Transport System (TEE)

The Transport Economic Efficiency (TEE) tables brings together the user and non-user benefit estimations, derived from the Active Mode Appraisal Toolkit (AMAT) to present the net business impact and present value of transport efficiency benefits. The TEE tables for the scheme are provided in Table 3-12.

Public Accounts (PA)

The Public Accounts (PA) table brings together the government costs of the scheme and the revenue and tax changes that would result. The revenue and tax changes that follow from changes in traffic flow and vehicle kms are derived from the Active Mode Appraisal Toolkit (AMAT), while the capital and operating costs are as described. The Public Accounts (PA) table for the scheme is provided in Table 3-13.

Appraisal Summary Table (AST)

Following the production of the AMCB table, the relevant values in the TEE, PA and AMCB tables are transcribed to the AST and are supported by qualitative assessments of environmental, social and economic impacts from the scheme outlined as part of section 3.8. The AST is provided in Appendix E.

Table 3-11 - Analysis of Monetised Costs and Benefits (AMCB), £

Analysis of Monetised Costs and Benefits, £

Noise	1,629	*(12)*
Local Air Quality	538	*(13)*
Greenhouse Gases	3,079	*(14)*
Journey Quality	421,027	*(15)*
Physical Activity - reduced risk of premature death	2,346,755	*(16)*
Physical Activity - reduced absenteeism	657,531	*(17)*
Accidents	24,430	*(17)*
Decongestion benefits (All road users)	65,087	*(18)*
Infrastructure - reduced damage to road surfaces	628	*(19)*
Wider Public Finances (Indirect Taxation Revenues)	10,872	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	3,509,204	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (18) - (11)*
Broad Transport Budget	1,320,669	*(10)-(19)*
Present Value of Costs (see notes) (PVC)	1,320,669	*(PVC) = (10) - (19)*
OVERALL IMPACTS		
Net Present Value (NPV)	2,188,535	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	2.66	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.

Table 3-12 - Economic Efficiency of the Transport System (TEE), £

Economic Efficiency of the Transport System (TEE), £		
Non-business: All users	**ALL MODES**	
User benefits	**TOTAL**	
Reduced risk of premature death	2,346,755	
Journey quality	421,027	
Vehicle operating costs		
User charges		
During Construction & Maintenance		
NET NON-BUSINESS BENEFITS: All users	2,767,782	*(1a)*
Non-business: Non-user impacts	**ALL MODES**	
Non-*User benefits*	**TOTAL**	
Noise	1,629	
Local Air Quality	538	
GHG emissions	3,079	
(De)congestion	65,087	
Accidents	24,430	
Vehicle operating costs	10,872	
User charges	0	
Construction & Maintenance	628	
NET NON-BUSINESS BENEFITS: OTHER	106,263	
Business		
benefits		
Reduction in absenteeism	657,531	
Vehicle operating costs		
User charges		
During Construction & Maintenance		
Subtotal	657,531	*(2)*
Private sector provider impacts		
Revenue		
Operating costs		
Investment costs		
Grant/subsidy		
Subtotal	0	*(3)*
Other business impacts		
Developer contributions	0	*(4)*
NET BUSINESS IMPACT	657,531	(5) = (2) + (3) + (4)
TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	3,531,576	(6) = (1a) + (1b) + (5)

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.

Table 3-13 - Public Accounts (PA), £

Public Accounts (PA) Table, £

	ALL MODES TOTAL	
Local Government Funding		
Revenue		
Operating Costs	65,929	
Investment Costs	1,255,367	
Developer and Other Contributions		
Grant/Subsidy Payments		
NET IMPACT	1,321,296	*(7)*
Central Government Funding: Transport		
Revenue		
Operating costs		
Investment Costs		
Developer and Other Contributions		
Grant/Subsidy Payments		
NET IMPACT		*(8)*
Central Government Funding: Non-Transport		
Indirect Tax Revenues	10,872	*(9)*
TOTALS		
Broad Transport Budget	1,321,296	*(10) = (7) + (8)*
Wider Public Finances	10,872	*(11) = (9)*

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.

3.10. Value for Money (VfM) Statement

The Value for Money (VfM) statement is carried out as a staged process to ensure that a complete and robust analysis is undertaken. A VfM statement has been produced using information within the AST (Appendix E) to provide a summary of the conclusions from the economic case. Table 3-14 shows the DfT VfM categories[38] and their relationship with the BCRs that have been generated through cost-benefit analysis. The purpose is to indicate whether the WCWCI scheme demonstrates value for money.

[38] DfT (2017) DfT Value for Money framework, https://www.gov.uk/government/publications/dft-value-for-money-framework

Table 3-14 - DfT VfM Categories

Benefit-Cost Ratio (BCR)	Value for Money Categories
Very High	BCR greater than or equal to 4
High	**BCR between 2 and 4**
Medium	BCR between 1.5 and 2
Low	BCR between 1 and 1.5
Poor	BCR between 0 and 1

Overall assessment of costs and benefits generated by the project shows that the **scheme achieves a Benefit Cost Ratio figure of 2.66 with a Net Present Value (NPV) of approximately £2.19 million**. The scheme can be therefore categorised as achieving **high value for money** in the classification provided by DfT.

This BCR demonstrates the value of the scheme and the importance of its implementation. The majority of benefits derive from health impacts originating from increased physical activity which has wider implications for businesses in the form of a reduction in absenteeism and a reduced risk of premature death. The scheme will also help to initiate mode shift by encouraging active mode travel, freeing up some capacity on the roads and providing a pleasant experience for users of cycling and walking infrastructure.

3.11. Sensitivity Testing

This section describes the sensitivity tests that have been carried out which reflect the uncertainty with regard to future growth and uplifts in pedestrian and cycling journeys attributed to the WCWCI scheme. A low and high growth scenario are applied to observed cycling and walking numbers to understand how the costs and benefits respond to lower and higher than predicted increases in cycling and walking numbers from the implementation of the scheme. Table 3-15 describes the low and high growth scenarios applied.

Table 3-15 - Sensitivity Tests: High and Low Growth Scenarios

	Low Growth Scenario	High Growth Scenario
Cycling	A reduction of 10% (relative to the core scenario) in the modelled uplifts in cycling journeys across Links 1A – 5A	An increase of 10% (relative to the core scenario) in the modelled uplifts in the cycling journeys across Links 1A – 5A
Walking	A 5% increase in pedestrian journeys on Links 1A – 5A	A 15% increase in pedestrian journeys on Links 1A – 5A

Cycling

The low scenario applies a 10% decrease relative to the core scenario in the modelled uplifts in cycling journeys across Links 1A – 5A. Table 3-16 shows a further reduction of 10% in future cycling journeys across each of the component links of the WCWCI scheme in the low growth scenario and a 10% increase in future cycling journeys under the high growth scenario relative to the core.

Table 3-16 - Cycling: Low, Core and High Growth Scenarios

	Link 1A	Link 1B	Link 2A	Link 3A	Link 4A	Link 5A[39]	Total
2021 Low Scenario							
DN	145	73	324	359	463	463	1,364
DS	158	82	429	388	511	463	1,568
Diff	+13	+9	+105	+29	+48	+0	+204
2021 Core Scenario							
DN	145	73	324	359	463	463	1,364
DS	160	83	441	391	516	463	1,591
Diff	+15	+10	+117	+32	+53	+0	+227
2021 High Scenario							
DN	145	73	324	359	463	463	1,364
DS	162	84	453	394	521	463	1,614
Diff	+17	+11	+129	+35	+58	+0	+250

Pedestrians

The low scenario tests an uplift of 5% for pedestrian journeys on links 1A – 5A relative to the 'do nothing', without scheme case. Table 3-17 shows a further 5% increase in future pedestrian journeys in the low scenario and a 15% increase future journeys for pedestrians under the high scenario across component links of the WCWCI scheme.

Table 3-17 - Pedestrians: Low, Core and High Growth Scenarios

	Link 1A	Link 1B	Link 2A	Link 3A	Link 4A	Link 5A	Total
2021 Low Scenario							
DN	447	132	653	1,026	755	755	3,013
DS	469	139	686	1,077	793	793	3,164
Diff	+22	+7	+33	+51	+38	+38	+151
2021 Core Scenario							
DN	447	132	653	1,026	755	755	3,013
DS	492	145	718	1,131	831	831	3,317
Diff	+45	+13	+65	+105	+76	+76	+304
2021 High Scenario							
DN	447	132	653	1,026	755	755	3,013
DS	514	152	751	1,180	868	868	3,465
Diff	+17	+11	+129	+35	+58	+0	+452

BCR calculations

BCR calculations are estimated for the low and high growth scenarios that reflect a lower and higher than expected uplift in future cycling and pedestrian journeys along links 1A – 5A from scheme implementation. Table 3-18 and Table 3-19 summarises the results of the sensitivity tests. Results produced from this analysis show that the expected BCR ranges from 2.12 to 3.29.

[39] Link 5A does not involve any provision of new cycling infrastructure and so is omitted from the sensitivity tests for cycling.

Table 3-18 – Benefit-Cost Ratio (BCR), by Link and for WCWCI Scheme – Low Growth Scenario

Ref	Present Value Benefit (PVB)	Present Value Cost (PVC)	BCR
Link 1A	£200,809	£198,170	1.01
Link 1B	£138,026	£453,214	0.30
Link 2A	£1,122,818	£302,425	3.85
Link 3A	£453,437	£100,268	4.52
Link 4A	576,560	£194,451	2.97
Link 5A	£303,212	£72,275	4.20
	£2,794,861	**£1,320,782**[40]	
	Scheme NPV	**£1,474,079**	
	Scheme BCR	**2.12**	

All entries are in 2010 prices and values

The overall assessment of the costs and benefits generated by the project shows that under the low growth scenario the scheme achieves a BCR of 2.12, with a Net Present Value of £1.47m in 2010 prices and discounted to 2010 over a 20-year appraisal period. The scheme is therefore categorised as offering **high value for money** even under the low growth scenario.

Table 3-19 – Benefit-Cost Ratio (BCR), by Link and for WCWCI Scheme – High Growth scenario

Ref	Present Value Benefit (PVB)	Present Value Cost (PVC)	BCR
Link 1A	£389,897	£198,143	1.97
Link 1B	£199,573	£453,183	0.44
Link 2A	£1,541,304	£302,348	5.10
Link 3A	£861,829	£100,212	8.68
Link 4A	£913,638	£194,398	4.70
Link 5A	£433,593	£72,259	6.00
	£4,339,834	**£1,320,542**[41]	
	Scheme NPV	**£3,019,292**	
	Scheme BCR	**3.29**	

All entries are in 2010 prices and values

The overall assessment of the costs and benefits generated by the project shows that under the low growth scenario the scheme achieves a BCR of 3.29, with a Net Present Value of £3.02m in 2010 prices and discounted to 2010 over a 20-year appraisal period. The scheme is therefore categorised as offering **high value for money** under the high growth scenario.

[40] Private Value Costs (PVC) differ from the core scenario, due to a reduction in road maintenance arising from a reduction in vehicle kms
[41] Private Value Costs (PVC) differ from the core scenario, due to a reduction in road maintenance arising from a reduction in vehicle kms

4. Financial Case

4.1. Overview

The financial case provides evidence on the affordability of the scheme, how it is to be funded and any technical accounting issues. It includes the cost profile for the scheme and the impact of the proposed investment on budgets and accounts. The financial case includes the following elements:

- Preliminary estimates of the expected implementation costs of the scheme, including the design, construction and risk allowance in nominal prices i.e. not adjusted for inflation;
- A breakdown of costs by scheme section in nominal prices;
- Cost profile showing year-on-year costs, and a breakdown by cost type and parties on whom they fall;
- A summary of key financial risks; and
- Consideration of the financial sustainability of the scheme, including ongoing costs of operation, maintenance and renewals.

4.2. Cost Profile

The anticipated cost of the scheme is approximately £1.6m (2020 prices), with the cost reliant on the WCTIS Phases 3 and 4 going ahead at the same time to share on-site costs. Scheme costs have been calculated in outturn prices based on preliminary design drawings and a bill of quantities. Scheme implementation costs are provided in Table 4-1.

Table 4-1 - Scheme Capital Costs by Year, 2020 prices

Project cost components	Capital cost items	Cost Estimate status*	Costs by year (£)				Totals
			2018/19	2019/20	2020/21	2021/22	
Design & Management	Design fees, Surveys and trial holes, Land Purchase	P	£0	£50,000	£150,000	£100,000	£300,000
Construction including Traffic-Related Maintenance	Non-Routine Re-construction	P	-	-	£200,000	£820,000	£1,020,000
	Site clearance, Diversions of Statutory services. Widening and re-surfacing of carriageway.						
Contingency	Risk Adjustment	P	-	-	£80,000	£200,000	£280,000
Indirect Tax	Non-Recoverable VAT (if applicable)	-	-	-	-	-	-
Total Cost	**(NB – Not base cost with real cost adjustment)**	**P**	**£0**	**£50,000**	**£430,000**	**£1,120,000**	**£1,600,000**

*O = Outline estimate, P = Preliminary estimate, D = Detailed estimate, T = Tender price

4.3. Project Funding

This section considers the capital funding requirements and commitments for the proposed scheme investment.

4.3.1. Sources of Funding

The sources of funding for the scheme are summarised in Table 4-2.

Table 4-2 - Scheme Funding Sources and Profile of Contributions

	2018/19		2019/20		2020/21		2021/22		Total
	Capital	Rev	Capital	Rev	Capital	Rev	Capital	Rev	
LEP funding	£0	n/a	£50,000	n/a	£430,000	n/a	£1,120,000	n/a	£1,600,000
GCC	-	n/a	-	n/a	-	n/a	-	n/a	-
Total	**£0**	**n/a**	**£50,000**	**n/a**	**£430,000**	**n/a**	**£1,120,000**	**n/a**	**£1,600,000**

All figures are in outturn prices

The proposal is to use the LEP funding to construct improvements to create Links 1A – 5A. The scheme has been developed to align with the LEP budget allocation with preliminary design drawings shown in Appendix A.

The construction cost estimates have been produced based on preliminary designs. The estimates are considered robust as the design drawings are well-developed due to the low risk nature of the works. The estimates do not include costs associated with the re-location of street apparatus or the diversion of utilities, which will be carried out as part of the detailed design stages.

Within the capital costs shown in Table 4-1, a suitable risk and contingency element has been included. These are considered appropriate for the scheme for the following reasons.

- The low risk nature of cycleway and footway works;
- Less well-developed scheme scope with preliminary design drawings providing some, if not all the material needed to carry out an accurate works cost estimate;
- Other GCC schemes proven to be within budget estimates and GCC procurement rules that govern variations in capital project estimates; and
- Security and earliest availability of funds.

4.3.2. Security and Earliest Availability of Funds

Table 4-3 - Security and Availability of Scheme Funding Contributions

		Security of funding contribution (✓)			Earliest available date for securing fund contribution	
Funding source	Fund details	Low	Medium	High	Part funding date	Full funding date
LEP	LEP			✓ Subject to approval by the LEP Board	n/a	On LEP Board approval in July 2020
GCC	GCC – Capital Funds	n/a	n/a	n/a	n/a	n/a

As scheme promoter, GCC will be liable for any future cost overruns associated with the delivery of the suite of transport schemes. This will be funded from within the scheme funding envelope of the full £22 million Capital grant or alternative funding, such as the highways capital programme, Section 106 developer contributions, Community Infrastructure Levy, etc.

As stated in the County Council's Constitution, 'Directors are responsible for ensuring that variations in capital project estimates that occur during the course of a contract are contained within the resources allocated to that service'. The scheme's costs will be monitored and managed accordingly.

Funding for delivery for each of phase of the works is subject to variation in scope, market forces and risks being realised. An agreement is in place with the GFirst LEP that funding can be transferred between phases to reflect underspend/overspend. This will be reflected in the extent of the scheme developed.

4.4. Financial Risk Management Strategy

This section examines the risks associated with the costs and financial requirements of the onsite infrastructure and engineering works. It considers the mitigation that may be needed to handle the identified risks, if they arise.

4.4.1. Risks to the Scheme Cost Estimate and Funding Strategy

Table 4-4 shows the financial risks and suggested mitigation measures associated with this scheme. The Risk Register in Quantified Risk Register has assessed the costs for the risks and is therefore a Quantified Risk Register.

Table 4-4 - Qualitative Financial Risk Assessment

Scheme financial risk item	Likelihood of risk arising (✓)			Impact severity (✓)			Predicted impact on scheme delivery and outcome (✓)			Suggested mitigation
	Low	Medium	High	Slight	Moderate	Severe	Slight	Moderate	Severe	
Unforeseen increase in scheme cost reduces the VfM	✓			✓			✓			Scheme will be amended to reduce costs whilst ensuring that agreed Outputs are achieved. In the event of cost overruns, GCC would value engineer the schemes to fit the available budget.
Earmarked / secured funds do not cover current scheme capital cost		✓			✓			✓		As above

4.5. Ongoing Maintenance

Gloucestershire County Council (GCC) will be responsible for the maintenance of the cycleways and footways post construction. The majority of the links are within the highway boundary that are already the responsibility of GCC to maintain. Where the links are on land owned by others, legal agreements will be put in place to ensure that the responsibilities for maintenance are clear. This will extend to the increased surface maintenance of the paths (both potholes and maintenance as well as the upkeep of any coloured surfacing).

4.6. Land Purchase

No additional land is required to be purchased from third parties in order to progress the scheme, either for the widened footways and cycleways or its construction.

5. Commercial Case

5.1. Overview

The Commercial Case provides evidence that the proposed investment can be procured, implemented and operated in a viable and sustainable way. The aim is to achieve best value during the process, by engaging with the commercial market.

5.2. Expected Outcomes from the Commercial Strategy

The outcomes which the commercial strategy must deliver are to:

- Confirm that procedures are available to procure the scheme successfully;
- Check that available/ allocated capital funds will cover contractor and construction costs;
- Verify that the risk allowance is sufficient; and
- Ensure that arrangements have been made to handle cost overruns.

5.3. Scheme Procurement Strategy

GCC have identified three procurement options for the delivery of LEP funded schemes. The alternative options are:

A. Full Public Contracts Regulations 2015 (PCR) compliant tender (Schemes greater than OJEU limit of £4,773,252)

GCC would opt for either an 'open' tender process, where anyone may submit a tender, or a 'restricted' tender process, where a Pre-Qualification is used to limit the number of candidates' who will be invited to submit tenders. An open procedure will take approximately one and a half months to complete, whereas a restricted procedure will take approximately two and a half months to complete following the date on which a contact notice is published on the OJEU website.

Once the tenders are received, they will be assessed and a preferred supplier identified, following which a mandatory 10 day 'standstill' period will be observed. During this time, unsuccessful tenderers may challenge the council's intention to award the proposed contract to the preferred contractor if they have grounds for believing that the council's procurement process did not meet the requirements of public procurement law.

B. Open Tender (Schemes greater than £1M but less than OJEU limit)

GCC would opt for an 'open' tender, where anyone may submit a tender. The tender would include a set of eligibility criteria and a quality submission. Depending on the exact tender assessment method chosen, candidates would be required to meet a quality threshold score or be selected using a quality / price evaluation.

Schemes will be procured via ProContract and this would include prior notifications of the tender approximately 4 weeks before the formal tender. Depending upon the complexity of the scheme supplier engagement, presentations by candidates will be arranged.

The minimum tender period is 5 weeks but could be longer for more complex schemes. All suppliers that meet the eligibility criteria will be assessed and a preferred supplier identified.

C. Delivery through Term Maintenance Contract (TMC) (Schemes less than £1M)

This option would involve GCC's Term Maintenance Contractor undertaking the work themselves, or appointing appropriate suppliers where necessary, under the council's existing Term Maintenance Contract. The TMC incorporates a Schedule of Rates that was agreed at the inception of the contract. The price for each individual scheme is determined by identifying the quantities of each required item thereunder into a Bill of Quantities. TMC may price 'star' items if no rate already exists for the required item. If the scope of a specific scheme is different from the item coverage within the TMC contract, a new rate can be negotiated.

Procurement route

The preferred procurement route for WCWCI is **Option A, Full PCR 2015 compliant Tender,** as the scheme is above the PCR financial limit.

For budget certainty, the scheme will be procured on a lump sum basis as an ECC Option A contract (Lump Sum with Activity schedule). This option is preferred as it allows for a greater transfer of risk to the Contractor through a priced contract.

The Activity Schedule used in this form of contract also gives greater confidence in the Contractor's price. This is as a result of the importance given to the Contractor's programme, as tenderers have to plan the scheme whilst preparing their Activity Schedule. This also means the programme is realistic and more likely to be adhered to as payments to the Contractor are linked to their activity schedule.

The ECC Option A contract is Gloucestershire County Council's preferred method of delivery for this size and type of scheme. This ensures consistency with internal processes, staff members, supply chain, benchmarking, performance etc. which should all aid successful delivery.

5.4. Commercial Risk Assessment

Table 5-1 provides a summary of the identified commercial risks surrounding the scheme.

Table 5-1 - Scheme Commercial Risk Assessment

Qualitative Commercial Risk Assessment										
Scheme Commercial Risk Item	**Likelihood of Risk Arising (ü)**			**Impact Severity (ü)**			**Predicted Effect on Scheme Procurement, Delivery & Operation (ü)**			**Immediate Bearer of Risk and Suggested Mitigation**
	Low	**Medium**	**High**	**Slight**	**Moderate**	**Severe**	**Slight**	**Moderate**	**Severe**	
***Scheme construction is delayed and/or costs increase.** **E.g. from unexpected engineering difficulties.**		✓				✓		✓		GCC, as scheme promoter, bears the risk in accordance with NEC4 clauses. Ensure that scheme development, design, procurement and construction procedures are sufficiently robust to minimise likelihood of construction difficulties.
Ongoing maintenance costs of scheme higher than expected	✓			✓			✓			GCC, as scheme promoter, bears the risk. Ensure that scheme design, materials selection and construction procedures are sufficiently robust to minimise likelihood of maintenance issues.

*Risk allocation will be apportioned between GCC and the Contractor undertaking the site works. This will be based upon NEC principles and regular on-site Risk Management meetings will be held to ensure prompt mitigation of risks.

6. Management Case

6.1. Overview

The Management Case outlines how the proposed scheme and its intended outcomes will be delivered successfully. It gives assurances that the scheme content, programme, resources, impacts, problems, affected groups and decision makers, will all be handled appropriately, to ensure that the scheme is ultimately successful.

Due to the location and proposed construction programmes for WCWCI and the West Cheltenham Transport Improvement Phase 3 & 4 Scheme (WCTIS 3&4), it is proposed that both WCWCI and WCTIS 3&4 be combined for construction. This avoids an extended works programme and provides opportunity for cost savings from economies of scale and sharing of overhead facilities such as site compounds and site supervision. The WCTIS 3&4 scheme is also subject to approval of a separate Full Business Case, if this scheme was not approved then the proposed scope of WCWCI could not be delivered in full within the budgets requested. In the event that FBC for WCWCI was approved, and FBC for WCTIS was not approved, we would propose the scope of the WCWCI be reduced to match the available budget. At that time an addendum to this FBC would be issued, to the LEP board, summarising the effects on the FBC reported outputs and demonstrating that the residual scheme remained viable and value for money.

6.2. Project Governance, Roles and Responsibilities

Project Governance

GCC have set up a clear and robust structure to provide accountability and an effectual decision-making process for the management of the LEP funded schemes. Each scheme will have a designated project manager who will be an appropriately trained and experienced member of GCC staff.

A detailed breakdown of meetings (along with the attendees, scope and output of each) which make up the established governance process is set out in this section.

Project Board Meetings (PBM)

Project Board Meetings are held monthly to discuss individual progress on each scheme and are chaired by Gloucester County Council term contractor Project Managers (PMs). Attendees include representatives for different aspects of LEP management (i.e. Communication, Traffic, Risk Management, and GCC Consultants design and/or construction team). Progress is also discussed in technical detail raising any issues or concerns for all to action. A progress report, minutes of meeting and an update on programme dates are provided ahead of the meeting for collation and production of the LEP Progress and Highlight Report.

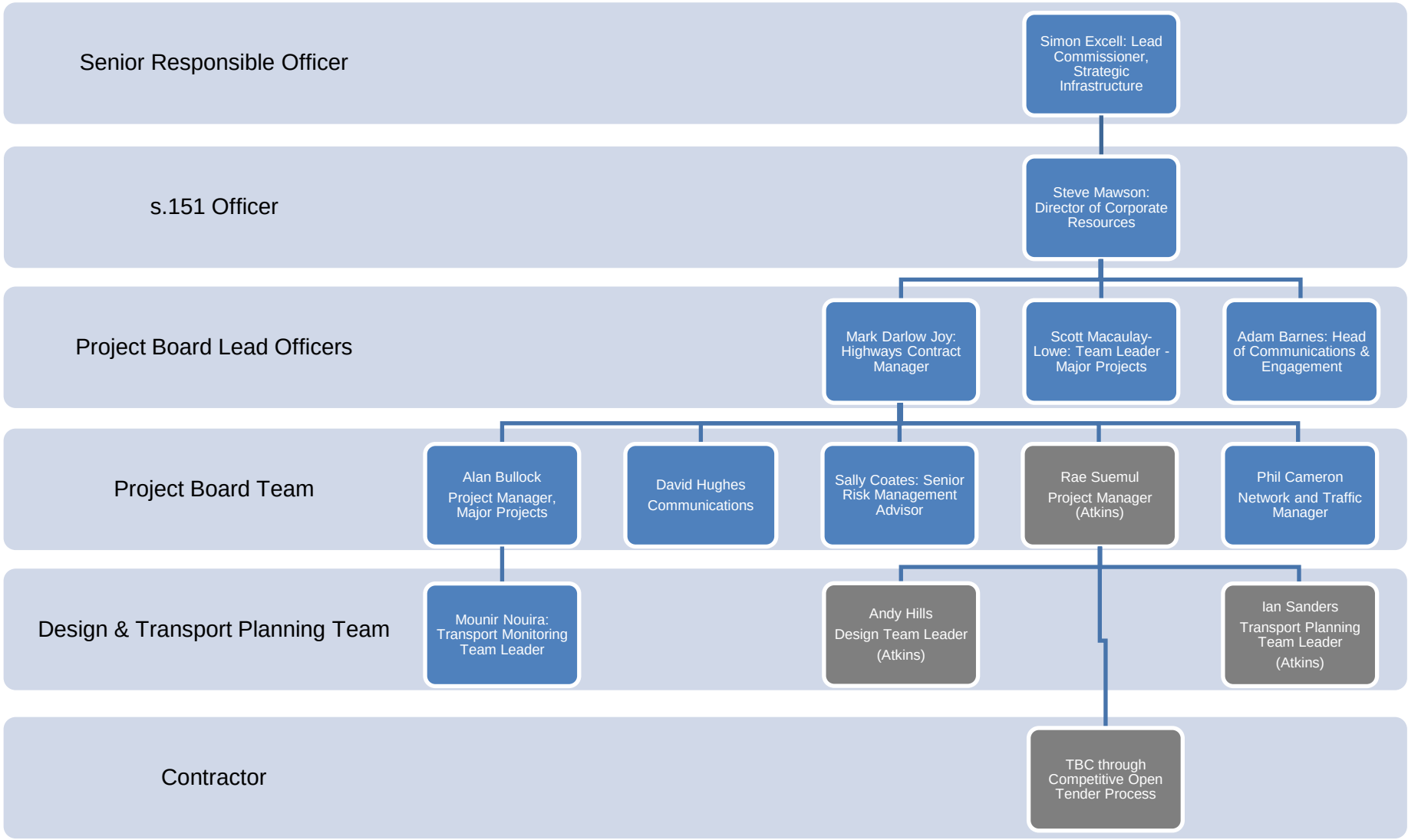
LEP Progress and Highlight Report

The Progress and Highlight Reports sent by the GCC PMs comprise of the following updates; general progress, project finances, issues, risks and meeting dates. The report also identifies any areas of concern or where decisions are required by the PBM. An agreed version of the latest Progress and Highlight Report is issued to the PB meeting attendees during the meeting.

6.3. Project Management Structure

Gloucestershire County Council and their consultants have agreed a project management structure for the project, as shown in Figure 6-1.

Figure 6-1 - Project Management Structure, WCWCI



6.4. Communications and Engagement Management

GCC have a tried and tested Communication and Engagement Management Plan which is used on all major projects. Effective use of the plan has resulted in limited adverse feedback from the public and ensured successful delivery of schemes both from a project management and public relations perspective. This section provides further information on how stakeholders are identified, how they are communicated to and the methods/ techniques used to communicate.

Aims and objectives

The main aim of the Communication and Engagement Plan is to ensure that stakeholders and members of the public are kept informed throughout the development and implementation of a scheme. This can range from keeping key stakeholders updated with critical information, (essential to the successful delivery of the scheme) to providing information to the public.

Table 6-1 - Stakeholder Categorisation Approach

Stakeholder Category	Stakeholder Characteristics
Beneficiary	Stakeholders who will receive some direct or indirect benefit from the scheme.
Affected	Stakeholders who are directly affected by the scheme in terms of its construction and/ or operation
Interest	Stakeholders who have some interest in the scheme, although not affected directly by its construction or operation
Statutory	Stakeholders who have a statutory interest in the scheme, its construction, operation or wider impacts
Funding	Stakeholders who are involved in the funding of the construction or operation of the scheme

Engagement categories

The information supplied to stakeholders can vary depending on their involvement with the scheme. Table 6-2 indicates the level of engagement that the variety of stakeholders can expect in relation to this scheme.

Table 6-2 - Stakeholder Engagement Levels

Engagement Category	Details of Engagement Method
Intensive consultation	Stakeholders who are directly affected by the scheme and whose agreement is required in order for the scheme to progress. Consultation throughout the design and implementation.
Consultation	Stakeholders who are affected by the scheme and can contribute to the success of its design, construction or operation. Consultation at key stages.
Information	Stakeholders with some interest in the scheme or its use. Information to be provided at appropriate stages.

6.5. Stakeholder Engagement

Table 6-3 summarises the strategy for managing engagement with stakeholders for the scheme. It itemises the relevant stakeholders and interests and indicates the stakeholder category with which each is associated.

Table 6-3 - Stakeholder Management Strategy and Method

Name of Stakeholder / Interested Group	Stakeholder Category	Engagement and Consultation Level	Engagement Method
Property owners and businesses operating in building affected by the works	Affected	Intensive consultation	Pre-exhibition briefing Direct contact with owners and where appropriate their agents.
Local MPs	Interest	Consultation	Pre-exhibition briefing
Elected Members	Interest	Intensive consultation	Pre-exhibition briefing
Scheme users	Beneficiary	Consultation Information	Public Share Events
Local press/radio	Interest	Information	Pre-exhibition briefing
Local Enterprise Partnership	Beneficiary Funding	Information	Through LGF Business Cases & progress reports

The following list details the consultees who were contacted as part of the extensive stakeholder consultation:

- Local MPs (Alex Chalk, Laurence Robertson, Richard Graham issued briefings and bulletins);
- Cheltenham Borough Council (Rhonda Tauman, Jem Williamson sent copies of plans and have commented);
- Officers from across Gloucestershire County Council (Transport Planning, Think Travel, ITU, Local Highways Managers etc some representatives at share session);
- Gloucestershire County Council Cycle Advisory and Liaison Group (Cycle Groups, Lead Cabinet Members, Members, Interest Groups at meetings and presented the plans at share session);
- Bus Service Providers (bulletin);
- Gloucestershire Fire and Rescue Service (bulletin);
- South Western Ambulance Service (bulletin);
- Road Haulage Association (bulletin);
- Freight Transport Association (bulletin);
- Cycle, Walking and Horse-Riding Groups (those identified as relevant on attachment included on bulletin circulation);
- Residents, general public and businesses (Residents on the bulletin list were asked to comment on WCTIS 3 and 4 and WCWCI which many have done);
- Local press / radio (Press are aware of the wider scheme, but they wouldn't take interest in the specific design);
- GFirst LEP (Barry attended CALG plan share and commented);
- Local Businesses (bulletin circulation);
- County Councillors (briefings and bulletin);
- Borough Councillors (briefings and bulletin); and
- Disability Groups (bulletin).

6.6. Public Share Events and Summary of Consultation Engagement

A total of two Public Share Events covering the WCWCI and WCTIS were scheduled to be held at two different locations in Cheltenham:

1. 17th March 2020 (14:00 – 19:00): Hester Way Community Resource Centre, Cassin Drive, Cheltenham GL51 0LG.
2. 19th March 2020 (16:30 – 20:30): Jurys Inn Hotel, Cheltenham, Gloucester Rd, Cheltenham GL51 0TS.

Due to public health concerns related to the COVID-19 pandemic, both events had to be cancelled at short notice. However, circa 1,200 properties received a leaflet regarding the consultation (and a subsequent leaflet with notification of the cancellation), and therefore awareness of the scheme and the event was high. In addition, the scheme was covered by the local press and radio, with further requests for feedback regarding the design of WCTIS.

The public were directed to the GCC Major Projects website, with four questions directly related to the WCWCI scheme. The results are summarised below, with the number of responses and percentages. The results show that the scheme was strongly supported by the public.

Table 6-4 – Online Feedback Form Responses

	Improve access to key employment and residential areas for pedestrians and cyclists in West Cheltenham	Increase walking and cycling uptake in West Cheltenham?	Provide a real alternative to local car travel for less able/confident cycle users?	Represent a good use of public funds?
Agree	40	36	32	37
Disagree	7	10	11	8
Neither Agree or Disagree	7	9	12	10
Total	54	55	55	55

	Improve access to key employment and residential areas for pedestrians and cyclists in West Cheltenham	Increase walking and cycling uptake in West Cheltenham?	Provide a real alternative to local car travel for less able/confident cycle users?	Represent a good use of public funds?
Agree	74%	66%	58%	67%
Disagree	13%	18%	20%	15%
Neither Agree or Disagree	13%	16%	22%	18%

For all the Public Consultation and Stakeholder Engagement, GCC have completed a variety of communications and engagement activity, to utilise as many digital channels as possible. Activity has included:

- Councils connected newsletter; article sent to all parish and town councils at the end of March 2020;
- Two members briefings; a letter and later a pdf presentation;
- Letter drops to 1200 properties x2 (one to invite residents to drop ins and one to cancel the events);
- Signs on the cycle path and footpaths in the scheme area;
- Email cascade within Cheltenham Borough Council;
- Requests to local public sector communications partners to display information;
- MP briefings via email. The Cheltenham MP was briefed face to face by a scheme supporter;
- Direct emails to key stakeholders – including local accessibility and cycling groups;
- Local businesses gathered for A40 travel forum, providing feedback on the travel plans as well as consenting to future scheme contact;

- WCTIS bulletins to our stakeholders list; made up of local businesses, key transport and community contacts and politicians;
- Highways staff newsletter – informing staff about proposals;
- Press release to local media; generating online and broadcast coverage;
- News item displayed on our website, generating 1,081-page views (of these 477 were unique);
- Latest News alert to 9000 govdelivery subscribers; and
- Social media posts x 10; reaching 181,165 accounts and achieving 246 clicks to the webpage.

Table 6-5 provides a summary of the key themes and comments from stakeholders on the preliminary designs for component links of the WCWCI scheme, along with how Atkins will respond to and/or address these comments at detailed design stage.

Table 6-5 - Themes Identified from Comment Box Responses

Theme	Examples	How Atkins responded to and / or addressed the comments
Geometric design improvement	The geometric design of some sections of the cycle way especially having sharp radii, limited cycle lane width and poor visibility.	The design team are continuing to review the geometric design of the cycle way. However, there are some conflicting movements and limited visibility which may require speed control measures.
Drawing details	Requests for further details regarding some of the design elements. For example, how the cycle track reaches and continues through the railway bridge.	The design team will review the bridge construction details to understand the scope for alterations to carriageway width and kerb heights with regard to bridge deck and parapet construction.
Alternative options/ betterments	Attendees proposed to look at some alternative options or betterments that they believe is a better solution such as upgrading of the cycle track from the roundabout to the end of Hatherley Lane cul-de-sac. Some help to cross Hatherley Lane at the junction of the cul-de-sac would also be useful. The aim would be to improve access to the shopping centre that includes B and Q. Also, considering a grade separated structure at Princess Elizabeth Way.	Crossing of Hatherley Lane is being considered as part of a separate scheme to make cycle improvements along the route. The design team will review if minor detailed design improvements can be made. It was clarified that a grade separated crossing is beyond the scope of this project and may require land take. Therefore, it has been considered as a non-viable option.
Improve connectivity	Attendees shared concerns regarding connectivity to/from the south via Whittington Road/Miserden Road.	The design team will investigate this further at the detailed design stage including feasibility of new link to Miserden Road.
Inclusive mobility	Ensure kerbs and signals push buttons are designed to accommodate wheelchair users. i.e. dropped kerbs to be incorporated and push buttons to be at a height that can easily be used by wheelchair users.	The design team is reviewing the design to ensure appropriateness to wheelchair users.
Improve existing infrastructure	Include pedestrian crossing points from Monkscoft / Wasley Road to Benhall Avenue.	For safety, the design team actively discourage crossing high traffic dual carriageways and will investigate ways of deterring

Theme	Examples	How Atkins responded to and / or addressed the comments
	Attendees also requested improving the existing infrastructure by repaving existing cycleways. Attendees requested installing traffic signals on B4063 to improve access to Gloucester road.	people from crossing the dual carriageway at this point. The existing underpass will be the preferred crossing route and is due for refurbishment including lighting and drainage remedial works. Cycle links to Gloucester are outside the scope of this project. This scheme is part of the Local Cycle & Walking Investment Plan (LCWIP) that aims to provide a high-quality connected cycle network.
Cyclists priority	Attendees think that widening the carriageway will attract more motorised vehicles into the area and the cyclists still do not have priority over vehicles especially at junctions.	The WCWCI scheme aims to give cycles priority throughout and includes priority for cycles at all side road junctions where it is safe to do so. More convenient crossings of all signalised junctions are being considered.
20mph zone on the Quietway	Attendees suggested converting the area of St. Mark's to 20mph zone to provide safer environment for pedestrians and cyclists.	The design team will investigate the viability of this proposal at later design stages.

6.7. Evidence of Previously Successful Management Strategy

GCC continue to deliver a wide and varied range of highway schemes from design conception through to delivery. The following examples are selected from a range of schemes that demonstrate GCC delivery capability and support the success of the management and governance strategy used.

Since 2014, the A40 Gloucester Northern Bypass has seen significant junction improvements funded through both the GFirst LEP and the DfT. Primarily these improvements have focussed on delivering additional network capacity at key pinch points, to alleviate congestion and improve journey times. The Walls Roundabout, C&G roundabout, Elmbridge Court roundabout and Over roundabout have all been subject to significant highway improvements in the last 5 years, with the Over roundabout being completed most recently in 2018. All of these schemes were managed by GCC from feasibility, through detailed design, procurement and construction.

The Walls and C&G scheme, completed in October 2014, was designed to support economic development, job creation and social regeneration, improving access with high quality connections between the urban centres, transport hubs and development sites. The overall objectives of the scheme were to unlock the development potential of the area, attract inward investment and maximise job opportunities for local people.

The scheme was successfully delivered within budget and on programme through the adoption of a robust management approach. The total value of the scheme was £3.1M of which £0.5M was funded by Central Government. The scheme was procured through an open tender process using the NEC 3 Option A contract which will also be the preferred method for this scheme.

GCC also worked in partnership with Griffiths contractors Ltd on the Elmbridge Court Roundabout major scheme. This was a £6.4m contract to improve capacity and reduce journey times on the A40 at the busiest roundabout in the County. This scheme follows the management strategy set out in this business case and was completed both on time (September 2017) and on budget.

Finally, Over roundabout was completed in autumn 2018, again using the tried and tested procurement and management/governance methods detailed in this business case.

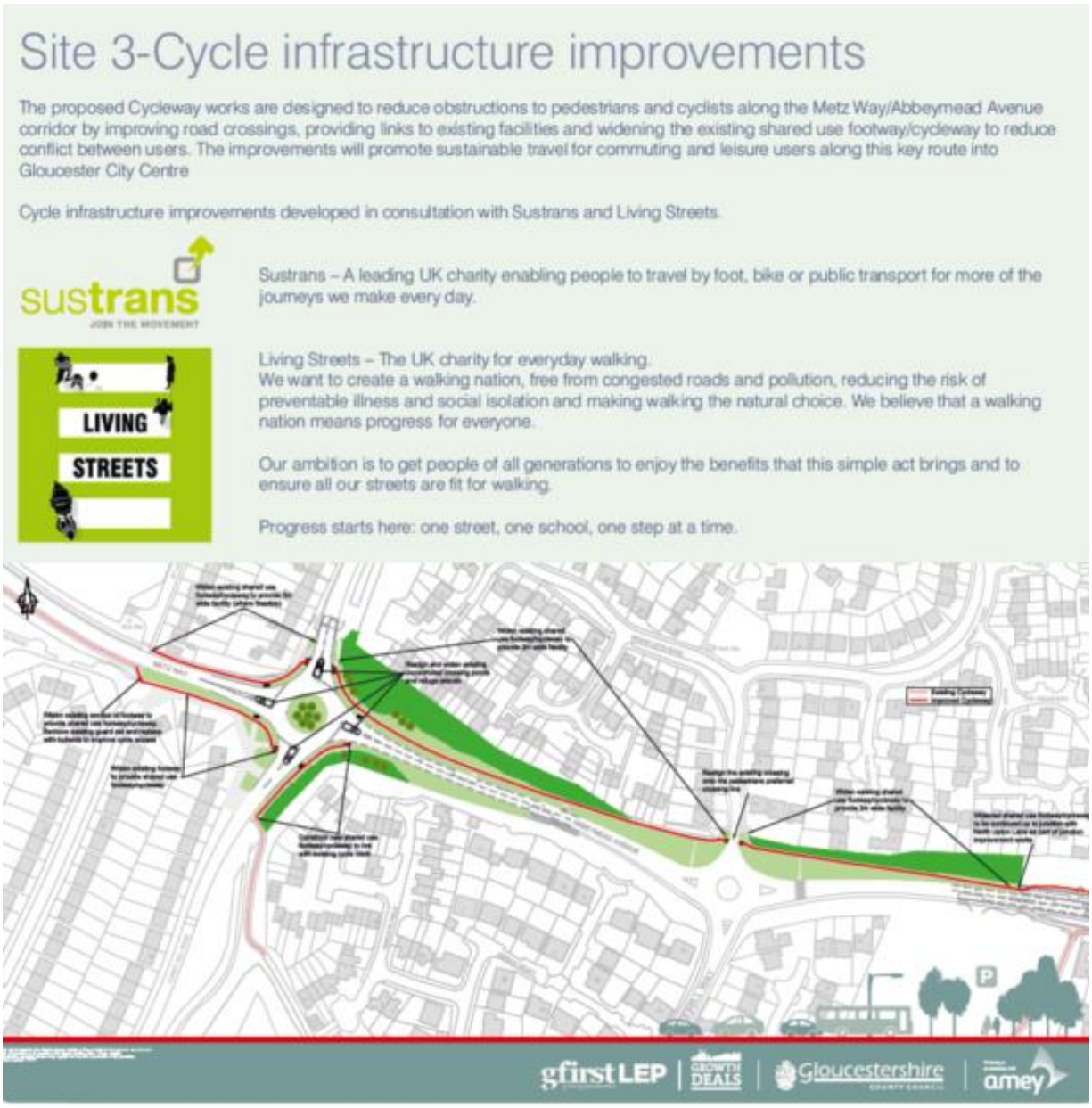
In addition to the major projects above, Gloucestershire County Council has a proven track record of delivery of cycle infrastructure schemes. The largest scheme of this type is Metz Way Improvements, Gloucester which is currently on site. The cost of the scheme is £1.5M and it is funded from two main sources. Around £1M is being provided from the Coopers Edge Development with a £500,000 contribution from the GFirst

LEP. The scheme includes cycle improvements which are part of a package of works delivering the following objectives:

- Improving link between Coopers Edge and Gloucester City Centre;
- Improving local junctions on the route; and
- Provide a better opportunity for modal shift from car use to walking, cycling and public transport.

The scheme has been designed by Gloucestershire County Councils Professional Services Consultant and a competitive tender process was used to appoint North Midland Construction as the Contractor.
The Metz Way scheme also included a prioritisation exercise where various enhancement measures were considered and then prioritised to align the scheme with the budget available. They key improvements were identified as the area around the Coney Hill roundabout and the proposed package of works was selected as offering the greatest improvements within the budget available. The budget estimate provided to GCC was proven to be robust and the Contract price was within the budget available.

Figure 6-2 - Metz Way Cycle Improvements overview



Throughout the County many of the cycle improvement works undertaken by GCC are below £500k in value and are therefore delivered by the Term Maintenance Contractor. Whilst this represents an alternative procurement route, the works further demonstrate the ability to deliver cycle improvement works of this nature.

An example of a scheme delivered through the current term maintenance Contractor is the Cheltenham Barriers to Cycling scheme. The scheme included a range of improvements to cycling across Cheltenham which are very similar in nature to this scheme. One area that received significant improvement was A40 Sandford Mill Road in Cheltenham. This road is one-way to vehicle traffic and the scheme installed a contra-flow cycle lane providing a convenient, safe and more direct cycle route to the east of Cheltenham.

Figure 6-3 - A40 / A40 Sandford Mill Road Roundabout Cycle Lane, Cheltenham

Figure 6-4 - A40 Sandford Mill Road Contra-Flow Cycle Lane, Cheltenham

GCC acknowledges the importance of continual assessment for the appropriateness of the management and governance structure within our major schemes. Whilst recent projects can demonstrate a high level of success, we continue to work with our members, commercial support, consultants and delivery partners to ensure that we deliver future schemes to the same, high standard.

The scheme is intended to be delivered using a collaborative approach between GCC staff and their appointed support organisations. GCC have identified appropriately trained and experienced staff that will be responsible for the management of the scheme. The identified staff fulfilling the GCC Project Manager and Atkins Project Manager roles, have been ring-fenced to support the scheme throughout its duration, from design through scheme procurement and onto construction supervision. They will have more junior staff available to support them as required.

GCC will utilise dedicated Professional Services Consultant resource through an existing contract to undertake design and also arrange early contractor involvement (ECI), where appropriate, to the design process to ensure best value.

6.8. Design and Construction Methodology

6.8.1. Design Methodology

The scheme is based on best practice for the design, construction and maintenance of walking and cycling infrastructure and draws on the following guidance and manuals to inform the development of the WCWCI scheme.

- Gloucestershire County Council's Manual for Gloucestershire Streets[42];
- Inclusive Mobility;
- Traffic Signs Manual and Traffic Signs Regulations and General Directions 2016; and
- London Cycle Design Standards[43].

6.8.2. Construction Methodology

The proposed works all involve standard construction methodology in accordance with Specification for Highway Works. The proposed works do not require special construction techniques and could be wholly carried out by conventional methods.

It is recognised that existing footpaths and cycleways may need to be closed temporarily during the works. If this is the case, alternative routes causing minimal disruption and with the shortest additional distance will be provided.

The Contractor selected for the works will have a proven track record in carrying out similar works.

6.8.3. Works compound

It is intended that the works compound for construction will be in the same location as the one for WCTIS. This will be situated within land to the south-west of Arle Court roundabout, as shown in Figure 6-5. Due to the location and proposed construction programmes for WCWCI and the West Cheltenham Transport Improvement Phase 3 and 4 Scheme (WCTIS 3 and 4), it is proposed that both WCWCI and WCTIS 3&4 be combined for construction. This avoids an extended works programme and provides opportunity for cost savings from economies of scale and sharing of overhead facilities such as site compounds and site supervision.

[42] https://www.gloucestershire.gov.uk/highways/plans-policies-procedures-manuals/manual-for-gloucestershire-streets/
[43] TfL (2014) London Cycle Design Standards, Chapter 4: Cycle lanes and tracks, http://content.tfl.gov.uk/lcds-chapter4-cyclelanesandtracks.pdf

Figure 6-5 – Works Compound, WCWCI and WCTIS

The works compound will consist of hardstanding areas for material storage and welfare facilities. The proposed compound boundary treatment along Hatherley Lane and the A40 would be close boarded fencing.

Access to the works compound is likely to be from Hatherley Lane. A minimum of 10m from the edge of Hatherley Lane shall be surfaced with bituminous material. An exit from the compound, onto the bus lane slip road on the A40, shall be provided with the same treatment.

6.8.4. Demolition

No demolition is required to complete the scheme.

6.9. Legal Powers Required for Construction

6.9.1. Land/Access

Works are all within the highways boundary and there is no requirement for land purchase for temporary and permanent works.

6.9.2. Traffic Regulation Orders (TRO)

When creating new shared use cycle ways, Gloucestershire County Councils policy is not to implement a formal traffic regulation order for the cycle way. Instead, a consultation exercise is undertaken where statutory consultees and affected stakeholders are invited to comment on the proposals. The consultation responses are then summarised in a report which is then signed off by a Gloucestershire County Council Senior Officer.

This process will be followed for the WCWCI Scheme. Much of the required consultation has now taken place during preliminary design and at the online share event. During preliminary design no feedback has been received to date that would indicate any future problems with the authorisation for the cycleways.

The only element of the scheme that will require a legal process to be followed is for the crossing notice for the new zebra crossing located across Queens Road in front of Cheltenham Spa Railway Station. Producing a crossing notice is a legal process that must be followed, but the outcome is an authorisation for the crossing not a formal traffic regulation order. The crossing notice process comprises:

- Informal consultation;
- Formal consultation;
- Formal advertising;
- Summary report; and
- Sign off for authorisation of crossing.

6.9.3. Environmental Restraints

As part of the preliminary design, environmental site walkovers have been carried out as well as desktop environmental scoping reports. Liaison is ongoing with the Environmental Health Officer to confirm whether any permissions that may arise, although not anticipated, will be addressed via the legally required procedures.

Where further detailed design work or environmental surveys are required, any mitigation or identified risk will be included in the Risk Register and costed appropriately. Thus far, the potential measures that may be required of the project include potential applications to work on trees subject to Tree Protection Orders, and Section 61 applications under the Control of Pollution Act 1974 (COPA 1974) to control construction noise. More will be understood through detailed design development about the requirement for these permissions.

6.10. Project Programme

Milestone dates for the programme from detailed design to construction are outlined in Table 6-6. A more detailed programme for the WCWCI scheme is provided in Appendix C.

Table 6-6 - WCWCI Programme: Activity and Target Dates

Activity	Target Date
Detailed Design Start	November 2019
Detailed Design End	July 2020
Submit Full Business Case for Approval	May 2020
Issue Supplier Engagement Notice	July 2020
Approve Full Business Case	July 2020
Issue Tender Documents	August 2020
Tenders Return	September 2020
Complete Tender assessment and award	November 2020
Construction Start	January 2021
Construction End	December 2021

6.11. Benefits Realisation Strategy

The benefits realisation strategy is designed to allow benefits that are expected to be derived from the scheme to be planned for, tracked and realised. It also sets out the evaluation of the scheme delivery, including construction and budget management.

The outputs and outcomes are those expected to be derived from the scheme:

- Outputs - tangible effects that are funded and produced directly as a result of the scheme; and/or
- Outcomes - final impacts brought about by the scheme in the short, medium and long term.

The scheme objectives and desired outputs / outcomes are summarised in Table 6-7.

The monitoring of the benefits realised against each objective is controlled within the Monitoring and Evaluation Plan which will set out the necessary data and information requirements to track the performance of the objectives.

Table 6-7 - Scheme Objectives, Outputs and Outcomes

Objective	Output and Outcome
Provide a continuous cycling and walking network from Arle Court roundabout to TGI Fridays Junction (A40/B4633)	Construction of the six WCWCI routes developed in this scheme resulting in fewer cars on the road, a reduction in congestion due to more efficient use of road space and a reduction in severance from better walking and cycling priority.
Provide a significant and measurable improvement to the current set of cycle and walking routes in West Cheltenham, by providing more direct and better-quality routes for commuters and leisure users	
Set improved design standards for cycling and walking routes in West Cheltenham	Creation of better cycling and pedestrian links through West Cheltenham, resulting in mode shift from cars to cycling/walking and an increase in physical activity in the local population.
Increase cycling and walking trips from Arle Court towards Cheltenham, by providing a real alternative to car travel for less able/confident cycle users	
Encourage active and healthy lifestyles through the provision of transport infrastructure	
Deliver collaborative and innovative working practices that promotes sustainable development and contributes toward GCC objectives on climate change	
Maximize the value achieved through the £1.6m GFirst LEP transport investment, ringfenced solely for the provision of cycleway and associated infrastructure as part of the wider WCTIS	Improved signage and marking for cyclists and pedestrians, resulting in a decrease in cycling and pedestrian related collisions.

Tracking the scheme benefits will be a key element in understanding the success of the scheme. Table 6-8 links the benefit realisation for specific measures with responsibility. It is also important to refer to the Risk Register for specific risks and associated controls throughout the project.

Table 6-8 - Benefits Realisation Responsibilities

Measure	Benefits Realisation	Responsibility
Delivery on time	Through contract management	Contractor
Delivery on budget	Through contract management	Contractor
Accelerating the release of employment land	New employment delivered at the West of Cheltenham strategic allocation	GCC / Cheltenham Borough Council / Developers
Wider transport benefits	Realisation involves completion of the scheme resulting in higher cyclist and pedestrian trip numbers.	LEP / GCC

6.12. Monitoring and Evaluation Plan

The purpose of the Monitoring and Evaluation Plan is to identify how the scheme benefits (direct and wider) and actual scheme delivery, (including construction and budget management), are to be evaluated.

The Monitoring and Evaluation Plan is to be owned by the Senior Responsible Officer (SRO), although ownership will be reviewed and delegated as necessary.

To determine whether the scheme benefits are being realised, the desired outputs and associated outcomes have been converted into measurable indicators of scheme benefits, as set out in Table 6-9.

A Monitoring Report will be produced prior to scheme opening detailing the baseline survey data. After opening, studies will be carried out approximately one year and five years later.

Table 6-9 – WCWCI Outputs and Outcomes – Indicators, Targets and Data Requirements

Ref #	Benefit (Desired output / outcome)	Benefit indicator	Target	Type	Specific data requirements
Desired outputs					
1	Creation of better cycling and pedestrian links	Completion of project	2.7km of new and improved cycle ways.	New and improvements to existing	N/A
2	Improved signage and marking for cyclists and pedestrians	Completion of project	Survey Results	New and improvements to existing	Primary research and user feedback
3	Creation of a continuous cycling network between Gloucester and Cheltenham	Completion of project	Joins with HE super cycle way scheme and designated funds applications	Qualitative	N/A
Desired outcomes					
4	Fewer cars on the road	Number of car trips	% Reduction	Quantitative	Automatic Traffic Counts (ATC's)
5	Reduction in congestion due to more efficient use of road space	Car journey times	Reduction in journey times	Quantitative	Automatic Traffic Counts (ATC's)
6	Increase in cycling and walking numbers	Number of cycling and walking trips	Increase	Quantitative	Manual Classified Counts (MCC)
7	Reduction in severance from better cycling and walking priority	Barriers to pedestrian and cycling access	Decrease	Qualitative	Origin/destination surveys
8	Mode shift from cars to cycling/walking	Number of cycling and walking trips	Increase	Quantitative	National Travel Survey data
9	Increase in physical activity in local population	Distance travelled by active mode	Increase	Qualitative/Quantitative	National Travel Survey data
10	Decrease in cycling and pedestrian related collisions	Number of cycling and pedestrian accidents	No increase	Quantitative	GCC Accident data

The One Year after Study will be carried out no less than one year after the completion of the scheme. It will include assessment against scheme objectives / desired Outcomes. Cycling and pedestrian surveys will be completed on each of the new cycle links.

The Five Year after Study will follow the same format as the One Year after study, but it will be able to provide a final appraisal of the scheme that includes all benefits. The Evaluation Summary Table will be

updated to include five-year results. A further consultation exercise to consult on the views of stakeholders and the public would be possible if required.

6.13. Summary

The Management case demonstrates that GCC, supported by the GFirst LEP, has the necessary resources and the proven expertise to deliver the WCWCI scheme in accordance with the programme and budget. It also shows that GCC has the necessary processes in place to ensure that decisions are made at the appropriate level and ensure that agreed assurance processes are followed.

The scheme is being delivered as part of the wider WCTIS programme, overseen by a Programme Board and by a project team that will be responsible for delivering other major projects. A plan for consultation via online public share events ensures engagement with businesses, landowners, the general public, cycle groups and users. Monitoring and evaluation will be co-ordinated through a simple plan that assesses the impacts and outcomes of the WCWCI scheme long with those for the WCTIS Phases 3 and 4 schemes.

7. Conclusion

7.1. Summary

The WCWCI scheme package proposed for available LEP funding (on the basis of the submission and approval of this Full Business Case) comprises a series of interlinking cycling and pedestrian routes, and the package is considered to be appropriate to achieve the agreed aims and objectives of the project.

The most significant benefit is derived from an increase in predicted walking and cycling trips and the associated health benefits for the users of the links, with the level of benefit exceeding the cost of the scheme. The scheme Net Present Value (NPV) is approximately £2.19m. It is also important to note that the Economic Case produces a Benefit-Cost Ratio of 2.66. The overall budget for the scheme is £1.6m. Further justification for approval of the scheme is detailed throughout the report, significantly in the qualitative analysis of the Full Business Case.

7.2. Recommended Next Steps

Development and delivery of the scheme should be approved. Due to the outcomes reported in this study and the anticipated return on the proposal, it is advised that the scheme represents high value for money and meets the policy objectives of the GFirst LEP and GCC.

Appendices

Appendix A. Preliminary Scheme Drawings

- CP3 – Arle Court to Benhall, GCC_CP3-ATK-HGN-XX_ML_Z-DR-CH-000101
- CP3 – Arle Court to Benhall, GCC_CP3-ATK-HGN-XX_ML_Z-DR-CH-000102
- CP 3 – Benhall to TGI Fridays Junction (A40/B4633), GCC_CP3-ATK-HGN-XX_ML_Z-DR-CH-001001
- CP 3 – Benhall to TGI Fridays Junction (A40/B4633), GCC_CP3-ATK-HGN-XX_ML_Z-DR-CH-001002
- CP 3 – Princess Elizabeth Way to Cheltenham Spa Railway Station, via Shakespeare Road, GCC_CP3-ATK-HGN-XX_ML_Z-DR-CH-001003
- CP 3 – Princess Elizabeth Way to Cheltenham Spa Railway Station, via Shelley Road, GCC_CP3-ATK-HGN-XX_ML_Z-DR-CH-001004
- CP 3 – Cheltenham Spa Railway Station: Honeybourne Line to Libertus Road, GCC_CP3-ATK-HGN-XX_ML_Z-DR-CH-001005

Appendix B. Programme

- Appendix B_WCWCI_FBC_Programme

Appendix C. Quantified Risk Register

- Appendix C_WCWCI_Quantified_Risk_Register

Appendix D. Active Mode Appraisal Toolkit (AMAT) Outputs

- Appendix D_WCWCI_Active Mode Appraisal Toolkit (AMAT)_Link 1A
- Appendix D_WCWCI_Active Mode Appraisal Toolkit (AMAT)_Link 1B
- Appendix D_WCWCI_Active Mode Appraisal Toolkit (AMAT)_Link 2A
- Appendix D_WCWCI_Active Mode Appraisal Toolkit (AMAT)_Link 3A
- Appendix D_WCWCI_Active Mode Appraisal Toolkit (AMAT)_Link 4A
- Appendix D_WCWCI_Active Mode Appraisal Toolkit (AMAT)_Link 5A

Appendix E. Appraisal Summary Table (AST)

- Appendix E_WCWCI_Appraisal Summary Table

Appendix F. On-site Audit

- Appendix F_WCWCI_ Onsite Audit - Link 1A
- Appendix F_WCWCI_ Onsite Audit - Link 1B
- Appendix F_WCWCI_ Onsite Audit - Link 2A
- Appendix F_WCWCI_ Onsite Audit - Link 3A
- Appendix F_WCWCI_ Onsite Audit - Link 4A
- Appendix F_WCWCI_ Onsite Audit - Link 5A