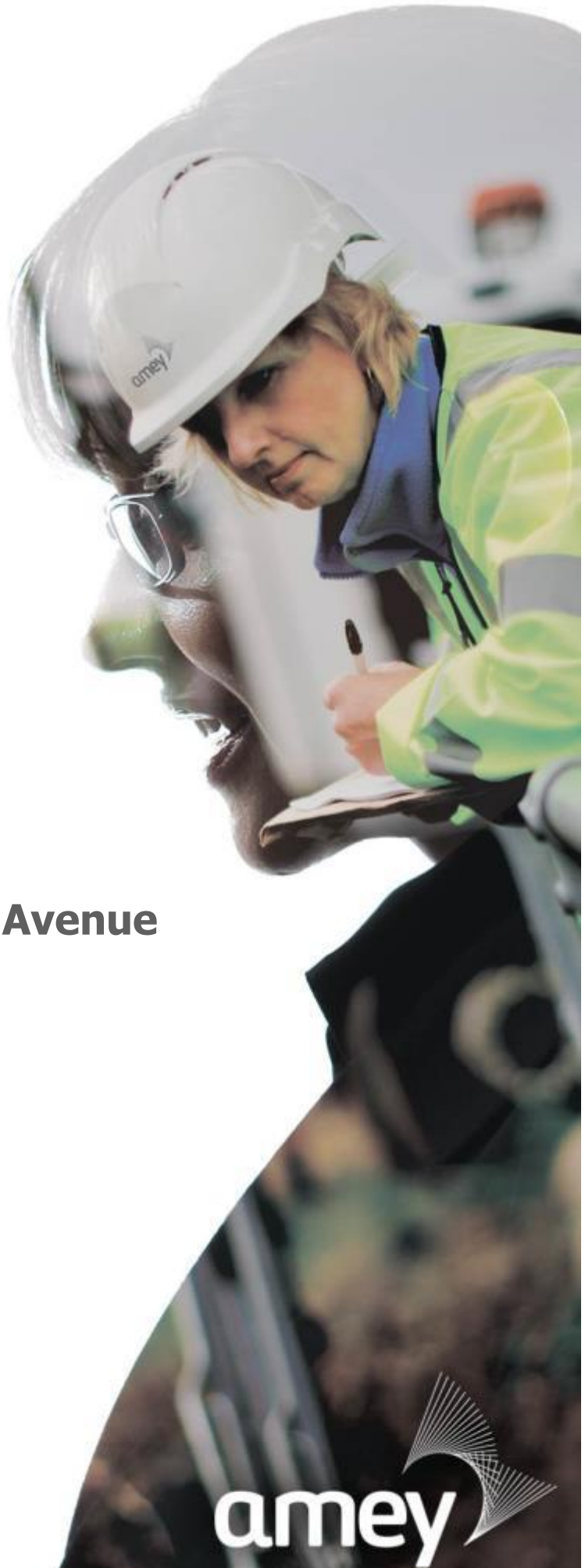
Gloucestershire COUNTY COUNCIL



Full Business Case

Metz Way to Abbeymead Avenue Improvements

COGL43041187 /A

August 2016

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Document Control Sheet

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1 Introduction

1.1 Purpose of this Document

This document provides information to support the implementation of the proposed changes along Metz Way and Abbeymead Avenue, Gloucester. This report is based on the preferred design options and aims to provide the required detail as set out in the Full Business Case Pro Forma, using appropriate guidance. This report follows on from submission of the Appraisal Summary Report (ASR).

1.2 Need for Proposed Changes

The scheme has been modified from previous proposals for the area, developed up to ten years ago, and is now designed to improve travel along the corridor for all users. Scheme drawings indicating the scope of the work are included as Appendix A.

Whilst the scheme is expected to contribute to the wider economic development of the area, it is focused on improving links between the relatively new development of Coopers Edge and the neighbouring established residential areas, to Gloucester City Centre and other attractors. Coopers Edge, when completed, will be a total of 1900 dwellings by 2018 (with a number of different house builders). At present, there are approximately 1400 dwellings completed. A drawing of the proposed Coopers Edge Development is included as Appendix D

The key objectives of the proposed scheme are as follows:

- Improve links between Coopers Edge & Gloucester;
- Improve local links in the area;
- Provide a better opportunity for modal shift;
- Improve the most direct route for all vehicles (Including buses) reducing CO2 emissions, noise and air pollution.

The overarching goal is to improve travel conditions for all users along the currently heavily congested sections of Metz Way. The scheme will aim to;

- Reduce traffic queues and congestion;
- Improve bus journey reliability;
- Apply latest technology to existing traffic signals;

- Improve cycling facilities;
- Upgrade existing pedestrian crossings.

1.3 Metz Way Study Area

The A4302 Metz Way and Abbeymead Avenue corridor are located within the city of Gloucester. The section concerned is an at grade, street-lit, wide single carriageway (WS2) type road presently subject to a 40mph speed limit along the majority of its length. Land use adjacent to the section under review comprises a mixture of commercial (retail and business), industrial, recreational and residential use. The speed limit reduces to 30mph adjacent to lengths where the latter two land uses predominate.

Footway is provided on both sides of the carriageway along the majority of the A4302 route in addition to a dedicated, segregated, off-road path for cyclists separating them from mainline traffic. Along limited lengths, footway is restricted to the southern-most side exclusively although uncontrolled crossing provisions in the form of pedestrian refuges are provided to facilitate access.

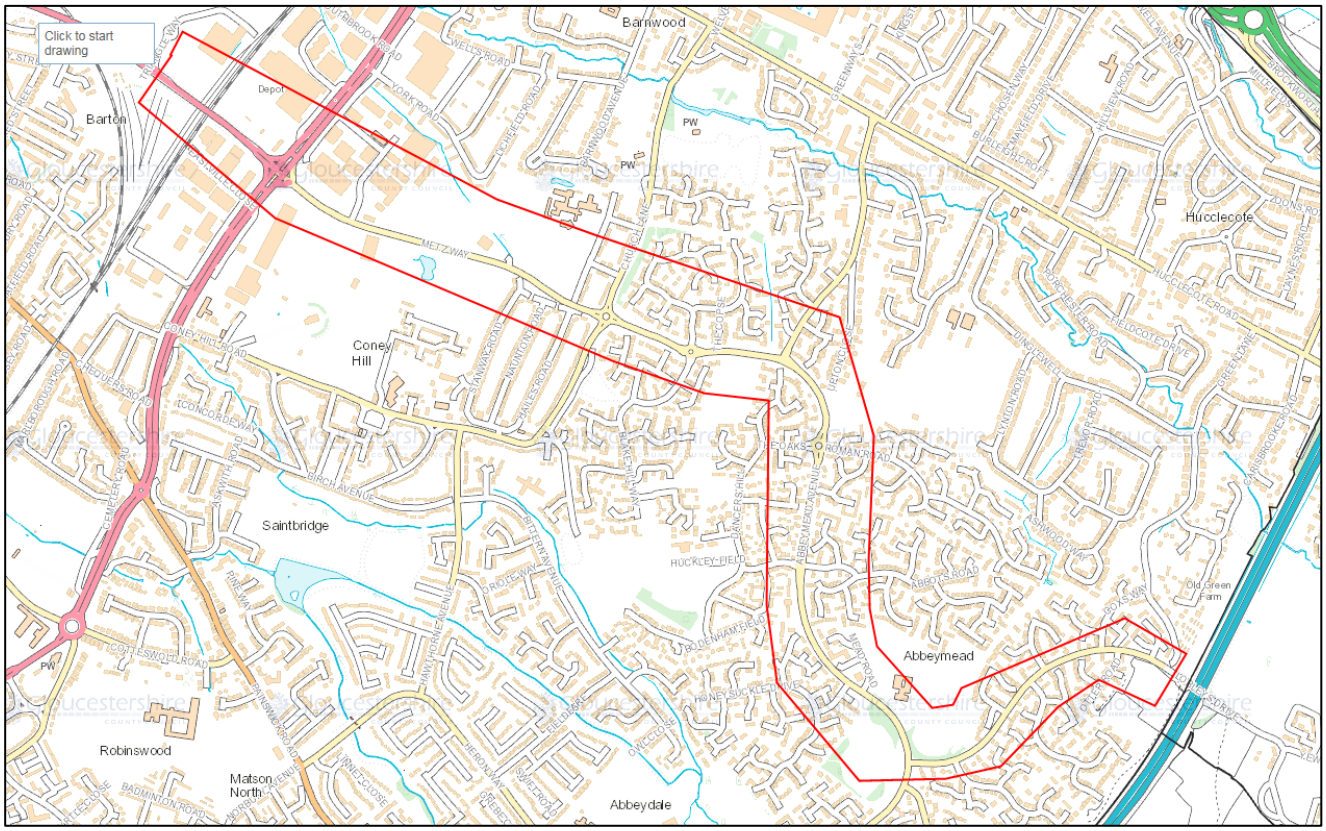


Figure 1-1: Study area, Metz Way/Abbeymead Avenue

2 Sections of the corridor considered for the Full Business Case

2.1 Option Testing and refinement of the scheme

For scheme evaluation, three main highway junctions were considered for improvements.

- A4302 Metz Way / A38 Eastern Avenue Traffic Signal Junction (Site 1)
- *A4302 Abbeymead Avenue / Coney Hill Road Roundabout Junction (Site 2)
- A4302 Abbeymead Avenue / North Upton Lane Traffic Signal Junction with MOVA detection and bus priority (Site 4)

*Note that the Coney Hill Roundabout improvement is not part of the final scheme, as it did not provide sufficient reward for expenditure.

The other key aspects of the scheme, benefiting bus users, cyclists and pedestrians are as follows;

- Coney Hill Road to North Upton Lane Cycling Improvements, with design advice from SUSTRANS (Site 3);
- Upgrade existing crossing to Toucan type (pedestrian and cycle crossing) with on crossing detection, on Abbeymead Avenue south of The Oaks/Roman Road (Site 5);
- Upgrade existing traffic signals at Abbeymead Avenue/Kimberland Way/Abbots Road Junction to incorporate Microprocessor Optimised Vehicle Actuation (MOVA) and bus priority. Pedestrian facilities upgraded to include nearside signal operation (Site 6);
- Upgrade existing controlled crossing point to Toucan type (pedestrian and cycle crossing) with on crossing detection on Abbeymead Avenue, south of Mead Road (Site 7).

2.2 Metz Way/Eastern Avenue

The improvement works here include carriageway widening along the Metz Way arm (East) to facilitate left-turn movements to Eastern Avenue (South). There is also widening to allow the full three lanes approaching the junction to be extended back as far as the Retail Park access/egress.

The signalling equipment at this junction requires significant upgrade which is outside the scope of this scheme. The future upgrade will include implementation of bus priority measures. Consequently bus priority measures at this location are not evaluated as part of this particular assessment. However, spare ducting will be installed to facilitate the future junction upgrade.

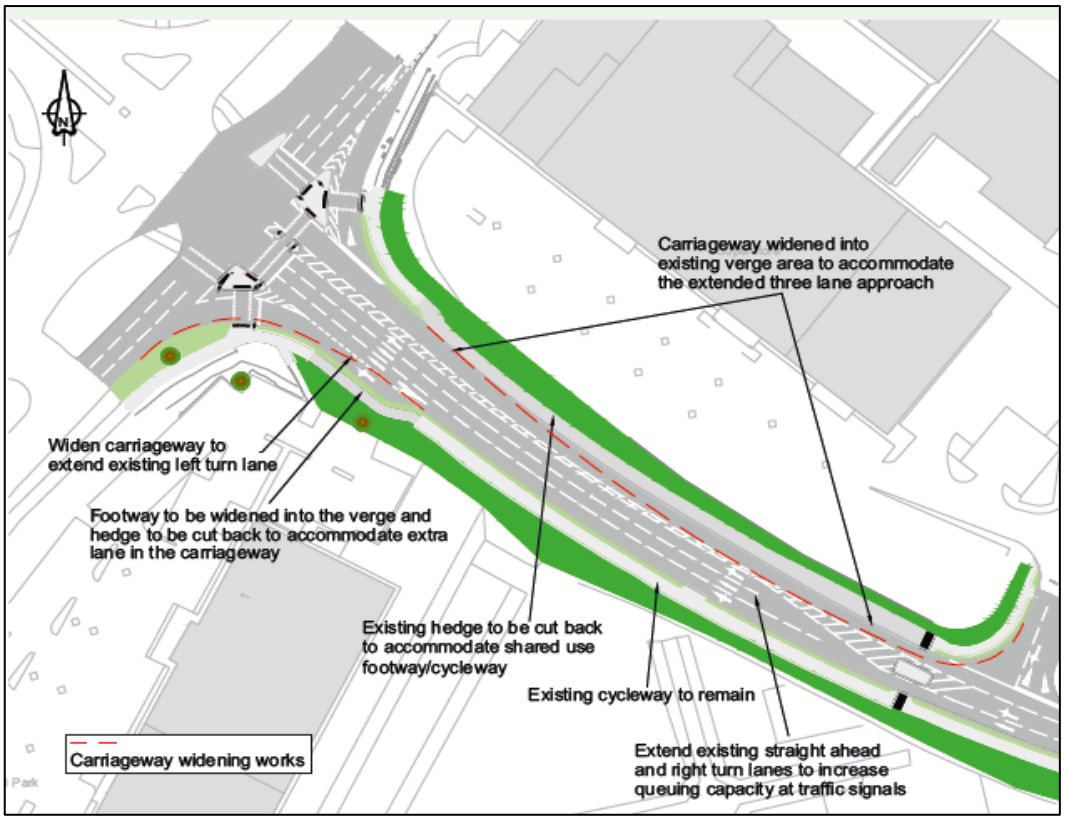


Figure 2-1: A4302 Metz Way / A38 Eastern Avenue Junction proposed layout.

Figure 2-2: Computer generated visualization of Metz Way/A38 Eastern Avenue Junction.

2.3 Abbeymead Avenue/North Upton Lane

The Proposed junction layout for the A4302 Abbeymead Avenue / North Upton Lane Junction is shown in Figure 2-3.

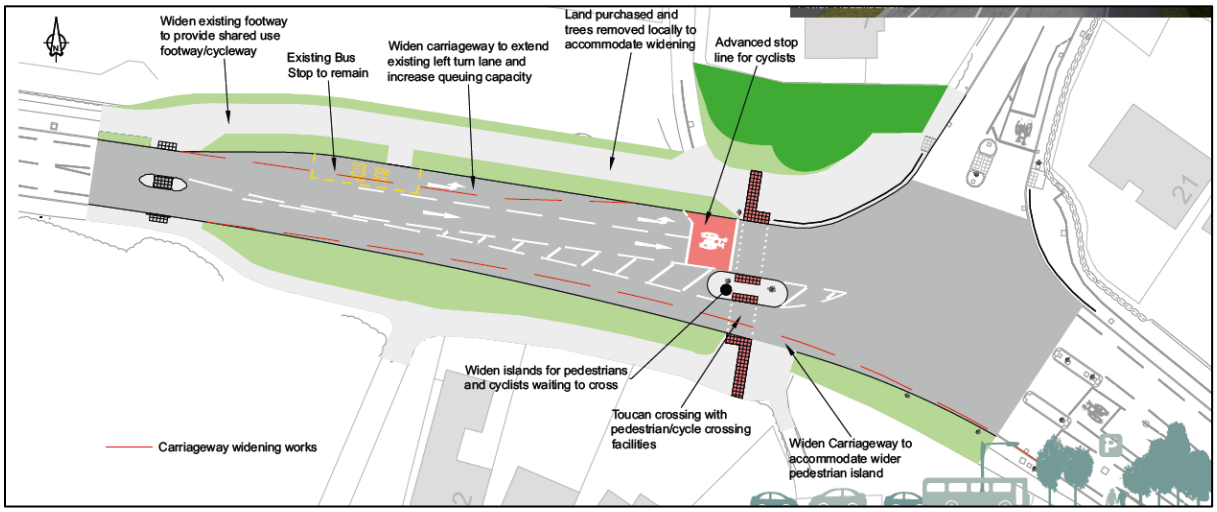


Figure 2-3: A4302 Abbeymead Avenue / North Upton Lane Junction Proposed layout.

Figure 2-4: Computer generated visualization of Abbeymead Avenue / North Upton Lane Junction.

As shown above, the proposed improvement works at this junction include carriageway widening along the Abbeymead Avenue (W) arm, to facilitate left-turn movements to the North Upton Lane arm. Dedicated lanes for cyclists have also been moved off road under the new proposal to separate cyclists from mainline traffic flows.

2.3.1 Other Signal Improvements

Other works included under the proposed improvements but not illustrated above include an upgrade of the signals which will be operated on MOVA (Microprocessor Optimised Vehicle Actuation) signal control. It is recognised that a junction's operational capacity can be improved between 5 and 10 % with the addition of MOVA control so the operational performance of the junction will be further enhanced.

Additional works include bus priority measures, a new controller unit, new signal poles, cables and an upgrade of all signal lights to LED. Although, these latter works will improve operational functioning and safety at the junction, derived benefits cannot be quantified in LINSIG and are beyond the scope of this assessment.

3 5-Case Model

The Transport Business Case process is designed to ensure that investments are directed at the right schemes and that these are managed and delivered in the best way. This ensures that transport investment addresses important issues in an effective way, delivering value for money.

The core of each stage of the Transport Business Case is the 5-Case Model which ensures that schemes:

- Are supported by a robust **case for change** that fits with wider public policy objectives – the 'strategic case';
- Demonstrate **value for money** – the 'economic case';
- Are **commercially viable** – the 'commercial case';
- Are **financially affordable** – the 'financial case';
- Are **achievable** – the 'management case'.

This document uses this 5-case model in an appropriate and proportionate way to demonstrate the merit of investing in the proposed Metz Way improvements.

3.1 Context of the Transport Business Case Process

Currently promoters of all schemes involving an investment of public funds over £5m ('major schemes') are required to prepare and submit both an Outline Business Case (OBC) and Full Business Case (FBC). For schemes of less than £5m, as in this case, it is still required to produce a Full Business Case, although the input and report should be proportionate to the specific scheme. For this project, it is considered appropriate to complete a Full Business Case Report, as presented in this document.

Recent Government policy changes have involved the devolution of decision-making for smaller major schemes, such as this project, to Local Enterprise Partnerships (LEPs). These bodies are designed to direct investment for an area based on economic priorities set through a partnership which is private-sector led.

4 The Strategic Case

4.1 Rationale for Intervention

The overall purpose of the investment is to reduce congestion along Metz Way and reduce queue times at the selected junctions. Additional improvements include bus priority measures which in turn will reduce bus journey times and improve reliability of the Abbeymead and Coney Hill service. A section of dedicated lane for cyclists has also been moved off road under the new proposal to separate cyclists from mainline traffic flows. This was designed in conjunction with Sustrans to improve road safety for cyclist. Pedestrian Improvements are also included within the proposals, within the addition of Toucan type pedestrian crossings.

4.2 Objectives and Critical Success Factors

Gloucestershire's Local Transport Plan (LTP3) sets out the transport strategy for the county and encompasses the period from 2011 to 2026. This has the aim of "providing a safe and sustainable transport network within Gloucestershire". In this context "safe" means a transport network that people feel safe and secure using and "sustainable" means a transport network that is both environmentally and financially sustainable.

In developing our approach to this Transport Business Case the contribution of the scheme towards key strategic objectives set out in the LTP3 has been considered. It is proposed that the scheme contributes to all of the objectives below.

- Minimise traffic congestion, particularly in urban areas and inter urban connections;
- Support sustainable economic regeneration and growth;
- Support a low carbon transport system and more sustainable travel behaviour to provide a greener, healthier Gloucestershire – covering carbon emissions, local environment, and physical activity;
- Improve road safety to make travel safer for all users, and increase personal and community safety for everyone;
- Support and encourage healthy lifestyles;
- Improve access to key services; and
- Protect and enhance the quality of the environment.

4.3 Summary of Scheme Objectives and Beneficiaries

The overarching goal is to provide a free flowing link, in terms of traffic, along the currently heavily congested section of Metz Way.

4.4 Changes from the Strategic Outline Case

The scheme objectives have changed because the proposals are now designed to benefit all vehicles, and not just buses. The reasons for the changes have been driven by the LEP and need for the scheme to benefit all residents of the area, regardless of mode choice.

4.5 Scheme Objectives

Objective 1: Improving link between Coopers Edge & Gloucester.

Objective 2: Improving local links in the area.

Objective 3: Provide a better opportunity for modal shift.

Objective 4: Providing the most direct route for all users, reducing CO2 emissions, and noise and air pollution.

Investment Objectives	**Main benefits Criteria by Stakeholder**
Investment Objective 1 Improving access between Coopers Edge & Gloucester	**Users** Improving journey times. Improving access to jobs and services. Improving local bus services. Direct, safe route to buses and other vehicles. **Residents of Gloucester** Providing an improved transport link in the area and providing other options of travel. **Local Enterprise Partnership** Maintaining attractiveness of area for domestic and non-domestic properties. Safeguarding of existing jobs and facilitation of new job creation.

Investment Objectives	**Main benefits Criteria by Stakeholder**
Investment Objective 2 Improving local links in the area	**Users** Improving journey times. Improving access to jobs and services. Improving local bus services. Direct, safe route to buses and other vehicles. **Residents of Gloucester & Abbeymead** Safer pedestrian crossing Encourage a shift from travelling by car to sustainable modes of transport. Local Enterprise Partnership Maintaining attractiveness of area for domestic and non-domestic properties.
Investment Objective 3 Reduce journey times along Metz Way and Abbeymead Avenue	**Users** Improving journey times. Improving access to jobs and services. Improving local bus services. Promotion of alternative modes of travel. Direct, safe route to buses and other vehicles. **Residents of Gloucester & Abbeymead** Improved journey times. **Local Enterprise Partnership** Maintaining attractiveness of area for domestic and non-domestic properties.

Investment Objectives	Main benefits Criteria by Stakeholder
Investment Objective 4 Provide a better opportunity for modal shift	**Users** Improving journey times. Improving access to jobs and services. Improving local cycle routes Increased pedestrian's crossings and priorities. Increased attraction to change transport modes. **Local residents and businesses** Avoiding increase in movements. Maintaining attractiveness of area for housing and investment. Maintaining road safety. **Local Enterprise Partnership** Avoiding increased maintenance on alternative routes.
Investment Objective 5 Providing the most direct route, reducing CO_2 emissions, noise and air pollution.	**Users** Maintaining lower vehicle operating costs. Avoiding journey time increases and delays. **Local residents and businesses** Avoiding significant increase in vehicle mileage. Environmental stakeholders. Avoiding increase in air pollution CO2 and noise. **Local Enterprise Partnership** Maintaining attractiveness of area.

Table 4-1: Objectives and Stakeholder Benefits

4.6 Need for the scheme

The Options Analysis and Economic Appraisal is based on the combination of these elements within a framework set out in UK Treasury guidance (5-Case Model) and the scheme objectives and Critical Success Factors of the scheme.

5 Proposals

5.1 Metz Way / Eastern Avenue

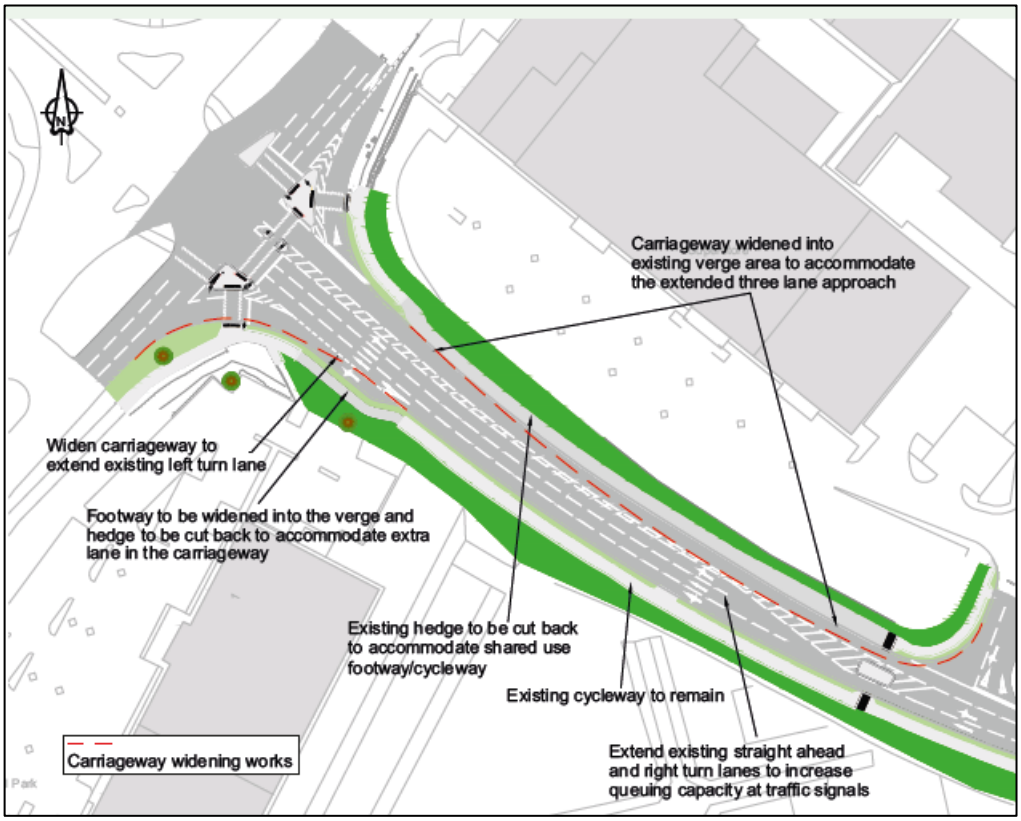


Figure 5-1: A4302 Metz Way / A38 Eastern Avenue Junction proposed

5.1.1 Description

This section of the scheme includes carriageway widening along the Metz Way (E) arm to facilitate left-turn movements to the Eastern Avenue (S) arm. There is also widening to allow the full three lanes approaching the junction to be extended back as far as the Retail Park access/egress.

5.1.2 Advantages

- Improved journey times on Abbeymead Avenue and Metz Way for all vehicles;
- Increase in highways capacity;
- The scheme can be delivered within the available budget;

5.1.3 Disadvantages

- Congestion along Metz Way and Abbeymead Avenue is primarily limited to the peak periods, and therefore it could be argued that the scheme does not provide a benefit at all times of the day.

5.2 Abbeymead Avenue/North Upton Lane

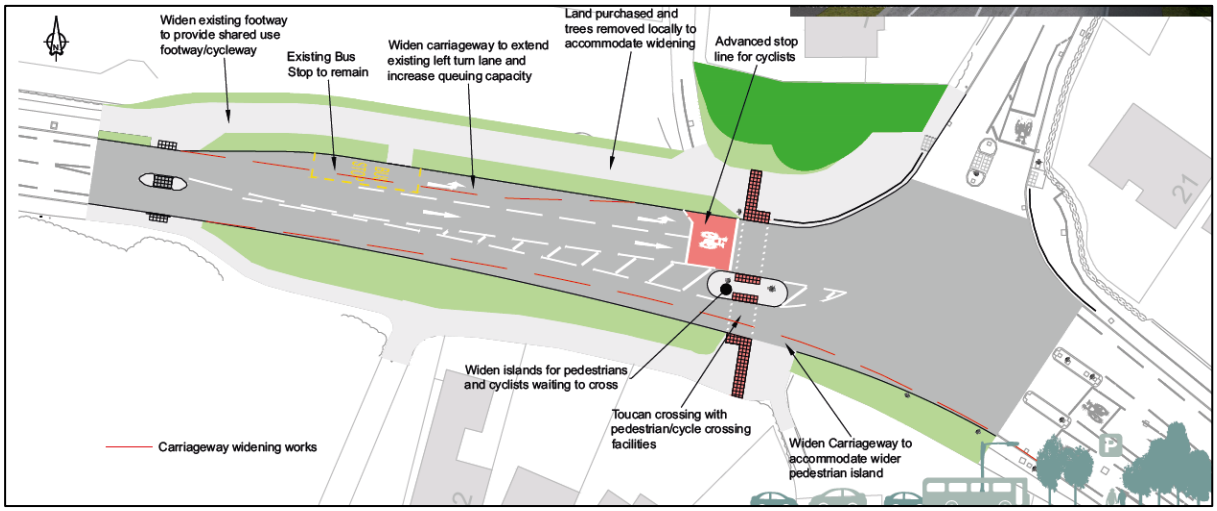


Figure 5-2: A4302 Abbeymead Avenue / North Upton Lane Junction Proposed layout.

5.2.1 Description

As shown above, the proposed improvement works at this junction include carriageway widening along the Abbeymead Avenue (W) arm to facilitate left-turn movements to the North Upton Lane arm. Dedicated lanes for cyclists have also been moved off road under the new proposal to separate cyclists from mainline traffic flows.

5.2.2 Advantages

- Widening existing footway to provide shared use of the footway cycleway.
- Extension of left turn lane increasing queuing capacity.
- Reduction in queue time for all users at junction.
- Significant safety improvement for pedestrians and cyclists.
- Improved journey times on Abbeymead Avenue and Metz Way for all vehicles.
- The scheme can be delivered within the available budget.

5.2.3 Disadvantages

Congestion along Metz Way and Abbeymead Avenue is primarily limited to the peak periods, and therefore it could be argued that the scheme only provides a limited benefit to traffic outside of these times, however the improvement to Toucan crossings will benefit pedestrians and cycle users.

5.3 Cycle Proposal

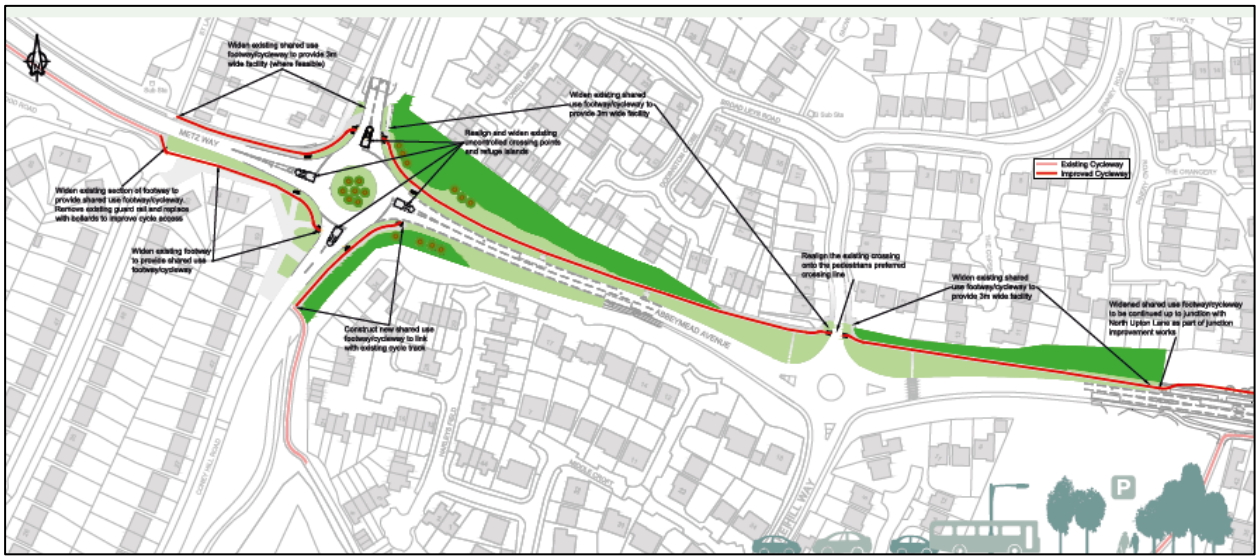


Figure 5-3: Cycle infrastructure improvements developed in consultation with Sustrans and Living Streets in the Metz Way and Abbeymead Avenue.

5.3.1 Description

The proposed cycleway improvements are designed to reduce obstructions to pedestrians and cyclists along the Metz Way/Abbeymead Avenue corridor by improving road crossings, providing links to existing facilities and widening the existing shared use footway/cycleway to reduce conflict between users. The improvements will promote sustainable travel for commuting and leisure users along this key route into Gloucester City Centre.

5.3.2 Advantages

- Reduction in conflict between users.
- Reducing the risk of preventable illness and social isolation by promoting exercise.
- Improved safety for cyclists.
- Increase reliability of the cycle route.
- Route more attractive and adding value for users.
- Can be delivered within budget.

5.3.3 Disadvantages

Existing cycle levels are high so the improvements will benefit existing users, however there is no guarantee the improvements will increase cyclist's numbers on this route.

5.4 Pedestrian Proposal

Sites 5 & 7 Pedestrian

5.4.1 Description

The existing pedestrian crossings will be upgraded to the latest Toucan type pedestrian and cycle crossings. The Wider Toucan crossings will allow both cyclists and pedestrians to cross together. They also have the green man/cycle symbol on the pole as part of a push button unit so pedestrians are facing oncoming traffic as well as the signal. The overhead detection monitors slow walking and vulnerable pedestrians and keeps the signal red. Equally, fast crossing pedestrians allow the signals to change to green quicker.

5.4.2 Advantages

- Improved safety for both pedestrians and cyclists.
- Added value for all users making route more attractive.
- Increased confidence in the route will encourage more users to use the service.
- Reducing the risk of preventable illness and social isolation by promoting exercise.
- Reduction in conflict between users.

5.4.3 Disadvantages

- Despite survey work, to establish clear pedestrian movement desire lines, it is accepted that the proposal will not benefit those users crossing away from the controlled crossing.

5.5 Bus Proposals

5.5.1 Description

A new bus lane was considered for this scheme however this was rejected in favour of a benefit for all users scheme. Although there are no direct improvements for the bus service the installation of bus priority signals at Abbeymead/North Upton Lane and Abbeymead/Kimberland Way junctions will improve journey time reliability.

Currently Stagecoach is experiencing 9% passenger growth on the route, carrying circa 9000 passengers a week. In March 2014 when Service 8 was initiated, it doubled the number of buses between Cooper's Edge and Gloucester. However, no changes have been made to the infrastructure on the Abbeymead Avenue/Metz Way corridor to compliment the new service. Any improvements along the corridor will contribute to an improved service and benefit all public transport users.

5.5.2 Advantages

- Reliable route with a reduction in congestion.
- Promote a modal shift away from private vehicle.
- Reduce CO2 Emissions.
- Increased confidence in service.

5.5.3 Disadvantages

- Minimal jouney times savings from MOVA and bus priority installations

5.5.4 Current Service

The bus route to/from Coopers Edge to Gloucester City Centre is operated by Stagecoach; Service 8. This route was new in March 2014, and part of a wider package of changes to the Abbeymead, Cooper's Edge and Abbeydale areas. Service 8 provides a 15 minute daytime service, plus hourly evening and Sunday buses. The graph below shows the variation in journey times on this route at present. This is expected to improve after the improvements of this scheme have been implemented.

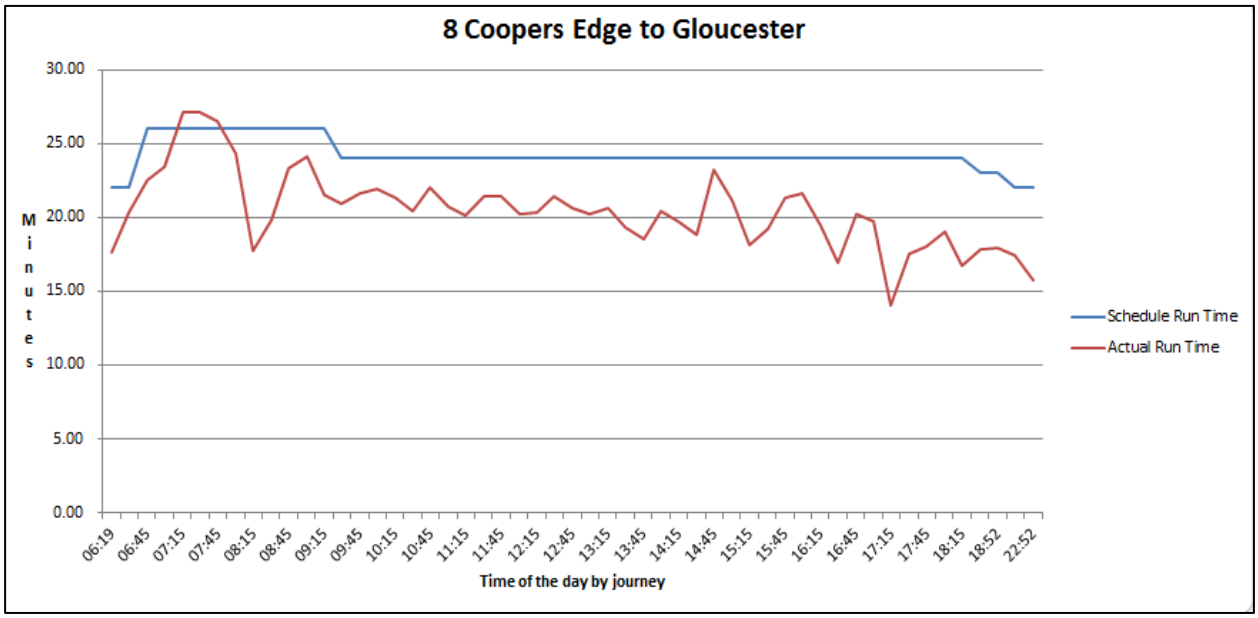


Figure 5-4- Shows the variation experienced on the number 8 bus service, which operates between Coopers Edge and Gloucester City Centre.

6 Economic Case

6.1 Introduction

The Economic Case provides evidence of how the scheme is predicted to perform, in relation to its stated objectives, identified problems and targeted outcomes. Ultimately, the Economic Case determines if the proposed Metz Way scheme is a viable investment, whose strengths outweigh its weaknesses and provides good value for money.

The predicted scheme appraisal focuses on those aspects of scheme performance that are relevant to the nature of the intervention. However, the impacts considered are not limited to those directly impacting on the measured economy, nor to those which can be monetised. The economic, environmental, social and distributional impacts of the proposal are all examined, using qualitative, quantitative and monetised information. In assessing value for money, all of these are consolidated to determine the extent to which the scheme benefits outweigh its costs.

The economic appraisal has been tailored to reflect the needs of the Metz Way Business Case and is discussed under the following headings:

- Options Appraised;
- Value for Money Method;
- Assumptions;
- Initial BCR;
- Adjusted BCR;
- Qualitative Impacts;
- Appraisal Summary Table (AST);
- Value for Money Statement; and
- Conclusion.

6.2 Options Appraised

Sections 2 and 5 set out the possibilities for capacity improvements at the two key

junctions along the A4302 Metz Way and Abbeymead Avenue corridor in Gloucester (i.e. Eastern Avenue and North Upton Lane) which are considered appropriate to providing an enhanced level of service for all users (i.e. highway, active and PT).

6.2.1 North Upton Lane Junction Improvement

Options for the North Upton Lane were considered in an initial feasibility study which was undertaken in July 2016 to identify practical modifications to the existing junction to provide improvements for Non-motorised Users (NMU) and also to reduce the traffic congestion. Four options were considered, including:

- Do Minimum
  - Retain the existing junction operation and layout;
  - Necessary additional works include a new controller unit, new signal poles, cables and an upgrade of all signal lights to LED;
- Option 1
  - The proposed improvement for Option 1 includes carriageway widening along the Abbeymead Avenue (W) arm to facilitate left-turn movements to the North Upton Lane arm. Dedicated lanes for cyclists have also been moved off road under the new proposal to separate cyclists from mainline traffic flows;
  - Other works included under the proposed improvements but not illustrated above include an upgrade of the signals which will be operated on MOVA (Microprocessor Optimised Vehicle Actuation) signal control;
  - Additional works include bus priority measures, a new controller unit, new signal poles, cables and an upgrade of all signal lights to LED;
- Option 2
  - The proposed improvement for Option 2 is based on Option 1 but upgrades the existing straight crossing to staggered TOUCAN crossing at the Abbeymead Ave (W) arm, to improve the traffic signal operation efficiency and maximize the junction capacity.
- Option 3
  - The proposed improvement for Option 3 is based on Option 2 but includes

provision of a new signal controlled TOUCAN crossing at the North Upton Lane arm to improve NMU safety.

The results of the feasibility study identified that the 'Do-nothing' option presented the worst case option of all those investigated in terms of both capacity and delay.

Overall, the Option 1 solution with the widening along the Abbeymead Ave (W) arm to facilitate left-turn movement to the North Upton Ln arm would improve the junction capacity especially in the PM peak period. The MOVA upgrade and proposed near-side TOUCAN crossing with kerbside call/cancel and on-crossing detection will provide more improvement to the site operation.

6.2.2 Eastern Avenue Junction Improvement

Options for the Eastern Avenue were considered in an initial feasibility study which was undertaken in January 2016 to identify design options that derive the greatest reduction in queueing and increases capacity. Three options were considered, including:

- Do Nothing
  - Retain the existing junction operation and layout;
- Option 1
  - The proposed improvement for Option 1 includes carriageway widening along the Metz Way arm (East) to facilitate left-turn movements to Eastern Avenue (South). There is also widening to allow the full three lanes approaching the junction to be extended back as far as the Retail Park access/egress;
- Option 2
  - The proposed improvement for Option 2 is based on Option 1 but includes additional carriageway widening along the Metz Way arm (East) to facilitate two left-turn lanes to turn left Eastern Avenue (South);

The results of the feasibility study identified that the 'Do-nothing' option presented the worst case option of all those investigated in terms of both capacity and delay.

Overall, the results showed that Option 2, with the two-lane left turn option, generated no difference in terms of degree of saturation or queuing when compared to Option 1. Therefore, Option 1 was chosen as the preferred option.

6.2.3 Kimberland Way Junction Control Improvement

Upgrading the existing traffic signals at Abbeymead Avenue/Kimberland Way/Abbots Road was investigated. Two options were considered for appraisal, including:

- Do Nothing
  - Retain the existing junction control;
- Option 1
  - The proposed improvements for Option 1 are to upgrade the existing junction to incorporate MOVA detection and bus priority system in order to retain consistency with of control with surrounding junctions;

6.2.4 Cycling Infrastructure Improvements

The cycle infrastructure improvements were developed in consultation with Sustrans and Living Streets. Two options were identified, including:

- Do Nothing
  - Retain the existing layout;
- Option 1
  - The proposed improvements for Option 1 are designed to reduce obstructions to pedestrians and cyclists along the Metz Way/Abbeymead Avenue corridor by improving road crossings, providing links to existing facilities and widening the existing shared use footway/cycleway to reduce conflict between users;

6.2.5 Pedestrian Crossing Improvements

The pedestrian crossing improvements were developed in consultation with Living Streets. Two options were identified, including:

- Do Nothing
  - Retain the existing crossing type;
- Option 1
  - The proposed improvements for Option 1 are to upgrade the existing pedestrian crossings to the latest Toucan type pedestrian and cycle crossings. The Wider Toucan crossings will allow both cyclists and pedestrians to cross together;

6.2.6 Sifted Appraisal Options

The preferred option will constitute the 'Do Something' option for appraisal purposes which will include the following:

- North Upton Lane Junction Improvement - Option 1;
- Eastern Avenue Junction Improvement - Option 2;
- Kimberland Way Junction Control Improvement - Option 1;
- Cycling Infrastructure Improvements - Option 1; and
- Pedestrian Crossing Improvements - Option 1.

The 'Do Something' will be assessed against a 'Do Minimum' option whereby necessary improvements along the corridor are introduced, namely: A new controller unit, new signal poles, cables and an upgrade of all signal lights to LED at North Upton Lane Junction.

6.3 Value for Money Method

The criteria for assessing the likely performance of the named scheme have been established in terms of measures for success as outlined in section 4.5 of the Strategic Case, as they will predict the scheme's ability to achieve its objectives and resolve identified problems.

The Economic Case for this scheme is focused on:

- Assessing the monetised direct, localised and economic efficiency benefits of the scheme;
- Qualitatively appraising the wider scheme benefits; and
- Offsetting the scheme benefits against the direct scheme capital costs.

Figure 6-1 overleaf shows the approach used to develop the economic case for the Metz Way/Abbeymead Avenue scheme.

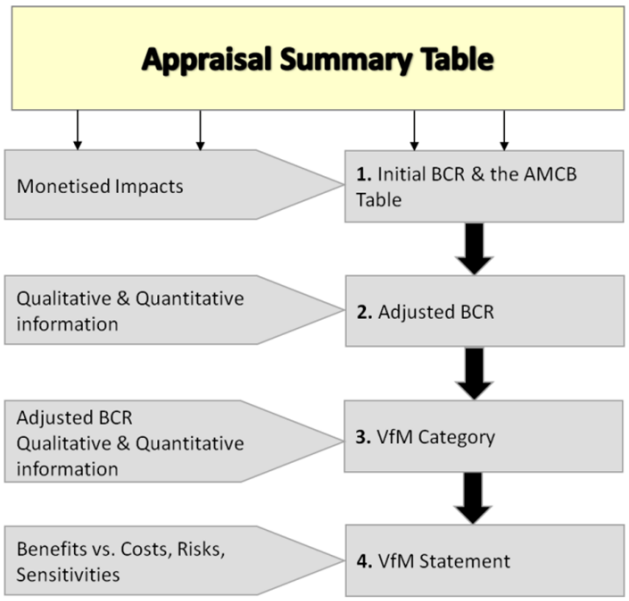


Figure 6-1: Value for Money Process

6.3.1 Stage 1 - Initial BCR

The Value for Money assessment follows guidance contained within 'Value for Money Assessment: Advice Note for Local Transport Decision Makers – December 2013. Stage 1 assesses those impacts that can be expressed in monetary terms. These monetised impacts are summed to construct an Initial Benefit Cost Ratio (BCR).

Having considered the nature of the scheme and its potential impacts on the economy, environment, social well-being and public accounts, the key benefits of the bypass are likely to be derived from a reduction in delays to traffic and subsequently travel time savings along the Metz Way/Abbeymead Avenue corridor. Calculation of benefits of the proposed scheme options was based on the output from models developed using LinSig software. LinSig software is used to model signalised junctions in detail, and is considered to be the most appropriate tool to assess the proposed improvements for the purpose of supporting the Business Case.

The initial BCR has been assessed within a WebTAG compliant framework drawing on the following:

- An assessment of monetised economic impacts namely: business users and providers travel time and vehicle operating cost impacts);
- An assessment of monetised environmental impacts, namely: greenhouse gas emissions;
- An assessment of monetised social impacts, namely: commuting and other users

travel time and vehicle operating cost impacts; and

- An assessment of public accounts impacts, namely: cost to the broad transport budget; and changes in indirect taxes.

6.3.2 Stage 2 - Adjusted BCR

The second stage of a Value for Money assessment builds on the initial monetised costs and benefits and considers qualitative and quantitative information on those impacts which can be monetised but where the evidence base used to derive the monetary values here is less robust than values used for the initial BCR and therefore it is important to consider these estimates as part of the adjusted BCR.

The impacts which are difficult to monetise for this particular scheme but which have nevertheless been appraised using qualitative and quantitative information and given an overall qualitative assessment score are listed below:

- Impacts on journey reliability;
- Impacts on physical activity;
- Impacts on accidents;
- Impacts on regeneration;
- Impacts on noise;
- Impacts on air quality;
- Impacts on landscape; and
- Impacts on journey quality.

6.3.3 Stage 3 - Qualitative Impacts

At Stage 3, where a monetary assessment is not feasible, analysis of non-monetised impacts have been undertaken in accordance with the methodology recommended within the relevant WebTAG units and the results have been summarised within this section. These impacts are as follows:

- Impacts on Townscape;
- Impacts on Historic Environment;
- Impacts on Biodiversity;
- Impacts on Water Environment; and

- Impacts on Severance.

6.3.4 Stage 4 – Value for Money (VfM) Statement

Finally, at Stage 4 a Value for Money conclusion has been drawn considering the evidence pulled together from Stages 1 to 3.

6.4 Scope for Proportionality in the Assessment

This business case has made an assessment of the potential impacts presented in DfT WebTAG guidance. An assessment has not been provided for:

- Delays during construction and maintenance;
- Wider impacts;
- Security;
- Option values and non-use values;
- Accessibility; and
- Affordability

6.4.1 Delays During Construction and Maintenance

Delays during construction and maintenance are not expected to have a significant effect on the scheme BCR and Value for Money. The nature of the scheme is such that it will largely be constructed with minimal impact on existing road users. Therefore construction delay and maintenance impacts have not been included in the analysis.

6.4.2 Wider Impacts

It is not considered that the level and type of benefits to be created by the scheme meets the requirement for an assessment in line with TAG Unit A2.1.

6.4.3 Security

No change to security is predicted to arise due to the scheme and therefore no assessment will be completed.

6.4.4 Option Values and Non-use Values

Option and non-use values should be assessed if the scheme being appraised includes measures that will substantially change the availability of transport services within the study area (e.g. the opening or closure of a rail service, or the introduction or withdrawal of buses serving a particular rural area). This appraisal is not required for the Metz

Way/Abbeymead Avenue scheme as there will not be a substantial change in the availability of transport services within the study area.

6.4.5 Accessibility

As there are no proposed changes in routings or timings of current public transport services, an assessment of access to services is not proposed.

6.4.6 Affordability

The scheme is likely to slightly reduce travel costs through reductions in fuel use due to congestion relief. However, its impacts on overall affordability will be small and therefore no assessment will be completed.

6.5 Assumptions

This section summarises the key assumptions supporting the Value for Money analysis. This includes the assumptions set out in WebTAG as well as further assumptions specific to the Metz Way/Abbeymead Avenue scheme.

6.5.1 Traffic Model/Economic Assessment Tools

Traffic inputs to the economic assessment have been derived from the LinSig junction models, which were developed specifically for the Metz Way/Abbeymead Avenue scheme appraisal.

Forecast outputs from the LinSig models have been input to the economic assessment for a number of situations, as follows:

- Highway network configurations:
  - Do-Something and Do-Minimum;
- Traffic demand scenarios:
  - Core Scenario (most likely);
- Forecast Traffic Assignment years:
  - 2017 and 2032; and
- Model periods:
  - AM Peak hour (0800-0900) and PM peak hour (1700-1800).

Travel time and vehicle operating cost have been assessed using DfT's Transport User Benefit Appraisal (TUBA 1.9.6) software program with trip and time matrix inputs taken

from the LinSig models and journey distances measured using Google maps.

6.5.2 Economic Assessment Parameters

TUBA Annualisation

In accordance with the guidance, the benefits generated in the modelled time periods have been annualised using annualisation factors. The annualisation factors are defined as the number of times each time period occurs over a full year.

Annualisation has been undertaken in accordance with the principles laid out in the TUBA guidance document (TUBA: General Guidance and Advice, version 1.9.6, January 2016, DfT). ATC data has been used to refine the annualisation factors in order to give a more realistic representation of each time slice.

Benefits have not been included for inter-peak, off-peak hours, weekends or bank holidays and hence the economic appraisal is considered to be a conservative estimate of the actual scheme benefits.

Table 3 below summarises the annualisation factors that have been calculated for each time slice.

Table 6-1: TUBA Annualisation Factors

TUBA Time Period	Hours	LinSigModel Period	No. of Traffic Model Periods per TUBA Period	No. of TUBA Period Days per Year	Annuali-sation Factor
Weekday AM Peak Period	0700-1000	0800-0900	2.40	253	658
Weekday Inter-Peak Period	1000-1600	Not Included			
Weekday PM Peak Period	1600-1900	1700-1800	2.78	253	703
Weekday Off-Peak Period	1900-1700	Not Included			
Weekend and Bank Holiday	0000-2359	Not Included			

TUBA Matrix Conversion Factors

Matrix inputs to TUBA were converted by applying conversion factors as shown in **Table 6-2.**

Table 6-2: Matrix Conversion Factors for TUBA

Type/ Period	Conversion	Car/LGV	OGV	Bus
Trip (AM)	PCU-to-Veh	0.96356	0.01822	1.0000
Trip (PM)	PCU-to-Veh	0.98450	0.00775	1.0000
Time (All)	Sec-to-Hour	0.00028	0.00028	0.00028
Distance (All)	M-to-KM	0.00100	0.00100	0.00100

Present Value Year/Discounting

The economic assessment has been summarised with costs and benefits discounted to a 'present value year' of 2010, at a 'discount rate' of 3.5% per annum for the first 30 years, from the date of appraisal and a rate of 3.0% for the subsequent 30 years.

All items evaluated in the economic assessment are monetary 'costs' of transport. However, these costs may be less with a highway improvement scheme (Do Something) in place, than without the scheme (Do Minimum), thereby providing scheme economic benefits.

The 'present value year' (PVY) is a device for representing the difference between the value of money in a future-year, when an item of transport cost will arise and the value in a common base year (i.e. the PVY). Each future year cost is worth less at PVY than at the year in which it is incurred, in order to reflect the principle of time-preference (i.e. people tend to prefer goods and services now, rather than later).

Future year expenditure is converted to PVY by applying the 'discount rate(s)' outlined above. For example, a cost of £1.0 million incurred in 2015 would be worth [1.0 / (1.035^5)] £ million, when discounted at 3.5% per annum, over 5 years, to 2010.

Appraisal Period

The appraisal has been completed for a 30-year assessment period (2017-2046).

Opening Year

Opening Year for the proposed Metz Way/Abbeymead Avenue scheme is expected to be 2017. This 'first scheme year' of 2017 has been taken into account in the capital

expenditure calculations and the TUBA assessment.

TUBA Parameters

Recommended 'default' parameters and values have been used in the TUBA assessment, except where indicated in this report.

6.5.3 Assessment of Public Accounts

This section summarises the capital costs associated with the proposed Metz Way/Abbeymead Avenue scheme. Capital costs have been calculated for both the Do Minimum and Do Something situations. This is because if the scheme was not approved, there are some costs that would need to be met. The signal equipment at the North Upton Lane junction is life expired and is in a poor state of repair. The equipment would deteriorate further over time and lead to its need to be replaced, due to safety and operational concerns.

Scheme costs have been prepared in accordance with TAG Unit A1.2 with Optimism Bias of 3% applied to costs. **Table 6-3** and

Table 6-4 summarise the basic costs from the Financial Case that are then applied to the appraisal.

The base costs have been adjusted to incorporate real cost adjustment (WebTAG A1.2) in construction costs. Since the EU referendum General inflation is assumed to be 1% per year, while construction costs are forecast to reduce by 1%.

Table 6-3: Do Something Appraisal Scheme Costs

Value (£m) 2010 prices, discounted to 2010 Market prices	
Construction Costs	1.272
Real Cost Impacts	-0.102
Risk	0.141
Optimism Bias	0.039
Total Scheme Cost	**1.350**

Table 6-4: Do Minimum Appraisal Scheme Costs

Value (£m) 2010 prices, discounted to 2010 Market prices	
Construction Costs	0.065
Real Cost Impacts	-0.007
Risk	0.072
Optimism Bias	0.004
Total Scheme Cost	**0.134**

In addition, TUBA calculated the changes in Indirect Taxes as a result of changes in speed and distance. These changes affect the amount of fuel being used and therefore affect the amount of taxes the Government receives. In line with WebTAG guidance they have been included as part of the Present Value of Benefits (PVB).

6.6 Initial BCR

As previously outlined, the Initial BCR consists of four key components, namely:

- An assessment of monetised economic impacts namely: business users and providers travel time and vehicle operating cost impacts);
- An assessment of monetised environmental impacts, namely: greenhouse gas emissions;
- An assessment of monetised social impacts, namely: commuting and other users travel time and vehicle operating cost impacts; and
- An assessment of public accounts impacts, namely: cost to the broad transport budget; and changes in indirect taxes.

6.6.1 Assessment of Economic Impacts

Business Users and Providers

Travel time saving benefits are derived by comparing the overall travel times in the do

minimum situation with travel times in the do something scenarios. It will take a shorter time to travel through the corridor when the scheme is implemented, and these time savings are converted into a monetary value. For the appraisal of travel time and VOC benefits, matrices (tables of trips, travel times and distances between all origins and destinations) from the LinSig model are entered into TUBA, along with other scheme specific data.

TUBA assesses travel time savings over the entire modelled area and then applies monetary values, known as Values of Time (VOT), to derive the monetary benefits of those time savings. WebTAG VOT parameters and forecast changes in their values over future years are included in the standard TUBA economics file (as used within TUBA version 1.9.6).

When road vehicles are used they incur costs such as fuel, maintenance, and wear and tear. These costs are known as Vehicle Operating Costs (VOC). When the scheme is implemented traffic that uses the Metz Way/Abbeymead Avenue corridor will experience less delay and therefore have quicker journeys. Such traffic therefore will have a slight decrease in VOC.

TUBA was also used to determine the overall VOC benefits or dis-benefits. WebTAG VOC parameters and forecast changes in their values over future years are included in the standard TUBA economics file (as used within TUBA version 1.9.6).

A breakdown of the output economic impacts from TUBA is given in **Table 6-5**.

Table 6-5: Economic Impacts (TUBA)

Value (£m) 2010 prices, discounted to 2010	
Benefits	
Travel Time	0.879
Vehicle Operating Costs	0.048
Private Sector Provider Impacts	-0.930
Net Business Impact	**-0.003**

As expected, the results show that there are time benefits caused by journey time improvements along the corridor. The results also show that there are slight VOC benefits. Taking into account the developer contribution it can be seen that net business

impact of the scheme is negligible.

6.6.2 Assessment of Environmental Impacts

This section summarises the monetised impacts of the scheme on the environment (i.e. greenhouse gases).

The impact of the Metz Way/Abbeymead Avenue widening scheme on greenhouse gas emissions has been assessed using the WebTAG Guidance (Unit A3.4 Greenhouse Gases, DfT, December 2015).

In line with the WebTAG Unit A3, the option of using the TUBA assessment method was used.

A breakdown of the greenhouse gas impacts from TUBA is given in **Table 6-6**.

Table 6-6: Greenhouse Gas Impacts (TUBA)

Value (£m) 2010 prices, discounted to 2010	
Benefits	
Greenhouse Gases	**0.008**

The reduction in carbon dioxide emissions over the 30 years appraisal period is a logical result based on the expected reduction in congestion.

6.6.3 Assessment of Social Impacts

TUBA was used to determine the travel time and VOC benefits for consumer users. This was done in the same way as for business users and providers. A breakdown of the output consumer user impacts from TUBA is given in **Table 6-7**.

Table 6-7: Economic Impacts (TUBA)

Value (£m) 2010 prices, discounted to 2010	
Benefits	
Travel Time – Commuter User	0.571
Travel Time – Other User	0.670
Vehicle Operating Costs – Commuter User	0.028
Vehicle Operating Costs – Other User	0.010

Value (£m) 2010 prices, discounted to 2010	
Net Consumer User Impact	**1.279**

6.6.4 Initial BCR

Results from the monetised, business user travel time / vehicle operation, consumer user travel time / vehicle operation and environmental assessments have been combined, to give an initial assessment of scheme impact. The summary costs and benefits are shown in **Table 6-8**.

Table 6-8: Initial Scheme Impact

Value (£m) 2010 prices, discounted to 2010	
Benefits	
Business Users	-0.003
Consumer Users	1.279
Greenhouse Gases	0.008
Indirect Taxes	-0.028
Present Value of Benefits (PVB)	**1.256**
Net Capital Expenditure Costs	0.286
Present Value of Costs (PVC)	**0.286**
Net Present Value (NPV)	**0.970**
Benefit/Cost Ratio (BCR)	**4.392**

The costs and benefits outlined above show that the Initial BCR of the scheme, based on standard monetised values, for the core scenario is 4.392. This is considered very high value for money according to DfT guidance.

6.7 Adjusted BCR

6.7.1 Impacts on the Economy

Reliability Impact on Business Users

Reliability is defined as a variation in journey times that transport users are unable to

predict. Hence, reliability is confined to random effects, arising from either variability in recurrent congestion at the same period each day – Day to Day Variability (DTDV) – or variability in non-recurrent congestion such as incidents. It excludes predictable variation relating to varying levels of demand by time of day, day of week, and seasonal effects that travellers are assumed to be aware of. Measurements of the monetised journey time reliability benefits from a scheme proposal should be based solely on the unpredictable variation, because of the extra costs incurred by travellers.

The reliability analysis has applied guidance on urban road reliability as set out in WebTAG A1.3. This uses a forecast of the improvement in standard deviations of journey time based upon journey distance and time in the do-minimum and do-something scenarios. Reliability benefits have been assessed across the modelled area for all origin-destination pairs, and monetised using a process equivalent to the TUBA calculation of user time benefits.

The value per unit improvement in reliability is measured as being equivalent to 80% of the user's respective value of time, which differs by journey purpose.

This reliability assessment captures only variations (both positive and negative) for highway users. Any additional impacts on reliability of public transport movements have not been captured.

The journey time reliability benefits analysis identified approximately £53k benefits (in 2010 prices discounted to 2010) for business users due to the scheme. This is equivalent to around 6% of the time benefits generated by the scheme.

Regeneration

Affected services serve areas subject to regeneration – increased efficiency will enable them to support this. Therefore, a qualitative impact score of moderately beneficial has been applied.

6.7.2 Impacts on the Environment

Noise

Sites 1 and 4 were assessed in relation to noise impacts (see appendix B1). A simple noise assessment was undertaken and calculations were carried out in accordance with the Calculation of Road Traffic Noise Manual. It was assumed that the proposed scheme does not alter the main parameters used in the calculations i.e. traffic volume, speed, composition etc.

There are no noise important areas within the scheme extents and there are no residential dwellings close to site 1, the nearest buildings are primarily commercial retail. Residential receptors are within approximately 20 metres of site 4.

In terms of change in noise, both schemes have a minor effect as the widening is to an existing heavily trafficked highway where the influence from the 'existing' highway is dominant over any impact from the 'altered' highway. The noise predictions carried out focused on the impact from just the altered section of highway, the results of which showed a change of up to +0.4 dB for both sites. It is noted however, that the actual change may be less due to the influence from the existing highway as detailed above. Changes of this magnitude equate to an appraisal rating of neutral and are not significant.

No mitigation is required but the contractor will be required to contact the environmental health officer (EHO) at Gloucester City Council to obtain knowledge on local issues and any issues regarding the construction noise, hours of work etc. A qualitative impact score of ***neutral*** has been applied.

Air Quality

The Air Quality Report (appendix B2) assessed the temporary effects of dust during the construction of Sites 1 and 4 of the scheme and the permanent effects from associated operational vehicle movements on local ambient levels of NO2 and PM10. With the appropriate mitigation in place, as recommended in the site-specific measures, there will be no significant temporary dust effects associated with the construction works.

The scheme is not located within an AQMA. The nearest AQMA is the Painswick Road AQMA approx. 850m south of the scheme. The proposed scheme will directly impact on the movement of traffic at a number of key junctions that are in relative close proximity to a number of residential receptors; however, screening calculations have shown it is unlikely there will be any breaches of the air quality objectives for NO2, PM10 or PM2.5. The impact of the scheme on air quality has been classed as ***neutral***/not significant.

Landscape

As part of the scheme design a simple landscape and visual impact assessment (appendix B3) was undertaken. The local character of the area is predominantly urban across several residential areas with sections of amenity grassland and parkland. The scheme is not within a conservation area or Area of Outstanding Natural Beauty (AONB). The Cotswold AONB starts approximately 800m south east of the scheme.

Vegetation clearance will have a negative impact on the current landscape setting although this is not likely to have a significant adverse impact. A number of trees will be directly impacted by the works, with certain trees flagged for removal (see appendix B4). Minimal tree/shrub removal will be undertaken to ensure the positive visual amenity and screening of the carriageway is retained and that visual impact is prevented or at least reduced for highly sensitive visual receptors. Although the carriageway widening will increase the urban factor of the landscape, the impact is expected to be minimal. Available space is a constraint in some areas therefore replacement planting will not be achievable. Trees may be able to be retained if appropriate working methods are employed and the root protection areas adhered to. The Arboricultural method statement (appendix B5) shall be followed and arboricultural supervision will be required. Trees with a Tree Preservation Order (TPO) status will not be affected as part of the scheme.

If further vegetation clearance is required then the landscape architect will be consulted to assess any additional impact and for recommendations for mitigation. Flexible surfacing solutions within the tree root protection areas will be utilised to ensure current positive visual amenity is retained where practicable. The landscape proposals will also consider the future maintenance requirements associated with the proposed sites. The retention of trees in close proximity to the carriageway increases the maintenance and in turn will increase the costs and disruption to road users and pedestrians during maintenance operations. A part time landscape architect/clerk of works will be present on site to inspect these works.

A qualitative impact score of ***neutral*** has been applied.

6.7.3 Social Impacts

Reliability Impact on Commuter and Other Users

The social reliability impact has been analysed using the same methodology as set out for Business Users.

The journey time reliability benefits analysis identified approximately £107k benefits (in 2010 prices discounted to 2010) for commuter and other users due to the scheme. This is equivalent to around 9% of the time benefits generated by the scheme.

Journey Quality

Journey times will be improved by a quicker, smoother and predictable transit along Metz Way for all users. Efficient and reliable public transport links and more efficient operation could then enable services to be operated at higher frequency or lower cost. The overall assessment of the level of journey quality is considered ***moderately beneficial.***

Accidents

The existing accidents have been reviewed covering the period 2010 to 2015 covering Metz Way and Abbeymead Avenue (see **Figure 6-2** and **Figure 6-3**). The data suggests that overall throughout the planned route of improvements there has only been some "Slight" accidents at the given junctions. The exception to this being at the Metz Way junction, where as seen in **Figure 6-2** there were two reported "serious" injuries one being identified on the left turn junction which is likely to be modified under this scheme.

A slight improvement in safety may result from the improved and designated cycle lanes planned allowing traffic and cyclist to travel on separate paths therefore this is likely to improve safety. The improved pedestrians routes and crossings is also likely to have an impact on safety with controlled and signalised priorities for pedestrians this will help improve safety and reduce conflict between different modes of transport. Therefore, a qualitative impact score of ***moderately beneficial*** has been applied.

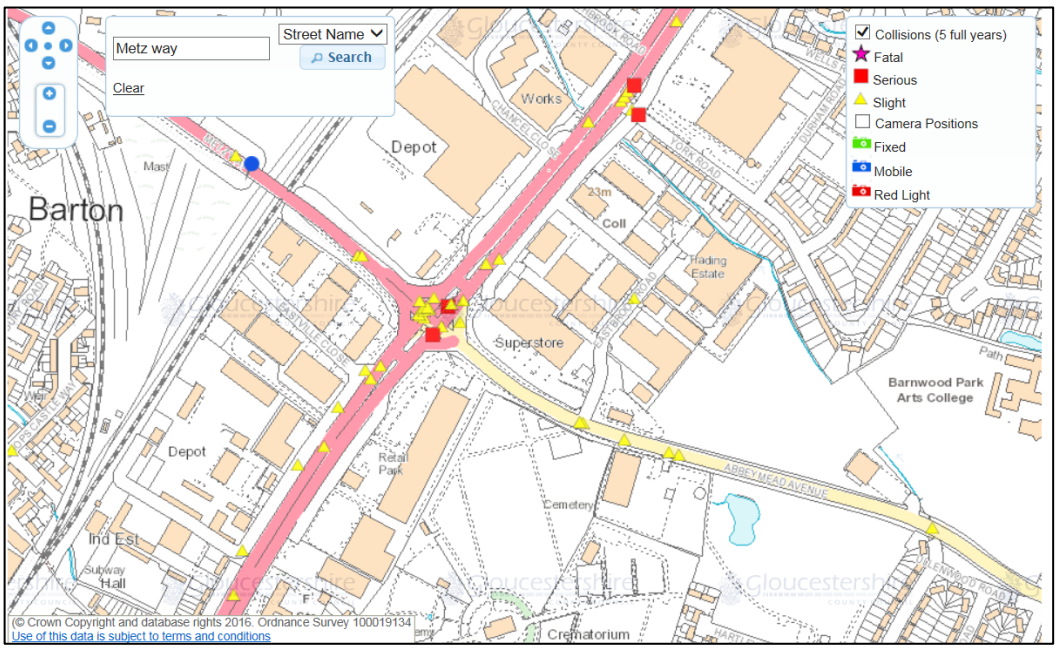


Figure 6-2: Accident Data at Abbeymead Avenue.

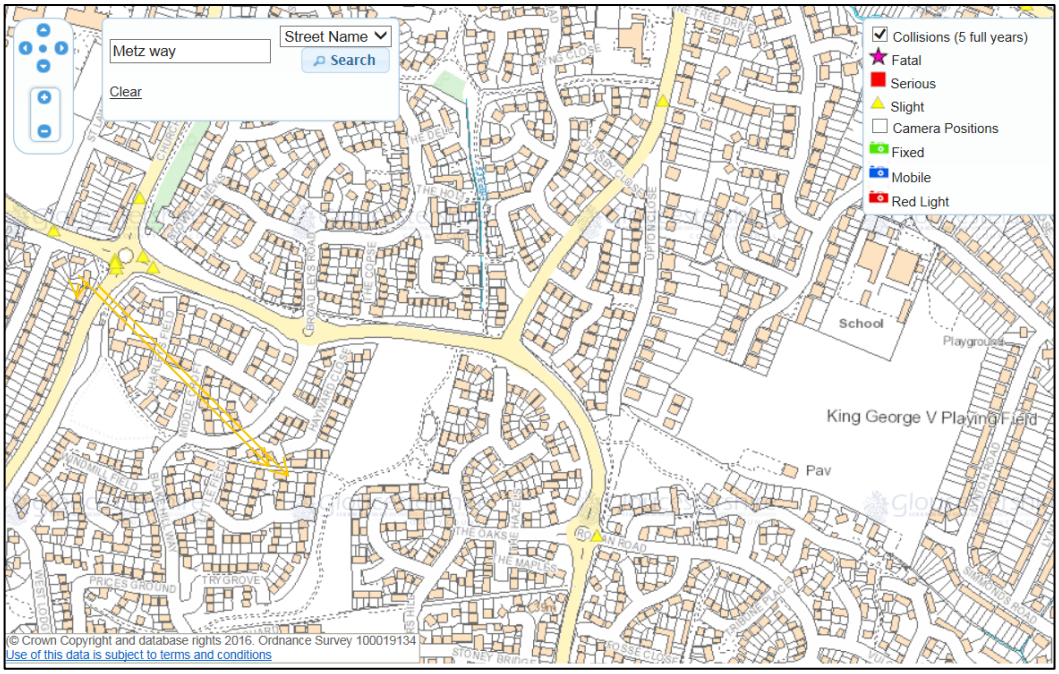


Figure 6-3: Accident Data at North Upton Lane.

Physical activity

Extended and resurfaced Footways/cycleways will allow for both pedestrians and cyclist having their own space on the route which in turn will reduce user conflicts between all users and make the route more attractive. This will encourage users to use these modes of transport and consequently promote physical activity as people become less reliant on the private car. Therefore, a qualitative impact score of ***moderately beneficial*** has been applied.

6.7.4 BCR Adjustment

Overall, the findings of the qualitative assessments are not considered to be significant enough to impact on the initial BCR category of Very High.

6.8 Qualitative Impacts

6.8.1 Impacts on the Environment

Townscape

Although the scheme is highly visible from urban areas and open spaces the new road furniture and carriageway widening is unlikely to have a significant adverse impact on the surrounding settings. There is currently a road present and visible to a number of visual receptors. Although predominantly urban there are a number of commercial properties which are considered of lower sensitivity and therefore the proposals are likely to have no significant adverse impacts. Therefore, a qualitative impact score of ***neutral*** has been applied.

Historic Environment

The initial environmental scoping assessment of the scheme revealed that there are no Listed Buildings within 300m of the scheme. There are no further designated Heritage Assets (Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields) within 1km of the scheme. Archaeological finds have been discovered in the surrounding area, but these are of unknown importance.

Consultation with Gloucester City Council archaeological services was undertaken and they confirmed that archaeological mitigation will not be required for this scheme and no further archaeological concerns are likely to be raised. Impact would therefore be ***neutral*** and this topic has been scoped out from further assessment.

Biodiversity

An ecological impact assessment has been carried out for sites 1 and 4 of the scheme (see appendix B6). There are no sites of international, national or regional environmental importance that will be impacted directly or indirectly through the scheme. An ecological walkover revealed that the scheme has the potential to impact the habitats of birds (e.g. scrub, trees) and badgers.

An active, outlier badger sett has been identified within close proximity to site 4. An assessment of the scheme has concluded that badgers may be impacted as a result of the aforementioned scheme and therefore an offence may be committed under the Protection of Badgers Act (1992). A person is guilty of an offence if, except as permitted by or under this Act, he interferes with a badger sett by doing any of the following things:

- Damaging a badger sett or any part of it;
- Destroying a badger sett;
- Obstructing access to, or any entrance of, a badger sett;
- Causing a dog to enter a badger sett; or
- Disturbing a badger when it is occupying a badger sett.

Intending to do any of those things or being reckless as to whether his actions would have any of those consequences.

A badger mitigation strategy has been developed and a Natural England derogation licence will be arranged prior to the commencement of works on site.

The mitigation strategy includes, under licence, the monitored closure of the badger sett and its permanent removal.

A timescale for the individual components required to achieve the programme is provided below;

Work stage	Aug	Sep	Oct	Nov	Dec	Jan
Badger sett closure method statement and licence application formulation						
Licence consideration by Natural England						
Installation of badger gates						
Checks of badger gates (11 visits over 30 days)						
Supervision of sett removal and installation of preventative measures						
Licence return						

Table 6-9: Timetable for Badger Mitigation Strategy

The required vegetation clearance will be undertaken between September and February (inclusive) to avoid the nesting bird season. If any vegetation clearance is required during the breeding season (March-August) then an inspection for active nests will be made within 48 hours prior to cutting. If an active nest is found, a buffer zone will need to be established and works delayed at this location until the chicks have fledged.

The overall impact on the natural and urban environment has been assessed as broadly ***neutral***. The removal of vegetation will make the wildlife corridors present smaller, but the impact is not considered to be significant.

Water Environment

No impacts to the water environment are anticipated as a result of the scheme. The scheme is not within a flood zone or floodplain with no main rivers passing under the road, there is however a risk of flooding from surface waters. There will be no major structural changes to the main existing drainage: therefore, this topic has been scoped out from further assessment. The Lead Local Flood Authority (GCC) will, however, be contacted to discuss any flood management actions/issues under the Flood and Water Management Act 2010. Appropriate pollution prevention measures will be implemented during works to prevent contamination to the water environment. There will be enhanced drainage capacity for any increases in flow rate as a result of the carriageway widening. The overall impact on the natural and urban environment has been assessed as broadly ***neutral***.

Severance

Neutral impact expected, although improved pedestrian crossings will improve the opportunities for crossing Metz Way and Abbeymead Avenue.

6.8.2 Overall Qualitative Impact

Overall, the findings of the qualitative assessments are not considered to be significant enough to impact on the adjusted BCR category of Very High.

6.9 Appraisal Summary Table

The quantitative and qualitative assessments of impacts made above have been input to the Appraisal Summary Table (AST) provided overleaf.

6.10 Value for Money Statement

The VfM has been prepared in accordance with the DfT's "Value for money assessment: advice note for local transport decision makers". The overall qualitative outcome is Very High, on a 4-point scale. This VfM is based on the quantified initial BCR for the scheme of 4.392 (i.e. Very High), with further adjustments for non-quantified BCR components and qualitative outcomes.

Table 6-10:Appraisal Summary Table – Metz Way to Abbeymead Avenue Improvements

Impacts		Summary of key impacts	Assessment		
			Quantitative	Qualitative	Monetary £m(NPV)
Economy	**Business users & transport providers**	Avoidance of increased costs, increased journey times, increased delay.	Benefit/Cost Ratio (BCR): **4.392**	Significant benefit	Value (£m) 2010 pric discounted to 2010 **£0.970M**
	Reliability impact on Business users	Avoid increase in journey times and increase safety.	See "commuting and other users"	Significant benefit	N/A
	Regeneration	Maintaining attractiveness of area for domestic and non- domestic properties. • Improving journey times. • Improving access to jobs and services. • Improving local bus services. • Direct, safe route for all vehicles.	Not calculated for this scheme	Moderately beneficial	N/A
NN/A Environmental/ANNV	**Noise**	During construction there will be minimal local impacts on adjacent properties due to noise.	Not quantified	Neutral Impact	N/A
	Air Quality	Air quality is unlikely to be affected.	Not quantified	Neutral Impact	N/A
	Greenhouse gases	Avoidance of Increase in carbon emissions due to the scheme encouraging a modal shift to more sustainable modes of transport.	Value (£m) 2010 prices, discounted to 2010 **£0.008M**	Neutral Impact	
	Landscape	Neutral Impact on landscape	Not quantified	Neutral Impact	N/A
	Townscape	The new road furniture and carriageway widening is unlikely to have a significant adverse impact on the surrounding settings.	Not quantified	Neutral Impact	N/A

	Biodiversity	There are no sites of international, national or regional environmental importance that will be impacted directly or indirectly through the scheme. A badger mitigation strategy has been developed and a Natural England derogation licence will be arranged prior to the commencement of works on site.	Not quantified	Neutral Impact after mitigation strategy implemented	
	Water Environment	There will be no impact on any watercourses.	Not quantified	Neutral Impact	
Social	**Commuting and Other users**	Avoidance of increased costs, increased journey times, increased delays and reduced reliability. Journey time saving along Metz and Abbeymead Avenue.	**Value of journey time changes(£)** Value (£m) 2010 Prices, discounted to 2010 **Benefits** Travel Time- Commuter User: **£0.571** Travel Time- Other User: **£0.670** Vehicle Operating Costs- Commuter User: **£0.028** Vehicle Operating Costs- Other users: **£0.010** **Net Consumer User Impact: £1.279**	Moderately beneficial	N/A
	Reliability impact on Commuting and Other users	Improved journey time reliability	The journey time reliability benefits identified approximately **107k** benefits (in 2010 prices discounted to 2010) for commuter and other users due to the scheme. This is equivalent to around **9%** of the time benefits generated by the scheme.	Moderately beneficial	N/A
	Physical activity	Designated cycle path and footpaths will allow pedestrians to have their own space which in turn will reduce user conflicts between all users and make the route more attractive. The improvements to the pedestrian's crosses will also improve safety and in turn encourage people to use this route.	Not quantified	Slightly beneficial	N/A
	Journey quality	Journey times will be improved by a quicker, smoother and predictable transit along Metz way for all users.	Not quantified	Moderately beneficial	N/A

	Accidents	An improvement in safety may result from the improved and designated cycle lanes planned allowing traffic and cyclist to travel on separate paths therefore this is likely to improve safety. The improved pedestrians routes and crossings is also likely to have an impact on safety with controlled and signalised priorities for pedestrians this will help improve safety and reduce conflict between different modes of transport.	Refer to accident Data	Moderately beneficial	N/A	
	Security	No Impact expected.	Not quantified	Neutral	N/A	
	Access to services	Access to services will not be affected by the proposed scheme, apart from an improved service to the town centre and Gloucester Business Park.	Not quantified	Slightly beneficial	N/A	
	Affordability	Provision of LEP funds **£0.5M**, Developer S106 **£1.1M**	Developer funds to be agreed	Neutral	N/A	
	Severance	No impact expected, although improved pedestrian crossings will improve the opportunities for crossing Metz Way and Abbeymead Avenue.	Not quantified	Neutral	N/A	
	Option and non-use values	Not relevant	N/A	N/A	N/A	
Public Accounts	**Cost to Broad Transport Budget**	User benefits Non-user benefits	Cost of scheme **(£1.6M)** with **1.1M** from Developer S106	Expected net overall benefit	N/A	
	Indirect Tax Revenues	No Impact Expected	Not quantified	N/A	N/A	

7 Commercial Case

7.1 Commercial Issues

The scheme will generate no direct income for the County Council.

7.2 Scheme Procurement

7.2.1 Procurement Options

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

A. Full OJEU tender (Schemes greater than OJEU limit of £4,322,012)

GCC would opt for an 'open' tender, where anyone may submit a tender, or a 'restricted' tender, where a Pre-Qualification is used to whittle down the open market to a pre-determined number of tenderers. This process takes approximately one month and the first part is a 47 day minimum period for GCC to publish a contract notice on the OJEU website.

The minimum tender period is 6 weeks but could be longer for more complex schemes. Once the tenders are received they will be assessed and a preferred supplier identified. There is a mandatory 10 day 'standstill' period, during which unsuccessful tenderers may challenge the intention to award to the preferred contractor.

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; this would include Pre-Qualification criteria which will be used to select 5 tenderers.

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 will be arranged.

The minimum tender period is 6 weeks but could be longer for more complex schemes. The successful 5 tenders will be assessed and a preferred supplier identified. A 10 day 'standstill' period will be adopted, during which unsuccessful tenderers may challenge the intention to award to the preferred contractor.

C. Delivery through Amey Highways Term Maintenance Contract (HTMC) (Schemes less than £500k.

This option is strictly not procurement as the HTMC is an existing contract. The HTMC is based on a Schedule of Rates agreed at the inception of the contract. The price for each individual scheme is determined by identifying the quantities of each required item into a Bill of Quantities. Amey 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 HTMC contract a new rate can be negotiated.

The preferred procurement route for the Metz Way /Abbeymead Avenue scheme is Option B Open Tender.

This option has been selected due to the estimated value (£1,112,000) of the scheme.

A detailed design has been produced for the scheme and the works are standard construction. For budget certainty the scheme will be procured on a lump sum basis as an ECC Option A contract (Lump Sum with Activity schedule).

7.3 Commercial Risk Assessment

The table below provides a summary of the identified commercial risks surrounding the scheme.

Qualitative Commercial Risk Assessment										
Scheme Commercial Risk Item	**Likelihood of Risk Arising (✓)**			**Impact Severity (✓)**			**Predicted Effect on Scheme Procurement, Delivery & Operation (✓)**			**Immediate Bearer of Risk and Suggested Mitigation**
	Low	**Medium**	**High**	**Slight**	**Moderate**	**Severe**	**Slight**	**Moderate**	**Severe**	
Scheme construction is delayed and costs increase, owing to unexpected engineering difficulties.		✓				✓		✓		GCC, as scheme promoter, bears the risk. 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.

Table 7-1: Scheme Commercial Risk Assessment

8 Financial Case

8.1 Project Costs

This section considers the capital costs associated with the proposed scheme investment.

8.1.1 Breakdown and Time Profile of Project Costs

Scheme Cost Breakdown and Profile						
Project Cost Components	**Capital Cost Items**	*** Cost Estimate Status (O/P/D/T)**	**Costs by year (£000) Year of Estimate:**			
			2016/17	**2017/18**	**2018/19**	**2019/20**
Design & Management	Design fees, Surveys and trial holes	D	230	70		
Construction including Traffic-Related Maintenance	Non-Routine Re-construction Re-Surfacing of carriageway and cycleway Signals upgrade	D	145	990		
Indirect Tax	Non-Recoverable VAT (if applicable)					
Contingency	(If appropriate)	D	40	125		
Indirect Tax	Non-Recoverable VAT (if applicable)					
Total Cost	Including Risk Adjustment Excluding optimism Bias (NB - Not Base Cost with Real Cost Adjustment)	D	415	1,185		
*O = Outline estimate, P= Preliminary estimate, D = Detailed estimate, T = Tender price,						

Table 8-1: Scheme Capital Cost Breakdown and Profile

8.2 Project Funding

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

8.2.1 Sources of Funding

The sources of funding for the scheme are summarised in Table 8-2 below.

Scheme Funding Sources and Profile of Contributions						
		Funding Contributions by year				
Funding Source	**Fund Details**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**All Years**
Gov. / LEP (direct)	GFirst LEP	£280,000	*£220,000	0	0	£500,000
S106	Private - Coopers Edge developers	£135,000	£965,000	0	0	£1,100,000
All Funding Sources	Total	£415,000	£1,185,000	0	0	£1,600,000

*subject to progress with statutory undertakers it may be possible to bring this spend forward to 2016/17.

Table 8-2: Scheme Funding Sources and Profile of Contributions.

8.2.2 Security and Earliest Availability of Funds

The total S106 funding from the Coopers Edge developers will be in the region of £1,100,000. There have been ongoing discussions with the developers agents as the design has progressed and the developers remain committed to this scheme. To date they have already made advance payments of £77,000 towards design development. They have committed to releasing a further £58,000 by the end of August 2016 which will be well ahead of the anticipated scheme award date in January 2017. The release of S106 funds will follow the finalisation of a Deed of Variation (DoV), which will confirm that the revised scheme discharges the developers of their obligations. GCC legal are progressing this and will complete in January 2017. The tender award will be held back until the DoV is complete and funds secured.

Table 8.3 below confirms the level of security and availability of funds

Security of Scheme funding Sources and Earliest Availability						
		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			✓	Dec 2016	Feb 2017
Private Funding S106	Private – Coopers Edge developers			✓	Aug 2016	Jan 2017

Table 8-3: Security and Availability of Scheme Funding Contributions

8.3 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.

8.3.1 Risks to the Scheme Cost Estimate and Funding Strategy

Table 8.4 show the financial risks and suggested mitigation measures associated with this scheme.

Qualitative Financial Risk Assessment										
Scheme Financial Risk Item	**Likelihood of Risk Arising (✓)**			**Impact Severity (✓)**			**Predicted Effect on Scheme Delivery & Outcome (✓)**			**Suggested Mitigation**
	Low	**Medium**	**High**	**Slight**	**Moderate**	**Severe**	**Slight**	**Moderate**	**Severe**	
Unforeseen increase in scheme cost reduces the VfM	✓			✓			✓			Amend preferred scheme design content to reduce scheme cost and increase VfM / BCR
Earmarked / secured funds do not cover current scheme capital cost	✓				✓			✓		Amend preferred scheme design content to reduce scheme cost

Table 8-4: Scheme Financial Risk Assessment

8.4 Ongoing Maintenance

From the GCC Maintenance contract, it is assumed the design life of the project is 30 years. To cover both two off-surface treatments and a surface course resurfacing, the cost of the ongoing maintenance is estimated as £23.20 per m2. For the scheme (approximately 505 m2), the maintenance cost for Gloucestershire County Council is assumed to be £388.85 per year.

9 Management Case

9.1 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.

9.2 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 below.

Project Board Meetings (PBM)

PB meetings are held monthly to discuss individual progress on each scheme and are chaired by Amey Project Managers (PMs). Attendees include representatives for different aspects of LEP management (i.e. Communication, Traffic, Risk Management, Amey 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 PB meeting. An agreed version of the latest Progress and Highlight Report is issued to the PB meeting attendees during the meeting.

9.3 Project Management Structure

Gloucestershire County Council and Amey have agreed a project management structure for the project, as shown in Table 9.4 below.

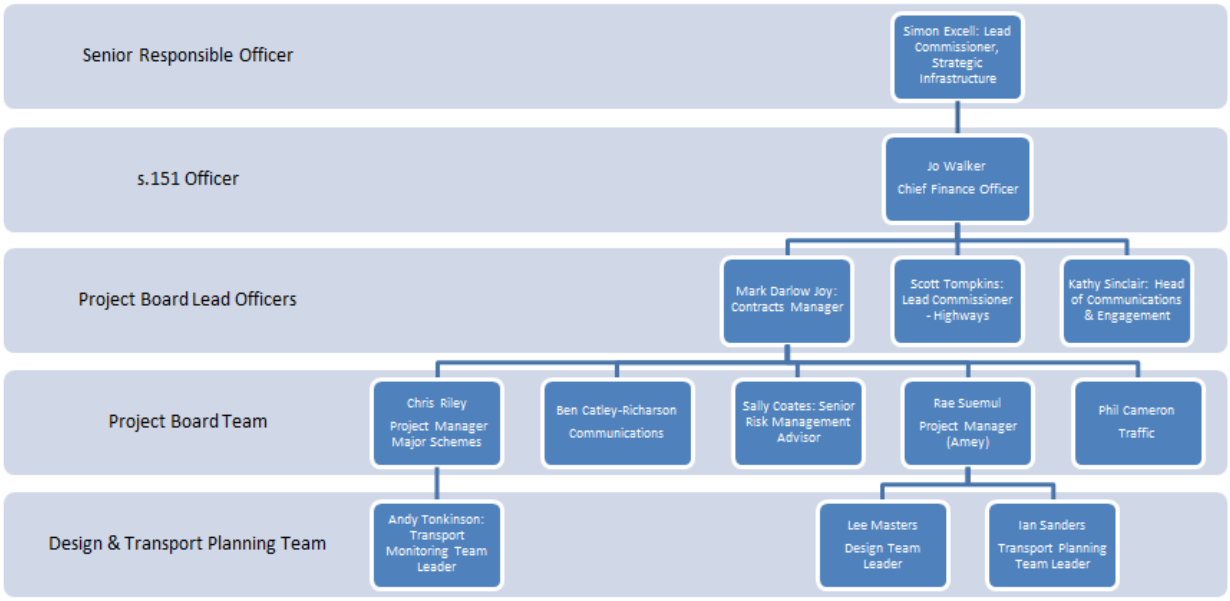


Table 9.3 : Project Management Structure for the Metz Way Scheme

A full GANTT chart showing the proposed project programme is included as an Appendix E.

9.4 Results of Public Share Event

The key outcomes from the consultation can be summarised as below. Two public consultation "Share Events" were held for the proposed Metz Way scheme. One was held at Coney Hill Rugby Club on the 9th of June 2016 and the other at Abbeydale Community Centre on the 28th June 2016. The overall consensus of the feedback received was positive with general support for the scheme and there were no notable objections to any of the proposed changes.

Residents were aware of a similar scheme 10 years previous and explained they thought this proposed scheme was an improvement on the one they had seen before.

A list of key points raised are summarised below, and where possible the points have been incorporated in the final designs.

Suggestions and concerns raised by attendees	**How responded to and addressed**
Blakehill Way zebra crossing, motorists often fail to stop when pedestrians are waiting to cross. Zebra needs more presence.	Concerns investigated. Preferred option, which will be included in scheme design is to remove the conventional existing zebra belisha beacons and install LED belisha beacons which are brighter than conventional beacons. Vegetation in verge to be cut back to improve visibility.
Merge on exit from Metz Way / Eastern Ave junction can be hazardous. Consider improved signing	The existing signing and road markings at the merge were reviewed. The road markings are to standards. The layout may benefit from "dual carriageway ends" warning signs. These will be incorporated within the scheme.
Install short section of cycle track missing south of Coney Rd roundabout between Coney Hill Rd and Abbeymead Ave.	Suggestion considered and plans amended to include missing length of cycle track.
Consider widening carriageway at Metz Way Homebase outbound bus stop to allow motorists to pass stationary buses safely.	Central hatching to be reduced to leave enough clear space next to bus stop to allow vehicles to pass a stationary bus.
Consider extending the red time between the westbound ahead traffic phase and the following pedestrian stage at the North Upton Lane traffic signals.	Signal timings will be reviewed as part of the planned changes to the North Upton Lane junction. The red time will be extended if appropriate.
Existing cycle track next to Metz Way between Coney Hill Rd and Eastern Avenue is in a poor condition	Improvements to path to be considered if any funding remains after other higher priority measures have been allowed for.
Maintain existing signing and cut back overhanging vegetation	To be dealt with by routine cyclic maintenance.
Check visibility of traffic signal heads on westbound approach to North Upton Lane traffic signals	Vegetation restricting view of signal head to be cut back as part of routine cyclic maintenance.
Short section of footway north of Roman Rd to be converted to a shared use facility, to complete a missing link between existing cycle tracks.	On further investigation alternative cycle routes are available and the proposed link is not considered essential.

Suggestions and concerns raised by attendees	How responded to and addressed
Bus stops and pedestrian refuges near Roman Rd and North Upton Lane causing safety issues with motorists going on the wrong side of the refuges in order to overtake stationary buses	Potential improvements where investigated including installation of bus lay-bys or relocation of bus stops and bus shelters. Unfortunately the high cost of such improvements could not be justified or given priority over other measures.
Bus shelter required between Coney Hill Rugby Club and Coney Hill Road	Suggestion not considered further. Generally bus shelters on outbound stops are not appropriate where passengers generally alight and are not waiting to board the bus.
Pedestrians (and cyclists) cross North Upton Lane at the traffic signals. Why isn't there a pedestrian push button facility at the junction?	Concern investigated. Potential layout with Toucan crossing on North Upton Lane considered and Linsig traffic signal model produced with new pedestrian stage at traffic signal junction. Unfortunately results of analysis predicted unacceptably long traffic queues on Abbeymead Avenue. Option not considered further.
Can the North Upton Lane Puffin crossing be linked to the North Upton Lane traffic signals	Suggestion discussed with GCC Traffic Signal section. Signals are not linked and there have been no reported issues regarding the lack of linking.

9.5 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 will provide further information on how stakeholders are identified, how they are communicated to and the methods/ techniques used to communicate.

9.5.1 Aims and objectives

The main aim of the Communication and Engagement Plan is to ensure that

stakeholders and members of the general 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 general public.

Table 9.5.1 below indicates the approach used by GCC to categorise the various scheme stakeholders.

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

Table 9.5.1: Stakeholder Categorisation Approach

9.5.2 Engagement Categories

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

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.

Engagement Category	Details of Engagement Method
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

Table 9.5.2: Stakeholder Engagement Levels

9.6 Stakeholder Communication Plan

Table 9.6 below 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.

Name of Stakeholder / Interest Group	Stakeholder Category	Engagement and Consultation Level	Engagement Method
Gloucester City Council	Beneficiary Statutory Affected	Intensive consultation	Collaborative partnership in development of scheme
Emergency Services	Statutory	Intensive consultation	Direct contact
Elected Members	Interest	Intensive consultation	Pre-exhibition briefing
Scheme users	Beneficiary	Consultation Information	Public Share Events
Residents	Interest	Consultation Information	
Access and rights of way groups (including cycling)	Interest	Consultation	
Local press	Interest	Information	Pre-exhibition briefing
Road Haulage Association	Interest	Consultation	Pre-exhibition briefing
Freight Transport Association	Interest	Consultation	Pre-exhibition briefing

Name of Stakeholder / Interest Group	Stakeholder Category	Engagement and Consultation Level	Engagement Method
*Natural England (Badger Licence)	Statutory	Intensive consultation	Direct contact
*Local Enterprise Partnership	Beneficiary Funding	Information	Through LGF Business Cases & progress reports
*Barnwood Trust	Affected	Intensive Consultation	Collaborative partnership in land transfer/dedication agreement

Table 9.6 : Stakeholder Management Strategy and Method

All stakeholder groups have been notified of the scheme and their input sought.

All stakeholders marked with * require further consultation for Badger mitigation, land transfer and progress reporting.

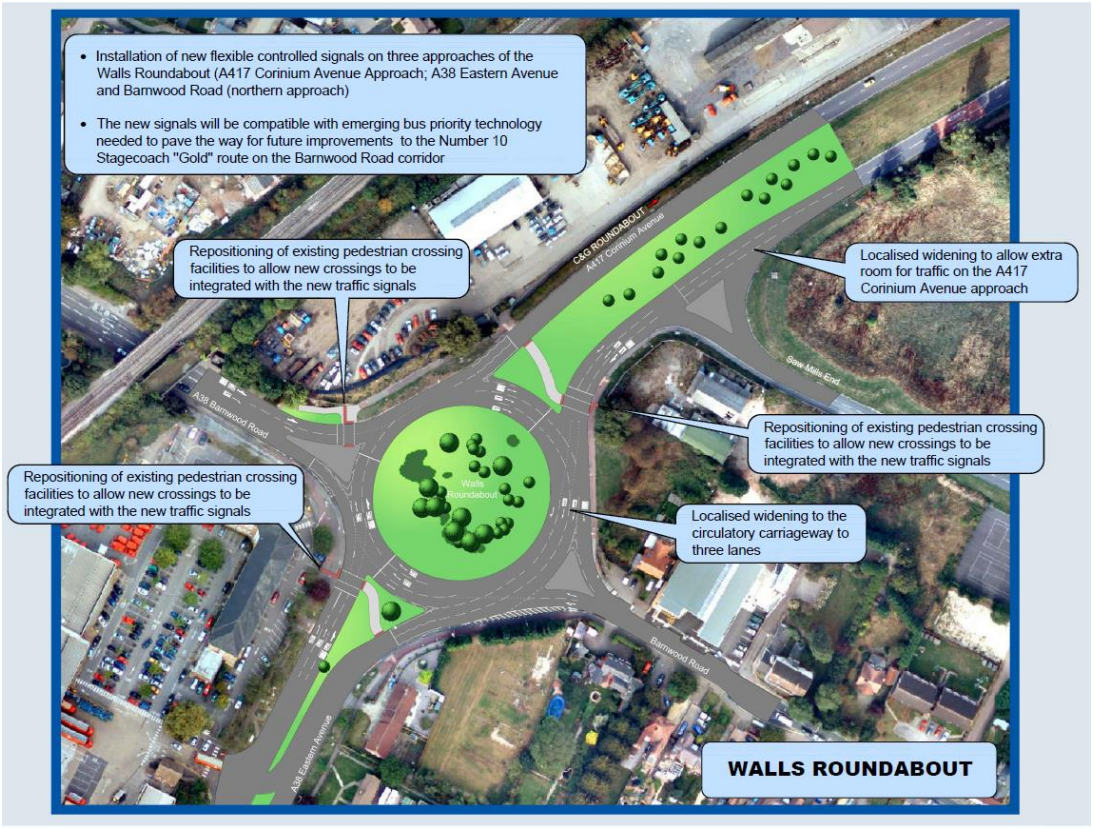
9.7 Evidence of Previously Successful Management Strategy

GCC have a successful track record of delivering major transport schemes within the county. The most recent of which was the Walls G&G Roundabout Contract (WC&G).

The WC&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 extent of the scheme is shown on the two layout plans below.

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 a full OJEU tender process.

The intended scheme outcomes are currently being monitored but the intended benefits of the scheme are anticipated to be realised.


Installation of new flexible controlled signals on three approaches of the Walls Roundabout (A417 Corinium Avenue Approach; A38 Eastern Avenue and Barnwood Road (northern approach)
The new signals will be compatible with emerging bus priority technology needed to pave the way for future improvements to the Number 10 Stagecoach "Gold" route on the Barnwood Road corridor
Repositioning of existing pedestrian crossing facilities to allow new crossings to be integrated with the new traffic signals
Localised widening to allow extra room for traffic on the A417 Corinium Avenue approach
Repositioning of existing pedestrian crossing facilities to allow new crossings to be integrated with the new traffic signals
Repositioning of existing pedestrian crossing facilities to allow new crossings to be integrated with the new traffic signals
Localised widening to the circulatory carriageway to three lanes
C&G ROUNDABOUT
A417 Corinium Avenue
A38 Barnwood Road
Gaw Mills End
Walls Roundabout
Barnwood Road
A38 Eastern Avenue
WALLS ROUNDABOUT


Replacement of the existing fix timed signals on Corinium Ave, Barnwood Link and Barnwood Bypass with a flexible (MOVA controlled) system
Localised changes to signing and lining on the junction approaches
ELMBRIDGE COURT ROUNDABOUT
A417 Barnwood Link
Localised widening (3 to 4 lanes) on the Barnwood Link
A417 Corinium Avenue
WALLS ROUNDABOUT
C & G Roundabout
M5 JUNCTION 11a
A417 Barnwood Bypass
Localised widening (3 to 4 lanes) and installation of traffic signals on the Barnett Way entry arm (there are no signals at the moment)
Barnett Way
Localised widening (3 to 4 lanes) on the Barnwood Bypass
C&G ROUNDABOUT

9.8 Availability and Suitability of Resources

The scheme is intended to be delivered using a collaborative approach between GCC staff and their appointed support organisation Amey. GCC have identified appropriately trained and experienced staff that will be the responsible for the management of the scheme. The identified staff, fulfilling the GCC Project Manager and Amey Project Manager roles, has 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 Amey resource through an existing contract to undertake design and also provide early contractor involvement (ECI), where appropriate, to the design process to ensure best value.

9.9 Design and Construction Methodology

9.9.1 Design Methodology

The scheme design is standard detail and in accordance with current issues of:

- Gloucestershire County Council's Manual for Streets
- Design Manual for Roads and Bridges
- Local Transport Notes
- Inclusive Mobility
- Traffic Signs Manual and Traffic Signs Regulations and General Directions 2016
- Sewers for Adoption design code

9.9.2 Construction Methodology

The proposed works all involve standard construction methodology in accordance with Specification for Highway Works. The Contractor selected for the works will have a proven track record in carrying out similar works.

9.10 Legal Powers Required for Construction

9.10.1 Land

The works at North Upton Lane requires 3rd party land. GCC legal are progressing this with the intension of adopting the areas via a dedication agreement. This will provide the necessary rights to access for the works and avoid a lengthy conveyancing process. It is envisaged that this will complete in January 2017.

9.10.2 Traffic Regulation Orders (TRO)

None required.

9.10.3 Enviromental Restraints

Badger Set

The badger set at North Upton Lane will require removal and a Badger Mitigation Strategy has been implemented and they will be cleared in time for the scheme.

9.11 Project Programme

The following milestone dates are from the schemes delivery programme, Gantt chart is provided as Appendix E

Activity	Target Date
Submit Full Business Case for Approval	23rd August 2016
Approve Full Business Case	04th October 2016
TRO Implementation	NOT REQUIRED
Issue Supplier Engagement Notice	14th October 2016
Issue Tender Documents	04th November 2016
Tenders Return	16th December 2016
3rd Party Land Dedication Agreement complete	09th December 2017
Badger Mitigation Actions Complete	20th January 2017
Complete Tender assessment and award	20th January 2017
Construction Start	20th February 2017
Construction End	25th August 2017

Table 9.7: Project Milestones

9.12 Benefit Realisation Strategy

9.12.1 Scope of the Plan

The Benefits Realisation Strategy is designed to enable benefits that are expected to be derived from the scheme to be planned for, tracked and realised. It is not considered appropriate that a full Monitoring and Evaluation Programme is required for this project.

9.12.2 Expected Benefits

The outputs and benefits 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 for the project as a whole are as follows (detailed in the Strategic Case), and are reflected as closely as possible in the Benefit Indicators and Targets, Table 9.8;

- Improving access between Coopers Edge & Gloucester;
- Improving local links in the area;
- Reduce journey times along Metz Way and Abbeymead Avenue;
- Provide a better opportunity for modal shift;
- Providing the most direct route, reducing CO2 emissions, noise and air pollution.

9.12.3 Benefit Measurement Methods

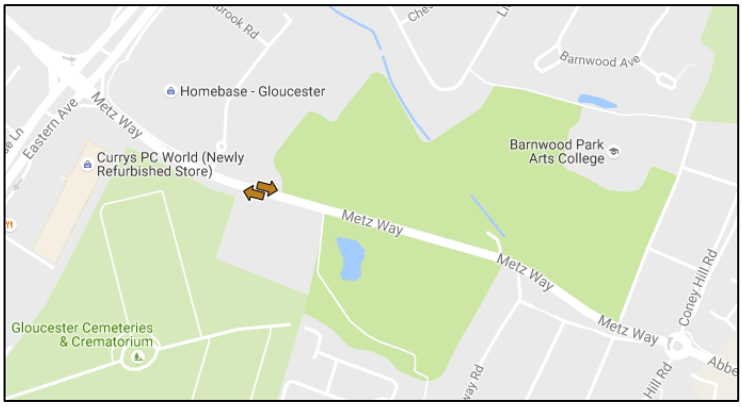
To determine whether the scheme benefits are being realised, the desired outputs and outcomes have been converted into measurable indicators of scheme benefits, as set out in the table below. Benefits have been classified as 'Quantitative' (Qn) or 'Qualitative' (Ql). Quantitative benefits are those which can be measured in terms of specific numerical values on a continuous scale, whether in absolute or percentage terms, whereas qualitative benefits are measured in category-based or descriptive terms.

Ref	Benefit (Desired Output / Outcome)	Benefit Indicator	Target	Type	Specific Data Requirements	Owner
Desired Outputs						
1	Implement the two junction improvements	Improved traffic flow on the highway	Increase in traffic flow over 5 years	Qn	ATC Data	GCC
2	Implement the cycling, walking and crossing improvements	Increase in sustainable modes of travel	Increase in walking and cycling	Ql	None	GCC
Desired Outcomes						
3	No decrease in traffic flows on Metz Way	Maintain or increase in flows (all vehicles)	No decrease over 5 years	Qn	ATC Data	GCC
4	Improvement in bus journey times from Coopers Edge to Gloucester	Journey times for buses	Reduction in bus journey times over 5 years	Qn	Stagecoach GPS data	GCC Stagecoach
5	Improvement in all vehicle journey times from Coopers Edge to Gloucester	Journey time from Lobleys Drive (M5 Bridge) to Eastern Avenue	Reduction in vehicle journey times over 5 years	Qn	BaseMap Bluetooth Data	GCC
6	Increased patronage of the buses from Coopers Edge to Gloucester	Increase in passenger numbers on Stagecoach Service 8	>9% increase per annum	Qn	Stagecoach patronage data	GCC Stagecoach
7	Increase in walking and cycling	Increase in sustainable modes	Increase in walking and cycling from Year 1 to Year 5	Qn	New Counts	GCC
8	Minimal accidents on Metz Way and Abbeymead Avenue	Low number of accidents	No accidents at the new junctions over 5 years	Qn	Accident Data	GCC

Table 9.8: Benefit Realisation Measurement - Indicators and Targets

9.12.4 Baseline Data Requirements

Baseline data for accidents and bus patronage are included in the Full Business Case. In terms of traffic data for Metz Way, the most appropriate permanent ATC site is on Metz Way (east of the Eastern Avenue junction), as shown below. The traffic volumes are as shown below, and will be used as a reference point for post-scheme 'after' analysis.



Direction Metz Way (East of Eastern Avenue)	AM Peak	PM Peak	12 hour	24 hour
Eastbound	396	908	6591	8088
Westbound	1002	469	6858	8244

*weekday traffic flows,
total vehicles 2 week period,
March 2016

Table/Figure 9.9: Baseline Traffic Data, Metz Way

For pedestrian and cycling data, there is currently no accurate data for this section of Metz Way and Abbeymead Avenue. However, a new level will be established after Year 1, and the same counts repeated at regular intervals (to be determined).

The bus journey times from Coopers Edge to Gloucester City Centre (Outcome 4) will be compared against the baseline results from Figure 5-4.

For vehicle travel times (Outcome 5), data has been obtained for the period January to August 2016, as presented below, with the timing points shown in red. The results are from Bluetooth/GPS data obtained by the County Council and are in seconds from the M5 motorway Bridge on Lobleys Drive to the Metz Way/Eastern Avenue junction. The results below will be compared for the Year 1 and Year 5 studies.

	Time (seconds)	
Start/End Location	**AM**	**PM**
M5 Motorway Bridge	**Starting Point**	
Abbeymead Avenue	104	109
Roman Road/ The Oaks	93	80
Eastbrook Road/KFC	137	92
Eastern Avenue	33	27
Total	**367**	**308**

Table/Figure 9.10: Baseline Journey Time Data, Lobleys Drive to Metz Way/Eastern Avenue

9.12.5 The One Year After Study

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.

9.12.6 The Five Year After Study

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 costs and 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 is possible.

9.13 Key Project Risks

A project risk register is to be maintained throughout the scheme duration. Copy attached as Appendix C.

The Construction risks will be passed to contractor during the construction phase.

10 Conclusions and Recommendations

10.1 Conclusions

A scheme for Metz Way and Abbeymead Avenue has been proposed for over ten years in various forms, and has been subject to previous consultation regarding bus provision along the corridor. The scheme has been amended throughout the development of the Business Case, and has now been designed such that it will benefit all transport users along Metz Way and Abbeymead Avenue. This scheme is expected to have a significant impact on the local area by reducing congestion, and contributing to the overall quality of the local infrastructure.

There are significant design benefits for cyclists and pedestrians in the scheme that, although not showing a significant economic benefit, are supported by the local residents and are key local improvements.

The scheme is likely to have a positive impact on safety, as the introduction of new crossings and the new facilities for cyclists and pedestrians will reduce conflict between users, and therefore make the route more attractive and safer. Consequently this is likely to encourage physical activity, and in turn encourage a modal shift to sustainable travel.

The majority of the scheme is to be funded through agreed S106 developer contributions (£1.1m), and therefore the required element of LEP monies is limited (£500,000).

It is also important to note that the scheme has been developed to meet the address the priorities of the LEP, as reflected by the four Scheme Objectives. The Value for Money score has produced an overall qualitative outcome for the scheme of Very High (BCR score of 4.392), indicated that the scheme would be significantly beneficial for the community.

10.2 Recommended Next Steps

Development and delivery of the scheme should be approved and scheduled for the 2016/2017 financial year.

10.3 Funding Recommendation

Due to the outcomes reported in this study, and the anticipated return on the public funded aspects of the proposal, it is advised that the scheme meets the criteria of schemes for the LEP and therefore should be approved for funding.