Junction 3, Peterborough

Full Business Case

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Document Control

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Executive Summary

This Full Business Case (FBC) demonstrates that there is a very strong strategic and economic case for investment in the Junction 3 Improvement Schemes. The improvements consist of a balanced mix of highway and active travel schemes and will provide Very High Value for Money with a benefit to cost ratio (BCR) of 6.49, whilst facilitating continued growth across Peterborough, particularly in the Hampton area.

This FBC confirms that the schemes have been robustly costed, and that the relevant commercial and management mechanisms are in place to ensure successful delivery of the schemes.

Strategic Dimension

The Strategic Dimension has considered the policy context in which this scheme has been developed. As well as policy, the need for intervention is explained, which includes the following issues which currently compromise local growth aspirations:

- Extensive peak hour queues and delay on the A1260 Nene Parkway and A1260 The Serpentine approaches to the junction
- High accident rates, particularly on the A1260 approaches
- Poor active travel provision along the routes offering alternatives to car travel through Junction 3.

Peak Hour Queues on the A1260 Nene Parkway and Poor Active Travel Routes

The policy review and data on existing and future issues was used to identify scheme objectives and a long list of potential improvement options. This long list was then assessed against these objectives using the DfT's Early Assessment Sifting Tool (EAST). Based on the assessment, the long list was then refined to a short list of schemes which were then assessed in greater detail, including traffic signal and microsimulation modelling. Full details of the modelling and assessment work undertaken to identify the Preferred Option can be found in the Junction 3 Option Assessment Report (October 2019).

The Primary objectives of the Junction 3 Improvement Scheme are to:

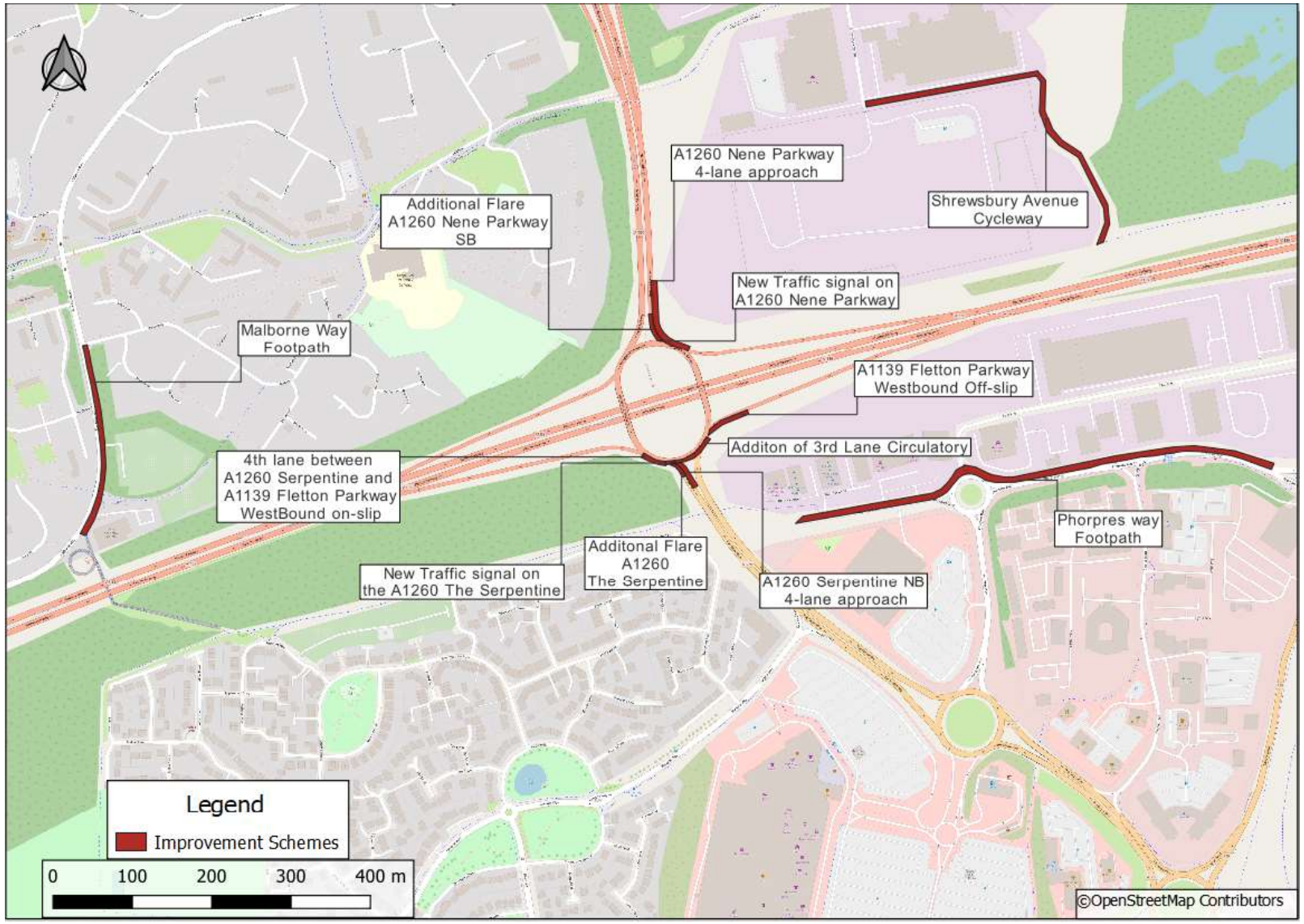
1. **Tackle congestion and improve journey times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3.
2. **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth within Hampton is promoted whilst providing for future demand.
3. **Protect and improve the biodiversity value within the study area:** Mitigate any adverse impact of a scheme and ensure biodiversity net gain within the study area.
4. **Improve active travel routes to provide a viable alternative to private car travel**: Ensure that the scheme provides a comprehensive network of pedestrian and cycling routes where needed.
5. **Improve road safety:** Reduce accidents and improve personal security for all travellers around the junction.

The Strategic Dimension concludes with details of the Junction 3 Improvement Scheme, and documents how this has evolved since the previous OBC phase of work.

The final package of schemes consists of the following components:

- Creation of a third southbound lane on Nene Parkway from Junction 31 to Junction 3.
- Addition a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a third lane.
- Signalisation of the Nene Parkway approach to Junction 3, with a 4-lane approach.
- Signalisation of The Serpentine approach to Junction 3, with a 4-lane approach.
- Creation a third lane on the A1260 The Serpentine northbound approach, extending approximately 200 metres back from Junction 3.
- Addition of 220m of new footpath between Saltmarsh and the Phoenix School.
- Upgrade to the Phorpres Way footpath (southern side) to current LTN 1/20 design standards, accompanied by several crossing points at Phorpres Close, Club Way and Cygnet Road.
- Upgrade to the Cycleway for approximately 450m between Shrewsbury Avenue and the gated access of the Nature Reserve.

The scheme outputs are shown in the Figure beneath.



Economic Dimension

The Economic Dimension demonstrates that the Junction 3 Improvement Schemes achieves a Benefit to Cost Ratio of 6.49 and offers Very High Value for Money.

The economic assessment is based upon a robust scheme target cost estimate formed with ECI input and has been calculated in line with TAG guidance over a 60-year appraisal period.

The transport user benefits of the scheme were assessed using the SATURN-based Peterborough Transportation model (PTM3). The model has used the forecast years of 2026, 2031 and 2036 to appraise the impacts of the scheme. Results from this modelling were then assessed using the Transport User Benefits Appraisal (TUBA, 1.9.17) tool to calculate a scheme BCR.

Model outputs were also used in conjunction with COBALT software to quantify accident saving benefits and noise / air quality benefits. These assessments are described in further detail in the Economic Dimension.

The Active Mode Appraisal Toolkit (AMAT) has also been used to calculate benefits associated with active travel infrastructure included in the scheme.

A breakdown of the scheme BCR is provided in the Analysis of Monetised Costs and Benefits (AMCB) table beneath.

Junction 3 Improvement Scheme AMCB	
Present Value of Benefits (PVB)	£48,992,000
Present Value of Costs (PVC)	£7,543,000
Net Present Value (NPV)	£41,449,000
Benefit to Cost Ratio (BCR)	6.49
Value for Money	**Very High**

A range of sensitivity tests have also been undertaken to determine the impact of different variables (such as cost, growth assumptions, varying values of environment) on the value for money offered by the scheme. These are set out within the Economic Dimension and demonstrate that the scheme BCR is robust.

Qualitative and Quantitative assessments have also been undertaken for the following areas:

- Deprivation
- Severance
- Accidents
- Landscape
- Historic Environment
- Biodiversity
- Noise and Air Quality
- Water Environments
- Accessibility Impacts

These assessments did not identify any significant concerns and the assessment results are included within the Appraisal Summary Table (AST).

Financial Dimension

The Financial Dimension demonstrates that the scheme has been robustly costed and that allocated funding is in place for delivery in line with the construction programme. The cost estimates for the scheme are summarised in the table beneath.

Description of Cost Type	Cost (£) Total
Base Investment Cost	9,380,364
Risk Adjusted Base Cost	10,215,019
Risk Adjusted Base Cost with Construction Industry Inflation (**Outturn Cost**)	**11,511,312**
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	13,886,945

The scheme Outturn Cost is £11,511,312 which includes risk allowance and inflation costs through to the end of construction in March 2024 (with post scheme monitoring to begin in 2025). This figure represents the funding needed by Peterborough City Council to deliver this scheme.

Note that £518,988 of the Outturn Cost was approved for release at the CPCA Board Meeting on October 19th 2022, and a developer S106 contribution of £50,000 has been secured, an therefore Peterborough City Council request the balance of £10,942,324 to deliver the scheme subject to the approval of this FBC.

The Inflated Risk Adjusted Costs incorporating Whole Life Costs (£13,886,945) includes inflated maintenance costs over the sixty-year assessment period, but the additional cost beyond the Outturn Cost is not required as part of the scheme funding and is purely calculated for the economic assessment to ensure that the scheme will continue to provide value for money with post construction costs considered.

The CPCA have funding available for the delivery of this scheme using its Transforming Cities Fund (TCF) allocation.

The funding breakdown by year and funding source is shown in the table beneath.

Funding Source	2022 / 23	2023 / 24	Total
Developer S106 Contribution	£ -	£ 50,000	£ 50,000
CPCA TCF Allocation	£ 518,988	£ 10,942,324	£ 11,461,312
Total	£ 518,988	£ 10,992,324	£ 11,511,312

Commercial Dimension

The Commercial Dimension demonstrates that the Junction 3 Improvement Scheme can be reliably procured and implemented through existing channels whilst ensuring value for money.

Delivery and supervision of the Junction 3 Improvement Scheme will be delivered in house by Peterborough Highway Services (PHS). PHS is a ten-year NEC3 Term Service Contract between Peterborough City Council and Milestone Infrastructure, with responsibility for improving and maintaining Peterborough's highway network. The contract was recently extended by five years, and the collaboration which began in 2013, now runs until 2028.

The contract is built upon a collaborative and multi-disciplined team capable of developing schemes from policy concept right through to design and construction, and then maintaining them.

All phases of the scheme to date, including feasibility, Preliminary Design, Detailed Design and ECI have been delivered through PHS, and using the contract for construction and site supervision will ensure consistency of knowledge and expectations with earlier phases of the project. All skills and competencies to deliver this scheme are available within the PHS contract and its supply chain.

The scheme construction will be procured using a Target Cost payment mechanism. This incentivises both parties to work together to reduce cost through a pain / gain mechanism. To ensure that the procurement remains commercially competitive and offers value for money, all subcontract packages will be subject to competitive tendering.

Management Dimension

The Management Dimension demonstrates that Peterborough City Council, through the PHS Framework, has the necessary experience and governance structure to successfully manage delivery of the Junction 3 Improvement Scheme.

The Council, through PHS, have successfully delivered the following highway improvement schemes in recent years. Both schemes are located on the Parkway Network at strategically sensitive locations and demonstrate PHS' ability to successfully manage and deliver highway schemes of this scale.

- Junction 20 Improvement Scheme (A47 Soke Parkway / A15 Paston Parkway) - £5.7m (2016 / 2017)
- Junction 17 – Junction 2 Improvement Scheme (A1139 Fletton Parkway) - £18m (2014 / 2015).

To date the delivery of the scheme has been managed by a Project Team, led by a PCC Project Manager. The Project Team consists of all the key project delivery partners. The Project Team has been responsible for the daily running of the project. The Project Team includes key stakeholders such as National Highways and the CPCA.

The existing PHS Project Board has overseen the continued development and delivery of the scheme to date by the Project Team and has made key decisions relating to the delivery of the project. The Project Board has been supported by technical specialists, with key stakeholders invited to attend as necessary.

Key project milestones for progressing to scheme delivery are outlined in the Table overleaf:

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Malborne Way Footpath and Shrewsbury Avenue Cycleway)
November 2022	Construction commences on the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes. Advance works begin for construction of the Junction 3 Highway and Phorpres Way schemes, including vegetation clearance and STATS diversions.
March 2023	Mobilisation and Compound set up.
April 2023	Construction starts on the Junction 3 Highway and Phorpres Way schemes.
March 2024	Construction finishes on the Junction 3 Highway and Phorpres Way schemes, and demobilisation.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

Stakeholder consultations were undertaken by the Project Team following the approval of the OBC. All key stakeholders were consulted via email or letter for comments on the Preferred scheme design. Responses to the consultation primarily focused on the environment and the information received was used to plan the construction works accordingly.

Stakeholder consultation with active travel groups also emphasised the opportunities to improve active travel connections around Junction 3, and this resulted in the addition of the Malborne Way and Shrewsbury Avenue active travel schemes.

Public consultation on the concept of a scheme at Junction 3 was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan1 that was adopted in January 2020 and again following the approval of the OBC (July 2020). The online consultation featured on the PCC website and social media for a six-week period (between the 21st October – 4th December 2020), and presented the scheme identified at OBC and Preliminary Design.

[1] https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf.

In addition to the online consultation exercise, 62 individual properties located within close proximity to Junction 3 (including Hedda Drive and Buckthorn Road in Hampton Hargate) were contacted via letter during the consultation period. The letter provided residents with details of the online consultation and invited them to comment.

A Risk Register was produced during the projects initiation to identify potential risks and to evaluate factors that could have had a detrimental effect on the project. The Risk Register is a live document and has been reviewed regularly at progress meetings and updates are reported to the CPCA through the monthly Highlight Reports.

Details about how the scheme will be monitored and evaluated against the objectives are included in the Management Dimension and consist of a range of quantitative and qualitative data collection exercises undertaken at one year and five-year intervals following scheme completion.

1. Introduction

1.1.1 This document sets out the Full Business Case for the Junction 3 Improvement Scheme in Peterborough.

1.1.2 The scheme will address severe levels of peak hour congestion and delay that compromise the operational efficiency of the junction, and the surrounding road network. By addressing existing issues, and building in additional capacity, the scheme will assist with delivering growth aspirations across Peterborough. The scheme will also address severance for active travel the vicinity of Junction 3 and provide better quality and more coherent routes for pedestrians and cyclists, especially for journeys traversing the A1139 Fletton Parkway.

1.1.3 This Full Business Case is the final stage of the decision-making process using the format as set out in "The Transport Business Cases" guidance published by the Department for Transport (DfT) in February 2022.

1.1.4 The level of detail provided within the Business Case continually builds as the project progresses from Strategic Outline Business Case (SOBC) to Outline Business Case (OBC), and then onto Full Business Case (FBC). This reflects the greater level of detail that becomes available as the scheme design matures and there is increased clarity around procurement and construction management.

1.1.5 An SOBC and an Optional Appraisal Report (OAR) were completed in October 2019. These were followed by an OBC that was approved by the approval by the Cambridgeshire and Peterborough Combined Authority (CPCA) in July 2020, paving the way for Detailed Design work to commence and which has culminated in the production of this FBC.

1.1.6 The primary purpose of the FBC is to:

- Confirm the need for change and the policy fit of the scheme, as established in the OBC.
- Demonstrate that a range of options have been considered, and that a preferred option has been identified that meets the scheme objectives.
- Evidence that the preferred option offers value for money, and has been robustly costed, and:
- Explain how the scheme will be procured, and how delivery of the project will be managed.

1.2 Location

1.2.1 Junction 3 is a large, grade separated junction serving two of Peterborough's busiest strategic roads. The junction is a crucial cornerstone junction of the Parkway Network, connecting the A1139 Fletton Parkway and A1260 Nene Parkway, thus providing the majority of access to south-west Peterborough.

1.2.2 The junction is used by vehicles from across the Peterborough area as well as longer distance trips destined for the A1(M), and experiences significant levels of peak hour congestion on the A1260 Nene Parkway and the A1260 The Serpentine approaches. Due to its strategic location, the junction is critical to Peterborough's growth aspirations.

1.2.3 Figure 1.1 beneath shoes the location of Junction 3 in relation to the Parkway Network and Peterborough City Centre.

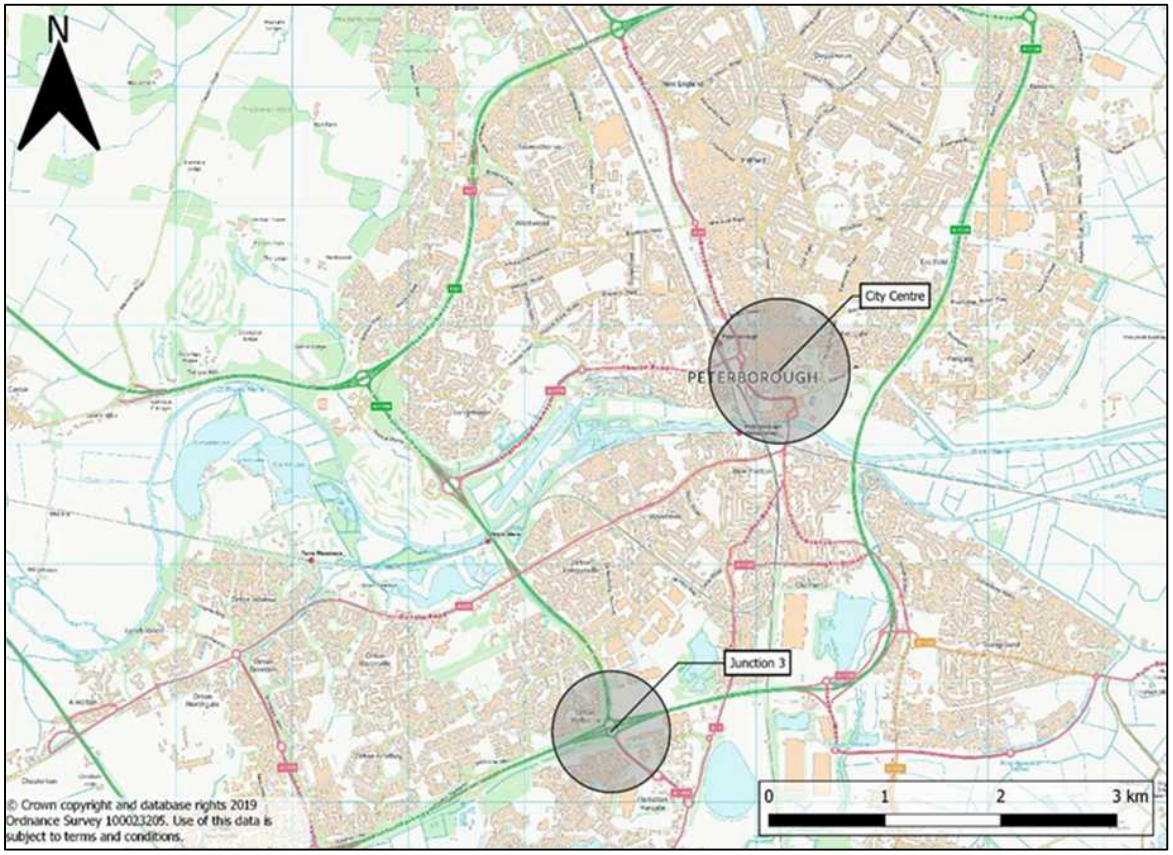


Figure 1.1: Junction 3 Location Plan

1.3 Study Area

1.3.1 The extent of the study area is shown in Figure 1.2 beneath. This includes Junction 3 and nearby elements of the Principal Road Network which are directly linked to the operation of the junction. Malborne Way is included within the study area as it experiences high levels of traffic using the route to avoid congestion at Junction 3 during the peak hours.

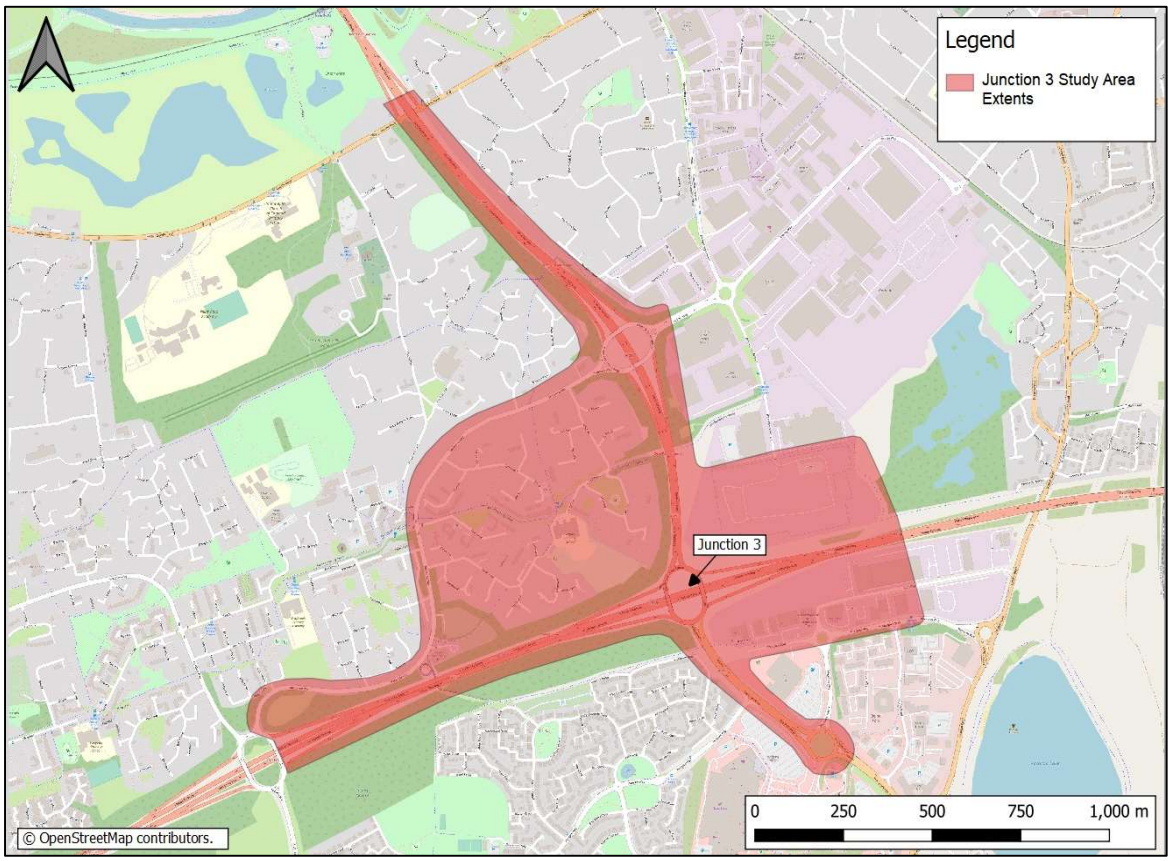


Figure 1.2: Study Area Extents

1.4 Growth Context

1.4.1 Junction 3 is a partially signalised grade-separated roundabout positioned above the A1139 Fletton Parkway. It is situated on the southern edge of Peterborough's urban area. The junction provides access to the A1260 Nene Parkway, A1139 Fletton Parkway, and A1260 The Serpentine.

1.4.2 The junction is heavily used by trips in the southwest of Peterborough, due to a large number of leisure facilities, businesses, and residences being located immediately south of the junction.

1.4.3 On average 56,000 vehicles pass through Junction 3 on a typical weekday, of which 5% are classified as commercial vehicles[2].

1.4.4 Peterborough's Local Plan was adopted in July 2019 and sets out the overall vision, priorities and objectives for Peterborough for the period up to 2036. The updated strategy identifies the required delivery of approximately 21,315 new homes and 17,600 new jobs between 2016 and 2036[3].

1.4.5 The population of Peterborough has grown considerably over recent years, increasing by 9.6% between 2011 and 2019, reaching a total population of 202,260 as of mid-2020 (based on Office for National Statistics estimates[4]). Peterborough's population growth is notably above the national average for England of 6.1%, making the area one of the country's fastest growing cities.

1.4.6 Most of this growth has been, and will continue to occur, south of the A1139 Fletton Parkway in and around the Hamptons, making Junction 3 the primary point of access onto Peterborough's strategic road network. The Local Plan identifies 7,400 homes and nearly 350,000 sqm (GFA) of employment space to be developed within Hampton over the next 15 years.

1.4.7 The A1139 Fletton Parkway also creates a significant barrier to active travel tips between the growth sites south of Junction 3 and the rest of Peterborough to the north. Improvements in this location should address this by improving the provision and quality of north-south active travel routes intersecting Fletton Parkway.

1.4.8 Peterborough's transport network was fundamentally redesigned in the 1970s to accommodate the then "Peterborough New Town" and has served the city well. However, capacity issues are now emerging on the road network because of recent housing growth, resulting in significant levels of peak hour congestion and delay. As congestion increases on the Parkway Network, and queues form at key junctions, the potential for delivering new homes and jobs in the area becomes increasingly constrained. Peterborough City Council are committed to addressing these highway constraints to ensure that its full growth aspirations can be realised.

[2] Manual Traffic Survey Data: November 2018

1.4.9 This Business Case promotes a scheme that will provide the necessary increase in highway capacity to unlock congestion and significantly reduce peak hour delay at Junction 3, which is a major pinch-point on the network. This will improve the capacity and operational performance of the Peterborough Parkway Network which is crucial to supporting further growth.

1.4.10 Improvements at Junction 3 are also expected to have wider network benefits beyond the Parkway Network, particularly to Malborne Way which experiences peak hour congestion as vehicles route away from Junction 3 in order to avoid queues.

1.4.11 Additionally, the improvements will improve north-south active travel routes that traverse the A1139 Fletton Parkway, reducing severance for pedestrians and cyclists, and increasting opportunities for active travel around Junction 3.

1.4.12 The Junction 3 Improvement Scheme set out within this document has been developed with significant input from environmental specialists and will mitigate the environmental impacts associated with construction, as well as deliver a biodiversity net gain.

1.5 Document Structure

1.5.1 The remainder of this document is structured as follows:

- **Chapter 2:** The Strategic Dimension identifies the need for an improvement at this location, documents initial options and outlines the preferred package of schemes.
- **Chapter 3:** The Economic Dimension demonstrates that the preferred package of schemes offers value for money.
- **Chapter 4:** The Financial Dimension shows how the scheme has been robustly costed, and how funding will be profiled.
- **Chapter 5:** The Commercial Dimension sets out how PCC will procure the scheme delivery in a way that delivers value for money.
- **Chapter 6:** The Management Dimension explains how delivery of the schemes will be managed.

[3] Peterborough Local Plan, 24th July 2019, https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/LTP.pdf.
[4] Office National Statistics, Mid-Year Population Estimates, UK, June 2020.

2. Strategic Dimension

2.1 Introduction

2.1.1 This chapter sets out the Strategic Dimension for the Junction 3 Improvement Schemes and demonstrates why improvements are needed in this area and how they will fit with local, regional and national policy, and enable Peterborough to deliver its planned growth.

2.2 Business Strategy

2.2.1 The Government's strategy for facilitating further economic growth requires continued investment in transport infrastructure to enable businesses to invest in job creation and the provision of new residential developments. Achieving economic growth, increasing living standards and the provision of new housing are key Government objectives at national, regional, and local level. This section details how improvements to Junction 3 and the surrounding area will contribute to achieving these strategic aims and polices.

Department for Transport Single Departmental Plan

2.2.2 The Single Departmental Plan published in June 2019[5] sets out the DfT's objectives and the plans for achieving them. The objectives are:

- Support the creation of a stronger, cleaner, more productive economy
- Help to connect people and places, balancing investment across the country
- Make journeys easier, modern and reliable
- Make sure transport is safe, secure and sustainable
- Prepare the transport system for technological progress and a prosperous future outside the EU
- Promote a culture of efficiency and productivity in everything they do.

2.2.3 The Junction 3 Scheme will reduce peak hour congestion, improve journey time reliability and add further capacity into Peterborough's Parkway Network. The delivery of these highway benefits will support housing and economic growth which are aligned to the main objectives set out above.

[5] https://www.gov.uk/government/publications/department-for-transport-single-departmental-plan/department-for-transport-single-departmental-plan--2

2.2.4 Upgrades to active travel routes associated with the Junction 3 Improvement Scheme will better connect residents of the city to places of employment and make transport more sustainable, aligning with the objectives of the DfT Single Departmental Plan.

Cambridgeshire and Peterborough Combined Authority

2.2.5 The CPCA was formed as a Mayoral Combined Authority in 2017. It is made of seven local authorities (Cambridgeshire County Council, Peterborough City Council (PCC), Huntingdonshire District Council, East Cambridgeshire District Council, Fenland District Council, Cambridge City Council and South Cambridgeshire District Council) and the Business Board (Local Enterprise Partnership).

2.2.6 The focus of the CPCA is on strategic issues (such as housing, transport and infrastructure demand) which cross council borders and span the entire Cambridgeshire and Peterborough area. The Devolution Deal for Cambridgeshire and Peterborough runs for 30 years and sets out key ambitions for the CPCA as well as including a list of specific projects which the CPCA and its member councils will support over that time.

2.2.7 To help achieve these ambitions and provide the requisite support, the CPCA has set out a short-term business plan[6] that is aimed at giving a clear pathway to deliver on their ambitious and transformational agenda for Cambridgeshire and Peterborough. The business plan sets out the CPCA budget plans for the next four-year period alongside a focussed to-do list of projects of which Improvement works at Junction 3 are listed. Figure 2.1 overleaf sets out the CPCA Policy Framework.

[6] https://cambridgeshirepeterborough-ca.gov.uk/wp-content/uploads/documents/key-documents/business-plan/current-business-plan/COMBINED-AUTHORITY-BUSINESS-PLAN.pdf.

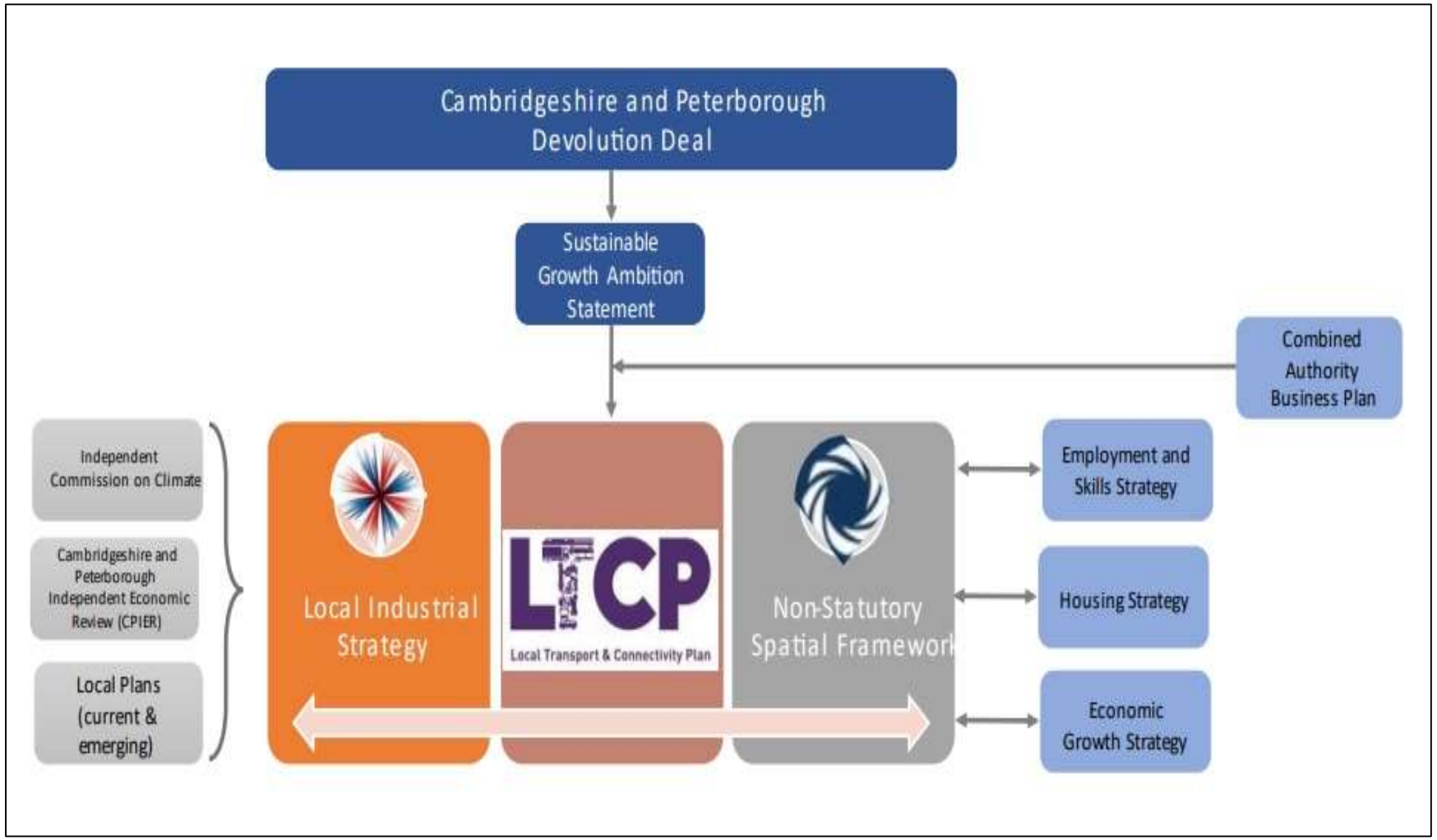


Figure 2.1: CPCA Policy Framework

Cambridgeshire and Peterborough Sustainable Growth Ambition Statement

2.2.8 The CPCA Mayor's Growth Ambition Statement sets out the region's priorities for achieving ambitious levels of inclusive growth and meeting the commitments of the Devolution Deal. The Statement's six themes for achieving regional growth focus on:

- People
- Climate and Nature
- Infrastructure
- Innovation
- Reducing inequalities
- Financial and systems.

2.2.9 The statement is underpinned by work undertaken by the Cambridgeshire and Peterborough Independent Economic Review (CPIER)[7]. The assessment makes a number of recommendations for the CPCA to take forward over the short, medium and long-term.

2.2.10 The success of Cambridgeshire and Peterborough as a project of national importance is highlighted in the CPIER. This is because the area contains some of the most important companies and institutions in the country, much of the country's high value agricultural land, and the cities and towns that continue to support both.

2.2.11 The CPIER identifies Peterborough as a City with a dynamic business environment, built on its history of industry including brickmaking and manufacturing. It is an attractive place for business due to its position on the A1 and East Coast Main Line, as well as for aspirational workers who want easy access to London, the Midlands and the North. The significance of Peterborough as a growing employment hub is demonstrated by the decision to relocate 1,000 civil servants from the Passport Office and Department for Environment, Food and Rural Affairs (DEFRA) to newly built offices in Fletton Quays in late 2022[8].

2.2.12 The Junction 3 Scheme will help achieve the ambition set out within the CPIER for 'Peterborough to become a leading place to live, learn and work' by 2030. The Improvement Scheme will address issues of delay and poor journey times at Junction 3, enabling the continued growth of the Hampton Township immediately south of the junction, and a key residential and employment sector to the south of the City. By addressing existing highway issues, increasing accessibility and enhancing the local area, the attractiveness of the Hampton area will increase - helping to retain existing businesses and support prospective investment in the area.

[7] https://www.cpier.org.uk.
[8] https://www.gov.uk/government/news/work-begins-on-a-major-new-government-hub-in-peterborough

2.2.13 The full extent of planned growth in the Hampton area is shown beneath in Figure 2.2.

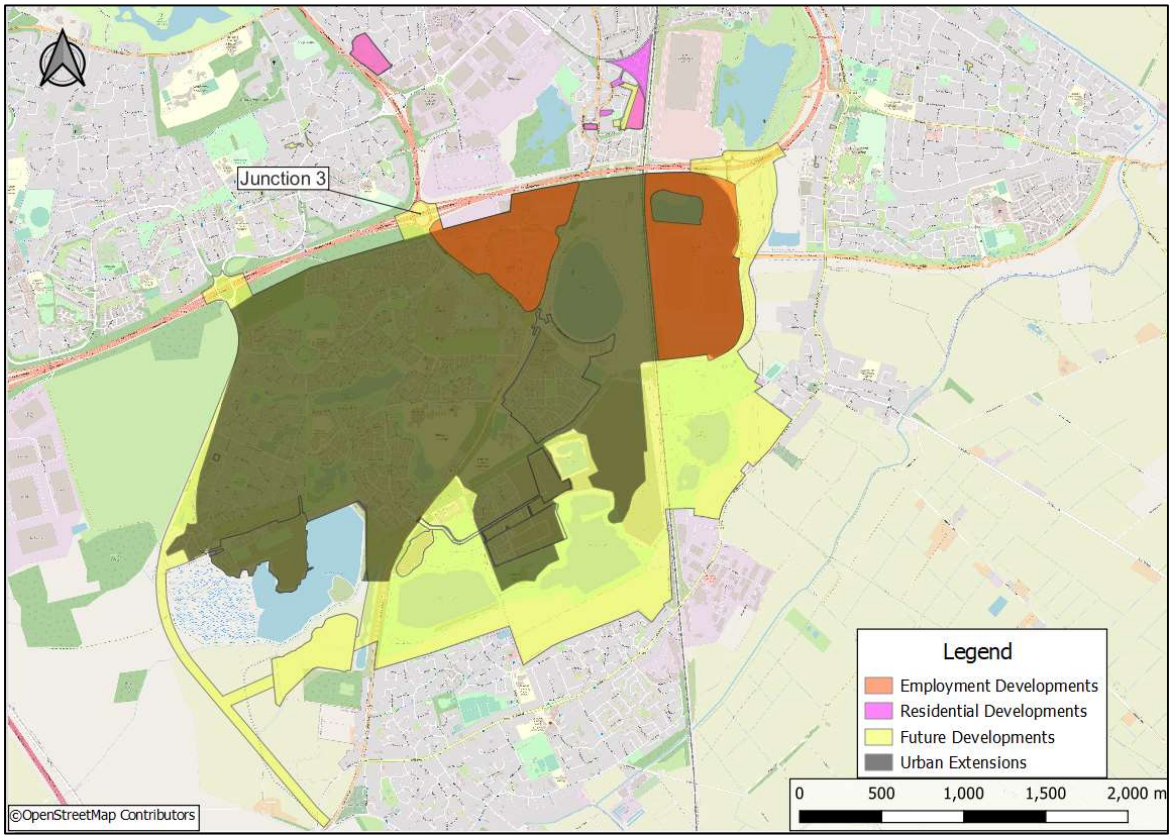


Figure 2.2: Existing and Future Developments around Junction 3

Cambridgeshire and Peterborough Independent Commission on Climate

2.2.14 The Cambridgeshire and Peterborough Independent Commission on Climate was created in 2020 by the CPCA board, with the purpose of providing authoritative recommendations to help the region mitigate and adapt to the impacts of climate change, which will enable the commitment of becoming 'net zero carbon by 2050' to be achieved.

2.2.15 Sectors in which the Commission focuses are transport, buildings, business and industry, nature and water and finally energy and waste.

2.2.16 Recommendations featured within the October 2021 report[9] specifically relating to transport and most relevant to major schemes funded by the CPCA include:

- Recommendation 3: Reduction in car miles driven by 15% to 2030 relative to baseline.
- Major new developments (>1,000 homes) should be connected to neighbouring towns and transport hubs through shared, public transport and / or safe cycling routes.
- CPCA, with its local authorities should explore options to improve cycling infrastructure.
- Alternatives to road investment should be prioritised for appraisal and investment; including active travel and public transport options, to opportunities for light rail and bus rapid transit or options to enhance rail connections.

2.2.17 Wider benefits of the above recommendations include improved air quality, improved health and increased connectivity by linking people up to jobs, opportunities, and services. This reiterates the six themes identified within the overarching growth ambition statement of the CPCA policy framework.

2.2.18 The Junction 3 scheme will help support the growth aspirations of Peterborough City Council and provide safe cycling routes for residents of the Hamptons to the rest of Peterborough and encourage more trips to be made sustainably. The highway improvements will add capacity and address existing and future issues of congestion and delay on the parkway, better connecting residents and commuters to the wider network, and reducing emissions from queueing vehicles.

[9] FINAL CLIMATE REPORT LOW (002).pdf (hubspotusercontent40.net)

Local Industrial Strategy

2.2.19 The Local Industrial Strategy[10] sets out the economic strategy for Cambridgeshire and Peterborough, taking a lead role in implementing the business growth, productivity and skills elements of the Growth Ambitions Statement.

2.2.20 In response to the findings of the CPIER, the Local Industrial Strategy focuses on the three sub-economies of:

- Greater Cambridge
- Greater Peterborough
- The Fens.

2.2.21 The CPCA Assurance Framework[11] states that investments will only be made if they can demonstrate that they will support the delivery of the Growth Ambitions Statement and the Local Industrial Strategies, as well as the more detailed place and sector strategies.

2.2.22 This has a direct implication for the Junction 3 Scheme, with a need to ensure it supports CPCA growth ambitions and align with the Local Industrial Strategy. As stated above Peterborough is identified as one of the three sub-economies and providing an efficient and reliable local transport network within the city is crucial to ensuring the continued success of the local economy in line with the CPCA Growth Ambition Statement. The Junction 3 Scheme will provide improvements to journey times and delay on a key junction to the south of the City, and directly support the growth 7,400 homes and nearly 350,000 sqm (GFA) of employment in the Hampton Township.

10 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/818886/Cambridge_SINGLE_PAGE.pdf.

11 https://cambridgeshirepeterborough-ca.gov.uk/wp-content/uploads/documents/combined-authority-board/committee-papers-and-minutes/Cambridgeshire-and-Peterborough-Combined-Authority-Assurance-Frameworkv3final-002.pdf.

Local Transport Plan

2.2.23 In January 2020, the CPCA adopted a Local Transport Plan for Cambridgeshire and Peterborough[12] and it replaces the interim Local Transport Plan published in 2017. The plan describes how transport interventions can be used to address current and future challenges and opportunities for Cambridgeshire and Peterborough and sets out the policies and strategies needed to secure growth and ensure that planned large-scale development can take place in the county in a sustainable way.

2.2.24 The Local Transport Plan is split in to two main parts: The 'Local Transport Plan' which sets out the vision, goals and objectives and the policies designed to deliver the objectives, and the 'Transport Delivery Plan' (2019 to 2035) which explains how the Local Transport Plan strategy will be delivered. It details programmes for delivery of improvements to the transport network and for its day-to-day management and maintenance.

2.2.25 The development of the Local Transport Plan was undertaken concurrently with the CPIER and the Growth Ambition Statement which enabled the challenges and opportunities detailed in these documents to be reflected within the Local Transport Pan. The Local Transport Plan completes the suite of documents which articulates the Combined Authority's response to the CPIER.

2.2.26 The vision for the Local Transport Plan is:

'To deliver a world-class transport network for Cambridgeshire and Peterborough that supports sustainable growth and opportunity for all'.

2.2.27 The goals of the Local Transport Plan outline the wider outcomes the transport network in Cambridgeshire and Peterborough will aim to achieve. They are:

- **Economy**: Deliver economic growth and opportunity for all communities
- **Society**: Provide an accessible transport system to ensure everyone can thrive and be healthy
- **Environment:** Protect and enhance our environment and tackle climate change.

2.2.28 The objectives of the Local Transport Plan underpin the delivery of the goals for an improvement at Junction 3, and form the basis against which schemes, initiatives and policies will be assessed. The initial scheme objectives for a Junction 3 Improvement Scheme were devised at the beginning of the study and pre-date the objectives of the Local Transport Plan.

[12] https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf.

2.2.29 Since the introduction of the CPCA's Local Transport Plan, these initial scheme objectives have been refined to ensure they meet those objectives both locally (for Peterborough) and regionally (for the CPCA). The scheme objectives for a Junction 3 Improvement Scheme are set in Section 2.8 of this chapter.

2.2.30 The objectives of the CPCA Local Transport Plan are:

- **Housing:** Support new housing and development to accommodate a growing population and workforce
- **Employment:** Connect all new and existing communities so all residents can easily access jobs within 30 minutes by public transport
- **Business and Tourism:** Ensure all of our region's businesses and tourist attractions are connected sustainably to our main transport hubs, ports and airports
- **Resilience:** Build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability
- **Safety:** Embed a safe system approach to all planning and transport operations to achieve Vision Zero (zero fatalities or serious injuries)
- **Accessibility:** Promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all
- **Health and Well-being:** Provide 'healthy streets' and a high-quality public realm that puts people first and promotes active lifestyles
- **Air Quality:** Ensure transport initiatives improve air quality across the region to exceed good practice standards
- **Environment:** Deliver a transport network that protects and enhances our natural, historic and built environments
- **Climate Change:** Reduce emissions to as close to zero as possible to minimise the impact of transport and travel on climate change.

2.2.31 Junction 3 is identified within the Local Transport Plan as a congestion pinch point on the Peterborough Parkway Network, where improvements are necessary to improve journey time reliability and enable the growth identified within the Local Plan to emerge[13].

[13] Peterborough Long Term Transport Strategy, 2010.

Emerging CPCA Local Transport and Connectivity Plan (LTCP)

2.2.32 The CPCA has drafted a new LTCP which sets out the transport strategy to meet the new challenges and opportunities faced within the region. The LTCP is expected to be finalised in late 2022 and will supersede the current Local Transport Plan (described above) which was adopted in January 2020.

2.2.33 The new LTCP for the region follows the election of a new Mayor (May 2021), and reflects updated priorities for the combined authority, acknowledging the shifting demands on transport (at a national and local scale) following the COVID-19 pandemic, better aligning with recent national strategies for decarbonising transport set forward by government, and reflecting climate change aspirations put forward by the Cambridgeshire and Peterborough Independent Panel of Climate Change.

2.2.34 The vision, aims and objectives set forward within the draft LTCP focus on areas of; improved public health, accelerated carbon reduction, protection of the environment, reduced inequalities, and making growth in housing, employment, and the economy more sustainable by investing in better transport infrastructure. Future transport projects for Cambridgeshire and Peterborough region will be guided by the LTCP.

2.2.35 The consultation phase for the draft LTCP ran from 12th May 2022 to 4th August 2022. Feedback from the consultation has been received and will be incorporated into the final version of the LTCP, which will be subject to approval of the CPCA Board in 2023.

Mayoral Ambitions

2.2.36 The CPCA Mayoral Election on the 6th May 2021 resulted in a new Labour Mayor (Dr Nik Johnson) being elected, replacing the incumbent Conservative Mayor who had held office since 2017.

2.2.37 The new Mayor vision is that future policies and actions will be driven by inclusivity and the '3 C's' of Compassion, Co-operation and Community, and have a stronger 'greenprint' running through strategy aiding the acceleration in carbon reduction by 2050[14].

2.2.38 In July 2021, the Combined Authority Board agreed to produce an updated Local Transport Plan. In September 2021, it was announced that the Local Transport Plan would become the Local Transport and Connectivity Plan (LTCP), to reflect the growing dependence on digital infrastructure.

[14] https://cambridgeshirepeterborough-ca.gov.uk/news/putting-compassion-co-operation-and-community-at-the-heart-of-reinvented-transport-masterplan/.

2.2.39 Despite the Junction 3 Improvement Scheme being developed before the new Mayors visions and publication of the LTCP, the Scheme does align closely to the 3'Cs:

- **Compassion:** The Scheme will improve the lives of local residents by addressing existing issues at Junction 3 and helping to improve journey times and the operational efficiency of the wider network including the residential areas of Hampton and Orton Malborne. Improvements to walking and cycling provision along Malborne Way, Shrewsbury Avenue and Phorpres Way will increase accessibility to key employment areas to the south of the City, whilst providing residents with healthy and sustainable travel opportunities.
- **Co-operation:** There has been strong engagement with key stakeholders throughout the design and development process, helping to create a Scheme which recognises the interests of all partners.
- **Community:** The improvements to walking and cycling provisions will increase accessibility between residential areas and areas of employment, supporting the health and wellbeing associated with active travel.

Gear Change / Local Transport Note (LTN) 1/20 Policy

2.2.40 In October 2020, The Council adopted the Local Transport Note 1 / 20: Cycle Infrastructure Design (LTN 1/20) guidance. The guidance sets out five core principles[15] for which new cycle infrastructure implemented by local authorities should comply to secure funding from government. Core principles set out within the guidance include routes that are:

- Coherent
- Direct
- Safe
- Comfortable
- Attractive.

2.2.41 The above LTN 1/20 core principles are embedded within the wider DfT Gear Change Policy, adopted in 2020[16], which sets out the vision to transform our future transport systems to a point where active travel becomes the 'natural first choice' for journeys by 2030, and is prioritised within policy and local transport schemes.

[15] Cycle Infrastructure Design (publishing.service.gov.uk)
[16] Gear change: a bold vision for cycling and walking (publishing.service.gov.uk)

2.2.42 The themes of the Gear Change policy outlines how the vision can be achieved under the secured £2bn funding dedicated to active travel over the period of 2020 - 2025. The four themes are summarised below:

- **Theme 1 - Better streets for cycling and people:** Create higher standards for infrastructure including safe, continuous, and direct routes for cycling, which are physically separated from pedestrians and high volumes of traffic
- **Theme 2 - Putting cycling and walking at the heart of transport, place and policy:** For local governments to receive funding for local highway investment, the presumption is that all new schemes will deliver or improve cycle infrastructure to the standards outlined in guidance
- **Theme 3 - Empowering and encouraging local authorities:** A new commissioning body 'Active Travel England', led by a walking and cycling commissioner will be established, awarding funding to schemes which adhere to standards and that ca be delivered within the tighter delivery timescale controls
- **Theme 4 - Enabling and protecting those who choose cycling and walking:** Use established funding to roll out cycle training, to combat bike theft, introduce legal changes and support all users to cycle safely.

2.2.43 The Junction 3 Scheme will adhere to the Gear Change principles by upgrading three active travel routes within the vicinity of the junction, which will help facilitate north-south access across the A1139 Fletton Parkway, providing better options for active travel users to the south of the City.

2.2.44 The schemes being delivered as part of the Junction 3 improvements are described in Section 2.16; however, the active travel improvements are introduced beneath to demonstrate the scheme's alignment to the Gear Change policy:

- Malborne Way footpath Scheme, consisting of the following:
  - 1.6m wide dropped crossing over the Saltmarsh approach to the Malborne Way / Saltmarsh priority junction.
  - 2.5m wide footway for 220m between the Malborne Way / Saltmarsh priority junction in the north and the footpath ramp adjacent to the Lime Academy Orton access junction, which provides a currently missing active travel link in the area.
  - 1.2m wide dropped crossing over the Lime Academy Orton access junction.
- Phorpres Close / Phorpres Way Footpath Scheme, consisting of the following:
  - Widening 200m of existing footway to 3m shared use path on southern side of Phorpres Way between Cygnet Road and Club Way roundabout.
  - Dropped crossing over Cygnet Road approach to Phorpres Way.
  - New crossings around the Phorpres Way / Phorpres Close / Club Way roundabout, including footway crossing points on the northern and eastern arms and a footway/cycleway crossing point on the western arm.
  - New 3m wide shared use path on the south-western side of the Phorpres Way / Phorpres Close / Club Way roundabout, providing a missing active travel link.
  - Widening of approximately 20m of footpath on the north side of Phorpres Close approach to Phorpres Way / Phorpres Close / Club Way roundabout.
- Shrewsbury Avenue Cycleway Scheme, consisting of the following:
  - A 3.5m wide cycleway for 450m from the southernmost point of Shrewsbury Avenue to the south-west corner of Stillwells Nature Reserve.
  - Resurfacing to make the existing route more attractive, comfortable, and safer.

2.2.45 The three active travel improvements associated with the Junction 3 Scheme will address missing links within the existing network, make routes more consistent and direct, and improve safety for active users.

2.3 Fit with the Wider Policy Context

2.3.1 The wider policy context is set out in Table 2.1 overleaf. Each policy document is set out alongside its objectives and a description of how the proposed scheme will support and facilitate those objectives.

Table 2.1: Wider Policy Context and Impact of the Scheme

Policy Framework	Policy Function	Objectives	Study Impact
Department for Transport Single Departmental Plan	Sets out the DfT's objectives and the plans for achieving them	• Support the creation of stronger, cleaner, more productive economy • Help to connect people and places, balancing investment across the country • Make journeys easier, modern and reliable • Make sure transport is safe secure and sustainable • Prepare the transport system for technological progress and a prosperous future outside the EU • Promote a culture of efficiency and productivity in everything we do.	Improvements at Junction 3 will: • Support the housing and economic growth ambitions of the city • Improve reliability for drivers on this section of the city's road network • Help connect residents to places of employment and encourage sustainable travel through active travel enhancements
Cambridgeshire and Peterborough Combined Authority Local Transport Plan	Describes how transport interventions can be used to address current and future challenges and opportunities. Sets out policies and strategies needed to secure growth and ensure planned large scale development can take place in the county in a sustainable way. The Local Transport Plan completes the suite of documents which articulates the Combined Authority's response to the CPIER	• Housing – support new housing and development to accommodate a growing population and workforce • Employment – connect all new and existing communities so all residents can easily access jobs within 30 minutes by public transport • Business and Tourism – Ensure all of our region's businesses and tourist attractions are connected sustainably to our main transport hubs, ports and airports • Resilience – build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability • Safety – embed a safe systems approach into all planning and transport operations to achieve Vision Zero (zero fatalities or serious injuries) • Accessibility – promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all • Health and Well-being – provide 'healthy streets' and high-quality public realm that puts people first and promotes active lifestyles • Air quality – ensure transport initiatives improve air quality across the region to exceed good practice standards • Environment – deliver a transport network that protects and enhances our natural, historic and built environments • Climate Change – reduce emissions to as close to zero as possible to minimise the impact of transport and travel on climate change.	Improvements at Junction 3 will: • Support the housing and economic growth ambitions of the city • Improve journey time reliability for drivers on this section of the city's road network • Reduce the number of accidents at the junction • Help connect residents to places of employment through active travel enhancements, and will enhance the north-south access over the A1139 Fletton Parkway • Undergo carbon assessments to ensure carbon cost savings are incorporated into design and construction • Enhance the transport network by incorporating environmental enhancements into the final scheme and achieve Biodiversity Net Gain
Peterborough City Council Strategic Priorities	The Council's priorities to help meet its vision to 'create a bigger and better Peterborough that grows the right way, and through truly sustainable growth'	• Drive growth, regeneration and economic development • Improve educational attainment and skills • Safeguard vulnerable children and adults • Implement the Environment Capital Agenda • Support Peterborough's culture and leisure trust Vivacity • Keep all our communities safe, cohesive and healthy • Achieve the best health and wellbeing for the city	Improvements at Junction 3 will: • Support the housing and economic growth ambitions of the city • Improve journey time reliability for drivers on this section of the city's road network • Reduce the number of accidents at the junction • Encourage greater uptake of sustainable travel, reducing operational impacts and improving health and wellbeing
Peterborough City Council Local Plan	Updates the 2011 Core Strategy and looks to deliver 21,315 homes and 17,600 jobs by 2036		
DfT Gear Change / LTN 1/20 Guidance	Introduces higher design standards for cycle infrastructure in which local authorities must comply. Sets the vision to transform future transport systems, so that active travel becomes the 'natural first choice' for journeys by 2030.	• Theme 1 - Better streets for cycling and people • Theme 2 - Putting cycling and walking at the heart of transport, place and policy • Theme 3 – Empowering and encouraging local authorities • Theme 4 - Enabling and protecting those who choose cycling and walking	Improvements at Junction 3 will: • Enhance cycle and walking infrastructure within the study area • Ensure improvements to active travel are of the latest design standards, ensuring that they are safeguarded appropriately.

Fit within Wider Environmental Policy

2.3.2 Alongside the overarching policies outlined in Table 2.1, local policy has a strong emphasis on the environment, particularly integrating environmental improvements into the development of new infrastructure at an early stage to minimise disruption on the environment during scheme design, construction, and ongoing operation.

2.3.3 Table 2.2 below outlines the policy context in relation to the environment, documenting policy objectives and how the proposed scheme will support and facilitate each objective. Environmental considerations within the scheme will be explored further within the latter stages of this chapter.

Table 2.2: Environment Policy Context and Impact of the Scheme

Policy Framework	Policy Description / Function	Objectives	Junction 3 Improvements Will:
Cambridgeshire and Peterborough Combined Authority Local Transport Plan	Objective 9: Deliver a transport network that protects and enhances our natural, historic and built environment. Ensuring schemes improve rather than damage the environment based on DEFRA, Environment Agency and Natural England guidance.	• Protection and enhancement of the natural environment • Improving sustainable access to the natural environment • Delivering green infrastructure	• Enhance the transport network by incorporating environmental enhancements into the final scheme • Will achieve Biodiversity Net Gain • Undergo extensive surveys, ensuring the protection of species • Engage with environmental stakeholders throughout the project, ensuring protection and licences for construction
Peterborough City Council Local Plan	Policy LP29: Any development should be prepared based on the overriding principle that; the existing tree and woodland cover is maintained, improved and expanded; and opportunities for expanding woodland are actively considered, and implemented where practical and appropriate to do so.	• Where the proposal will result in the loss of tree or woodland the Council will expect the retainment of trees that make a significant contribution to the landscape or biodiversity value of the area, provided this can be done without compromising the achievement of good design for the site. • Where it is appropriate for higher value tree(s) (category A or B trees) and/or woodland to be lost, then appropriate mitigation via compensatory tree planting will be required. Such planting should meet the five Tree Planting Principles • Where appropriate and practical, opportunities for new tree planting should be explored as part of all development (in addition to any necessary compensatory tree provision).	• Undergo extensive surveys, gaining understanding of the species and value of trees located within the study area • Actively explore / implement additional planting areas within the study area following guidance on replanting principles
Peterborough City Council – Trees and Woodland Strategy (2018)	The strategy sets out the benefits provided by trees and woodlands, how the Council aim to maintain, improve and expand tree cover, as well as the wider management of the City's tree stock in regards to development.	• To maintain and enhance the tree population of the city • To increase the tree canopy cover across the city with particular reference to areas with low canopy cover. • To maintain and maximise the ecosystem services provided by the Council's trees. • To promote biodiversity and conserve tree and woodland ecosystems. • To conserve and protect ancient woodland and ancient trees with significant ecological, historical and amenity value. • To work with partners to expand the woodland cover through sustainable external funding.	• Include environmental elements within the final scheme design, enhancing the local environment and biodiversity within the study area • Actively explore / implement additional planting areas within the study area following guidance on replanting principles whilst working with partners Aragon • Undergo extensive surveys, gaining understanding of the species / habitats, and possible impact to these within the study area and identify mitigations • Engage with environmental stakeholdders to protect the identfied species and historic environment on site within design and construction
DfT proposed Environment Bill (Nature and Conservation Covenants) 2020	The Environment Bill will use a localised action approach to help contribute to the recovery of our natural environment, improving biodiversity and protecting urban street trees.	• 10% biodiversity net gain requirement on new development / schemes • Strengthened biodiversity duty on public authorities • Local Nature Recovery Strategies (LNRSs) • Species Conservation Strategies and Protected Sites Strategies • Targeted measures to protect existing trees	• Achieve Biodiversity Net Gain at a minimum of 20 % • Provide substantial evidence during option development with regard to tree loss, accounting for species type, maturity and ecological value. • Provide mitigations for species / historic environment protection during construction
CPCA / PCC endorsed Natural Cambridgeshire Doubling Nature Vision	By doubling the area of rich wildlife habitats and natural green-space, Cambridgeshire and Peterborough will become a world-class environment where nature and people thrive, and businesses prosper.	• Access to green space for communities • Air Quality, quality of life and public health • Long term financial gains • Ownership of the vision and growth agenda by local communities through an enhanced 'sense of place' • Increasing tree cover and the network of woodlands, hedgerows, within and around our towns and cities • Expanding the flower-rich grasslands on the limestone plateau west of Peterborough • Ensuring that at least 90% of our richest wildlife areas are in good ecological condition	• Include environmental elements within the final scheme design, enhancing the local environment and biodiversity within the study area • Implement compensation tree planting where necessary and achieve Biodiversity Net Gain at a minimum of 20% • Explore low maintenance environmental options for long -term gain for the Council

2.4 The Need for Change

2.4.1 This section discusses the need for change which sets the requirement for the Junction 3 Improvement Schemes.

2.4.2 It should be noted that the following section outlining the problems identified at Junction 3 and the justification for improvements are based on pre-Covid-19 conditions, however these have been proved to remain current and relevant. The impact of Covid-19 on highway usage at Junction 3 is discussed in greater detail in Section 2.12 'Key Risks'.

Problems Identified

2.4.3 There is a very clear and compelling case for improvements within the vicinity of Junction 3.

2.4.4 Junction 3 is the cornerstone of the Parkway Network in the south of Peterborough, linking the A1139 Fletton Parkway with the A1260 Nene Parkway. The Hampton Township to the south of Junction 3 has experienced high levels of residential and economic growth over the past 20 years and this is set to continue to at least 2036. The Local Plan identifies 7,400 homes and nearly 350,000 sqm (GFA) of employment space to be developed within Hampton over the next 15 years. The employment area is set to deliver approximately 13,000 jobs[17].

2.4.5 Evidence of existing and future conditions demonstrates that the following issues need to be addressed to ensure that further growth can be realised:

- Extensive peak hour queues on the A1260 Nene Parkway
- Peak hour queueing on the A1260 The Serpentine
- High accident rate, particularly rear end shunts
- Inadequate pedestrian / cycle facilities and connectivity.

2.4.6 If not resolved, these issues will compromise the City's growth aspirations, as well as the Council's objective to remain a pleasant place to live and work, and negatively impact on residents' lives.

[17] Peterborough Local Plan, 24th July 2019, https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/LTP.pdf.

Extensive Queues on the A1260 Nene Parkway

2.4.7 Extensive queueing occurs on the A1260 Nene Parkway southbound approach to Junction 3, particularly in the PM Peak Period. Figure 2.3 shows the observed queue from this approach stretching past the Junction 31 on-slips in the PM peak period.

Figure 2.3: Observed PM Peak Hour Queuing on the A1260 Nene Parkway Southbound

2.4.8 This is considered to be a “rolling queue”. Rolling queues are characterised by the vehicles spending a large proportion of their time moving at low speeds, as opposed to coming to a full stop for an extended time. This sort of queueing tends to occur as a result of congestion at major roundabouts, where vehicles at the head of the queue slow down to find a gap.

2.4.9 The majority of traffic on this approach will make a right turn onto the A1139 Fletton Parkway. This creates a high number of weaving movements for vehicles coming from the Junction 31 on-slip.

2.4.10 The queuing at this location also results in trips diverting along Malborne Way which is an adjacent residential distributor road. Vehicles approaching Junction 31 on the A1260 Nene Parkway southbound and on Morley Way have the opportunity to decide whether to continue on to Junction 3 or re-route via Malborne Way based on the level of queuing that is occurring on A1260 Nene Parkway southbound in the PM peak hour. The rat-running traffic on Malborne Way can cause queuing and congestion along Malborne Way approaching Junction 2.

Queuing on the A1260 The Serpentine

2.4.11 During both the AM and PM peak congestion occurs on the A1260 The Serpentine approach. As shown in Figure 2.4 and 2.5, queues generally extend back to the junction with Hargate Way but can sometimes extend back to the Tesco roundabout (500m to the south-east) in the AM Peak. In the PM peak period, queuing / slow moving traffic extends back beyond the Tesco roundabout.

2.4.12 The queuing at Junction 3 on the A1260 The Serpentine approach is a result of the high volume of vehicles exiting the circulatory on to A1139 Fletton Parkway westbound resulting in few gaps being available to exit the approach.

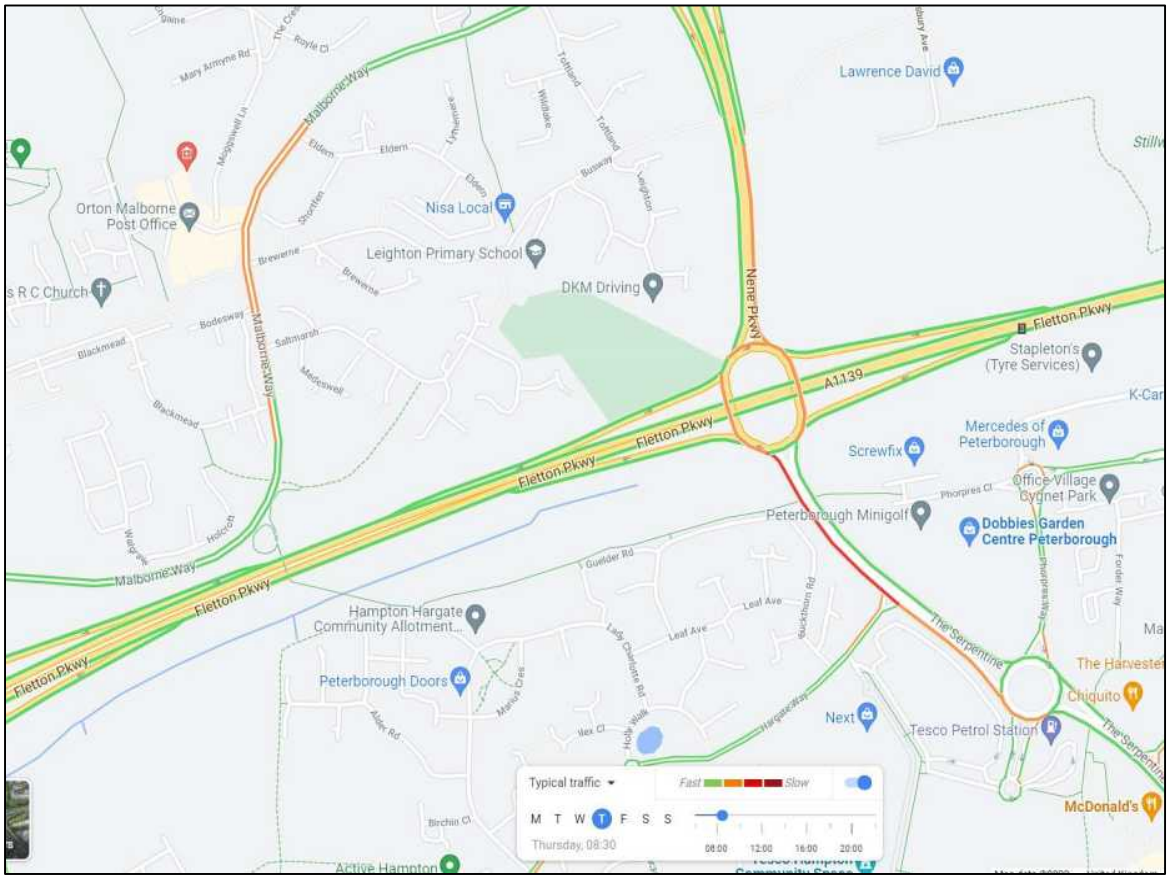


Figure 2.4: Google Traffic, Typical AM Peak Congestion surrounding Junction 3 (January 2022)

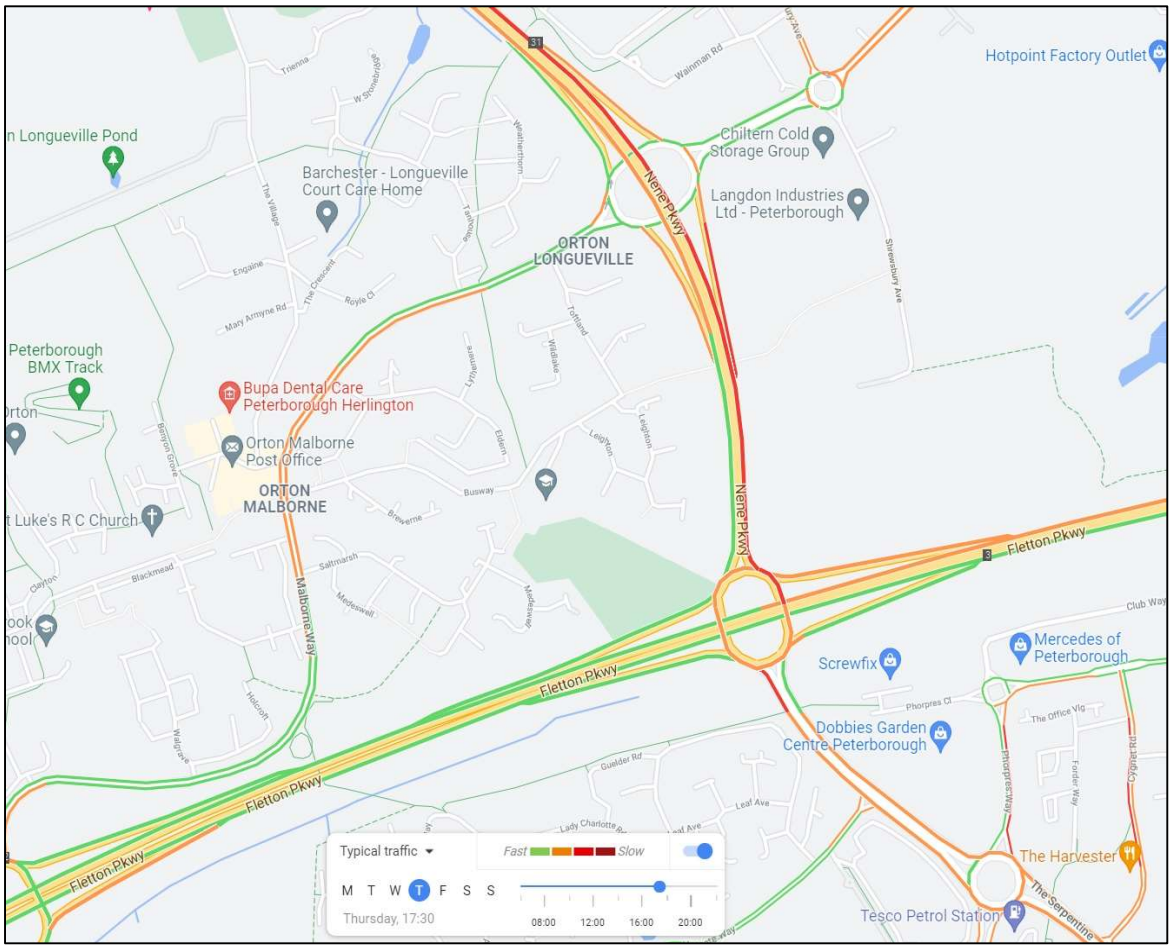


Figure 2.5: Google Traffic, Typical PM Peak Congestion surrounding Junction 3 (January 2022)

High Accident Rate

2.4.13 Personal Injury Accident (PIA) data was collected for the period between 2014 and 2019, during which time there were 69 accidents recorded at Junction 3. Table 2.3 highlights the majority of these accidents (88%) were classified as 'Slight', with the remaining 12% classified as 'Serious'. There have been no fatal accidents recorded at the junction between 2014 - 2019.

2.4.14 Note that the data in Table 2.3 covers the period of January 2014 to June 2019, representing five and a half years of data.

Table 2.3: Accident Data by Severity and Year

Accident Analysis	Year					
	2014	2015	2016	2017	2018	2019
Slight	13	10	16	6	16	-
Serious	1	4	2	-	-	1
Fatal	-	-	-	-	-	-
Total	**14**	**14**	**18**	**6**	**16**	**1**

2.4.15 Figure 2.5 highlights the locations where the majority of accidents occurred, with clusters being positioned on the A1339 Fletton Parkway Eastbound on-slip and on the A1260 The Serpentine approach to Junction 3.

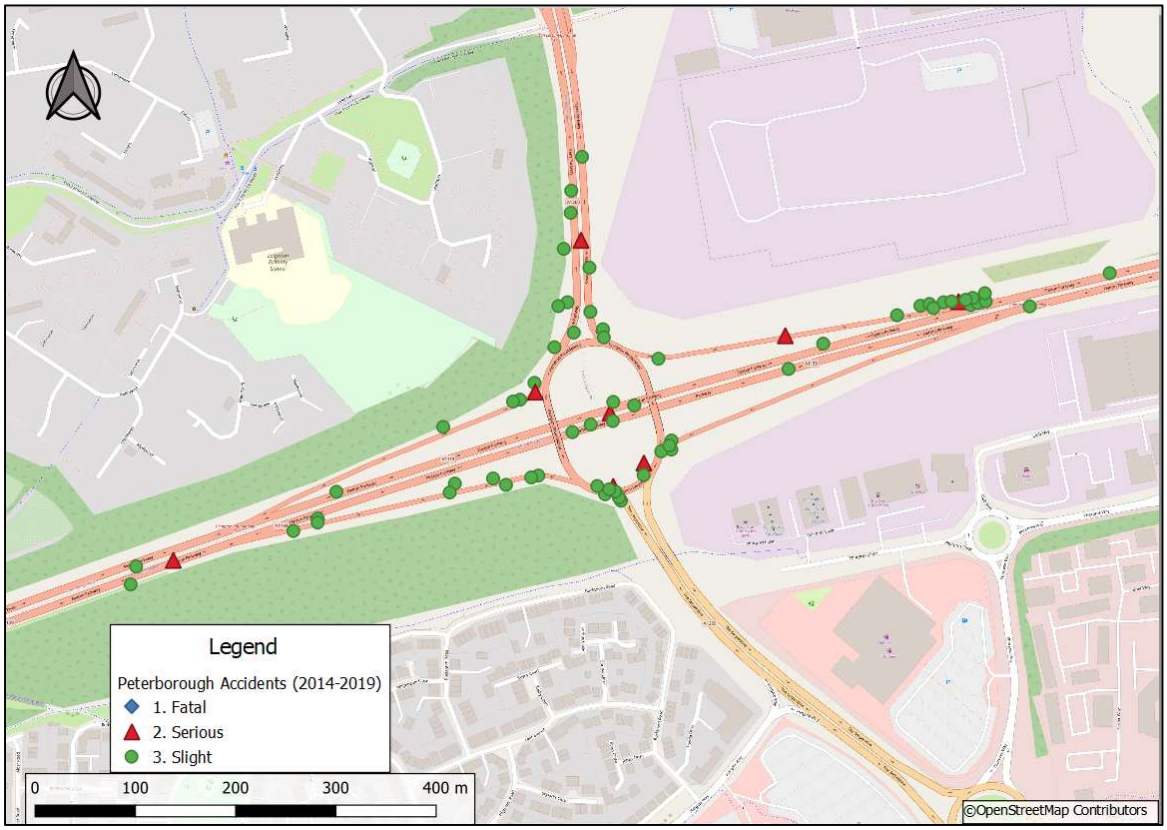


Figure 2.6: Accident Locations, 2014 - 2019

2.4.16 Figure 2.6 shows an accident cluster present on the A1260 The Serpentine approach as vehicles join the circulatory. Accident data shows a high number of rear end shunts occur at the stop line of The Serpentine approach, reflecting the driver behaviour of the roundabout. Due to the high number of right turning vehicles from the A1260 Nene Parkway to the A1139 Fletton Parkway westbound, gap availability for vehicles on the A1260 The Serpentine is limited, leading to driver frustration.

2.4.17 Accidents on the A1139 Fletton Parkway eastbound on-slip result from the merge with the parkway. Poor visibility for drivers on the slip road coupled with heavy traffic on the parkway result in high incident rates at this location. Improvements to this slip road to improve the safety for motorists is outside the scope of this project, however this issue has been identified for resolution by the Junction 3 - 3A project which is being considered for funding.

2.4.18 Analysis into the time of accidents has shown that of 26% of accidents within the vicinity of Junction 3 have occurred during peak periods (AM 08:00 – 09:00, IP 14:00 – 15:00, PM 17:00 – 18:00).

Poor Pedestrian / Cycle Facilities and Connectivity

2.4.19 Pedestrian and cycle facilities within the immediate vicinity of Junction 3 are primarily situated to the south of the junction, with pathways and an underpass connecting the residential area of Hampton Hargate to the business park area along Phorpres Way (east of the A1260 The Serpentine).

2.4.20 Figure 2.7 beneath shows the location of these facilities.

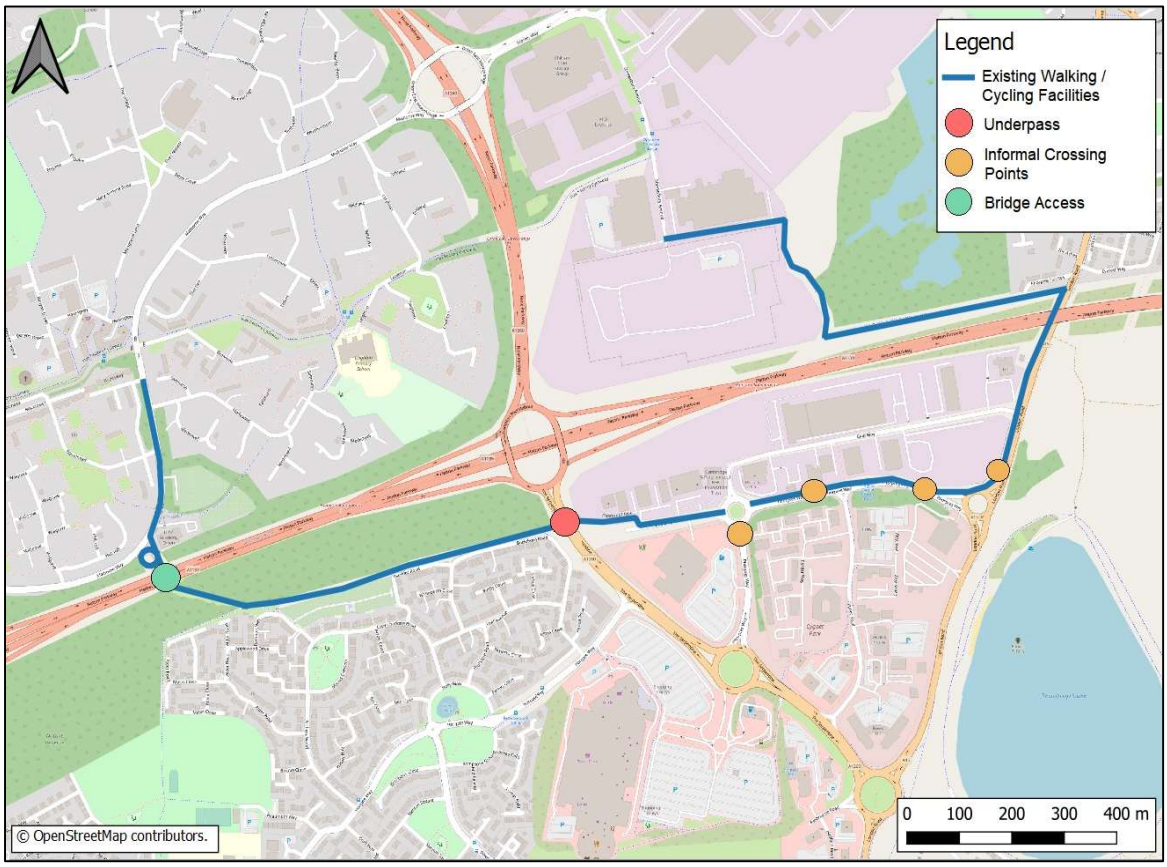


Figure 2.7: Walking and Cycling Infrastructure Locations

2.4.21 Figure 2.8 overleaf shows the relative density of existing cycleway provision in the Junction 3 area. Higher levels of provision are represented by the darker coloured cells, and the figure demonstrates there are opportunities to improve provision in the immediate vicinity of Junction 3.

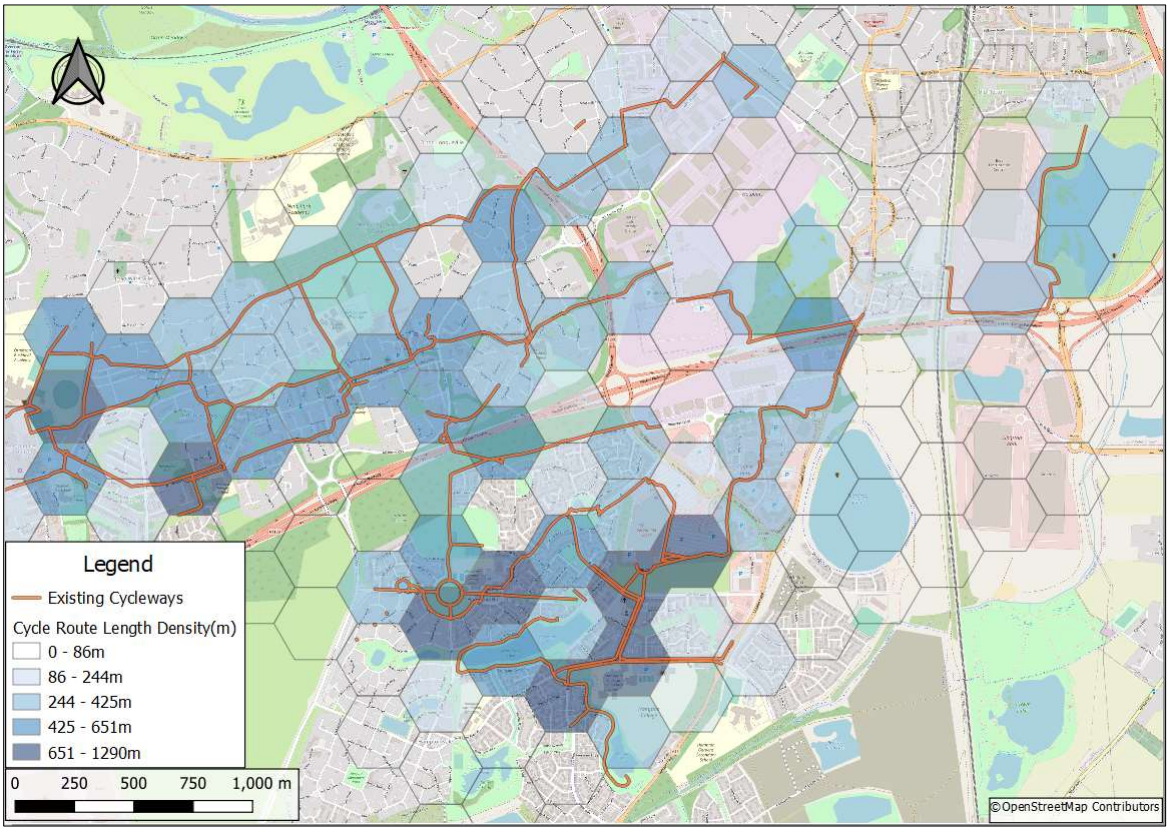


Figure 2.8: Existing Cycle Infrastructure in the Junction 3 Study Area

2.4.22 A non-motorised user audit (NMU) was conducted during this phase of work to inform active travel provision designs. The audit assessed the facilities highlighted in Figure 2.6 to review the quality of the existing provision at the junction and wider study area, and to identify any improvements that could be made alongside construction of the Junction 3 scheme. LTN 1/20 guidance was considered during the audit, with emphasis on the following:

- Quality of the pedestrian / cycle footpaths
- Location of crossing points (Phorpres Way only), and the ease of crossing
- Extent of street lighting
- Perceived safety of the underpass.

2.4.23 The audit identified that the continuity and quality of active travel routes was poor in places, especially to the north of the A1139 Fletton Parkway and along Phorpres Way.

2.4.24 Figure 2.9 shows a section of the Shrewsbury Avenue cycleway which leads to the A15 London Road route passing beneath the A1139 Fletton Parkway to the east of Junction 3. Much of the route is in poor condition as shown beneath and in need of investment. The cycleway is narrow, and the surface quality is poor.

Figure 2.9: Shrewsbury Avenue Cycle Way

2.4.25 Figure 2.10 overleaf shows a section of the route which passes over the A1139 Fletton Parkway to the west of Junction 3. This is located along Malborne Way between Saltmarsh and the footbridge over the parkway.

2.4.26 There is no footpath along this stretch although a clear desire line exists as evidenced by the worn track through the grass.

Figure 2.10: Malborne Way

2.4.27 Figure 2.11 overleaf shows images from the Phorpres Way audits that show some desirable crossing points. These crossing points are unofficial, with no dedicated cyclist / pedestrian areas, and no dips in the kerbs.

Figure 2.11: Phorpres Way Desirable Crossing Points on Cygnet Road (Left) and Phorpres Close / Club Way Roundabout (Right)

2.4.28 Local employment areas to the north, south, and east of Junctions 31 and 3 are particularly car-dependent, as shown in Figure 2.12 below. However, car availability for residents is lower in the Orton and Hampton, where the schemes are located, than other areas of Peterborough as shown in Figure 2.13 overleaf. Improving the quality of strategic active travel corridors such as Malborne Way, Shrewsbury Avenue and Phorpres Way is expected to reduce the need to travel by car to local employment sites and increase the appeal of active travel.

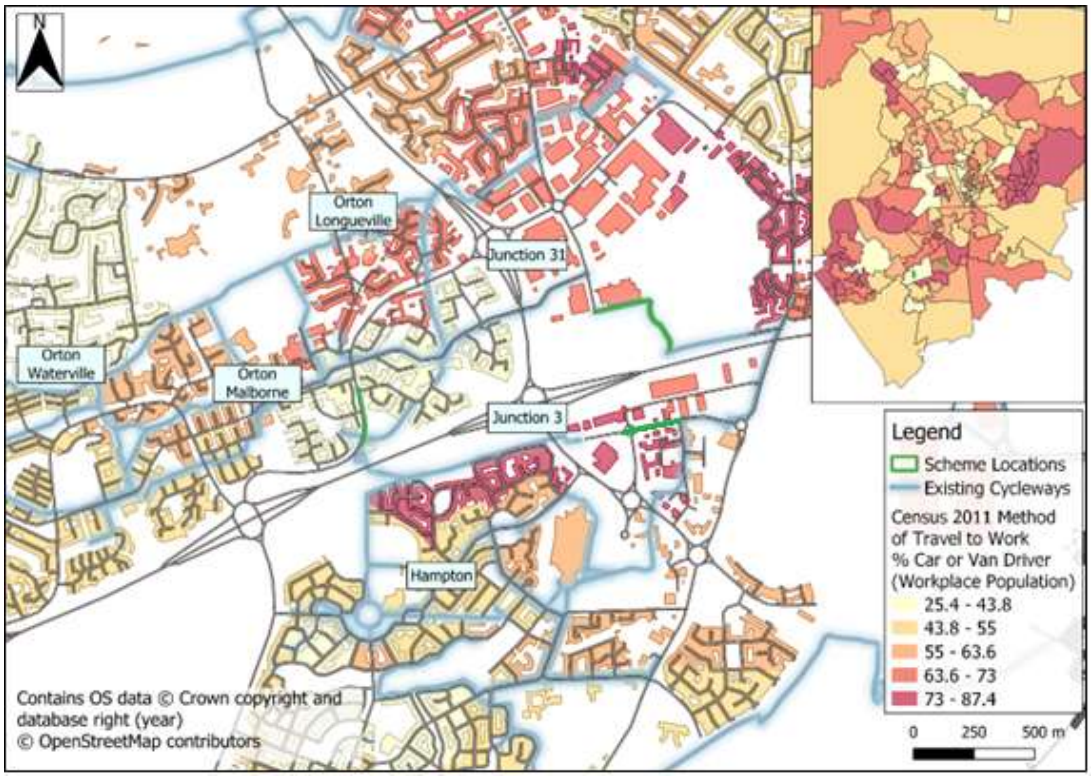


Figure 2.12: Census 2011 Method of Travel to Work - Percentage Car or Van Driver within Workplace Population

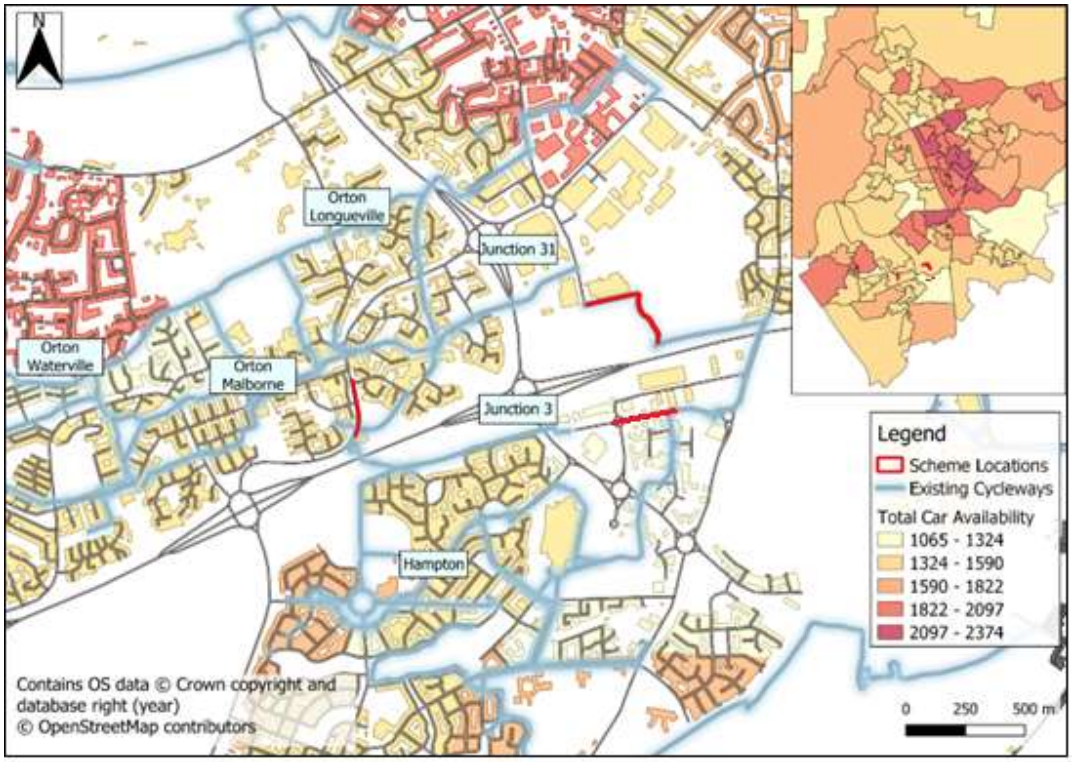


Figure 2.13: Census 2011 Total Car Availability by LSOA

2.4.29 The average car travel to work mode share for the Ortons and Hampton is 62%, whereas the whole of Peterborough is 61%. Whilst local car driver levels to workplaces are representative of overall Peterborough levels and local car availability is lower than the rest of the city, there is still potential to reduce car driver trips from local residential areas and increase the number of walking and cycling commuter trips.

2.4.30 It is expected that providing improved active travel infrastructure will encourage residents to travel by foot or bicycle instead of by car, and therefore help reduce existing and future year peak hour congestion and delay. Without an improvement in active travel infrastructure, the study area will remain a car-dependent destination with untapped potential for walking and cycling.

2.5 Impact of Not Changing

2.5.1 The impact of not progressing this scheme would be:

- Worsening of congestion, delay and journey times.
- Likelihood of accidents will rise.
- Attractiveness of Hampton (and Peterborough) will decrease.
- Attractiveness of Peterborough as a place to live, work and travel will decrease.
- Active transport network does not serve users' needs in this area.

Congestion, Delay and Poor Journey Times

2.5.2 The existing issues of congestion, delay and poor journey times will continue to worsen, impacting the operational performance of Junction 3 and the wider highway network within its vicinity, including Junction 31, the A1260 Nene Parkway and Malborne Way.

2.5.3 Table 2.4 beneath compares the delay and total travel time through Junction 3 in 2018 (Base scenario) and in 2031 (Do Minimum scenario). The data highlights the operation of Junction 3 will deteriorate if nothing is implemented.

Table 2.4: Delay Comparison between 2018 Base Model and the 2031 DM Scenario

Location	Approach	Exit	Delay Time (secs)				Travel Time (secs)			
			AM		PM		AM		PM	
			2018	2031	2018	2031	2018	2031	2018	2031
Junction 3	A1260 Nene Parkway	A1260 Nene Parkway	-	-	-	-	-	-	-	-
		A1139 Fletton Parkway (East)	83	139	180	172	109	164	206	198
		A1260 Serpentine Green	137	210	200	181	181	254	244	224
		A1139 Fletton Parkway (West)	160	218	215	186	199	257	253	224
		Total	**381**	**567**	**595**	**539**	**488**	**675**	**703**	**647**
	A1139 Fletton Parkway (East)	A1260 Nene Parkway	52	51	45	55	104	103	97	107
		A1139 Fletton Parkway (East)	-	-	-	-	-	-	-	-
		A1260 Serpentine Green	30	41	31	32	73	84	74	75
		A1139 Fletton Parkway (West)	-	-	-	-	-	-	-	-
		Total	**81**	**92**	**76**	**87**	**177**	**187**	**171**	**182**
	A1260 Serpentine Green	A1260 Nene Parkway	104	118	85	97	138	152	119	131
		A1139 Fletton Parkway (East)	113	127	117	135	149	163	152	170
		A1260 Serpentine Green	141	184	121	144	193	235	173	197
		A1139 Fletton Parkway (West)	61	66	48	52	81	86	68	72
		Total	**419**	**495**	**371**	**428**	**560**	**635**	**512**	**570**
	A1139 Fletton Parkway (West)	A1260 Nene Parkway	25	28	27	27	60	64	62	63
		A1139 Fletton Parkway (East)	-	-	-	-	-	-	-	-
		A1260 Serpentine Green	75	94	72	74	130	148	127	128
		A1139 Fletton Parkway (West)	-	-	-	-	-	-	-	-
		Total	**100**	**122**	**99**	**101**	**190**	**212**	**189**	**191**
	Junction Total		**981**	**1277**	**1141**	**1155**	**1415**	**1709**	**1575**	**1590**

2.5.4 The total delay time for the Junction in the 2018 AM peak hour is 981 seconds and the PM peak hour is 1,141 seconds, by 2031 this has risen to 1,277 seconds in the AM peak hour and 1,155 seconds respectively.

2.5.5 Delay on Malborne Way is shown to significantly increase between 2018 and 2031, particularly in the PM peak hour, where delay increases from 105 seconds to 346 seconds in 2031.

2.5.6 The A1260 Nene Parkway shows a reduction in delay and travel time in the PM peak hour between 2018 and 2031, this is due to the demand on the other arms of the junction increasing and providing more opportunities for vehicles to exit on the circulatory carriageway. In addition, more vehicles are choosing to re-route along Malborne Way which experiences a significant increase in delay and travel time in the PM peak hour. This is considered unacceptable as Malborne Way's function is to provide access to housing, local amenities, and a Primary School, and not to accommodate trips displaced from the Strategic Road Network.

Likelihood of Accidents will Increase

2.5.7 It is likely that accidents will increase at Junction 3 in line with traffic growth if nothing is done, particularly accidents such as rear end shunts. As shown above, the forecast increase in delay and travel time is expected to rise which will entail more stopping and starting on approach to the junction.

Attractiveness of Hampton (and Peterborough) as a Place to Work Will Decrease

2.5.8 Junction 3 provides the main access to the Hampton Township, which contains many large businesses and residential developments, which will all be affected by its operation. As traffic, queueing, and delays increase, it is likely that the area will become gridlocked in peak times. Businesses and their employees in this area will become increasingly frustrated with the difficulty in accessing and exiting their premises and may look to relocate or work elsewhere.

2.5.9 This may also have a detrimental impact on the Council's objective for Peterborough to be an attractive place to live and work. If residents and employees experience increased journey times around the City when accessing employment opportunities, they may choose to work elsewhere. In addition, companies looking to relocate to the city may instead consider other towns and cities with better transport conditions.

2.5.10 The location of Junction 3 on the main route into Peterborough from the A1 (M) and southwest, and the impact of delay and congestion on the A1139 Fletton Parkway (often queuing back to Junction 17 of the A1 (M) during PM peaks) means that issues at this junction have an impact across the whole City, and also on strategic long-distance trips using the A1139 to transition from the A1 (M) and the A47.

Active Transport Network Will Not Serve User's Needs

2.5.11 The potential for active travel is greatest when good quality and coherent routes are provided. Gaps have been identified in the active travel infrastructure around Junction 3, which may result in less active mode uptake in the area.

2.5.12 The A1139 Fletton Parkway acts as a barrier to active travel, although there are crossing points for non-motorised users at the overbridge to the west and beneath the bridge to the east. Gaps identified in the active travel network include routes that feed these crossing points. The potential uptake in active travel trips will be suppressed if these crossing points are not made easily accessible.

2.5.13 If north / south active travel is suppressed, use of the nearby business parks and shopping centres will be discouraged.

2.6 Internal Drivers for Change

2.6.1 Internal drivers for change are the factors which are driving the need for change, and come from the scheme promoter, such as aspirations for growth, or to increase network resilience. In this instance the scheme promoters are the CPCA and Peterborough City Council.

2.6.2 The internal drivers for improvements at Junction 3 come from levels of deprivation for the city, local growth aspirations, the support provided by the CPCA to enable growth to be realised, and recent policy adoptions emphasising active travel.

Index of Deprivation

2.6.3 As highlighted in the introduction, Peterborough's population has grown considerably over recent years, with levels of growth being significantly higher than the national average and other counties within the region.

2.6.4 The socio-economic growth of the city has not kept pace with population growth, resulting in the city being reported as one of the 'most deprived' areas within the country and CPCA region[18], in relation to income deprivation and income disparity[19].

2.6.5 Figure 2.9 beneath shows residential areas of the city by Index of Multiple Deprivation (2019)[20]. Areas in dark red are amongst the top 10% most deprived in England and areas of dark green are amongst the 10% least deprived.

[18] Peterborough.pdf (cambridgeshireinsight.org.uk)
[19] Office of National Statistics, English indices of deprivation 2019
[20] CDRC Mapmaker: Deprivation Indices (IMD) (English 2019 IMD (E19))

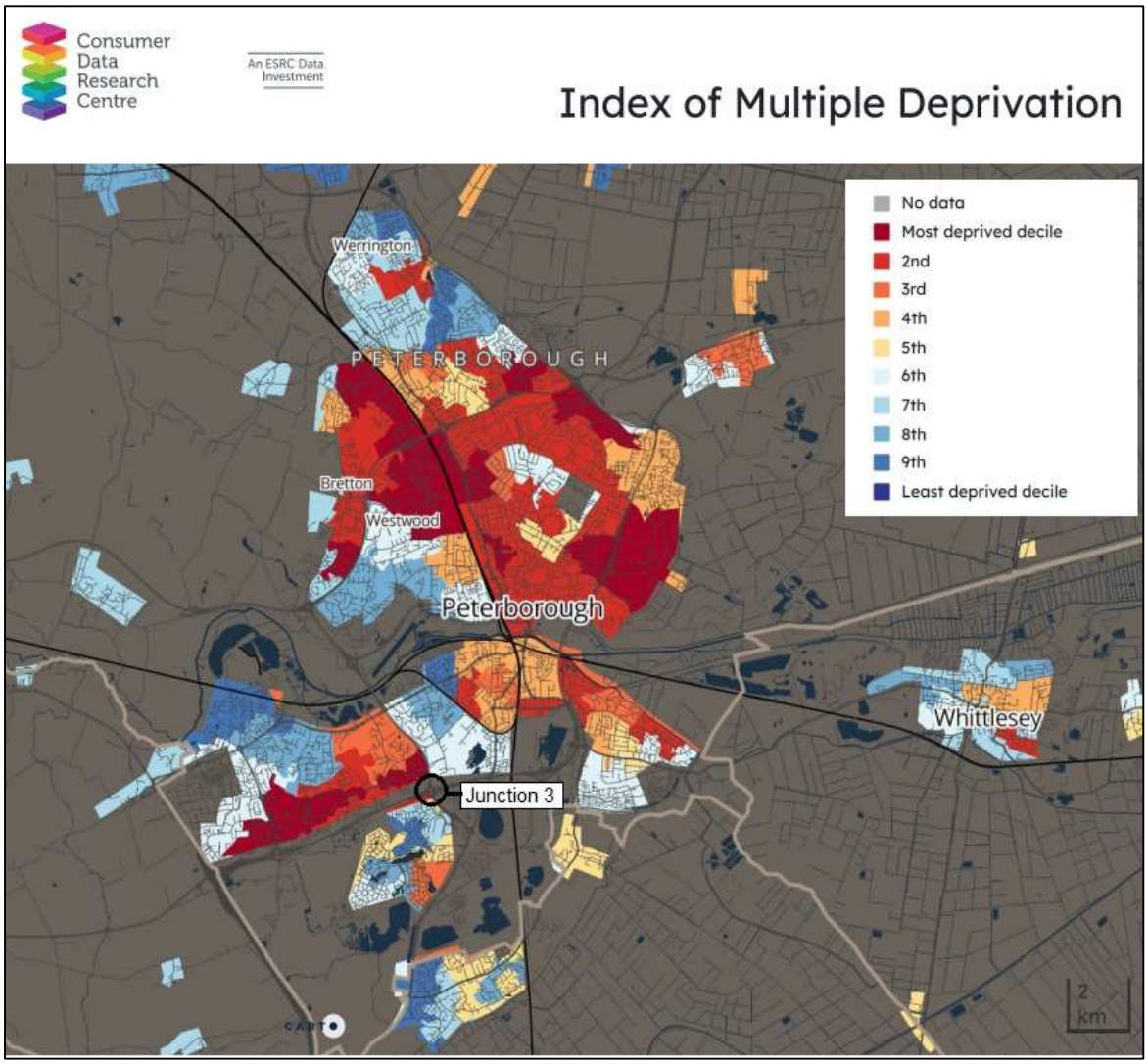


Figure 2.14: 2019 Index of Multiple Deprivation (Consumer Data Research Centre)

2.6.6 As highlighted in Figure 2.14, residential areas surrounding the City Centre rank amongst the top 40% of the most deprived in the country, whilst residential areas surrounding the study area are shown to vary from the top percentile to the 6th percentile for deprivation within Peterborough.

2.6.7 The deprivation issues of Peterborough have been acknowledged by government with the city being categorised as a 'Priority One Area' within the context of the Levelling Up Agenda. This allocation demonstrates investment is required within the city to tackle economic differences and drive prosperity, enabling socio-economic opportunities to be realised. The £4.8 billion Levelling Up Fund will allow Peterborough and other Priority One areas to be prioritised for investment into local infrastructure, essentially 'levelling up' left behind regions of the UK.

Local Growth Aspirations

2.6.8 Peterborough is forecast to experience significant employment and population growth over the next few decades, reflecting a continuation of past trends. The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities, and objectives for Peterborough for the period up to 2036. The updated strategy identifies the required delivery of 19,440 new homes and 17,600 new jobs by 2036[21], a significant proportion of which is located in the Hamptons immediately to the south of Junction 3. This level of growth will in turn further strengthen the City's economy, contribute to regional growth, and increase the demand for travel on the local network.

2.6.9 Peterborough strives to become a 'destination of choice', to be continually recognised as a regional centre and economic partner with Cambridge. With the attractiveness of the City set to increase as a place to live, work and travel, this in turn creates pressure in relation to housing and employment growth, which in turn increases the strain on the transport infrastructure. Improving the transport infrastructure to enable Peterborough's strong history of growth to continue is the main internal driver for change at Junction 3.

2.6.10 The Local Transport Plan identifies Junction 3 as a key scheme for introducing infrastructure requirements that are needed to address existing capacity constraints on the network and those that are required to cater for the travel demand arising from the growth ambitions of the City.

2.6.11 Similarly, findings from The Long Term Transport Strategy (LTTS) which feeds into the Peterborough Local Plan identifies the A1139 Fletton Parkway and The Serpentine / Phorpres Way roundabout as key locations for scheme improvements. With such locations directly connected to Junction 3, future schemes are likely to further mitigate the impact of growth and improve traffic conditions to the south of the City.

2.6.12 It is acknowledged that if no changes are made to existing congestion and journey time issues on major routes across the City, then growth aspirations will be compromised.

[21] https://www.peterborough.gov.uk/council/planning-and-development/planning-policies/local-development-plan.

Combined Authority Support

2.6.13 The CPCA has identified a number of strategic projects which it believes will provide transformational benefits for the area. The feasibility study for Junction 3 Improvements was one of the studies shortlisted as a priority, beginning in 2017.

2.6.14 The CPCA recognises that the development of a wider, multi-year pipeline of transport schemes can also contribute towards its objectives. The benefits of such a pipeline include:

- The provision of a steady flow of transport improvements over the short, medium and long-term including potential strategic projects of the future
- Greater opportunity to consider local issues and spread investment around the Combined Authority area
- Early investment in the development of schemes places the Combined Authority in a strong position to bid for and secure additional funding as alternative sources become available.

2.6.15 In order to populate the pipeline of work, feasibility studies and technical assessment of potential schemes of schemes needs to be undertaken and business cases produced. These are essential steps in defining an improvement and securing funding for its realisation.

2.6.16 At the onset of the Junction 3 project in October 2017, the CPCA methodology for prioritising investment was based on the criteria shown in Table 2.5 beneath.

Table 2.5: Combined Authority Criteria

Dimension	Criteria
Strategic	• Reduce congestion • Unlock housing and jobs
Economic	• Scale of impact • Value for money
Financial	• Other funding sources / contributors
Management	• Delivery certainty • Project risks • Stakeholder support

2.6.17 Junction 3 was prioritised for investment by the CPCA, and the CPCA's investment strategy is another internal driver for change, and an enabler for a scheme to be developed at this location.

Adoption of Gear Change Policy and LTN 1/20 Guidance

2.6.18 In July 2020 DfT published the 'Gear Change: A Bold Vision for Cycling and Walking' strategy, announcing £2 billion of new funding for improving walking and cycling infrastructure across the UK, enabling active travel to become the 'natural choice for journeys by 2030', as stated in the strategy vision[22].

2.6.19 This new national guidance for highway authorities places greater importance on active travel, introducing higher design standards for implementing new and improving existing infrastructure.

2.6.20 The Local Transport Note (LTN 1/20), a key tool for delivering the strategy, was adopted by PCC in October 2020 placing greater emphasis on incorporating active travel schemes or improvements within larger highway schemes. Under the adoption it is acknowledged that where government funding is sought after by local authorities for schemes where the main element is not walking and cycling, 'there is a presumption that schemes must deliver or improve infrastructure to standards outlined in the LTN 1/20 guidance to secure funding'[23].

2.6.21 The recent publication and adoption of these strategies by the CPCA and PCC has diversified the scope of highway schemes for the City of Peterborough. The adoption of LTN 1/20 has resulted in three active travel schemes being incorporated into the overall Junction 3 project, including measures to extend the existing shared use provisions, create new footpaths on missing links within the wider network and increase safety for active travel users by installing additional crossing points.

2.7 External Drivers for Change

2.7.1 External drivers for change come from outside of the scheme promoter's organisation, and include factors such as public opinion, legislative changes or as a response to other events.

2.7.2 There are no direct external drivers for change behind the Junction 3 improvement schemes, however there are several other factors relating to Malborne Way and wider employment areas that support the case for investment at Junction 3. These are discussed overleaf.

[22] Gear change: a bold vision for cycling and walking (publishing.service.gov.uk).
[23] LCWIP (Aug 21) (peterborough.gov.uk).

Malborne Way Quality of Life

2.7.3 Malborne Way provides vehicle access to residential areas in Orton Malborne. During the PM peak hour, the congestion and delay at Junction 3 results in many drivers choosing to re-route via Malborne Way and use less appropriate residential and local distributor roads.

2.7.4 This reduces the quality of life for residents of Orton Malborne, as the otherwise quiet road is flooded with traffic during the peak periods. Improvements to Junction 3 should reduce the need for vehicles to re-route along Malborne Way, and thus improve the quality of life for residents.

2.7.5 Figure 2.12 shows the through-route used along Malborne Way in Red, and the strategically preferred route via Junction 3 in Blue.

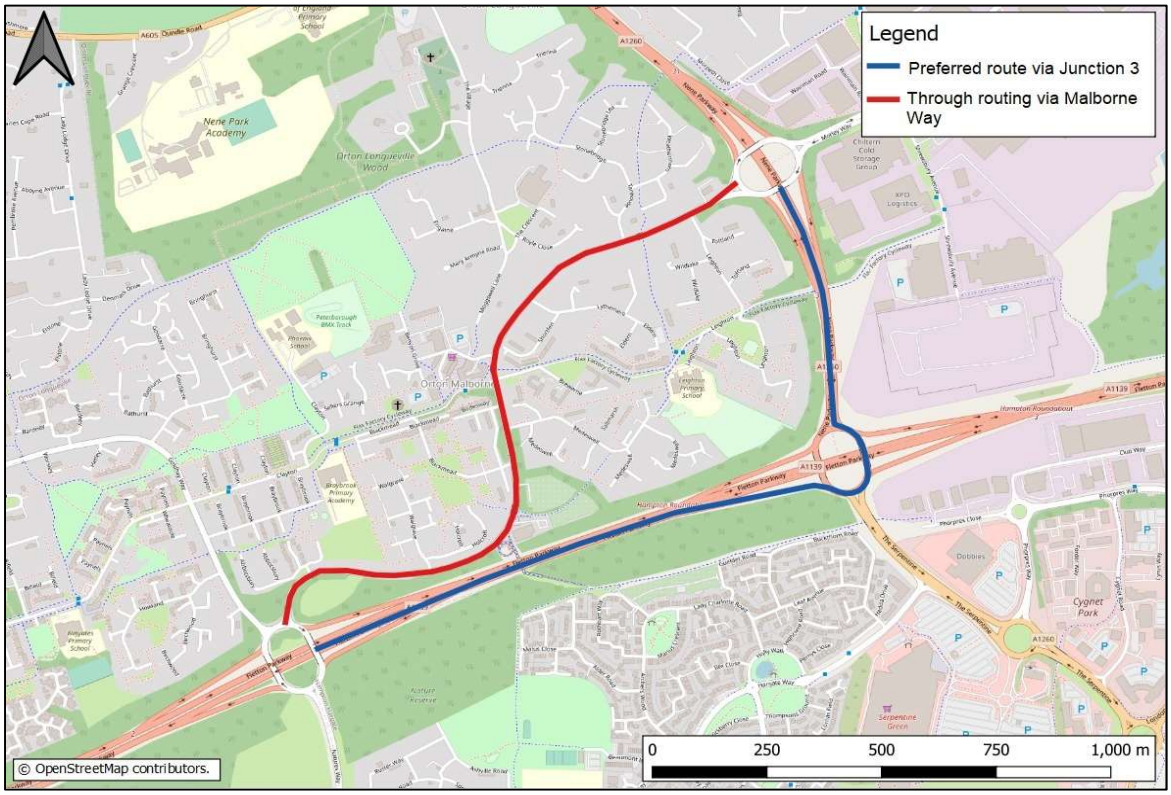


Figure 2.15: Through-Route via Malborne Way compared to the Preferred Route via Junction 3

Employment Areas

2.7.6 Junction 3 acts as a gateway to a large residential and employment area known as Hampton. The Hampton Township has been developed over the past 25 years and is identified for a significant proportion of residential and employment growth in the Local Plan for the next 15 years. Table 2.6 below summarises information about recent and planned developments in the area[24].

Table 2.6: Development in the Hampton Area

Site Name	Residential Units	Employment (m^2)	Retail (m^2)	Leisure (m^2)	Jobs
British Sugar Offices	-	6,922	-	-	590
Serpentine Green Extension	-	-	12,335	11,866	257
Great Haddon (Core + Employment)	5,350	324,500	11,500	-	10,686
Alwalton Gateway	-	17,200	-	-	2,250
Hampton Heights	350	-	-	-	-
Hampton Leys	1,700	-	-	-	-

2.7.7 Table 2.6 demonstrates that Junction 3 is a key location for growth in Peterborough. Improvements will be necessary to accommodate the full growth ambition. If peak hour journey times are not improved around Junction 3, it could inhibit the operation of current and prospective businesses, resulting in restriction to their growth which could ultimately cause them to relocate.

2.7.8 Lynchwood Business Park, whilst not located in the study area, will also benefit from improvements to Junction 3. Commuters travelling between the north of Peterborough and Lynchwood often use A605 Oundle Road as an alternative to the Parkway Network and Junction 3.

2.7.9 Ideally commuters to Lynchwood would use the Parkway Network (and thus Junction 3), as the parkway is better suited to the traffic volumes than the A605 Oundle Road. Improvements to Junction 3 should attract trips from Oundle Road, which benefits both the Lynchwood commuters and the other users of the A605 Oundle Road (including residents and schools, as well as non-motorised users).

[24] Peterborough Local Plan (Adopted version).

2.8 Scheme Objectives

Strategic Objectives

2.8.1 A transport scheme can have both primary and secondary objectives. The primary objectives are the fundamental outputs required from the scheme and therefore must be achieved. Secondary objectives are other outputs that may be achieved but are not necessary to the success of the scheme.

2.8.2 The objectives for the Junction 3 Improvement Schemes were developed ahead of the option development workshop to provide a framework for participants of the workshop, through which the relative benefits and disadvantages of the proposed options could be discussed. The objectives are based on the goals and outcomes from local policy documents such as the Peterborough Local Plan.

2.8.3 Although these objectives pre-date those of the CPCA as previously discussed in this chapter, work has been undertaken to build upon the objectives and ensure they align with those of the CPCA. The primary and secondary objectives for the Junction 3 scheme are listed beneath.

2.8.4 Primary objectives include:

1. **Tackle Congestion and Improve Journey Times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3.
2. **Support Peterborough's Growth Agenda:** Ensure that the planned employment and housing growth within Hampton is promoted whilst providing for future demand.
3. **Protect and Improve Biodiversity Within the Study Area:** Mitigate any adverse impact of a scheme and ensure biodiversity net gain within the study area.
4. **Improve Active Travel Routes to Provide a Viable Alternative to Private Car Travel**: Ensure that the scheme provides a comprehensive network of pedestrian and cycling routes where needed.
5. **Improve Road Safety:** Reduce accidents and improve personal security for all travellers around the junction.

2.8.5 Secondary objectives include:

6. **Positively Impact Traffic Conditions on the Wider Network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as the A1260 Nene Parkway and Malborne Way.

2.8.6 The Junction 3 Improvement Scheme will need to satisfy all the primary objectives, and the secondary objective if possible.

SMART Objectives

2.8.7 It is valuable to further establish Specific, Measurable, Achievable, Relevant and Time-constrained (SMART) objectives based on the Strategic Objectives, to act as measures of success and provide a clear basis for post-implementation evaluation. The following SMART objectives have been defined for the Junction 3 Improvement Scheme:

2.8.8 The Primary SMART objectives are:

1. **Tackle Congestion and Improve Journey Times:** To ensure that non-transient delay at Junction 3 remains beneath following 30 seconds on both A1260 approaches within the monitoring period (to 2029).
2. **Support Peterborough's Growth Agenda:** to provide sufficient highway capacity at Junction 3 (determined by a Degree of Saturation (DoS) of less than 90%) to support the creation of 7,400 dwellings across the Hamptons within the current Local Plan period (to 2036).
3. **Protect and Improve Biodiversity Within the Study Area:** to provide a 20% Biodiversity improvement within one year of scheme completion.
4. **Improve Active Travel Routes to Provide a Viable Alternative to Private Car Travel**: to achieve a 20% increase in walking and cycling trips along the sections of Malborne Way Footpath, Shrewsbury Avenue Cycleway and Phorpres Way being improved.
5. **Improve Road Safety:** to achieve a 50% per year reduction in personal injury accidents at the A1260 Nene Parkway and A1260 The Serpentine approaches following completion of the scheme.

2.8.9 Secondary objectives include:

6. **Positively Impact Traffic Conditions on the Wider Network:** To ensure that peak hour through trips along Malborne Way remain beneath 500 vehicles per hour in either direction within the monitoring period (to 2029).

2.9 Measures of Success

2.9.1 Table 2.7 overleaf sets out the measures for success which the scheme should be monitored against. The primary objectives are shown in white, and the secondary objectives are highlighted in green. These measures have been incorporated into the Benefits Realisation Plan which is discussed within the Management Dimension (Chapter 6).

Table 2.7: Study Objectives and Measures of Success

Objective	Scheme Outcome	Measure of Assessment
Tackle congestion and improve journey times	• To reduce congestion and journey time delays on the primary approaches to Junction 3	• Traffic surveys to be conducted within the study area • Comparison of existing and future journey times for key approaches of Junction 3
Support Peterborough's growth agenda	• To increase capacity at Junction 3, to ensure successful delivery of committed and statutory development in Hampton catering for existing and future traffic demand	• Preferred scheme to be assessed against future traffic growth.
Protect and improve the biodiversity value within the study area	• Increase biodiversity through planting and landscaping as part of the scheme delivery.	• Post-scheme review of biodiversity gain compared to pre-scheme situation.
Improve Active Travel routes to provide a viable alternative to private car travel	• To improve the quality and cohesion of active travel routes around Junction 3.	• Audit of existing and post scheme active travel provision.
Improve road safety	• To reduce delay and journey times on Malborne Way, positively impacting the interaction between A1260 Nene Parkway and Malborne Way.	• Comparison of existing and future accident rates on the approaches to Junction 3.
Positively impact traffic conditions on the wider network	• To reduce traffic flows along Malborne Way.	• Traffic surveys to be conducted along Malborne Way.

2.10 Constraints

2.10.1 Scheme constraints are set out in Table 2.8 beneath, including proposed mitigations.

Table 2.8: Constraints and Measures of Mitigation

Constraint	Detail of Constraint	Response / Mitigation Measure
Funding	The cost of the scheme will need to compete with other transport infrastructure funding priorities, and improvements will need to be achievable within budgets available. Funding is from the CPCAs TCF allocation and must be spent by March 31st, 2024.	Dialogue with the CPCA to ensure the scheme is identified within its financial programme, and that the scheme is included within all necessary funding decisions. Construction programme to ensure that the scheme is completed by March 31st, 2024.
Environmental / Ecology	Land to the south-west of the junction is classified as a Special Area of Conservation and Site of Special Scientific Interest (SSSI), supporting a population of Great Crested Newts (GCN's), network of meso-eutrophic standing water and nationally rare and scarce stonewort plant species. Junction 3 is located within a Red Impact Risk Zone for GCN's due to the suitable foraging and commuting terrestrial habits present within the proposed working area / areas of connectivity and between the nearby waterbodies	Will be managed through ecological / arboriculture surveys to inform design and identify measures necessary to protect vulnerable species and plants during construction. Given the nature of the proposed works (i.e., limited to the existing carriageway and roadside verges) a Precautionary Method of Working (PMoW) for GCN's will be implemented, with any habitat manipulation carried out under the supervision of a suitably qualified ecologist. Works will be programmed during GCN active season (Mar – Sept). Required licences and proposed mitigation methods will be discussed and agreed with Natural England (key stakeholder) prior to construction.
	Located directly beneath the western side of Junction 3 is the Romano-British Settlement SE of Orton Longueville Scheduled Monument.	Scheduled Monument Consent from the Secretary of State is required in writing before the construction of Junction 3. Milestone Infrastructure will apply for Scheduled Monument Consent with a Written Scheme of Investigation from an archaeological contractor. All groundwork operations will be carried out under archaeological supervision (watching brief).
	Shelterbelts along the A1139 Fletton Parkway and to the north along A1260 Nene Parkway are formed by semi-mature species such as Ash, Sycamore, Field Maple, Cherry, Hawthorn, Hazel and Dogwood trees. To the south of Junction 3 the landscape is relatively young which will mature over time to provide additional screening. Vegetation removal for the works is a constraint.	Offset any loss of trees associated with the construction of the scheme by replanting across the study area and the inclusion of proposed landscaping elements.
	Construction and operation of Junction 3 has the potential to change noise and vibration levels in the local area.	Further assessment will be required to determine whether nearby sensitive receptors and property will experience an increase in noise and vibration levels. Increases in noise and vibration levels will require further assessment and mitigation.
Topographical	The site features large existing embankments on all arms of Junction 3 (level differences of 10-15m), where widening is proposed. The proposals will require the existing embankments to be relocated and potentially supported by a retaining structure in some instances.	Topographical surveys / trail holes have been undertaken early within the design to identify any issues which could impact scheme designs. Additionally, Borehole surveys has also been undertaken to enable geotechnical design of relocated embankments.
	Records of historic soil contamination at Junction 2 along the A1139 Fletton Parkway, located 1.2km to the west of the study area.	Further assessment is required to determine whether contamination is present at Junction 3. Sampling and chemical analysis will be undertaken to identify contaminants and will allow for the correct classification of waste.
Highway Boundary / Scheme Design	Scheme proposals are to keep the design footprint within the existing highway boundary. Construction of proposed embankments may require the temporary use of land outside the highway boundary.	Early identification of land ownership within the highway boundary and wider identification of Peterborough City Council land such as CRA Land.

	Existing drainage system records for the site are limited, with surveys unable to provide information on condition, levels or sizes of pipes, outfalls and chambers in some instances.	Due to the limited information for the existing drainage, the proposed design is to connect into known pipes, with levels to be determined on site during construction. Where proposed pipes replace existing pipes within the proposed widening area, the new pipes will be upsized in order to allow for the increased catchment area due to the proposed widening. Ealy Contractor Involvement (ECI) meetings have been held, discussing further drainage surveys nearer construction as well as requirements on site once construction has commenced.
Structural Design	The LBC Conveyor Bridge on the A1260 Nene Parkway has a current service of 47 years. The structure is currently not showing signs of distress, however the change in load resulting from the scheme (additional lane over the bridge) called for assessments to be undertaken during Detailed Design. The structure proposes low risk for the scheme.	Reviews of previous assessments as well as site visits and uncertified line beam analysis undertaken during Detailed Design, have concluded the structure to be adequate to carry full highway loading and therefore the risk of structural inadequacy as a result of the additional lane over the structure is considered to be very low risk. As a result of assessments, it is agreed a full-certified assessment of the structure will be undertaken prior to construction onsite.
Disapproval from the public or stakeholders	The scheme has been capable of gaining support during stakeholder and public consultations. One comment from a member of the public was received during the consultation period. Further feedback from residents as construction progresses is considered a slight constraint.	Early stakeholder engagement taken place with comments and feedback worked into scheme designs where appropriate. The comment received during the public consultation has been addressed by the PCC Project Manager and comments have been incorporated into the Monitoring and Evaluation measures for the scheme. Further information on the final scheme design and construction timescales will be sent to residents near Junction 3 prior to construction. Feedback from the selected properties will be handled via the Project Liaison Officer (PLO) and the PCC Project Manager. Where feedback is provided, both the PLO and PCC Project Manager will work closely to mitigate any issues. Regular communication will be undertaken with the residents throughout the construction of Junction 3 to ensure that residents are kept informed of the construction programme and temporary impacts.
Statutory Undertakers Plant	Presence of Statutory Undertakers Plant within the scheme extents. GPR survey undertaken, however full 3D and level information was not provided for all utilities.	NRSWA C4 process to be undertaken with utility companies, prior to construction commencing onsite. Due to GPR survey results full clash detection was not able to be undertaken, therefore there is a risk of additional works and costs related to existing utilities.
Traffic Management	Complex traffic management requirements are expected for the construction of the scheme.	Early involvement of PCC required to plan TM arrangements and programme.

2.10.2 The following powers and approvals will be required to deliver the scheme.

Table 2.9: Table of Required Powers and Approvals

Type	Consent / Approval	Issuer	Description	Current Status
Highways	TTRO	Peterborough City Council	Temporary Traffic Regulation Order allowing temporary restrictions to the road, enabling traffic management required for construction.	Will be sought prior to construciton. Temporary roadspace booking to be confirmed once construction programme finalised.
Environment	Site of Special Scientific Interest (SSSI) Assent	Natural England	Assent needed from Natural England due to the proximity of the works to the Orton Pit SSSI/SAC site. This has to be in place prior to the start of construction.	HRA Likely Significant Effects (LSE) Assessment has been completed to support the application. Notice to be submitted to Natural England when construction programme has been confirmed. The determination period is up to 28 days.
	Scheduled Monument Consent	Historic England	Consent is required due to the 'Romano-British Settlement SE of Orton Longueville' Scheduled Monument underlying Junction 3, even if impacts are unlikely. This has to be in place prior to the start of construction.	Quote obtained from Headland Archaeology to support application process. Application to be generated once design finalised, including drainage. The determination period is typically 8 weeks.
	Written Scheme of Investigation (WSI)	Peterborough City Council	The PCC Archaeologist has specified that a WSI detailing the proposed pre-construction archaeological mitigation works must be issued for approval. This must be approved prior to the start of construction unless otherwise agreed in writing.	Engagement with the PCC Archaeologist is on-going considering the low likelihood of any archaeological remains being impacted by the proposed works, meaning a WSI is unlikely to be required.
	Arboricultural Method Statement	Peterborough City Council	The existing arboricultural assessment and method statement needs to be reviewed and updated based on the finalised scope of vegetation clearance. This should be shared with the relevant PCC Planning teams as part of the consultation process and approved prior to the start of construction, especially considering the sensitivity of this subject.	This will be commissioned as soon as the scope of vegetation clearance is finalised.
	Biodiversity Net Gain (BNG)	Peterborough City Council	BNG assessments and associated offsetting proposals need to be agreed and finalised with PCC prior to the start of construction to ensure compliance with PCC's strategic 20% BNG target.	Initial BNG assessments have been undertaken, but these need to be reviewed and updated in line with the finalised design and scope of vegetation clearance. A workshop will then be arranged to review the outputs from these assessments and explore offsetting options.
	Land Drainage Consent(s)	Peterborough City Council / Internal Drainage Board	Land Drainage Consent will be required from the Lead Local Flood Authority for any temporary or permanent works which will impact the channels, or flows, of ordinary watercourses. Consents will need to be in place prior to the start of such activities.	Application documents will be formulated once the drainage design has been finalised. The determination period is typically 8-12 weeks.
	Waste Exemptions	Environment Agency	Waste exemptions must be obtained to cover the re-use, storage and treatment of any waste on site as appropriate, even if temporary. These must be in place prior to the start of construction.	Waste exemptions will be registered prior to construction. This is an online process, is free of charge, and takes approximately 1 hour.
	Section 61 Consent	Peterborough City Council	A Section 61 consent will be required due to the scope and extended programme of works. This prevents the local authority from issuing a Section 60 notice in response to incidents of noise and vibration impacts on local receptors, providing agreed mitigation measures are being implemented, and is in the best interest of the project from a stakeholder management perspective. This will need to be in place prior to the start of construction.	This will need to be commissioned once sufficient construction methodology information is available and a programme of works has been confirmed. It is anticipated that it will take approximately 3 months to produce the application and get it approved.
	Materials Management Plan (MMP)	Environment Agency / PCC Contaminated Land Team	Additional representative chemical testing is required within the footprint of the proposed excavation works. This needs to cover the Milestone Standard Excavated Waste Suite, in addition to fluorides and sulphates considering historic contamination. This is needed regardless of whether excavated is re-used on site, or removed off site for disposal. Due to the large excavation quantities, it is likely that a CL:AIRE compliant MMP will be need to be developed and implemented to cover re-use of such material on site.	Chemical soil testing will be commissioned at the earliest opportunity, once the design is finalised. If deemed necessary following further assessment, it is anticipated that the MMP will take up to 3 months to develop and get externally verified.
	Flood Risk Assessment	Environment Agency / Peterborough City Council / Internal Drainage Board	Due to the increases in hardstanding areas and associated additional runoff, it is anticipated that the Flood Risk Assessment will need to be commissioned and approved by the Environment Agency and Lead Local Flood Authority at the earliest opportunity.	This will be commissioned as soon as the drainage design is finalised.
Design	Drainage Consents	Anglian Water/EA/City Council	Potential Drainage Consents	To be reviewed after further drainage investigations
Governance	Cabinet Report	Peterborough City Council	A paper will need to be prepared and shared with internal departments for their approval. Once approved an order will be raised for the next stage.	The paper is dependent on obtaining initial funding approval from the CPCA. A request is to be made at November's CPCA Board meeting.

2.11 Scope

2.11.1 The project scope is to construct a scheme at Junction 3, which achieves the primary objectives listed beneath within the constraints set out above in Table 2.8:

1. **Tackle Congestion and Improve Journey Times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3.
2. **Support Peterborough's Growth Agenda:** Ensure that the planned employment and housing growth within Hampton is promoted whilst providing for future demand.
3. **Protect and Improve Biodiversity Within the Study Area:** Mitigate any adverse impact of a scheme and ensure biodiversity net gain within the study area.
4. **Improve Active Travel Routes to Provide a Viable Alternative to Private Car Travel**: Ensure that the scheme provides a comprehensive network of pedestrian and cycling routes where needed.
5. **Improve Road Safety:** Reduce accidents and improve personal security for all travellers around the junction.

2.12 Interdependencies

2.12.1 The scheme is generally contained within PCC owned land; however, some temporary land may be required during construction for access and the location of a site compound. Discussions with landowners are currently underway and there are not anticipated to be any issues acquiring this temporary access.

2.12.2 Beyond temporary access to private land, the Junction 3 Improvement Scheme is partially dependent on the completion of the Junction 15 Improvement Scheme which is currently under construction and located two miles to the north. Traffic management cannot be deployed at Junction 3 until the traffic management is removed at Junction 15 as the proximity of the two junctions would result in unacceptable levels of disruption on the road network. The Junction 15 Improvement Scheme is expected to be completed in Spring 2023, and the construction of the Junction 3 Improvement Scheme will begin immediately after this. It should be noted that any delay to the Junction 15 construction completion date, could delay the commencement of construction at Junction 3. This risk will be monitored by the Project Team, in the lead up to construction.

2.13 Key Risks

2.13.1 The Risk Registers provided in Appendix A identify the project and construction risks assocaired with the Junction 3 Improvement Scheme and provide appropriate mitigation measures for these.

2.13.2 The main risks associated with the Junction 3 Improvement Schemes are:

- Funding Limitations
- Environmental Constraints
- COVID-19 (legacy).

Funding Limitations

2.13.3 The Junction 3 Improvement Scheme will be funded through the CPCA's Transforming Cities Fund (TCF) allocation. This funding is time limited, and construction (spend incurred) must begin before 31st March 2023 and be completed by 31st March 2024.

2.13.4 The construction programme reflects these timescales, with construction of the Malborne Way and Shrewsbury Avenue active travel schemes scheduled between November 2022 and March 2023 (funding for these schemes was approved in October 2022) and the Phorpres Way and Junction 3 highway works scheduled for to being in April 2023 and complete by March 2024.

2.13.5 The construction programme for Junction 3 is approximately 49 weeks long and so there is a risk that any delays in the construction phase may impact on the completion date, and access to TCF funding. This risk will be monitored closely throughout the project, and programme efficiencies identified if necessary. The construction programme is considered to be robust and currently includes contingencies.

Environmental Constraints

2.13.6 The key environmental constraints associated with the Junction 3 Improvement Scheme can be summarised as follows:

- The requirement to obtain Natural England SSSI Assent prior to construction due to the proximity of the works to the Orton Pit SSSI/SAC, which is both ecologically and hydrologically sensitive and holds the UK's (and possibly Europe's) largest population of Great Crested Newts (GCN). Supporting documentation has been produced and the application is being submitted. The determination period is 28 days.
- The requirement to obtain Historic England Scheduled Monument consent prior to the start of construction due to the Romano-British Settlement Site beneath the junction. This will be commissioned as soon as the design is finalised. The determination period is 8 weeks.

- Ensuring suitable replacement planting and associated management plan is agreed and implemented prior to construction to account for the significant woodland belts which will be lost through construction of the improved junction. Initial BNG assessments have been undertaken, but these need to be reviewed and updated in line with the finalised design and scope of vegetation clearance. A workshop will then be arranged to review the outputs and explore offsetting options.
- Undertaking additional representative chemical testing within the footprint of the proposed excavation works. This needs to account for fluorides and sulphates considering historic contamination and is required regardless of whether excavated is re-used on site or removed off site for disposal. Due to the large excavation quantities, it is likely that a CL:AIRE compliant MMP will need to be developed and implemented to cover re-use of such material on site. This typically takes up to 3 months to develop and get externally verified.
- Initial vegetation and ground clearance works will have to be undertaken under a Precautionary Method of Working (PMW), adopting a two phased approach to minimise the risk of potential harm to GCN, nesting birds, and reptiles.

COVID-19 (Legacy)

2.13.7 There is a risk that the legacy of COVID-19 on travel patterns could undermine the need for the scheme should traffic levels remain significanly below those observed when the scheme was identified and developed prior to the pandemic.

2.13.8 Constant monitoring of traffic levels has been in place across Peterborough throughout the COVID-19 pandemic and has been used to assess the impact of the pandemic on traffic levels on Peterborough's highway network.

2.13.9 Figure 2.13 overleaf shows traffic data from a permanent monitoring site located on the A1260 Nene Parkway approach / exit from Junction 3. The data is from March 2020 through to November 2022, and shows that traffic levels have remained consistent and stable for much of 2022, and there is now little fluctutation due to the pandemic.

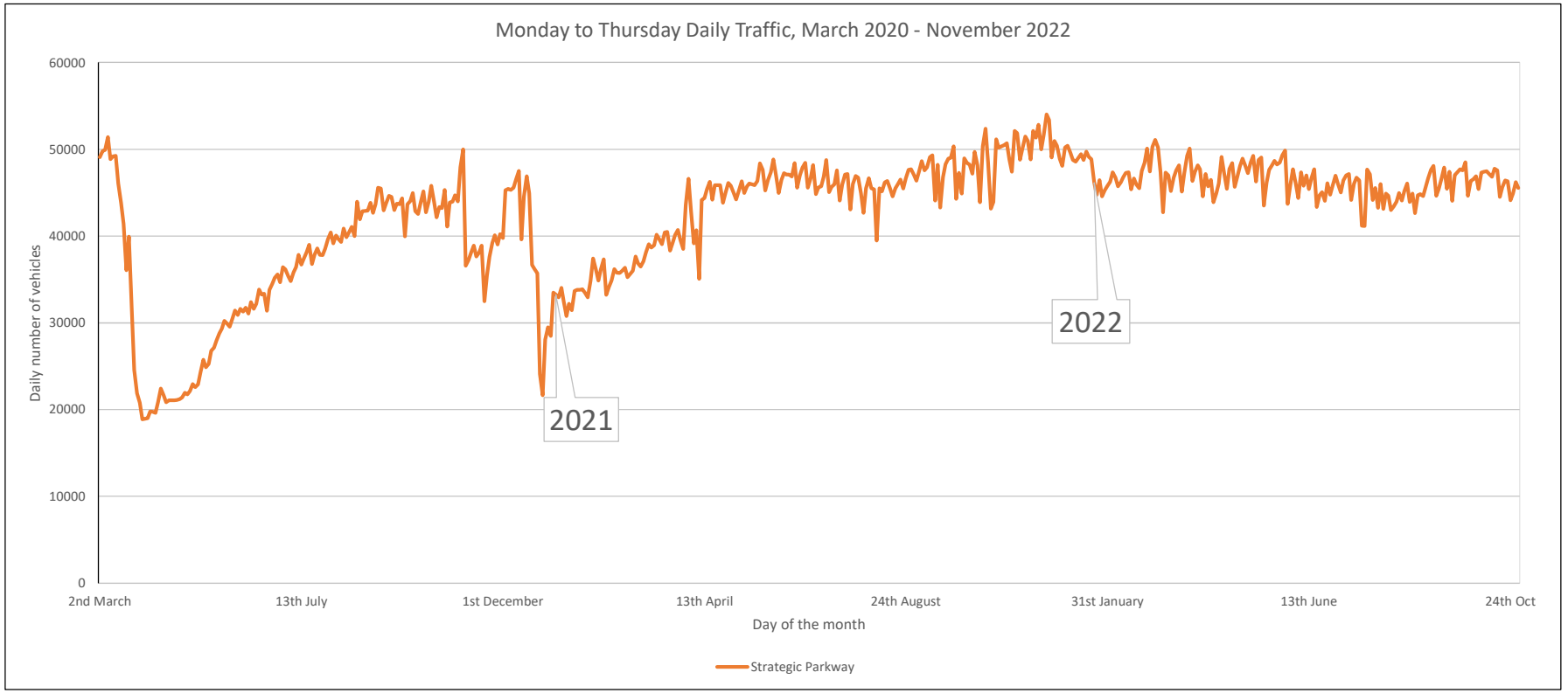


Figure 2.16: COVID-19 Traffic Monitoring - A1260 Nene Parkway

2.13.10 Figure 2.13 shows a clear reduction in demand on the A1260 Nene Parkway at Junction 3 during the early phases of the pandemic, and that this was consistently below the pre-COVID-19 levels of approximately 52,000 vehicles a day (24-hour flow). Traffic levels began to rise as government restrictions levelled off during 2022 and are now consistent with minimal fluctuation.

2.13.11 Traffic flows since March 2022 (when restrictions were lifted) are generally within 95% of pre-pandemic levels. This increase in traffic has resulted in the return of congestion and significant queuing at Junction 3. Figure 2.14 shows peak hour queuing captured during site visits on the 17th of March 2022.

2.13.12 The image on the left shows queues during the AM peak hour extending back along the A1260 The Serpentine approach to the Tesco / Serpentine shopping centre roundabout located approximately 460m to the south.

2.13.13 The image on the right highlights the PM peak hour southbound queue on the A1260 Nene Parkway approach to Junction 3.

Figure 2.17: Junction 3 Peak Hour Congestion (March 17th, 2022)

2.13.14 There is a clear indication from Figure 2.13 and 2.14 that traffic demand at Junction 3 has recovered to pre-pandemic levels, with congestion observed in 2022 consistent with conditions originally observed in 2018 as detailed earlier in this chapter.

2.13.15 Appendix A contains the Project Key Risk Register which identifies each of these risks and considers mitigation measures. The Risk Register is a live document which is managed by Peterborough City Council and is reviewed regularly by the CPCA in monthly Project Board meetings.

2.14 Stakeholders

2.14.1 The key stakeholders for the Junction 3 Scheme are:

- CPCA as the Local Transport Authority and funding body for the scheme
- PCC 'The Council' as the Local Highway Authority
- Peterborough City Cabinet Member for Transport, Ward Councillors, and parish clerks
- Natural England in regard to Ecological assessments and licences required for the scheme
- Historic England in regard to Archelogy / Cultural Heritage assessments within the studies footprint
- PCC representatives for the natural and historic environment, Wildlife, Archelogy and Heritage, Water and Drainage and Environmental Health
- Aragon Direct Services as the Local Authority Trading Company responsible for the future maintenance of the cities tree stock and green spaces across Peterborough
- Local Businesses situated in Hampton, affected by changes to the transport network
- Homeowners of properties located within close proximity to Junction 3, including Hedda Drive and Buckthorn Road (Hampton Hargate)
- Emergency services / Cambridgeshire Fire and Rescue Service
- Local Cycle Forum.

2.14.2 Engagement and communication with key stakeholders is an essential element in the planning process for major transport schemes. Stakeholder's needs and requirements have been considered for the final scheme design for Junction 3, following the completion of stakeholder consultation.

Stakeholder Consultation

2.14.3 Stakeholder consultations were undertaken by the Project Team following the approval of the OBC. All key stakeholders were consulted via email or letter for comments on the Preferred scheme design.

2.14.4 Responses to the consultation primarily focused on the environment, including drainage in relation to the close proximity to the Orton Pit SSSI and SAC, biodiversity as Junction 3 is located in a Red Zone for the protected species of Great Crested Newts, as well as the need for wider improvements to active travel.

2.14.5 The environment and biodiversity were discussed with Natural England. As the statutory regulator for the adjacent SSSI and SAC, Natural England were provided with a series of scheme drawings (in March 2022), including vegetation clearance, groundworks, and drainage designs.

2.14.6 Initial concerns set forward by Natural England focused on drainage and the potential of pollution to the sites water courses and soil. As a result of the construction and operation of the Junction 3 works. If pollution were to occur, it would negatively impact the sensitive water chemistry present within the confines of the Orton Pit SSSI and SAC. The recommendation from Natural England was that a Habitat Regulation Assessment (HRA) screening is to be undertaken to further assess if the design is likely to have significant effect on the SSSI and SAC. This has been done, and results from the HRA have been provided to Natural England and the application for consent is being reviewed.

2.14.7 Additional comments from Natural England were received in relation to Great Crested Newts, as extensive populations are known within the immediate vicinity of Junction 3. The species are afforded protected status under the Wildlife and Countryside Act 1981 (schedule 5 and 8) and the Conservation of Habitats and Species Regulations 2017 (as amended), and it was advised that the appropriate licences are required prior to construction along with a Precautionary Method of Working (PMoW) for GCN'S. The PMoW states that works will be programmed during GCN active season (March – September) and that any habitat manipulation will be carried out under the supervision of a suitably qualified Ecologist, who either holds a low-class impact licence or a surveying and handling licence for the species.

2.14.8 Stakeholder consultation with active travel groups also emphasised the opportunities to improve active travel connections around Junction 3, and this resulted in the addition of the Malborne Way and Shrewsbury Avenue active travel schemes.

Public Consultation

2.14.9 Public consultation on the concept of a scheme at Junction 3 was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan[25] that was adopted in January 2020. This consultation made residents of the City aware that Junction 3 had been identified as a location for improvements. It should be noted that no details on the form of the scheme were provided at the time of the consultation and that no objections relating to the principle of improvements to Junction 3 were received.

2.14.10 Public perceptions of the Preferred Scheme were then assessed following the approval of the OBC (July 2020) and prior to the commencement of Detailed Design. The online consultation featured on the PCC website and social media for a six-week period (between the 21st October – 4th December 2020), and presented the scheme identified at OBC and Preliminary Design.

2.14.11 In addition to the online consultation exercise, 62 individual properties located within close proximity to Junction 3 (including Hedda Drive and Buckthorn Road in Hampton Hargate) were contacted via letter during the consultation period. The letter provided residents with details of the online consultation and invited them to comment.

2.14.12 One comment was received during the consultation period in relation to the 3rd lane on the A1260 The Serpentine northbound approach, north of Hargate Way', voicing concerns about difficulties faced when exiting Hargate Way, and how proposed changes along the A1260 The Serpentine may impact drivers from the residential area further.

2.14.13 Design changes were made during Detailed Design and the extension of the existing flare on the A1260 is now unlikely to impact the operation of the A1260 The Serpentine / Hargate Way junction as vehicles exiting will experience no change to conditions.

2.14.14 Monitoring of the junction will be undertaken at regular intervals and is included with the scheme monitoring and evaluation plan. If the monitoring identifies an issue at the junction, then further consideration will be given to potential improvements.

2.14.15 More information regarding the design changes from Preliminary to Detailed Design are discussed in Section 2.17.

2.14.16 It should be noted that the public consultation outlined above did not include the final design for the Phorpres Way active travel improvements, nor did it include the Malborne Way and Shrewsbury Avenue improvements. This was due to design for Phorpres Way being developed during later phases of the design work, and additional active travel improvements being identified as the project has progressed to FBC phase. This is in line with the greater emphasis placed on active travel improvements by both the Council and the CPCA.

[25] https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf.

2.14.17 Regular communication will be undertaken with residents throughout the construction phase to ensure that residents remain informed of the construction programme and any temporary impacts. Where feedback is provided, both the PLO and PCC Project Manager will work closely with individuals to mitigate any issues raised.

2.15 Scheme Development

2.15.1 This section discusses the process followed for developing options and shortlisting those against the scheme objectives using the DfT's Early Assessment and Sifting Tool (EAST) assessment. This section also explains the technical work undertaken to assess the shortlisted options and identify a preferred option. Further information on this is included in the Junction 3 Option Assessment Report (OAR), which was submitted to the CPCA along with the Strategic Outline Business Case in October 2019.

2.15.2 An option development workshop was held on the 4th December 2018 and attended by representatives from PHS. The workshop reviewed the existing conditions and issues at Junction 3, explored its relationship with the surrounding road network and discussed the various constraints at the site. The purpose of the workshop was to develop potential improvement options to be assessed.

2.15.3 A total of ten options were devised, with potential schemes ranging widely in estimated cost and level of impact on the network. These ten options form the 'Long List', and' and are summarised in Table 2.10.

Table 2.10: Junction 3 Long List of Options

A1260 Nene Parkway
Provide 3 lanes from Junction 31 to Junction 3 southbound
Provision of a bridge to A1139 Fletton Parkway westbound
Dedicated left from A1260 Nene Parkway to A1139 Fletton Parkway eastbound
A1139 Fletton Parkway East
Widening of westbound off-slip to 3 lanes
Improvements to eastbound on-slip merge
A1260 The Serpentine
Lengthen flare to Hargate Way
Dedicated left turn lane to A1139 Fletton Parkway westbound
Circulatory Carriageway
Improve lane markings on the roundabout circulatory and reduce circulatory speeds
Full Signalisation
Malborne Way
Increase southbound carriageway to 2 lanes

EAST Assessment

2.15.4 The EAST assessment was used to assess the Long List of options against the scheme objectives identified in the Strategic Dimension, and to refine this to a Short List of options that were taken forward for technical assessment as described in the OAR.

2.15.5 The options were scored against the following CPCA and PCC objectives using the EAST framework. Scores were based on the discussion and collective opinion of the workshop delegates. The objectives against which the options were scored are shown in Table 2.11 overleaf.

Table 2.11: Scheme Objectives

Strategic Objectives
Ability to reduce congestion / Improve journey times
Making best use of existing infrastructure
Ability to provide safety improvements
Ability to support the local growth agenda, including housing and employment growth
Economic Objectives
Affordability (Value for Money)
Scale of impact on local environment
Management / Deliverability Objectives
Land Acquisition
Project / scheme risk
Stakeholder support and public acceptability

Shortlisting Summary

2.15.6 Table 2.12 summarises the EAST assessment and which options have been shortlisted for progression to the OAR.

2.15.7 It should be noted that the option 'to improve lane markings on the roundabout circulatory and reduce circulatory speeds' will not be assessed as a standalone option, however it will be included within the final scheme design.

Table 2.12: Options Shortlisting Summary

Option	Option Description	Strategic Dimension			Economic Dimension			Management / Deliverability			Total Score	Shortlisted
		Reduce Congestion / Improve Journey Time	Making best use of existing infrastruture	Safety	Ecological Impact	Noise / Air Pollution Impact	Value for Money / Affordability	Land Acquisition & CPO	Scheme Risk / Buildability	Stakeholder Support		
1	Provide 3 lanes from Junction 31 to Junction 3 on A1260 Nene Parkway Southbound	2	1	1	0	0	1	0	1	1	**7**	✔
2	Provision of a bridge from A1260 Nene Parkway to A1139 Fletton Parkway westbound	3	1	0	-1	-1	1	0	1	0	**4**	✔
3	Dedicated left from A1260 Nene Parkway to A1139 Fletton Parkway eastbound	2	1	1	-1	0	1	0	-1	1	**4**	✔
4	Widening of A1139 Frank Perkins Parkway westbound off-slip to 3 lanes	1	1	0	0	0	1	0	0	1	**4**	✔
5	Improvements to A1139 Frank Perkins Parkway eastbound on-slip merge	2	2	2	-1	0	3	0	0	1	**9**	✔
6	Lengthen flare on northbound approach of A1260 The Serpentine	1	1	0	0	-1	0	0	1	0	**2**	✔
7	Dedicated left turn lane from A1260 The Serpentine to A1139 Fletton Parkway westbound	1	1	1	-2	0	1	0	-1	0	**1**	✔
8	Improve lane markings on the roundabout circulatory and reduce circulatory speeds	0	1	1	0	0	0	0	0	1	**3**	✔
9	Full Signalisation	2	2	2	0	1	2	0	1	-1	**9**	✔
10	Increase southbound carriageway of Malborne Way to 2 lanes	2	1	0	-1	-1	3	0	-1	-3	**0**	✔

Technical Assessments

2.15.8 The shortlisted options were assessed using a purpose built AIMSUN microsimulation model. The traffic model was constructed to represent the morning (AM) Peak hour from 08:00 to 09:00, and an evening (PM) peak hour from 17:00 to 18:00, in order to represent the most congested time periods. These peak periods were defined from the traffic surveys undertaken at the site in 2018.

2.15.9 A 2018 base model was built using current traffic data at the junction. The model was then validated and calibrated to ensure it represented the traffic conditions experienced by drivers on this part of the network.

2.15.10 To understand traffic conditions in future years, growth factors were derived from the DfT's Trip End Model Presentation Program (TEMPro). Future year models were built using these growth factors for 2021, 2026 and 2031 scenarios.

2.15.11 The results from the Do Minimum (without scheme) modelling showed that the worst delays and longest travel time in both the AM and PM peak hours for the 2026 and 2031 forecast years were on the A1260 Nene Parkway southbound approach. The A1260 The Serpentine northbound approach also experienced significant delays and long travel times in both forecast years.

2.15.12 The modelling then assessed each of the shortlisted options to determine which were the best performing and most appropriate to select as the Preferred Option. Full details of the modelling can be found in the OAR and the LMVR.

Preferred Option

2.15.13 The modelling results confirmed that many of the shortlisted options would have a positive impact on the operation of Junction 3 in the forecast years of 2026 and 2031. However, no single option provided a suitable solution to address all of the issues identified at Junction 3, and so several of the options were packaged together to form the Preferred Scheme.

2.15.14 The Preferred Scheme, as it stood at OBC, included the following improvements:

- Create a third southbound lane on Nene Parkway from Junction 31 to Junction 3.
- Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a third lane.
- Signalisation of the A1260 Nene Parkway approach to Junction 3, with a 4-lane approach.
- Signalisation of the A1260 The Serpentine approach to Junction 3, with a 4-lane approach.
- Create a third lane on the A1260 The Serpentine northbound approach, extending approximately 200 metres back from Junction 3.

2.16 Scheme Development Since OBC

2.16.1 The Junction 3 Improvement Scheme has been further developed following stakeholder engagement during the Detailed Design phase. These changes are summarised in Table 2.13 beneath.

Table 2.13: Preferred Option Amendments Since Preliminary Design

Scheme Change (since Preliminary Design)	Requirement for Change
Removal of the A1260 Nene Parkway southbound lane gain, between Junction 31 and Junction 3.	Further investigation highlighted the potential difficultly with constructing the lane gain due to the significant level differences between the carriageway and the adjacent land. The true extent of the environmental impact associated with the loss of a well-established treeline was also a deciding factor. Operational and economic sensitivity testing has demonstrated that this does not adversely impact the performance of the scheme, and this is discussed further on the following page.
Addition of 220m of new footpath between Saltmarsh and the Phoenix School.	Stakeholder feedback received during the FBC / Detailed Design phase of the project identified a need for further active travel improvements as part of the Junction 3 project. An active travel audit of the routes around Junction 3 identified a clear desire line along the verge of Malborne Way that was uncatered for. This has now been included in the Junction 3 Improvement Scheme.
Upgrading the Phorpres Way footpath (southern side) to current LNT 1/20 design standards, accompanied by several crossing points at Phorpres Close, Club Way and Cygnet Road.	The upgrading / extension of the shared use facility along Phorpres Way follows the greater emphasis from both The Council and the CPCA for active travel improvements to be incorporated into Major Schemes, as well as for active travel provisions within the City to meet current LNT 1/20 standards. Improvements to active travel in this location will provide an extension of the existing shared use facility, making the provision more accessible and consistent with the wider network, and providing better active travel connection to a large employment area.
Upgrading the Cycleway for approximately 450m between Shrewsbury Avenue and the gated access of the Nature Reserve.	This was also added following a greater policy emphasis on active travel. This improvement will make it more attractive, comfortable, and safe for users. The enhancement of the pathway will promote active travel in the area surrounding Junction 3 and will help improve the standard of the north-south active travel route across the A1139 Fletton Parkway.

2.16.2 The Detailed Design has re-considered the proposed southbound lane gain on the A1260 Nene Parkway southbound approach to Junction 3. The following section explains this change and the impact it has on the operation and viability of the proposed scheme.

Operational Impact of the Removal of the A1260 Nene Parkway Lane Gain

2.16.3 The lane gain arrangement on the A1260 Nene Parkway between Junction 31 and Junction 3 included within the Preliminary Design, has been considered as a potential highway improvement by the Council for many years.

2.16.4 Site surveys and discussions with stakeholders highlighted of difficulty of constructing the lane gain due to significant level differences between the carriageway and the land running immediately east of the parkway. Further arboricultural surveys identified a high number of well-established trees, which would need to be removed if the lane gain were to be constructed. The area affected by the level difference is shown in Figure 2.18.

Figure 2.18: Area of Level Difference.

2.16.5 Coupled together, these issues would have a significant impact on the cost of the scheme with either a new embankment or retaining wall required, and the associated tree loss would significantly increase the environmental impact associated with the scheme.

2.16.6 In light of these discussions, a 'without lane gain' scenario was assessed using the Junction 3 AIMSUN Next model and traffic signal modelling software LinSig. An Economic Assessment for this scenario was also undertaken. Results from the traffic modelling, as highlighted in Table 2.14, shows that the Junction 3 Improvement Scheme can perform as well as, if not better, without the lane gain.

Table 2.14: Aimsun Modelling Lane Gian Sensitivity Test

Location	Approach	Exit	2031 Delay Time (secs)				2031 Travel Time (secs)			
			AM		PM		AM		PM	
			With Lane Gain	Without Lane Gain	With Lane Gain	Without Lane Gain	With Lane Gain	Without Lane Gain	With Lane Gain	Without Lane Gain
Junction 3	A1260 Nene Parkway	A1260 Nene Parkway	-	-	-	-	-	-	-	-
		A1139 Fletton Parkway (East)	131	83	230	222	156	107	256	245
		A1260 The Serpentine Green	213	149	119	104	256	190	162	144
		A1139 Fletton Parkway (West)	247	184	105	93	296	232	154	140
		Total	**590**	**417**	**455**	**419**	**709**	**528**	**573**	**530**
	A1139 Fletton Parkway (East)	A1260 Nene Parkway	434	420	287	289	491	477	344	345
		A1139 Fletton Parkway (East)	-	-	-	-	-	-	-	-
		A1260 The Serpentine Green	134	135	58	59	181	182	105	106
		A1139 Fletton Parkway (West)	-	-	-	-	-	-	-	-
		Total	**568**	**555**	**345**	**348**	**672**	**659**	**449**	**452**
	A1260 The Serpentine	A1260 Nene Parkway	171	165	68	64	211	205	109	104
		A1139 Fletton Parkway (East)	280	276	263	256	321	318	305	298
		A1260 The Serpentine Green	265	272	167	162	323	330	226	221
		A1139 Fletton Parkway (West)	85	84	50	50	121	120	86	86
		Total	**800**	**797**	**549**	**532**	**976**	**973**	**726**	**709**
	A1139 Fletton Parkway (West)	A1260 Nene Parkway	19	19	37	35	55	54	73	70
		A1139 Fletton Parkway (East)	-	-	-	-	-	-	-	-
		A1260 The Serpentine Green	105	105	127	117	159	159	181	171
		A1139 Fletton Parkway (West)	-	-	-	-	-	-	-	-
		Total	**124**	**124**	**164**	**152**	**214**	**214**	**254**	**242**
	Junction Total		**2,083**	**1,893**	**1,513**	**1,450**	**2,571**	**2,373**	**2,001**	**1,931**
Malborne Way	Eastbound		46	35	28	23	159	147	141	138
	Westbound		146	150	76	72	262	267	192	188
	Bidirectional Total		**192**	**184**	**104**	**95**	**421**	**414**	**334**	**326**

2.16.7 The removal of the lane gain is shown to provide benefit to all approaches of Junction 3 in relation to both delay and journey times across both the AM and PM peak hours. In 2031 the total junction delay is reduced by 190 seconds (3 minutes 10 seconds) in the AM peak hour and 63 seconds (1 minute 3 seconds) in the PM peak hour under the 'without lane gain' scenario.

2.16.8 The greatest saving in delay resulting from this change is experienced on the A1260 Nene Parkway approach, with a 173 seconds (2 minutes 53 seconds) reduction.

2.16.9 The impact of the lane gain removal on delay along Malborne Way is also shown to be minimal, with a decrease of 9 seconds shown in the AM peak hour and 5 seconds in the PM peak hour, for those travelling eastbound. For motorists travelling westbound an increase of 4 seconds delay is expected in the AM peak hour, and a decrease of 4 seconds delay in the PM peak hour. In the PM peak, the total travel time for vehicles is less in the 'without lane gain' scenario for both eastbound and westbound movements.

2.16.10 Results from the LinSig modelling shown in Table 2.15 concurs with the modelling from AIMSUN Next detailed above, highlighting a benefit in the 'without lane gain scenario'.

Table 2.15: LinSig Modelling Lane Gian Sensitivity Test

Measure	AM Peak		PM Peak	
	With Lane Gain	Without Lane Gain	With Lane Gain	Without Lane Gain
PRC %)	25.8	27.0	34.3	34.3
Delay	46.04	46.35	40.38	40.36

2.16.11 Table 2.15 shows the AM peak hour sees an increase in Practical Reserve Capacity (PRC) at the junction in the 'without lane gain' scenario, whilst the PRC in the PM peak hour remains the same across both scenarios.

2.16.12 It was concluded from the LinSig modelling that the removal of the lane gain arrangement on the A1260 Nene Parkway would have no significant effect on the spare capacity of Junction 3 and would not have a negative impact on the operation of the Junction.

2.16.13 The final step to understanding the impact of removing the lane gain from the scheme was to assess the impact on the Scheme Benefit to Cost Ratio (BCR) and value for Money category.

2.16.14 The BCR reported in the Junction 3 Outline Business Case was 3.251, which reflects 'High Value for Money'. The Economic Assessment for the 'without lane gain' scenario was updated using the Junction 3 AIMSUM Next model outputs, and the scheme cost reduced by £500,000 to reflect the reduction in construction costs associated with the lane gain element.

2.16.15 Table 2.16 below provides a comparison of the Monetised Costs and Benefits between the two scenarios.

Table 2.16: AMCB Comparison for Lane Gain and No Lane Gain Scenario

Value (£'000s) 2010 prices, benefits discounted to 2010	With Lane Gain	Without Lane Gain
Benefits		
Greenhouse Gases	-108	- 41
Consumer Users (commuting)	8,651	14,374
Consumer Users (Other)	4,250	6,960
Business Users/Providers	3,438	6,550
Indirect Taxes	222	-82
Present Value of Benefits (PVB)	**16,453**	**27, 843**
Costs		
Broad Transport Budget	5,061	4,730
Present Value of Costs (PVC)	**5,061**	**4,730**
Net Benefit / BCR Impact		
Net Present Value (NPV)	**11,392**	**23,113**
Benefit/Cost Ratio (BCR)	**3.251**	**5.886**

2.16.16 The BCR for the 'without lane gain' scenario is 5.886, higher than the original scheme at OBC, and offers 'Very High Value for Money'.

2.16.17 In light of all the information, there is a clear case for removing the lane gain arrangement from the Junction 3 Improvement Scheme and this is reflected within the Detailed Design.

2.16.18 Further information on the sensitivity testing can be found in Appendix B.

2.17 Carbon Assessment

2.17.1 CPCA and PCC have committed to combat climate change and PCC aim to achieve 'Net Zero' carbon emissions by 2030. Preliminary and detailed design carbon assessments have been undertaken for the main Junction 3 Improvement Scheme in accordance with the following commitment from the Council's Carbon Management Action Plan (Council CMAP) 2021: "Develop detailed carbon assessments for major highway projects and use the information to influence the final design." Preliminary Design carbon assessments have also been undertaken for the 3 Active Travel Schemes linked to this project: Phorpres Way, Malborne Way, and Shrewsbury Avenue.

2.17.2 The purpose of the preliminary design carbon assessments was to baseline the construction carbon cost of the schemes early in the design process and highlight 'hotspot' areas where carbon reduction efforts needed to be focused. The detailed design carbon assessment was undertaken to highlight carbon reductions achieved primarily through value engineering and using less carbon intensive materials. It has also provided an updated carbon footprint to demonstrate where construction phase carbon reduction initiatives need to be focused and provides the foundation for future workshops.

2.17.3 The preliminary design baseline carbon cost of the main Junction 3 Improvement Scheme was **1,490 tCO2e**. This was reduced to **1,276 tCO2e** after completion of detailed design (Figure 2.20). This represents a carbon reduction of **214 tCO2e (-14%)**, which is equivalent to 43 return flights from London to Sydney using direct flights. This was achieved primarily through value engineering. It is also worth noting that certain increases in carbon output for the detailed design phase assessments may be attributed to having more information available for carbon accounting. Although this can partly mask the impacts of certain carbon reduction initiatives, it does increase the accuracy of the assessment and ensures efforts are focused in the correct areas during future stages (Figure 2.19). Breakdowns of the preliminary design carbon assessments for the 3 Active Travel Schemes (Phorpres Way: 240 tCO2e, Shrewsbury Avenue: 47 tCO2e, and Malborne Way: 123 tCO2e) are also presented below.

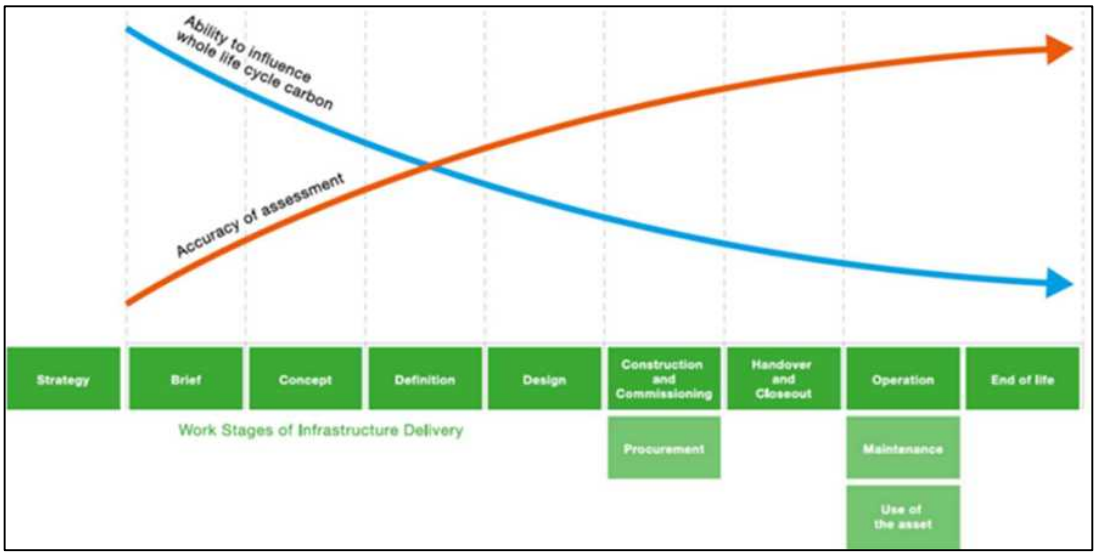


Figure 2.19: Relationship Between Work Stages, Assessment Accuracy and Ability to Influence Whole Life Cycle Carbon. Source: Green Construction Board

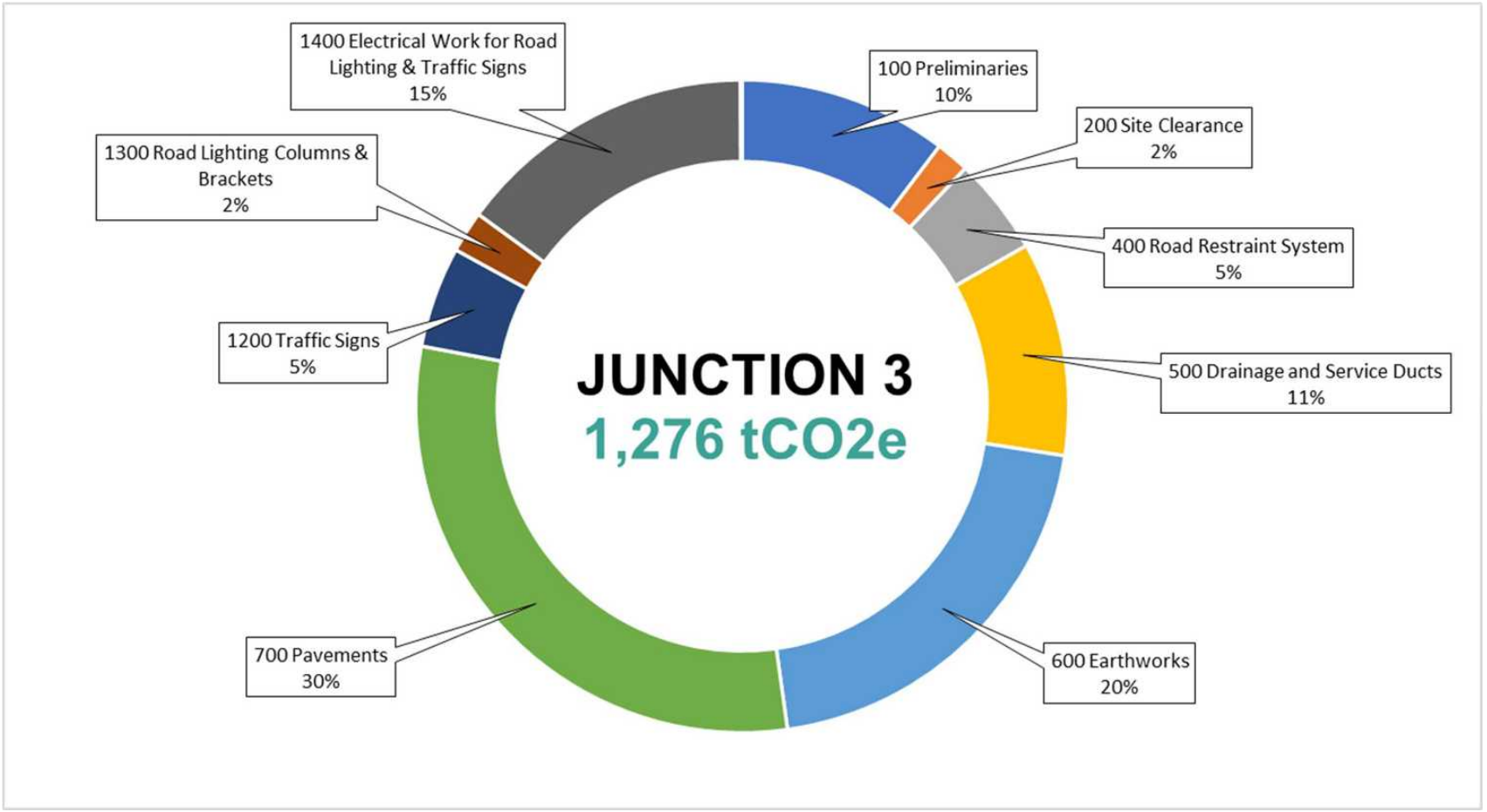


Figure 2.20: Junction 3 Improvement Scheme Detailed Design Carbon Footprint by Work Activity Series

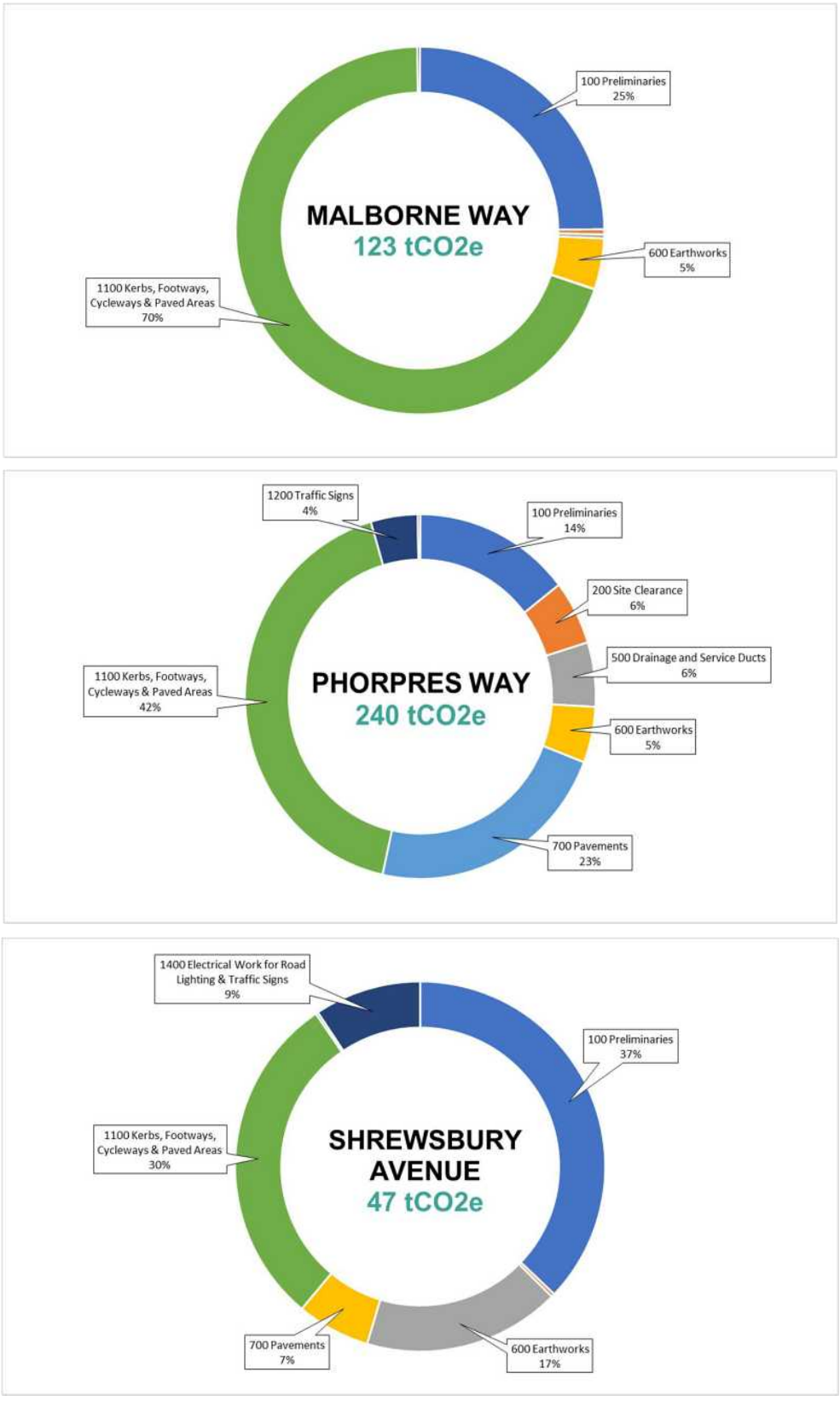


Figure 2.21: Preliminary Design Carbon Footprints of Junction 3 Active Travel Schemes

2.17.4 Carbon calculations were undertaken using the Milestone Infrastructure Carbon Tool supplemented by manual calculations to estimate carbon emissions using spend data. The assessment is based on the Bill of Quantities (BoQ) provided for both the preliminary and detailed design phases.

2.17.5 Figure 2.20 and **Error! Reference source not found.**Figure 2.21 demonstrate that the highest carbon contributors based on the latest designs are:

Junction 3:

- Series 700: Road Pavements – 385 tCO2e (30%)
- Series 600: Earthworks – 260 tCO2e (20%)
- Series 1400: Electrical Work for Road Lighting & Traffic Signs – 190 tCO2e (15%)

Phorpres Way:

- Series 1100: Kerbs, Footways, Cycleways & Paved Areas – 101 tCO2e (42%)
- Series 700: Road Pavements – 54 tCO2e (23%)
- Series 100: Site Preliminaries – 35 tCO2e (25%)

Shrewsbury Avenue:

- Series 100: Site Preliminaries – 17 tCO2e (37%)
- Series 1100: Kerbs, Footways, Cycleways & Paved Areas – 14 tCO2e (29%)
- Series 600: Earthworks – 8 tCO2e (17%)

Malborne Way:

- Series 1100: Kerbs, Footways, Cycleways & Paved Areas – 86 tCO2e (70%)
- Series 100: Site Preliminaries – 31 tCO2e (25%)
- Series 600: Earthworks – 6 tCO2e (5%)

2.17.6 Individual carbon assessments have been undertaken for Junction 3 and the associated active travel schemes to allow further scrutiny of variations in carbon outputs between preliminary and detailed design stages. These are presented in Table 2.17 below.

Table 2.17: Carbon Footprints at Preliminary and Detailed Design Stages

Scheme	Preliminary (tCO2e)	Detailed (tCO2e)	% change
Junction 3	1490	1276	-14%
Phorpres Way	240	-	-
Shrewsbury Avenue	47	-	-
Malborne Way	123	-	-
Total	**1900**	**-**	**-**

2.17.7 The significant carbon reduction achieved between preliminary and detailed design phases for the Junction 3 Improvement Scheme is attributed primarily to value engineering, which links to Figure 6 below. These initiatives include:

- Specifying warm mix asphalt – **30.9 tCO2e** (**2.5%** of detailed design footprint)
- Descoping island build outs – **5.6 tCO2e** (**0.4%** of detailed design footprint)
- Retaining existing carriageway – **62.1 tCO2e** (**4.9%** of detailed design footprint)
- Descoping new pavement construction – **57.8 tCO2e** (**2.2%** of detailed design footprint)

2.17.8 The carbon data has been collated in a manner which also allows us to undertake further analysis of the carbon hotspots. For example, those shown in Figure 2.20: Junction 3 Improvement Scheme Detailed Design Carbon Footprint by Work Activity SeriesFigure 2.20 for Junction 3 can be further scrutinised to identify specific work 'categories' and 'activities' which are contributing the most significant proportions of carbon and facilitate a more focused carbon reduction effort. Table 2.18 and Figure 2.22 below highlight these and provide some suggested carbon reduction measures for consideration.

Table 2.18: Junction 3 Detailed Design Carbon Footprint By Work Activity

Activity	Carbon Output (tCO2e)	Potential Carbon Reduction Measures
Imported Acceptable material Class 6P in embankments and other areas of fill	114.5	· Re-use site-won material as fill · Use recycled alternative · Identify closest approved supplier(s)
Cement Bound Granular Material Base Course to Clause 822 - Minimum C8/10 or T3 210mm thick in carriageway, hardshoulder and hardstrip	74.0	· Use of Cold Recycled Bound Materials · Use of geotextiles to reduce base depth
CASC+ 68+ PSV Surface Course 50mm in carriageway, hardshoulder and hardstrip	63.9	· Use of 'SuperLow' asphalt · Use of asphalt with higher RAP content
Trench for duct not exceeding 300mm wide, depth not exceeding 1500mm in verges/unmade ground SL	52.9	· Use of electric plant · Use of Hydrotreated Vegetable Oil (HVO) fuel
CASC+ 58 PSV Surface Course 50mm in carriageway, hardshoulder and hardstrip	50.9	· Use of 'SuperLow' asphalt · Use of asphalt with higher RAP content
Imported Acceptable material Class 6F4 in embankments and other areas of fill	49.7	· Re-use site-won material as fill · Use recycled alternative · Identify closest approved supplier(s)
AC 20 Dense Bin 40/60 Binder Course to Clause 929 270 thick (laid in three layers) in carriageway, hardshoulder and hardstrip	44.8	· Use of Cold Recycled Bound Materials · Use of asphalt with higher RAP content
Precast concrete chamber 1200mm internal diameter with D400 cover/frame, depth exceeding 1m not exceeding 2m in verge	43.0	· Use of recycled plastic alternative · Retain and re-use existing assets
375 mm internal diameter UPVC drain on bed Type S, in trench, depths to invert not exceeding 2 metres	39.4	· Use of recycled aggregates for bedding · Use of ducting with higher recycled content
Safety barrier, N2W2, designed to be impacted on one side only, straight or curved exceeding 120m radius	36.7	· Re-use existing barrier · Use of steel with higher recycled content
AC 20 Dense Bin 40/60 Binder Course to Clause 929 110 thick (laid in two layers) in carriageway, hardshoulder and hardstrip	36.2	· Use of Cold Recycled Bound Materials · Use of asphalt with higher RAP content
Pre-Cast Concrete Kerb Splay 255x914x125mm) (SP) laid straight or curved exceeding 12 metres radius	32.2	· Use of Durakerb products · Use of concrete with higher GGBS content
Trapped gully specified design group PERCS Appendix D3 with D400 grating and frame	32.2	· Use of recycled plastic alternative · Retain and re-use existing assets
Sub-Contractors General Prelim Construction	31.2	Mains power connection for welfare

Contractors General Prelim Construction	31.2	· On-site renewable energy solutions · Use of HVO fuel within diesel generators

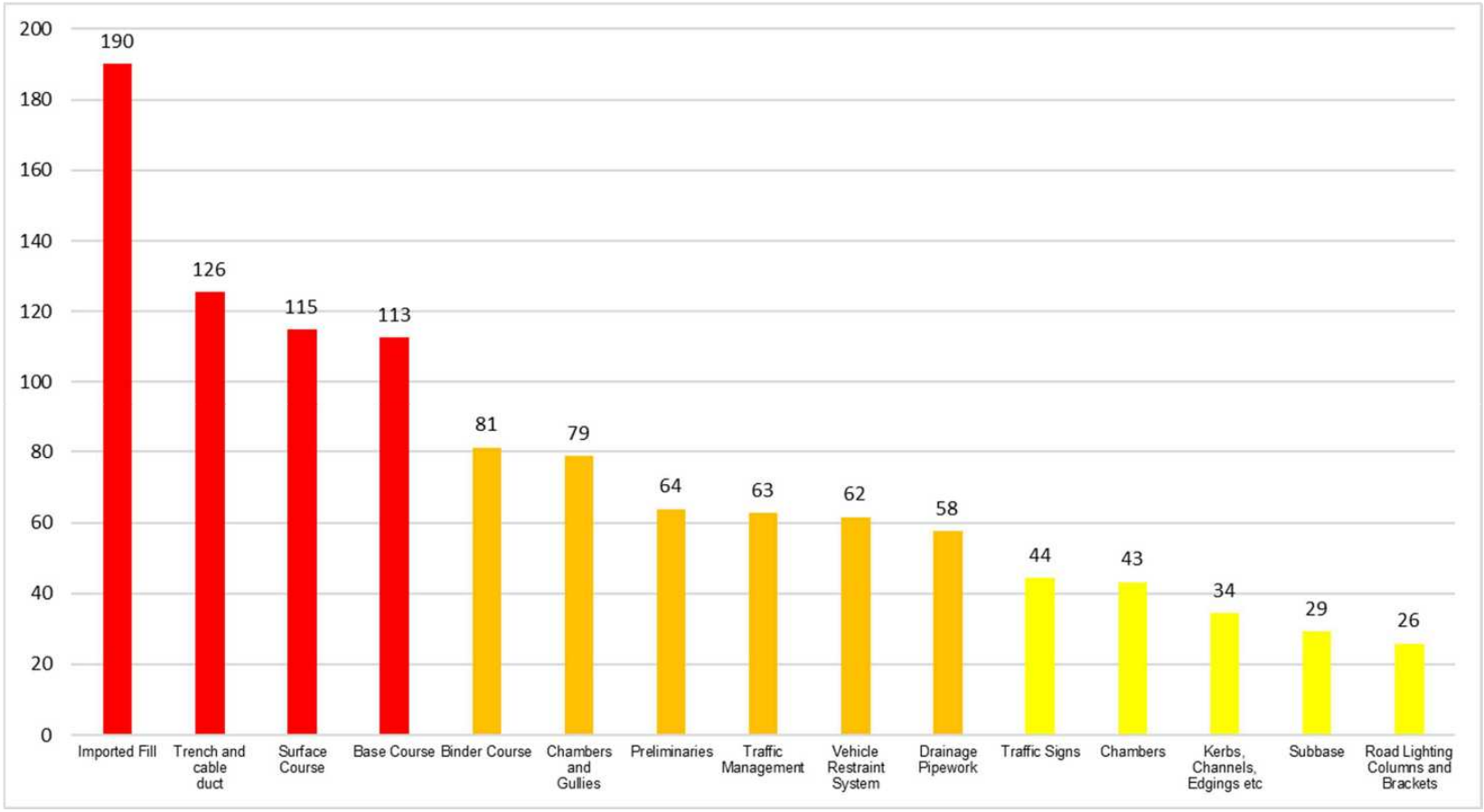


Figure 2.22: Junction 3 Detailed Design Carbon Footprint By Work Activity

2.17.9 It is recommended that a carbon reduction workshop is arranged at the earliest opportunity to help collaboratively identify further initiatives which could be considered for implementation. It is advised that this is coordinated at the earliest opportunity with representation from client, design, principal contractor, and supply chain organisations. Linked to the carbon 'hotspots' identified above, the workshop should focus on construction phase carbon reduction initiatives for Junction 3, and detailed design value engineering options for the active travel schemes. This will provide an opportunity to develop a carbon reduction plan for the schemes incorporating clear actions, responsibilities, and deadlines to ensure effective implementation of carbon reduction measures which also deliver cost savings. In all cases, construction will prioritise non-hazardous, reused, refurbished, recycled, and recyclable equipment and materials within specification, and those made from renewable sources with low(er) embodied energy, carbon footprint and water footprint.

2.17.10 The data generated from these carbon assessments can also be used to quantity the potential carbon savings associated with such interventions. This helps to ensure that we get the greatest carbon reductions for any additional expenditure required though, overall, it is anticipated that there will be a cost saving associated with such initiatives. For example, a simple switch to Hydrotreated Vegetable Oil (HVO) during the construction phase of the main Junction 3 works could save up to 308 tCO2e (24% of detailed design footprint) and £14,321 (based on November 2022 fuel rates).

2.17.11 As has been achieved for Junction 3 through detailed design, the principles of 'Build Less' and 'Build Clever' should always be embedded within the design development of a scheme to help drive the most significant carbon reductions possible (Figure 2.23). In the interest of continuous improvement, this reinforces the importance of undertaking the initial carbon assessment and workshop at the earliest opportunity when there is sufficient information available (i.e. BoQ). It should also be noted that there are operational phase carbon savings associated with the Junction 3 improvements and associated active travel schemes which have not yet been quantified, such as reducing congestion and idling traffic, and promoting active travel instead of driving. The intention is to quantify these aspects more effectively as suitable carbon accounting methods are developed and agreed.

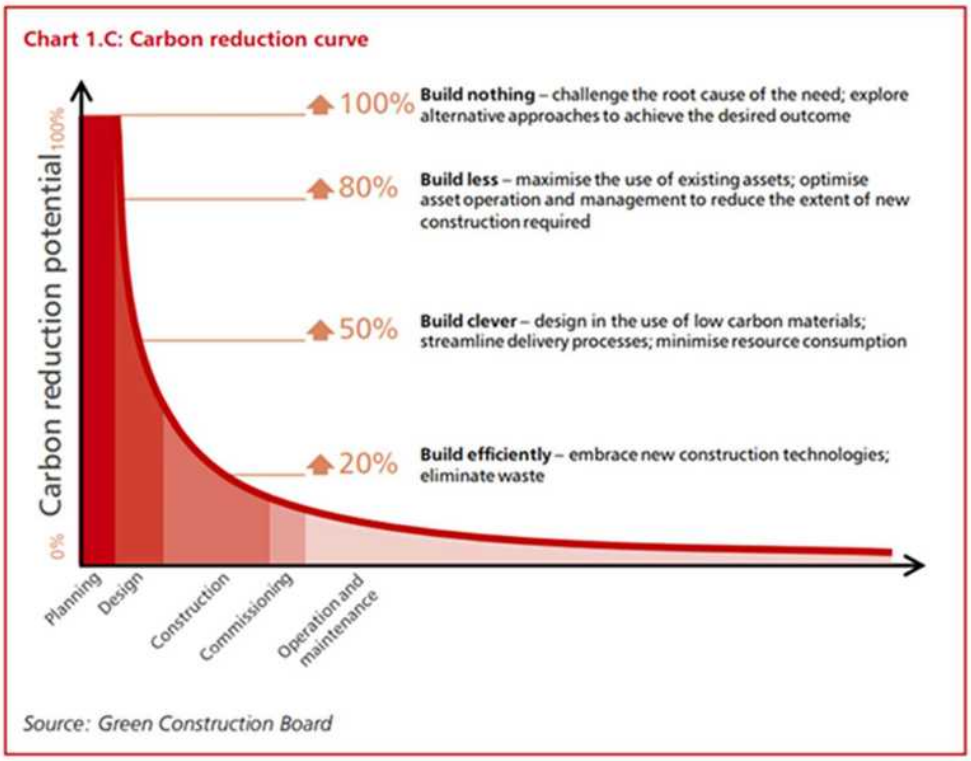


Figure 2.23: Relationship Between Work Stages and Carbon Reduction Potential

2.17.12 These carbon assessments should also be updated when there are as-built (for Junction 3) and Detailed Design (for active travel schemes) BoQ available. This will allow us to confirm the final carbon outputs associated with the schemes and highlight carbon reductions achieved throughout the whole project life cycles. This will require effective data collection during the construction phase. It is envisaged that this will provide another case study for future PCC and CPCA projects to replicate and build on adopting the approach summarised in Figure 2.24 below.

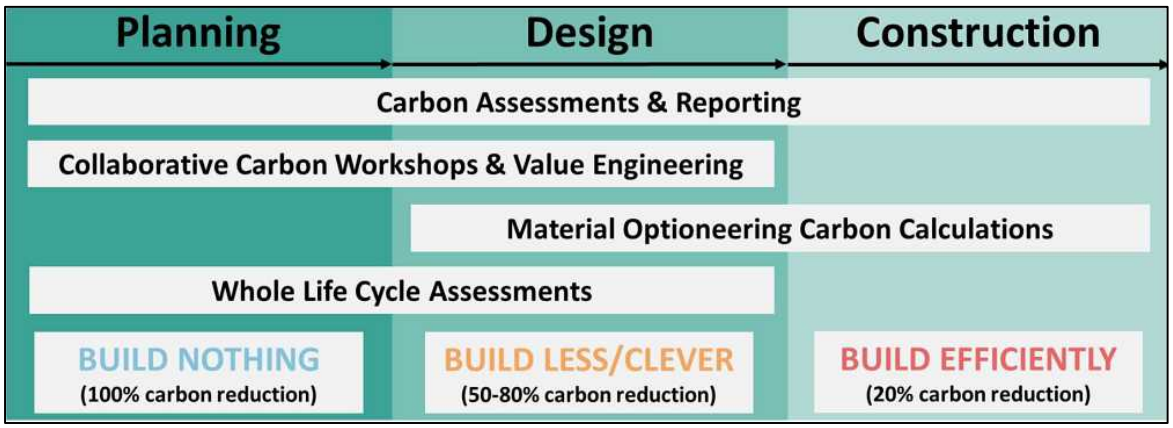


Figure 2.24: Project Lifecycle Carbon Reduction Process

3. Economic Dimension

3.1 Introduction

3.1.1 This chapter sets out the approach taken to assess the Economic Dimension for the Junction 3 Improvement Scheme and demonstrates that the packages of schemes offers Very High Value for Money.

3.1.2 The scheme appraisal focuses on the aspects of scheme performance that are relevant to the nature of the intervention. These impacts are not limited to those directly impacting on the economy or those which can be monetised. The economic, environmental, social and distributional impacts of the proposal are all examined, using qualitative, quantitative and monetised information where appropriate.

3.1.3 The latest TAG guidance has been used to undertake this appraisal, including the following units:

- The Transport Business Cases, Updated February 2022
- Transport Analysis Guidance, Updated October 2022
- TAG unit A1-1 cost-benefit analysis, Updated October 2022
- TAG unit A1-2 scheme costs, Updated May 2022
- TAG unit A1-3 user and provider impacts, Updated May 2022
- TAG unit A3 environmental impact appraisal, Updated May 2022
- TAG unit A4-1 social impact appraisal, Updated October 2022
- TAG unit A4-2 distributional impact appraisal, Updated October 2022
- TAG unit A5-4 marginal external costs, Updated October 2022
- TAG unit A5-5 highway appraisal, January 2014
- TAG unit M1-1 principles of modelling and forecasting, January 2014
- TAG unit M1-2 data sources and surveys, May 2020
- TAG unit M3-1 highway assignment modelling, May 2020
- TAG unit M4 forecasting and uncertainty, Updated August 2022
- TAG databook, October 2019.

3.2 Options Appraised

3.2.1 The Junction 3 Improvement Scheme consists of the following components:

- Create a third southbound lane on Nene Parkway from Junction 31 to Junction 3.
- Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a third lane.
- Signalisation of the Nene Parkway approach to Junction 3, with a 4-lane approach.
- Signalisation of The Serpentine approach to Junction 3, with a 4-lane approach.
- Create a third lane on the A1260 The Serpentine northbound approach, extending approximately 200 metres back from Junction 3.
- Addition of 220m of new footpath between Saltmarsh and the Phoenix School.
- Upgrading the Phorpres Way footpath (southern side) to current LTN 1/20 design standards, accompanied by several crossing points at Phorpres Close, Club Way and Cygnet Road.
- Upgrading the Cycleway for approximately 450m between Shrewsbury Avenue and the gated access of the Nature Reserve.

3.2.2 The General Arrangements for the schemes are provided in Appendix C.

3.3 Economic Assessment

Approach to Appraisal

3.3.1 The Economic Dimension for the proposed scheme is focused on the following aspects:

- Assessing the monetised direct, localised, and economic efficiency benefits of the scheme
- Qualitative appraisal of wider scheme benefits, such an environmental, noise, and enablement of planned development
- Offsetting identified benefits against the scheme costs to provide a Benefit to Cost (BCR) ratio.

3.3.2 It is acknowledged that a scheme can only be considered value for money if it meets the strategic objectives, and so this has been considered throughout the economic assessment.

3.3.3 Details regarding the costs and benefits are detailed in the rest of this chapter.

3.4 Present Value Costs

3.4.1 A robust scheme cost estimate has been produced based on the Detailed Design information. The Base Investment Costs are detailed in Table 3.1 below, and the subsequent steps taken to calculate the Present Value Costs (PVC) are described beneath.

3.4.2 The benefits assessment was undertaken over a 60-year appraisal period from the scheme opening year (2024 to 2084), with costs included from 2022 through to 2085. Further detail about the scheme costs is provided within the Financial Dimension.

3.4.3 The Base Investment Cost is the capital cost required to construct the scheme in current year (2022) prices, without a risk allowance or optimism bias. This is derived from the scheme cost estimate based on design information and early contractor involvement (ECI) and is the building block for all subsequent cost calculations. All Sunk Costs (those already incurred) have been omitted from the economic assessment in line with TAG unit A1.2.

3.4.4 Table 3.1 shows the Base Investment Cost profiled in line with the construction programme, and broken down into Construction, Land, Preparation and Supervision, and Other costs.

Table 3.1: Base Investment Cost (2022 Prices)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Total Base Investment Cost (£)
2022	114,958		35,459		150,418
2023	5,249,195		1,026,812	518,727	6,794,734
2024	1,882,229		348,460	194,523	2,425,212
2025			10,000		10,000
Total	**7,246,383**		**1,420,731**	**713,249**	**9,380,364**

3.4.5 The PVC has been calculated as followed:

- Real Cost increases were calculated based on the Base Investment Cost spend profile. The Base Cost adjustment factor was calculated by dividing the Construction Industry Inflation Rate (10% to 2024 / 2025, and then 5%[26] thereafter) by the Annual GDP Factor derived from the TAG Databook (May 2022) for each of the years within the assessment period. The inflation rate was informed by the construction output price indices as well as knowledge of costs associated with recent schemes in Peterborough. Peterborough Highways Services work is measured using BCIS indices.

[26] Turner & Townsend raises inflation forecast to 8.5% (theconstructionindex.co.uk)

- Optimism Bias was then applied in line with guidance provided in TAG unit A1.2 (May 2022). An Optimism Bias rate of 20% was applied to represent the maturity of the design (Stage 3: Detaield Design). The total Optimism Bias applied was £2,028,593.
- Costs were then rebased back to 2010 using factors derived from the TAG Databook (May 2022) GDP Deflator.
- Costs were then discounted to 2010 in line with guidance provided in TAG unit A1.2
- Finally, costs were converted to 2010 Market Prices using a factor of 1.19.

3.4.6 Note that the final three steps are undertaken within the TUBA software, and that risk has been excluded from the Economic Assessment in line with the latest TAG guidance.

3.4.7 Table 3.2 overleaf shows the costs described above, split into construction costs and maintenance costs. The calculation of maintenance costs is discussed in Section 4.3 of the Financial Dimension.

Table 3.2: Economic Dimension Scheme Cost Estimate

Description of Cost Type	Construction Cost (£)	Maintenance Cost Over 60 Years (£)
Base Investment Cost	9,380,364	313,888
Base Cost with Real Cost Increases	10,142,965	2,375,633
Risk Adjusted Base Cost with Real Cost Increases	10,142,965	2,375,633
Risk Adjusted Base Cost with Real Cost Increases and Optimism Bias	12,171,558	2,375,633
Rebased to 2010 Price Year	9,541,307	1,862,263
Discounted to 2010 Prices	6,046,909	370,865
Adjusted to Market Prices	7,084,392	441,329

3.4.8 A full profile for these costs is provided within Appendix D.

3.5 Present Value Benefits

3.5.1 The economic assessment of the Junction 3 Improvement Schemes has considered the following:

- Transport User Benefits (and disbenefits)
- Accident Benefits (and disbenefits)
- Environment Benefits (and disbenefits)
- Active Travel Benefits (and disbenefits)

Transport User Benefits

3.5.2 The transport user benefits of the scheme were assessed using the SATURN based PTM3 (built in v11.4.07H). The appraisal forecast years developed in the SATURN model are 2026, 2031 and 2036, which have been used to appraise the impacts of the core scenario. The year 2036 marks the end of the Local Plan period.

3.5.3 The key objective of the SATURN model is to forecast, accurately, the likely transport impacts that the proposed schemes would have on highway users of the surrounding road network. User benefits can be calculated by modelling the highway network, in various years, and comparing with / without scheme scenarios to determine how introducing a scheme will impact on travel behaviour and patterns.

3.5.4 Full details relating to the calibration and validation of the model can be found in the Local Model Validation Report (LMVR), and details about the forecasting procedure can be found in the Forecasting Report.

3.5.5 Two core network scenarios were developed for the Economic Assessment, these were the Do-Minimum (DM) and Do-Something (DS) scenarios. The DM scenario represents future growth and committed network assumptions without highway intervention (without scheme), and the DS scenario includes the package of schemes within the model network (with scheme) with the same level of future traffic growth.

3.5.6 The difference between the DM and DS scenarios demonstrates the benefits of implementing the scheme. These benefits are measured using:

- Network assignment statistics
- Link flow changes
- Journey times
- Journey routing.

3.5.7 The model output files were then entered into the Transport User Benefits Appraisal (TUBA, 1.9.17) software to undertake the Economic Assessment and calculate a BCR.

3.5.8 The annualisation factors shown below in Table 3.3 were used within TUBA to calculate the likely annual transport user benefits for the AM, Inter, and PM peak hours. The figures have been derived using data from nearby National Highways (formerly Highways England) WebTRIS data and local ATC data from 2017, compared against the survey data.

Table 3.3: TUBA Annualisation Factors

Time Slice	Time Period	Estimated Annualisation Factor	Description
1	AM Peak Hour	260	08:00 – 09:00
2	Inter-Peak Hour	1,624	14:00 – 15:00
3	PM Peak Hour	259	17:00 – 18:00

3.5.9 TUBA produces figures for a number of benefits, including Greenhouse Gases, User benefits, and Indirect taxation. Indirect taxation often provides a negative benefit figure. This is a result of the reduced fuel being purchased as journeys become more efficient with the improvements. This in turn reduces the money the government receives in fuel taxes.

3.5.10 This identifies the Present Value Benefits (PVB) to be £13,471,000. A breakdown of the TUBA benefits can be seen in Table 3.4 beneath.

Table 3.4: TUBA Benefits Breakdown

Benefits (£'000s), 2010 prices	
Greenhouse Gases	143
Consumer Users (Commuting)	1,759
Consumer Users (Other)	8,160
Business Users / Providers	3,572
Indirect Taxes	-163
Present Value of Benefits (PVB)	**13,471**

3.5.11 The breakdown of benefits demonstrates that the scheme is anticipated to have a positive impact on greenhouse gas emissions (£143,000). There is a disbenefit of - £163,000 to indirect taxation as a result of improved journey times reducing fuel consumption which is directly taxed by central government.

3.5.12 TUBA also provides data on where the benefits of the scheme are found including but not limited to; benefits by time saving and benefits by distance. These benefits are broken down by vehicle type and journey purpose to best understand who benefits from the scheme.

3.5.13 Table 3.5 below shows the time benefits saving by vehicle.

Table 3.5: Non-Monetised Time Benefits by Time Saving

Non Monetised Time Benefits By Time Saving							
Time Benefits (thousands of person hrs) by size of time saving							
Vehicle type	Purpose	< -5 mins	-5 to -2 mins	-2 to 0 mins	0 to 2 mins	2 to 5 mins	> 5 mins
Car	Business	-15	-185	-447	783	144	0
Car	Commuting	-68	-1,004	-1,535	2,435	536	0
Car	Other	-39	-912	-5,985	9,468	1,709	0
LGV	Business	-14	-168	-550	897	108	0
HGV	Business	-3	-43	-187	324	33	3

3.5.14 Table 3.5 shows that car users experience the greatest time benefit from the implementation of this scheme and that within car users, those that are undertaking 'other' journeys (not for business or commuting) experience the greatest impact.

3.5.15 Table 3.5 also shows that the majority of journey time savings are between 0 to 2 minutes, followed by 2-5 minutes. Time savings greater than 5 minutes are experienced by HGVs only, and to a very small degree (3,000 person hours)

3.5.16 The TUBA benefits arising from each time period are shown in Table 3.6 below.

Table 3.6: Transport User Benefits by Time Period

Junction 3 Improvement Scheme Benefits (£,000)	
Time Period	User Time
AM Peak	3,158
Inter Peak	6,782
PM Peak	3,028

3.5.17 Table 3.6 shows that the greatest benefits are realised in the Inter-Peak period, at £6,782,000, and the AM and PM periods realise similar levels of benefits at just over £3,000,000.

3.5.18 Table 3.7 below shows the time benefits saving by vehicle type and journey purpose.

Table 3.7: Non-Monetised Time Benefits by Distance

Non Monetised Time Benefits By Distance									
Time Benefits (thousands of person hrs) by distance									
Vehicle type	Purpose	< 1 kms	1 to 5 kms	5 to 10 kms	10 to 25 kms	25 to 50 kms	50 to 100 kms	100 to 200 kms	>200kms
Car	Business	9	42	70	76	39	33	11	1
Car	Commuting	27	-1	-32	146	62	146	15	0
Car	Other	142	810	876	1055	574	491	222	72
LGV	Business	2	-4	31	85	87	54	9	9
HGV	Business	0	0	8	2	17	29	43	28

3.5.19 The table shows that those making trips between 10 – 25 kilometres benefit the most from the proposed scheme, followed by journeys between 5 – 10 kilometres. As with the benefits by time savings, car users experience the greatest benefits, mostly those who travel for 'other' purposes or commuting.

Accident Benefits

3.5.20 Model outputs have been entered into the Cost and Benefit to Accidents – Light Touch (COBALT, v2.3) software to undertake an assessment of accident savings. The assessment was undertaken using modelled 24 hour-AADT with and without scheme flows by link and junction. COBALT calculates the monetised accident savings between with and without scheme for each forecast year over a 60-year appraisal period, using default accident rates for certain types of infrastructure.

3.5.21 The total accident savings in 2010 values and prices is £33,607,900. COBALT estimates the scheme would result in a reduction of 975.7 accidents over a 60-year appraisal period. There would be a reduction of 2.1 fatal, 82.6 serious and 1204.0 slight casualties.

Environment Benefits

3.5.22 Changes in greenhouse gas emissions, air quality, and noise have been quantitatively assessed and monetised, with and without scheme.

3.5.23 The TUBA assessment estimated £143,000 benefits relating to a reduction of 1,711 tonnes of untraded CO_2 emissions and 8 tonnes of traded CO_2 emissions across all three modelled time periods over a 60-year appraisal period.

3.5.24 The combined AMATs estimated £5,650 benefits relating to Greenhouse Gas Reductions over the 20-year appraisal period of the active travel improvements, and £790 of Noise benefits.

3.5.25 Air quality and noise impact assessments had also been undertaken and the quantitative results of which had been used within the Air Quality Valuation and Noise Workbooks. The air quality and noise impact assessments used 24-hour AADT and 18-hour AAWT total vehicular flow, % HGV, and speed data extracted from the SATURN models as input.

3.5.26 Baseline noise surveys were undertaken in line with the Calculation of Road Traffic Noise (CRTN) using the 1988 Shortened Measurement method. All surveys have been carried out by suitably qualified acousticians.

3.5.27 Road traffic noise calculations have been carried out in accordance with the methodology set out in the Department for Transport's Memorandum 'Calculation of Road Traffic Noise' using SoundPLAN noise modelling software.

3.5.28 Existing receptor locations have been considered and used to establish the change in the daytime LA10,16h noise levels. As per TAG Unit A3, the results have been converted to LAeq 16h (07:00 to 23:00 hours) to avoid overlap with the Lnight period (23:00 to 07:00). Predictions were generated for the following scenarios:

3.5.29 Short Term Assessment – Do Minimum scenario in the opening year against the Do Something scenario in the opening year (2026).

3.5.30 Long Term Assessment (With Scheme) – Do Minimum scenario in the opening year against the Do Something scenario in the future (opening + 15) year (2036 – latest available modelled year).

3.5.31 Long Term Assessment (Without Scheme) – Do Minimum scenario in the opening year against the Do Minimum scenario in the future (opening +15) year (2036 – latest available modelled year).

3.5.32 The impact magnitudes scales for road traffic noise have been determined based on the guidance within the DMRB LA 111 (Rev 2) and mitigation options presented, if required.

3.5.33 The scope of the operational Air Quality assessment includes the following:

- Liaise with the local planning authority to define and agree a scope of works.
- Carry out a review of existing local, regional, national and international policies and guidelines regarding the protection of air quality and identify any potential impacts from neighbouring facilities and sensitive receptors with the potential to be affected by the proposed development.
- Review existing baseline conditions utilising existing local authority monitoring data and Defra's background mapping concentrations.
- Undertake a detailed dispersion modelling using ADMS-Roads to determine the change in pollutant concentrations because of the operation of the Scheme at existing sensitive receptor locations.

3.5.34 The following scenarios have been assessed:

- Baseline/ Model verification (likely to be 2019 as this is the most recent year that has not been affected by COVID and thus traffic flows considered "normal").
- Do Minimum (2026) – opening year of the scheme without development.
- Do Something (2026) – opening year of the scheme with development.

3.5.35 The methodology outlined within TAG Unit A3 Section 3 has been followed and the TAG Local Air Quality (LAQ) Workbook utilised.

3.5.36 The study area used for the assessment has been calculated using DMRB LA105 Guidance.

3.5.37 The total air quality benefits in 2010 values and prices are £176,649 over a 60-year appraisal period. It was estimated that the scheme would result in a decrease of NOX emissions and PM2.5 emissions of 33 tonnes and 1 tonne, respectively.

3.5.38 The total noise benefits in 2010 values and prices are -£198,892 over a 60-year appraisal period, and combines the following benefits:

- Sleep disturbance: - £95,890
- Amenity: - £69,320
- Acute Myocardial Infarction (AMI): - £17,050
- Stroke: - £6,630
- Dementia: - £10,001.

3.5.39 It was estimated that the scheme would result in a net increase of 36 households experiencing daytime noise, and a net increase of 35 households experiencing night-time noise.

Active Travel

3.5.40 The benefits associated with active travel improvements in the Junction 3 area were assessed using the Active Mode Appraisal Toolkit (AMAT).

3.5.41 The AMAT assessment has used the following intervention specific details for calculating active travel benefits:

- Appraisal Year – 2022
- Intervention opening year – 2023
- Final Year of Funding – 2023
- Appraisal Period – 20 years
- Area type – Other Urban
- Number of daily walking and / or cycling trips without the proposed intervention
- Number of daily walking and / or cycling trips with the proposed intervention
- Percentage of an average walking or cycling trip that will use the intervention
- Current walking and cycling infrastructure for the route
- Proposed walking and cycling infrastructure for the route.

3.5.42 The number of walking and cycling trips without the proposed interventions have been sourced from Strava Metro, Census 2011 Method of Travel to Work, Vivacity AI sensors, and historic Automatic Traffic Counts (ATC).

3.5.43 The number of walking trips with the proposed intervention has been calculated by:

- Identifying a comparable location within Peterborough that has a higher walking mode share (based on the Census 2011) and better walking infrastructure.
- Identifying the walking mode share for the scheme location based on the Census 2011.
- Calculating an uplift factor that increases the scheme location walking mode share to the levels of the comparable location.
- Applying the resultant uplift factor to the number of walking trips without the proposed interventions.

3.5.44 The number of cycling trips with the proposed interventions has been calculated by:

- Identifying the PCT Government Target (Equality) Ratio (Scenario / Baseline) for the existing route at the scheme location.
- Applying the ratio as an uplift factor to the number of cycling trips without the proposed interventions.

3.5.45 For example, a comparison between Shrewsbury Avenue in Orton Longueville, which is a comparable land use, and the Phorpres Way area was undertaken to understand the potential for travel to work by walking and cycling. The assessment identified that Shrewsbury Avenue had a travel to work mode share of 5.33% for walking and 8.17% for cycling, whereas the Phorpres area had mode shares of 3.77% for walking and 5.80% for cycling. The uplift factors would therefore be 1.414 for walking and 1.409 for cycling.

3.5.46 Table 3.8 below shows the number of walking and cycling trips by scenario for each scheme.

Table 3.8: Do Nothing and Do Something Daily Active Travel Trips by Scheme

Scheme	Daily Walking Trips		Daily Cycling Trips	
	Do Nothing	Do Something	Do Nothing	Do Something
Malborne Way	235	281	-	-
Shrewsbury Avenue	156	186	159	266
Phorpres Way	209	295	243	342

3.5.47 Table 3.9 beneath summarises the benefits for each scheme.

Table 3.9: Summary of Active Mode Appraisal Toolkit Benefits by Scheme

Benefit Item	Benefits (£,000s)			
	Malborne Way	Shrewsbury Avenue	Phorpres Way	**Total**
Congestion Benefit	2.98	32.45	33.80	**69.23**
Infrastructure Maintenance	0.02	0.18	0.19	**0.39**
Accident	0.51	5.58	5.81	**11.90**
Local Air Quality	0.07	0.79	0.82	**1.68**
Noise	0.03	0.37	0.39	**0.79**
Greenhouse Gases	0.24	2.65	2.76	**5.65**
Physical Activity (Health)	108.29	688.73	774.35	**1,571.37**
Journey Ambience	22.53	91.56	113.24	**227.33**
Absenteeism	6.60	2.24	45.33	**54.17**
Indirect Taxes	-0.31	-3.33	-3.47	**-7.11**
Total	**140.96**	**821.02**	**973.01**	**1,934.99**

3.5.48 The benefits over a 20-year appraisal period for the Malborne Way, Shrewsbury Avenue, and Phorpres Way junction schemes are £1,934,990 in total, with the benefits mostly arising from the Phorpres Way and Shrewsbury Avenue schemes. Health benefits associated with physical activity form the most benefits in each scheme.

Benefits Summary

3.5.49 The Transport User, Active Mode, and Accident benefits are summarised in Table 3.10.

Table 3.10: Transport User, Active Mode, and Accident Benefits Summary

Type	Description	Value (£,000s)
TUBA	Greenhouse Gases	143
	Consumer Users (Commuting)	1,759
	Consumer Users (Other)	8,160
	Business Users / Providers	3,572
	Indirect Taxes	-163
	Total TUBA PVB	13,471
Active Mode Appraisal	Congestion Benefit	69.2
	Infrastructure Maintenance	0.4
	Accident	11.9
	Local Air Quality	1.7
	Noise	0.8
	Greenhouse Gases	5.7
	Physical Activity (Health)	1,571
	Journey Ambience	227
	Absenteeism	54
	Indirect Taxes	-7
	Total AMAT PVB	1,935
Environment	Noise	-199
	Air Quality	177
COBALT	Accident Benefit	33,608
Benefits Summary	*Active Mode Appraisal PVB*	*1,935*
	TUBA PVB	*13,471*
	Environment PVB	*-22*
	COBALT PVB	*33,608*
	Total PVB	48,992

3.5.50 Most benefits come from Accident savings calculated by TUBA (£33,608,000), followed by the Transport User benefits (£13,471,000).

3.6 Benefit Cost Ratio

3.6.1 The estimated PVB has been compared to the PVC to calculate a Benefit-Cost Ratio (BCR). A Value for Money (VfM) category is then determined based on this BCR. The VfM categories defined by DfT in the Value for Money Framework are shown in Table 3.11 below.

Table 3.11: DfT VfM Categories

Value for Money Category	Description
Very High	BCR greater than or equal to 4.0
High	BCR between 2.0 and 4.0
Medium	BCR between 1.5 and 2.0
Low	BCR between 1.0 and 1.5
Poor	BCR between 0.0 and 1.0
Very Poor	BCR less than or equal to 0.0

3.6.2 The values presented in Table 3.12 overleaf indicate the PVB, PVC, Net Present Value (NPV) and BCR for the scheme. The NPV represents the net total value of a scheme, with scheme costs subtracted from its monetised benefits. PVB, PVC and NPV values are expressed in £'000s in 2010 market prices and values to allow direct comparison.

Table 3.12: Junction 3 Study Improvements AMCB Table

Type	Description	Value (£,000s)
TUBA	Greenhouse Gases	143
	Consumer Users (Commuting)	1,759
	Consumer Users (Other)	8,160
	Business Users / Providers	3,572
	Indirect Taxes	-163
	Present Value of Benefits (PVB)	13,471
	Broad Transport Budget	7,543
	Present Value of Costs (PVC)	7,543
Active Mode Appraisal	Congestion Benefit	69.2
	Infrastructure Maintenance	0.4
	Accident	11.9
	Local Air Quality	1.7
	Noise	0.8
	Greenhouse Gases	5.7
	Physical Activity (Health)	1,571
	Journey Ambience	227
	Absenteeism	54
	Indirect Taxes	-7
	Total AMAT PVB	1,935
Environment	Noise	-199
	Air Quality	177
COBALT	Accident Benefit	33,608
Economic Dimension Summary	*Active Mode Appraisal PVB*	*1,935*
	TUBA PVB	*13,471*
	Environment PVB	-22
	COBALT PVB	33,608
	Total PVB	**48,992**
	Total PVC	**7,543**
	Net Present Value (NPV)	**41,449**
	BCR	**6.49**
	Value for Money	**Very High**

Value for Money Statement

3.6.3 The Junction 3 Improvement Schemes will provide **Very High Value for Money** with a Benefit Cost Ratio of **6.49**.

3.7 Scheme Risks, Sensitivities and Uncertainties

Risks

3.7.1 Sensitivity tests have been undertaken to understand the robustness of the Junction 3 Improvement Schemes BCR against key risks and common DfT sensitivity scenarios.

3.7.2 A full record of the risks associated with this project are captured in the Project and Construction Risk Registers included in Appendix A.

3.7.3 The key risks identified for this project include programme delays which affect the availability of funding (TCF funding is time limited) and higher than expected costs associated with the creation of a third lane along the A1260 The Serpentine approach due to level differences.

Sensitivity Testing

3.7.4 Sensitivity tests have been undertaken to confirm the robustness of the business case in a number of eventualities. These eventualities can affect the benefits (such as changes to forecast trips from high and low levels of growth) or the costs (such as a greater proportion of risk being realised).

3.7.5 A summary of each of the sensitivity tests undertaken is provided beneath along with the resultant BCRs, and full details on the sensitivity tests undertaken are provided in the Junction 3 Sensitivity Testing Technical Note which is included in Appendix C.

Cost Sensitivity Test

3.7.6 Table 3.13 below demonstrates the VFM category that various PVCs would result in. The current core scenario PVC of £7,543,000 falls into the Very High category, and could increase by £4,705,000 before it falls into the High Value for Money Category.

Table 3.13: Value for Money Categories and the Associated Present Value of Costs (£,000s)

VfM Category	Description	PVB	PVC required to achieve VfM statement
Poor	BCR between 0 and 1	£ 48,992	>=£48,992
Low	BCR between 1 and 1.5	£ 48,992	£48,992 to £32,661
Medium	BCR between 1.5 and 2	£ 48,992	£32,661 to £24,496
High	BCR between 2 and 4	£ 48,992	£24,496 to £12,248
Very High	BCR greater than or equal to 4	£ 48,992	<=£12,248

Low Growth

3.7.7 The Low Growth sensitivity test assesses the impact of a reduced number of forecast motor vehicle trips in the SATURN forecast mode.

3.7.8 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would still offer Very High Value for Money in a Low Growth scenario with a BCR of 7.258.

High Growth

3.7.9 The High Growth sensitivity test assesses the impact of an increased number of forecast motor vehicle trips in the SATURN forecast model.

3.7.10 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money in a High Growth scenario with a BCR of 9.253.

Reduced Accident Benefits

3.7.11 The Reduced Accident Benefits sensitivity test assesses the impact on the total PVB if the benefits by accident saving are reduced by 50%.

3.7.12 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 4.267 should the predicted accident savings benefits be severely reduced.

No Accident Benefits

3.7.13 The No Accident Benefits sensitivity test assesses the impact of removing the accident saving benefits from the PVB.

3.7.14 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer High Value for Money with a BCR of 2.039 if accident benefits were excluded from the monetary assessment.

Low Active Travel Uptake

3.7.15 The Low Active Travel Uptake sensitivity test assesses the impact of reducing the number of new active travel users assumed in the Active Mode Appraisal Toolkit.

3.7.16 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 6.367 should the actual uptake in active travel be less than forecast in core scenario.

High Active Travel Uptake

3.7.17 The High Active Travel Update sensitivity test assesses the impact of increasing the number of new active travel users assumed in the Active Model Appraisal Toolkit.

3.7.18 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 6.617 should the actual uptake in active travel be greater than forecast in core scenario.

Reduced AMAT Appraisal Periods

3.7.19 The Reduced AMAT Appraisal Periods sensitivity test assesses the impact of reducing the number of years included in the AMAT assessments, reflecting reduced longevity of the scheme.

3.7.20 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 6.360 should the AMAT appraisal period be reduced.

Increased AMAT Appraisal Periods

3.7.21 The Increased AMAT Appraisal Periods sensitivity test assesses the impact of increasing the number of years included in the AMAT assessments, reflecting increased longevity of the scheme.

3.7.22 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 6.616 should the AMAT appraisal period be reduced.

Low Environment Values

3.7.23 The Low Environment Values sensitivity test assesses the impact of reducing the estimated NPV of Air Quality benefits.

3.7.24 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 6.474 should the values associated with air quality reduce.

High Environment Values

3.7.25 The High Environment Values sensitivity test assesses the impact of increasing the estimated NPV of Air Quality benefits.

3.7.26 The sensitivity test demonstrates that the Junction 3 Improvement Schemes would offer Very High Value for Money with a BCR of 6.557 should the values associated with air quality increase.

Sensitivity Test Summary

3.7.27 The PVB, PVC and BCR for each of the sensitivity tests is shown beneath in Table 3.14.

Table 3.14: Sensitivity Test Summary

Sensitivity Test	PVB (£,000)	PVC (£,000)	NPV (£,000)	BCR	VfM
Core	**48,991**	**7,543**	**41,449**	**6.49**	**Very High**
Low Growth	54,743	7,543	47,200	7.25	Very High
High Growth	69,793	7,543	62,250	9.25	Very High
Reduced Accident Benefits	32,188	7,543	24,645	4.26	Very High
No Accident Benefits	15,384	7,543	7,841	2.03	High
Low Active Travel Uptake	48,022	7,543	40,480	6.36	Very High
High Active Travel Uptake	49,912	7,543	42,369	6.61	Very High
Reduced AMAT Appraisal Period	47,970	7,543	40,427	6.36	Very High
Increased AMAT Appraisal Period	49,902	7,543	42,359	6.61	Very High
Low Environment Values	48,836	7,543	41294	6.47	Very High
High Environment Values	49,457	7,543	41,914	6.55	Very High

3.7.28 Figure 3.1 shows the range of sensitivity test BCRs. The Figure demonstrates that the Junction 3 Improvement Scheme offers at least High Value for Money in all scenarios assessed, and that there is a strong cluster of BCR values in the 6.0 – 7.0 range, confirming that the High Value for Money category is robust.

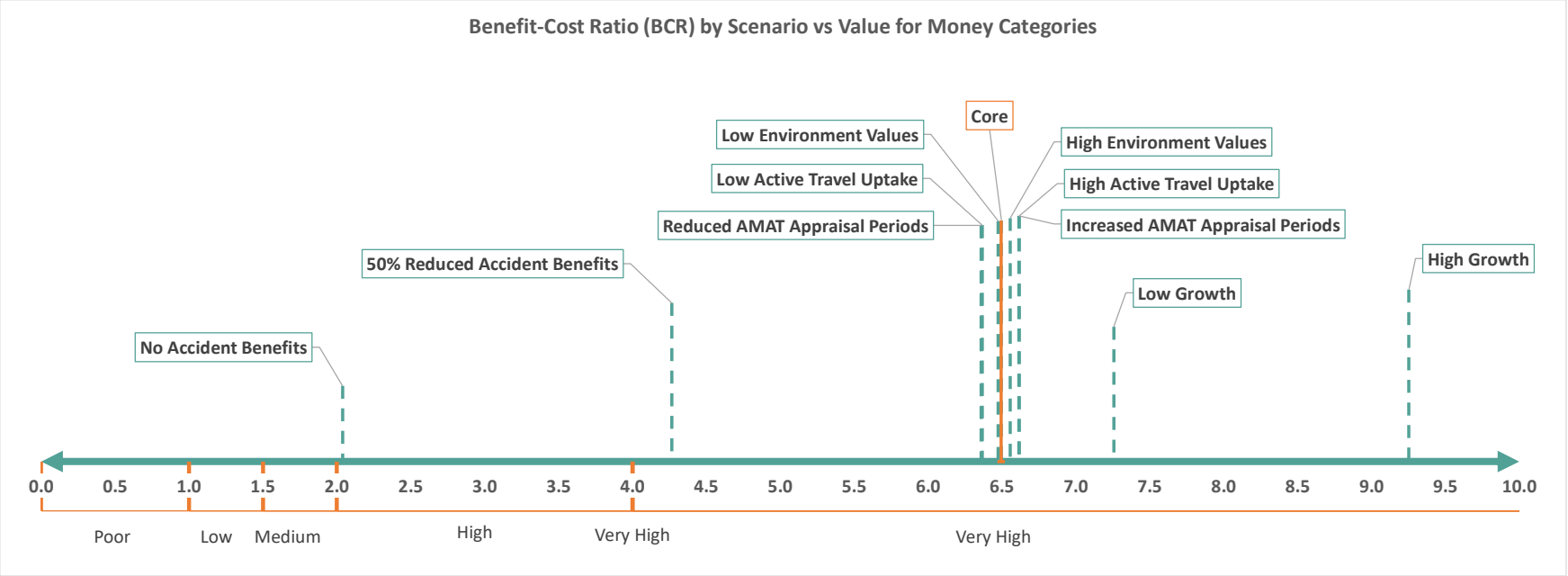


Figure 3.1: Sensitivity Test BCR Ranges

3.8 Distributional Impacts

3.8.1 The quantitative distributional impacts of the package have been considered to understand the variance of transport user benefits across social groups using grading outlined in TAG Unit A4.2 Distributional Impact Appraisal.

3.8.2 The transport user benefits have been assessed against the Income Deprivation domain from the latest English Indices of Multiple Deprivation (IMD 2019), as shown in Table 3.15 below.

Table 3.15: Distributional Impact Appraisal

	Most deprived areas ←			→ Least deprived areas	
Distributional Assessment	0%-20%	20%-40%	40%-60%	60%-80%	80%-100%
Total Benefits (£,000s)	545	905	5,225	-	-
Total Disbenefits (£,000s)	-	-	-	-478	-122
Share of User Benefits	8%	14%	78%	-	-
Share of User Disbenefits	-	-	-	80%	20%
Population	59,233	45,540	35,836	32,873	10,972
Share of Population	32%	25%	19%	18%	6%
Assessment	✔	✔	✔ ✔ ✔	✖✖✖	✖✖✖

3.8.3 The assessment shows that IMD 2019 0-60% most deprived areas in Peterborough benefit from the scheme, whereas the 40% least deprived areas disbenefit from the scheme. The 40% to 60% IMD quintile receives the vast majority (78%) of the transport user benefits, followed by the 20% to 40% quintile.

3.8.4 This assessment demonstrates that the scheme supports the Levelling up agenda by generating benefits for the more deprived areas.

3.9 Additional Qualitative Assessments

3.9.1 Due to the nature of the scheme, the appraisal and Value for Money assessments have primarily focused on monetising the following transport user benefits:

- Reducing Congestion
- Reducing infrastructure maintenance required
- Reducing road accidents
- Improving local air quality
- Reducing noise
- Reducing greenhouse gases
- Reducing risk of premature death
- Reducing absenteeism
- Improving journey ambience
- Reducing journey times for pedestrians and cyclists
- GVA uplift during the scheme's construction phase.

3.9.2 It is anticipated that there will be a number of additional social, distributional, and environmental benefits resulting from the scheme. Consequently, the current scenario PVB is considered to provide a conservative estimate of the overall level of benefit likely to result from the scheme.

3.9.3 As such, a qualitative appraisal of the likely key additional economic, environmental and social benefits has been undertaken.

3.9.4 The impact of a scheme on the environment, which includes landscape, townscape, the historic environment, biodiversity, and the water environment, has been appraised using the following generic steps as outlined in TAG Unit A3:

- Step 1 – Scoping and identification of study area
- Step 2 – Identifying key environmental resources and describing their features
- Step 3 – Appraise environmental capital
- Step 4 – Appraise the proposal's impact
- Step 5 – Determine the overall assessment score.

3.9.5 Social impacts consider the human experience of the transport system and its impact on social factors as stated in TAG Unit A4.1 Social Impact Appraisal, and includes:

- Accidents
- Physical Activity
- Security
- Severance
- Journey Quality
- Option and Non-Use Values
- Accessibility
- Personal Affordability.

3.9.6 The assessment of the impact for each social and environmental resource has been outlined in TAG Worksheets (Appendix E) for qualitative appraisal and the Appraisal Summary Table (Appendix F).

3.9.7 Note that these qualitative assessments have not been included within an Adjusted BCR, and that the scheme BCR and Value for Money statement are based on transport user, accident saving, air quality, noise and active mode appraisal benefits.

Landscape Impacts

3.9.8 Landscape impacts consider both the 'physical and cultural characteristics of the land (its use and management)' and the perception of those characteristics. These characteristics can make a significant contribution to local distinctiveness and community perception of value, providing a 'sense of place'[27].

3.9.9 Peterborough lies within the following five National Character Areas as shown in Figure 3.2, of which Junction 3 lies within Area 88:

- Area 46 – The Fens
- Area 75 – Kesteven Uplands
- Area 88 – Bedfordshire and Cambridgeshire Claylands
- Area 89 – Northamptonshire Vales
- Area 92 – Rockingham Forest

[27] TAG UNIT A3 Environmental Impact Appraisal (publishing.service.gov.uk)

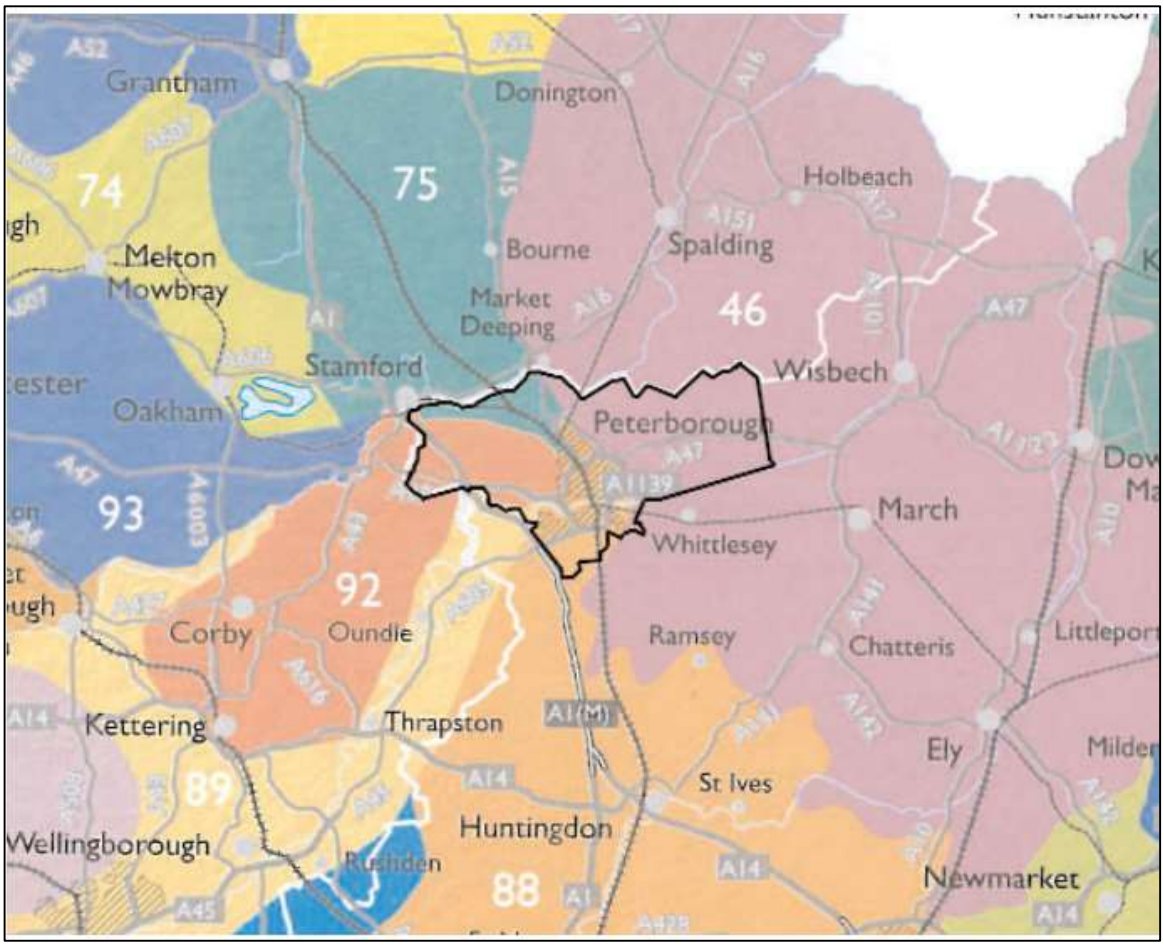


Figure 3.2: National Character Areas

3.9.10 On a smaller scale the Peterborough Landscape Character Assessment (LCA) undertaken in 2007 identified six landscape character areas within the City, as displayed within Figure 3.4 overleaf. The LCA provided guidance on the character and local distinctiveness of the landscape within these areas and assessed the landscape in terms of its sensitivity to change and ability to accept development. The six landscape character areas are[28]:

- Nene Valley
- Nassaburgh Limestone Plateau
- Welland Valley
- Peterborough Fens
- Peterborough Fen Fringe
- South Peterborough Claylands.

[28] Peterborough Local Plan (Adopted version)

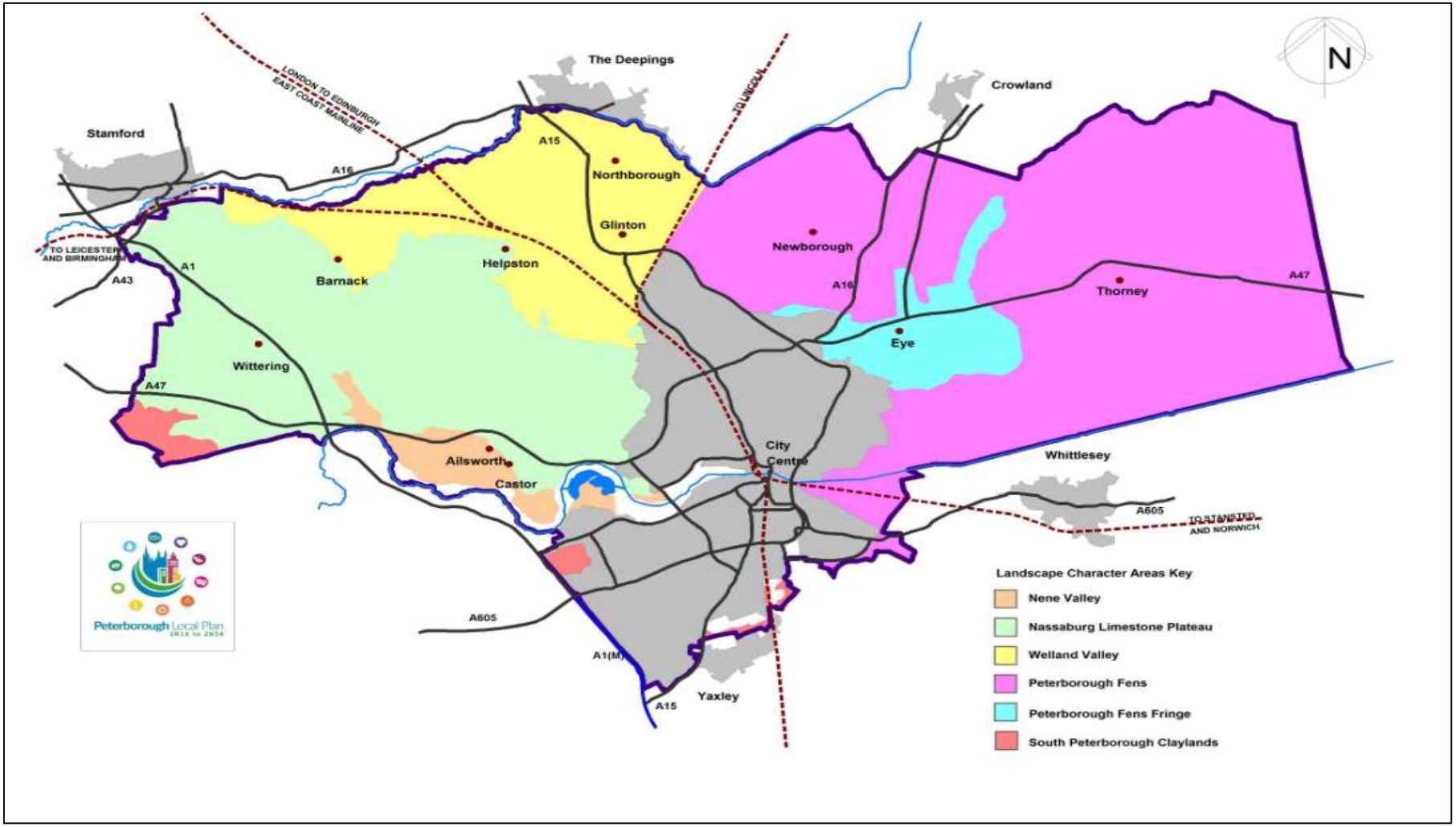


Figure 3.3: Peterborough Landscape Character Areas

3.9.11 Most of the urban area of Peterborough (indicated in grey above), within which Junction 3 is situated, lies on the South Peterborough Claylands. The clays have been a resource for the brick industry, which overtime has mostly disappeared and been replaced by development.

3.9.12 The study area surrounding Junction 3 is located near to residential boundaries of Orton Malborne to the north-west and Hampton Hargate to the south-west, as well as industrial areas to the north-east along Shrewsbury Avenue and commercial areas of The Serpentine Green Shopping Centre to the south.

3.9.13 The grade separated interchange layout is typical of infrastructure found across the City, resulting in the landscape characteristic of the junction being not locally distinctive. Despite this, the landscape surrounding junction 3 does hold local importance in regard to the screening effect on its embankments. This is particularly seen to the north of the junction and along the A1139 Fletton Parkway embankments where linear groups of mature shelterbelts can be found. To the south of the junction more ornamental planting and managed landscaping is present, providing the setting for the shopping centre and surrounding retail outlets.

3.9.14 The trees along the A1139 Fletton Parkway and to the north of Junction 3 typically comprises of a shelterbelt for the residential areas of Orton Malborne and Hampton Vale. These shelterbelts are formed by semi-mature, mass planting of species such as Ash, Sycamore, Field Maple, Cherry, Hawthorn, Hazel and Dogwood trees. These trees provide an important screening function for residential receptors.

3.9.15 Increased exposure of the highways infrastructure from the result of tree loss will likely lead to a perceived increase in noise levels and reduced tranquillity. Options for retaining more trees / vegetation and replacement planting on site are being carefully explored, and other trees and vegetation will be retained in accordance with the Arboricultural Method Statement.

3.9.16 Overall, it is expected that there will be a slight adverse effect on Landscape.

Townscape Impacts

3.9.17 The Junction 3 Improvements have been assessed as having a slight beneficial (positive) impact on the surrounding townscape.

3.9.18 Townscape is the physical and social characteristics of the built and non-built urban environment, as well as the perception of those characteristics. It is the combination of these that make up and contribute to townscape character and ‘sense of place’.

3.9.19 Physical characteristics include development form of buildings, structures, and spaces. Social characteristics are determined by how physical characteristics are used and managed.

3.9.20 The Townscape character of the area is a busy, active and urban highways interchange, to the south of the city centre. There is a presence of significant development within the surrounding area consisting of residential, commercial, and/or light industrial buildings and facilities.

3.9.21 The proposed schemes will retain the essential townscape character of the area whilst promoting active travel by expanding the pedestrian and cycleway network and improving safety and connectivity.

Historic Environment Impacts

3.9.22 The man-made historic environment ('heritage', or heritage resource, heritage assets) comprises of:

- Buildings of architectural or historic significance
- Areas, such as parks, gardens, other designed landscapes or public spaces, remnant historic landscapes and archaeological complexes
- Sites, such as ancient monuments, places with historical associations such as battlefields, preserved evidence of human effects on the landscape, and archaeological sites.

3.9.23 The historic environment includes the sense of identity and place that the combination of buildings, areas and sites provides. Characteristics of the historic environment can contribute to local identity and be representative of an area's distinctiveness. They can be significant within the study area of a scheme as a result of form, rarity, or historical associations, with appreciation of characteristics changing with time.

3.9.24 Listed Buildings and Conservation Areas, and their settings, have statutory protection under the Planning (Listed Buildings and Conservation Areas) Act 1990. A Listed Building may not be demolished, altered, or extended in any manner which would affect its character or setting without Listed Building Consent. There are three grades of listing: • Grade I – buildings of exceptional interest • Grade II* - particularly important buildings of more than special interest • Grade II – buildings of special interest. Conservation Areas manage and protect the special architectural and historic features that make a place unique. Higher building design quality is required to ensure the area can be preserved, and character and appearance improved.

3.9.25 Figure 3.4 show the historic features within a 1km radius of Junction 3.

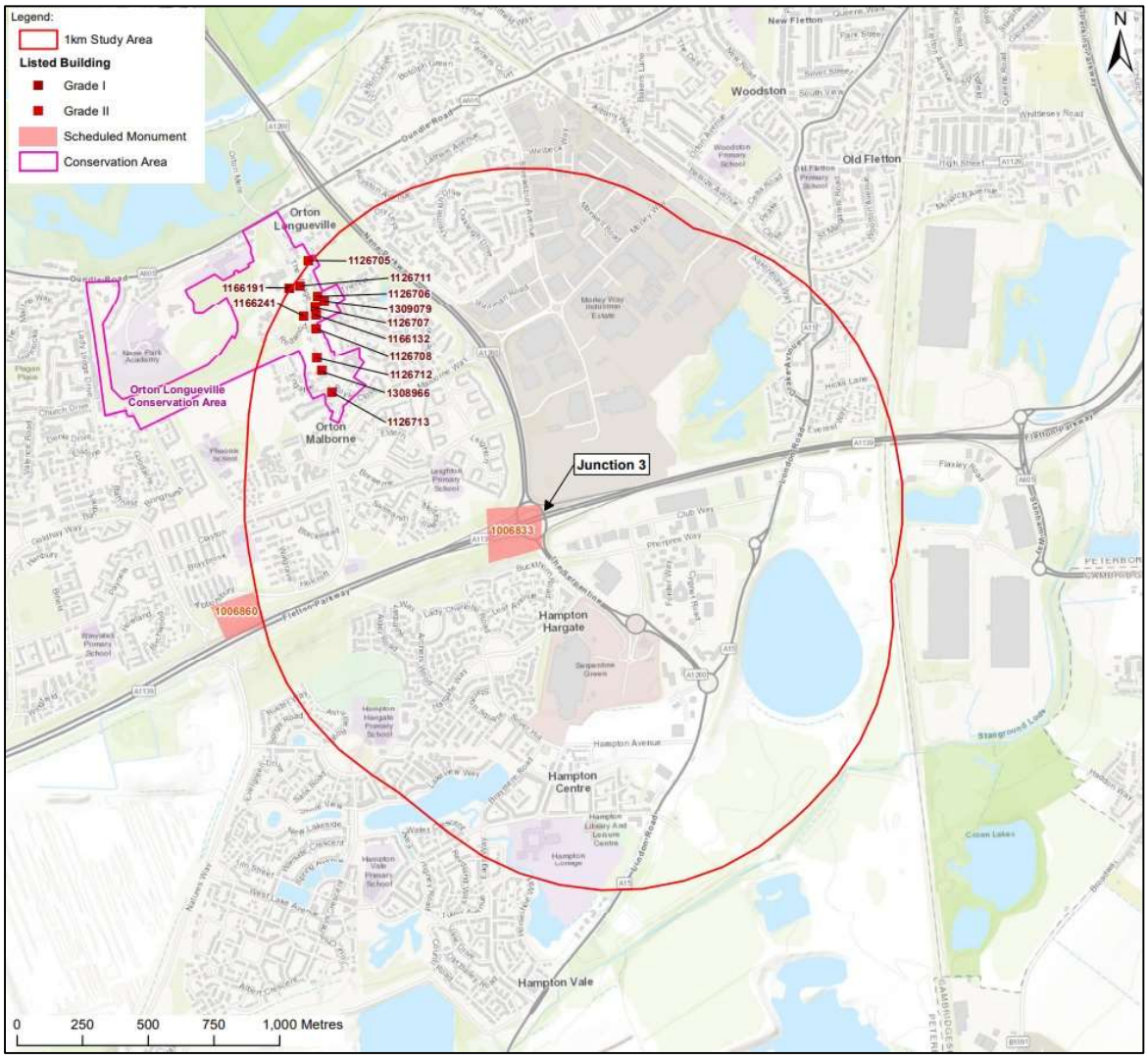


Figure 3.4: Historic Environment Within 1km Radius of Junction 3

3.9.26 As shown above there is one Scheduled Monument (NHLE 1006833), one Conservation Area (Orton Longueville) and 12 Listed Buildings; 11 Grade II and one Grade I within 1km of Junction 3.

3.9.27 The Conservation Area of Orton Longueville was designated in October 1970 and includes the historic core of the village, which holds positive townscape elements, The Grade I Listed Church of the Holy Trinity dates from c.1275 and is considered of high heritage importance due to its architectural and historical interest. These elements, which are detailed further in Table 3.16, are not impacted as a result of the proposed scheme at Junction 3.

Table 3.16: Historic Environment Features within a 1km Radius of Junction 3

List Entry	Name	Grade	Listing Date	Grid Reference
1166191	Church of The Holy Trinity	I	13/12/1957	TL 16826 96516
1126705	1, The Village	II	14/11/1974	TL 16898 96622
1126706	Hall Farmhouse	II	14/11/1974	TL 16934 96483
1126707	Number 5	II	14/11/1974	TL 16925 96444
1126708	Winterfold	II	14/11/1974	TL 16929 96360
1126711	Wall and Gate Piers on East Side of Churchyard of Church of The Holy Trinity	II	24/02/1982	TL 16866 96524
1126712	Hemingdale	II	14/11/1974	TL 16931 96249
1126713	Number 22	II	24/02/1982	TL 16988 96117
1166132	The Orchard	II	14/11/1974	TL 16929 96415
1166241	Number 2, The Village	II	24/02/1982	TL 16882 96408
1308966	Grange Farmhouse	II	24/02/1982	TL 16951 96199
1309079	Barn to South East of No 3 (Hall Farmhouse)	II	14/11/1974	TL 16959 96466

3.9.28 The nearest of these designated heritage assets is the Scheduled Monument NHLE 1006833; a 'Romano-British Settlement SE of Orton Longueville', which is situated directly underneath the western side of current junction's roundabout. This site was scheduled following archaeological excavations undertaken in the 1970's prior to the construction of the parkway. At the time a total of 1.4ha was excavated prior to road construction, however it remains unclear what archaeological remains may have survived within the area following the construction of the parkway. At present the setting of the monument is one of road infrastructure, and no remains of the monument are visible above ground.

3.9.29 The Heritage Impact Appraisal for the scheme concluded that the proposed development would not impact on the setting of the scheduled monument, especially considering that this does not contribute to its heritage significance. Buried archaeological remains associated with the Scheduled monument are not expected to fall within the footprint of the scheme. A Scheduled Monument Consent will need to be obtained for the works regardless due to the proximity of the feature.

3.9.30 Recent Archaeological investigations in the immediate area surrounding the scheme have produced no significant archaeological features or artefacts.

3.9.31 If archaeological remains were to be uncovered onsite within undisturbed pockets of land, a slight adverse impact on the historic environment would be realised, however the impact on such remains will be mitigated against through the implementation of an archaeological programme of work (e.g., watching brief of all new ground disturbance / strip, map and record methodology to be followed). This would be agreed with key PCC stakeholders such as The Council's Archaeologist and Principal Conservation Officer and aligned with the Local Plans LP19 policy and subsequent Archaeology policy statements.

3.9.32 Overall, the impact to the historic environment from the proposed scheme is considered to be a neutral effect. Historic England have been consulted throughout the Detailed Design phase, gaining the necessary consent for constructing within the boundary of the identified Scheduled Monument.

Biodiversity Impacts

3.9.33 The Junction 3 Improvement Schemes have been assessed as having a neutral impact of biodiversity.

3.9.34 TAG appraisal of biodiversity focuses on the effects of transport schemes on biodiversity and earth heritage (geological) interests.

3.9.35 Policy LP28 (Biodiversity and Geological Conservation) of the Peterborough Local Plan states that for:

- International Sites – Proposals having an adverse impact on the integrity of such areas, that cannot be avoided or adequately mitigated to remove any adverse effect, will not be permitted other than in exceptional circumstances. Such circumstances include no suitable alternatives, imperative reasons of overriding public interest, and necessary compensatory provision can be secured
- National Sites – Development proposals within or outside an SSSI, likely to have an adverse effect on an SSSI, will not normally be permitted unless the benefits of the development, at this site, clearly outweigh both the adverse impacts on the features of the site and any adverse impacts on the wider network of SSSIs
- Local Sites – Developments likely to have an adverse effect on locally designated sites will only be permitted where the need and benefits of the development clearly outweigh the loss and the coherence of the local ecological network is maintained
- Habitats and Species of Principal Importance – Where adverse impacts are likely, development will only be permitted where the need for and benefits of the development clearly outweigh these impacts. In such cases, appropriate mitigation or compensatory measures will be required.

3.9.36 Figure 3.5 overleaf highlights the land-based designations within the study area.

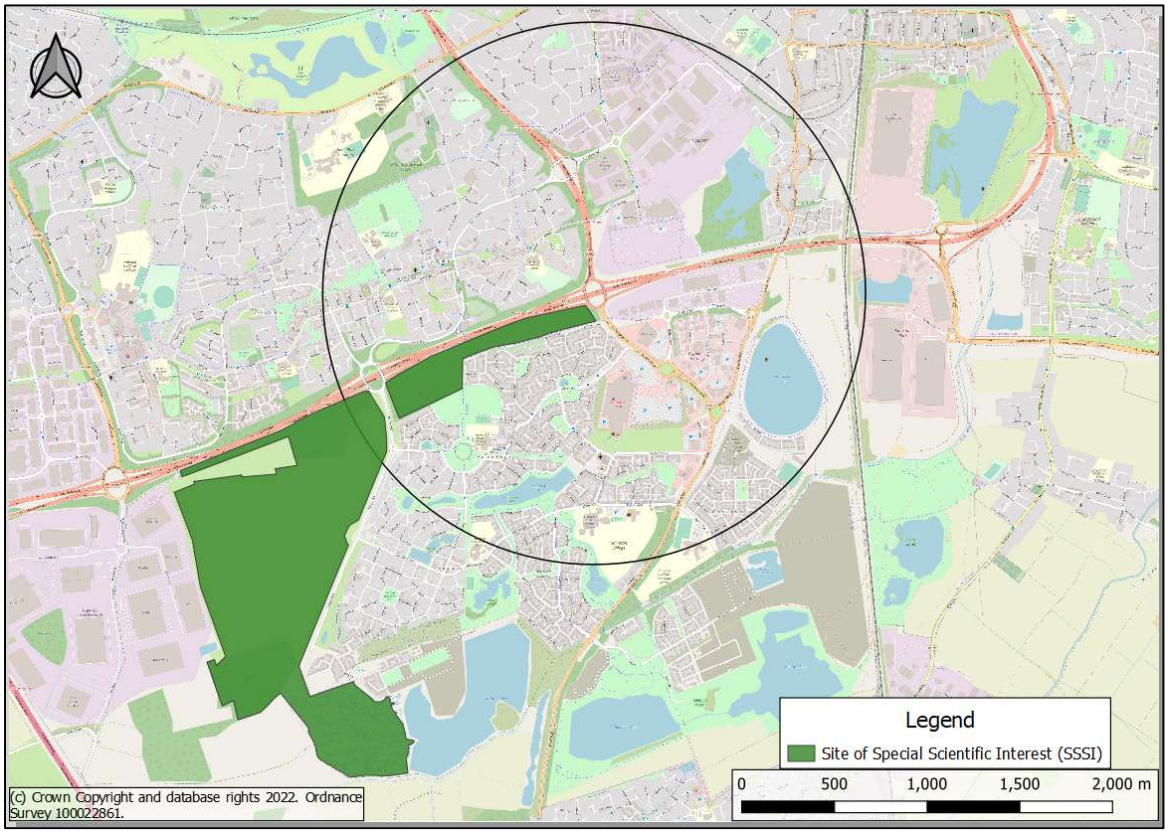


Figure 3.5: Land Based Designations within the Vicinity of Junction 3

3.9.37 Junction 3 lies within an Impact Risk Zone (IRZ) of the Orton Pit Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). The site which spans 141.2ha is comprised of an extensive network of ponds, which occupy the disused linear ridge and furrows, created as a result of the clay extraction in the 1940's – 1990's associated with Peterborough's historic Brick Industry.

3.9.38 This site is afforded protection under the Wildlife and Countryside Act 1981 (schedule 5 and 8), Conservation of Habitats and Species Regulations 2017 (as amended) and the Natural Environment and Rural Communities Act 2006 (NERC), for its extensive population of Great Crested Newts (Triturus Cristatus) (GCN), which is one of the largest populations known in the UK, and its network of meso-eutrophic standing water which support an assemblage of nationally rare and scarce charophyte stonewort plant species.

3.9.39 Given the high status of the population of GCN's in the area, it should also be noted that Junction 3 is positioned within a Red Zone for the protected species, as shown in Figure 3.6 below. This reiterates the importance of the SAC and SSSI on a regional, national and international scale.

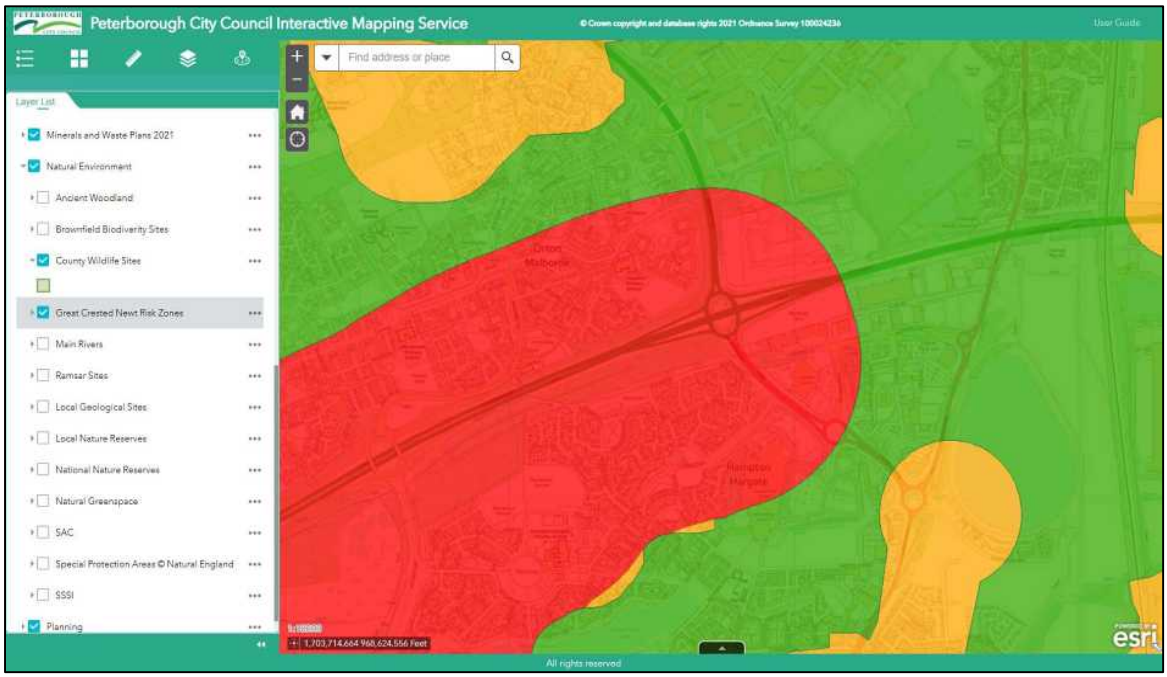


Figure 3.6: Junction 3 Great Crested Newt Risk Zones

3.9.40 Suitable foraging and commuting terrestrial habitats for GCN's have been identified between such waterbodies of the SAC and SSSI and the proposed area of works for the scheme. Consistent engagement with Natural England has been maintained throughout this phase of work, and assent from Natural England will be obtained prior to the start of works.

3.9.41 A Likely Significant Effects (LSE) assessment has been undertaken and concluded there will be no significant effects on the interest features or condition providing suitable Precautionary Methods of Working are implemented.

3.9.42 Alongside biodiversity features mentioned above, habitats within the vicinity of Junction 3 includes amenity grassland (A1139 verges), areas of scattered scrub and tall ruderals, as well as landscape screening planting for the existing parkway network. Ecological surveys undertaken in March 2021 have identified the following findings:

- **The site has negligible potential for hosting bats and badgers:** Suitable trees were assessed however a lack of suitable features (e.g. cracks/crevices) were observed. Despite negligible potential for bats, the potential for light pollution exists during the construction and operational phases of the proposed scheme. In response to this, all lighting that is required for the proposed scheme will be designed in accordance with the relevant British Standards and Institute of Lighting Professionals

- **Tree vegetation is likely to support breeding birds**: Localised areas of existing vegetation were identified to provide food and nesting opportunities for common bird species. It is expected that vegetation supporting breeding birds will be removed to enable the proposed works to be undertaken. To avoid adverse effect on breeding birds any clearance works related to the scheme will be completed outside of the bird breeding season (March-September). Further mitigation will be included within the Construction Environment Management Plan (CEMP)
- **The site has limited potential to host basking and foraging reptiles:** The site has been assessed as providing limited opportunities to support common reptile species. To avoid any potential adverse impact on reptiles if found, works will be programmed during the reptile active season (March-September) and therefore it is considered likely that, should reptiles be present in the area they would move away of their own accord. Should works run outside the active season months, ecological supervision will be introduced for the removal of loose debris/tall ruderals.

3.9.43 Precautionary Methods of Working have been developed with further pre-works checks planned to enable any additional mitigation measures to be implemented as required.

3.9.44 Suitable stakeholder engagement and planning will be undertaken to achieve 20% net gain in biodiversity through on-site and off-site habitat management initiatives, but this will be subject to agreement and suitable provision of land from PCC..

Water Environment Impacts

3.9.45 The Junction 3 Improvement Schemes have been assessed as having a neutral impact on the water environment.

3.9.46 The scheme footprints are generally underlayed by a an unproductive ‘Secondary A’ aquifer which is considered low risk. Groundwater vulnerability is mostly low, with some small pockets of medium-high sensitivity, but this will be managed through standard control measures implemented through the Construction Environmental Management Plan (CEMP).

3.9.47 Although there is potential for existing watercourses and waterbodies to be impacted, these are generally artificial drainage ditches and attenuation ponds with low geomorphological value. Existing water quality within nearby surface water features is generally poor based on current Water Framework Directive (WFD) status.

3.9.48 Pollution prevention measures have been incorporated into the design from an operational perspective and will be implemented through the CEMP during the construction phase.

3.9.49 As shown in Figure 3.7 below Junction 3 is located within a Flood Zone 1; 'an area with low probability of flooding'. This indicates that there is low risk of flooding during both construction and operational phases.

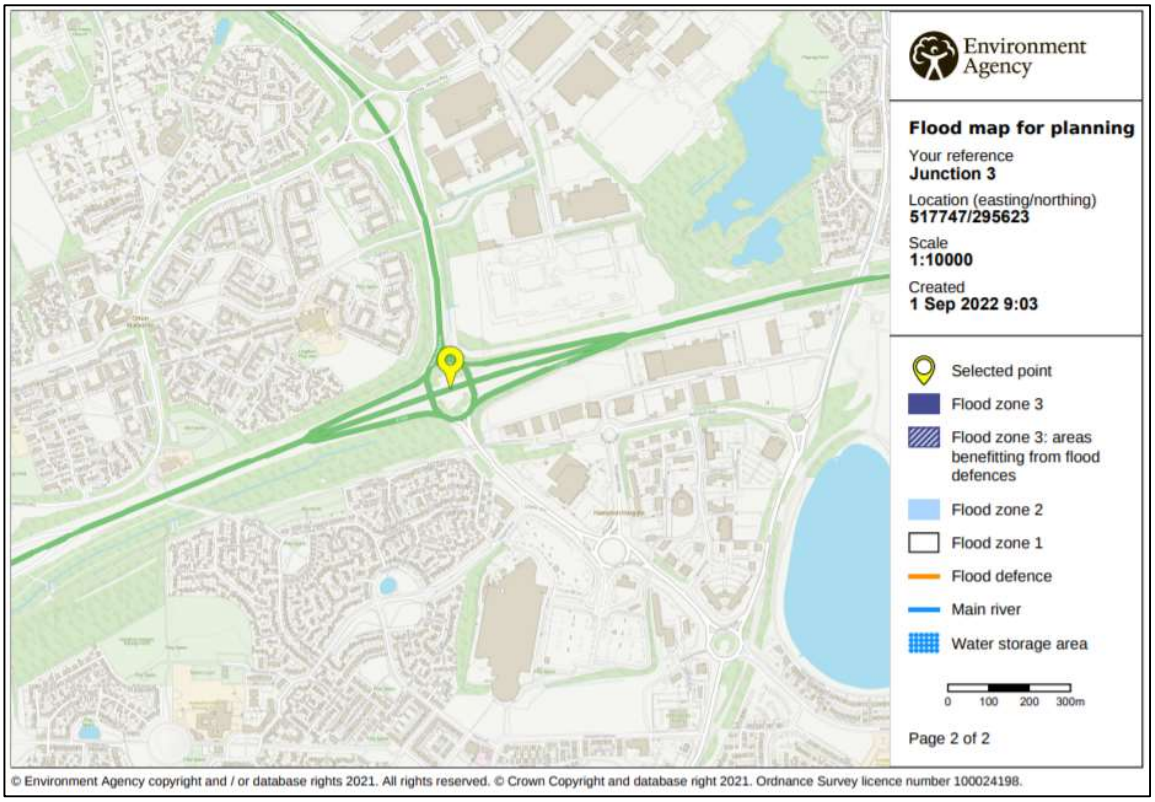


Figure 3.7: Environment Agency Flood Map for Planning

3.9.50 Increased runoff associated with larger areas of hardstanding will be accounted for in the finalised drainage design.

Personal Security Impacts

3.9.51 The Junction 3 Scheme is not expected to have an impact in terms of personal security, and therefore these impacts have not been assessed.

Severance Impacts

3.9.52 Severance impacts consider the separation of residents from facilities and services caused by changes in transport infrastructure or by changes in traffic flows. As stated in TAG Unit A4.1, severance primarily relates to non-motorised modes and in particular pedestrians.

3.9.53 Severance is classified as follows:

- **None:** Little or no hindrance to pedestrian movement
- **Slight:** All people wishing to make pedestrian movements will be able to do so, but there will probably be some hindrance to movement
- **Moderate:** Pedestrian journeys will be longer or less attractive; some people are likely to be dissuaded from making some journeys on foot.
- **Severe:** People are likely to be deterred from making pedestrian journeys to an extent sufficient to induce a reorganisation of their activities. In some cases, this could lead to a change in the location of centres of activity or to a permanent loss of access to certain facilities for a particular community. Those who make journeys on foot will experience considerable hindrance.

3.9.54 The Junction 3 improvement scheme is not expected to worsen the severance already posed by the A1139 Fletton Parkway.

3.9.55 The active mode improvements at Shrewsbury Avenue, Malborne Way and Phorpres Way will help reduce severance as they improve routes and provide new footway surfaces leading to the existing overbridge and underpass.

Accessibility Impacts

3.9.56 Accessibility impacts relate to the range of opportunities and choices people have in connecting with jobs, services, and friends and family. Access depends on where people live, where services are located, and the availability of home delivery of goods and services. It can also relate to the availability and affordability of transport, with journeys that are time and cost appropriate.

3.9.57 The scheme is expected to have a slight beneficial impact on access to the transport system of the study area, as a number of bus stops are located in close proximity to active travel schemes (such as Phorpres Way).

3.9.58 Further information regarding the categories included within the qualitative assessment is provided within the EIA report found in Appendix G and the Ecological Survey Report found in Appendix H.

3.10 Summary of Benefits and Costs

3.10.1 The Junction 3 Improvement Scheme has a Present Value of Cost of £7,543,000 and a Present Value of Benefit of £48,991,640 resulting in a Net Present Value of £41,448,640 and a BCR of 6.49 offering Very High Value for Money.

3.10.2 Sensitivity testing has demonstrated that the scheme would still offer Very High Value for Money in most eventualities, although removing potential accident benefits could see the scheme move into the “High” Value for Money category.

4. Financial Dimension

4.1 Introduction

4.1.1 The Financial Dimension concentrates on the affordability of the proposed scheme, its funding arrangements and technical accounting issues.

4.2 Scheme Costs

4.2.1 The scheme cost estimates for the Financial Dimension have been prepared in line with guidance set out in TAG Unit A1.2 Scheme Costs (DfT, May 2022). Each of the steps taken to produce the cost estimates are explained within this chapter.

4.2.2 The schemes have been target costed through the Peterborough Highway Services (PHS) contract based on the design pack, construction schedule and full bill of quantities. The estimate includes a risk allowance and inflation, as well as non construciton related costs associated with scheme delivery, such as project management, landscaping and legal costs. The scheme cost estiamte was preapred in November 2022.

4.2.3 Note that project costs incurred to date have been omitted from the costs presented beneath as “sunk costs” in line with TAG guidance.

4.2.4 The cost profile used within this FBC is based upon the milestone activities set out in the Management Dimension (Chapter 6), and the dates used to calculate the scheme cost, including the application of inflation, are shown in Table 4.1 overleaf.

Table 4.1: Implementation Timeline

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Malborne Way Footpath and Shrewsbury Avenue Cycleway)
November 2022	Construction commences on the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes. Advance works begin for construction of the Junction 3 Highway and Phorpres Way schemes, including vegetation clearance and STATS diversions.
March 2023	Mobilisation and Compound set up.
April 2023	Construction starts on the Junction 3 Highway and Phorpres Way schemes.
March 2024	Construction finishes on the Junction 3 Highway and Phorpres Way schemes, and demobilisation.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

4.2.5 Note that the CPCA authorised the early release of construction funding for the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes. This was to bring as much of the Transforming Cities Funding (TCF) spend as possible into the 2022 / 23 financial year to reduce the amount of construction required in the 2023 / 24 financial year, thereby reducing the risk of scheme delays jeopardising the availability of approved funding as TCF funding is time limited and must be spent by the end of the 2023 / 24 Financial Year.

4.2.6 The decision to release a portion of the scheme construction costs early was supported by a value for money assessment undertaken in August 2022. The purpose of this assessment was to demonstrate that the two accelerated schemes (Malborne Way Footpath and Shrewsbury Avenue Cycleway), would still offer value for money should the rest of the Junction 3 scheme fail to be delivered. This assessment is included in Appendix I for reference.

4.2.7 Although delivery of these two schemes has been accelerated, they still form part of the Junction 3 Improvement Scheme, and have been treated as such within this FBC. This Financial Case presents the scheme costs for the package as a whole (including those schemes identified for early delivery) to present a full picture of the costs, but these schemes are omitted from the funding request having already been approved at an earlier CPCA Board Meeting.

4.3 Scheme Cost Estimate

4.3.1 Each of the scheme cost estimates presented within the Financial Dimension are shown in Table 4.2 beneath and explained in further detail within this chapter.

Table 4.2: Financial Dimension Scheme Cost Estimate

Description of Cost Type	Cost (£) Total
Base Investment Cost	9,380,364
Risk Adjusted Base Cost	10,215,019
Risk Adjusted Base Cost with Construction Industry Inflation (**Outturn Cost**)	**11,511,312**
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	13,886,945

4.3.2 Note that the costs calculated for use within the Economic Assessment are presented in the Economic Dimension (Chapter 3).

4.3.3 A full 60-year schedule showing how the costs have been calculated is presented in Appendix J.

Base Investment Cost

4.3.4 The Base Investment Cost is the capital cost required to construct the scheme in current year (2022) prices, before the application of risk or inflation. This is the scheme cost estimate based on Detailed Designs and built from the bill of quantities and construction programme. The Base Investment Cost has been informed by a target costing exercise, and supply chain contractors have reviewed the design information and provided input into the costing exercise.

4.3.5 Table 4.3 shows the Base Investment Cost broken down into Construction, Land, Design, Supervision, and 'Other' costs.

Table 4.3: Base Investment Cost (2022 Prices)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Total Base Investment Cost (£)
2022	114,958		35,459		150,418
2023	5,249,195		1,026,812	518,727	6,794,734
2024	1,882,229		348,460	194,523	2,425,212
2025			10,000		10,000
Total	**7,246,383**		**1,420,731**	**713,249**	**9,380,364**

4.3.6 The scheme Base Investment Cost is £9,380,364, this includes £7,246,282 of Construction related costs, £1,430,731 of Preparation and Supervision costs and £713,249 of Other costs.

4.3.7 The Preparation costs relate to the remaining design tasks associated with pre-construction works (such as procuring TTROs and environmental permits) and design support throughout the construction phase. The Supervision costs include site supervision during mobilisation, construction, and demobilisation, as well as environmental and archaeological monitoring throughout the programme.

4.3.8 The 'Other' costs relate to procurement and post scheme monitoring. An allowance of £10,000 has been made in 2025 for post scheme monitoring which is due to be undertaken at one and five year intervals following completion of the scheme in 2024. Further details of the post scheme monitoring are provided in the Monitoring and Evaluation Plan detailed in the Management Dimension (Chapter 6).

4.3.9 There are no 'land or property' costs associated with this scheme.

4.3.10 A breakdown of the Base Investment Cost by individual scheme is shown in Table 4.4. overleaf.

Table 4.4: Base Investment Cost (2022 Prices) by Scheme

Scheme		Construction	Supervision	Land	Design	Other	Scheme Total
1	Junction 3 Highway Scheme	£ 5,860,408	£ 800,730	£ -	£ 232,696	£ 611,326	**£ 7,505,159**
2	Phorpes Way	£ 1,041,100	£ 138,711	£ -	£ 142,217	£ 101,923	**£ 1,423,952**
3	Malborne Way Footpath	£ 154,780	£ -	£ -	£ 72,524	£ -	**£ 227,305**
4	Shrewsbury Avenue Cycleway	£ 190,095	£ -	£ -	£ 33,853	£ -	**£ 223,948**
Total		**£ 7,246,383**	**£ 939,441**	**£ -**	**£ 481,290**	**£ 713,249**	**£ 9,380,364**

Risk Adjusted Base Cost

4.3.11 The Risk Adjusted Base Cost takes the Base Investment Cost and adds the risk allowance. The following risk allowances have been included within the scheme costs.

- Contractor's Risk Provision (3%) of construction cost: of for standard contracting risks such as inclement weather and plant failure.
- Budget Detail Contingency (3.5%) of construction cost: for incidental costs not covered by the core bill of quantities.
- Design Development Contingency (3.5%) of construction cost: for alterations to the design or scope at later phases of the project.
- Employer's Risk: based on experience of similar recent schemes. This equates to 2% of the construction cost.

4.3.12 The total risk allowance equates to 10% of the construction costs, or 8% of the total project costs.

4.3.13 Table 4.5 below shows Risk Adjusted Base Cost. The application of risk has been profiled to match the construction programme.

Table 4.5: Risk Adjusted Base Cost (2022 Prices)

Calendar Year	Construction Costs (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Other Costs (£)	Risk Allowance (£)	Risk Adjusted Base Cost (£)
2022	114,958		35,459		22,578	**172,996**
2023	5,249,195		1,026,812	518,727	602,917	**7,397,651**
2024	1,882,229		348,460	194,523	209,160	**2,634,372**
2025			10,000			**10,000**
Total	**7,246,383**		**1,420,731**	**713,249**	**834,655**	**10,215,019**

4.3.14 The addition of the risk allowance takes the Risk Adjusted Base Cost to £10,215,019. The risk allocation by scheme is shown in Table 4.6 beneath.

Table 4.6: Risk Adjusted Base Cost (2022 Prices) by Scheme

Scheme		Risk Allocation	
1	Junction 3 Highway Scheme	£	642,404
2	Phorpes Way	£	124,516
3	Malborne Way Footpath	£	35,724
4	Shrewsbury Avenue Cycleway	£	32,011
Total		**£**	**834,655**

Inflated Risk Adjusted Cost (Outturn Cost)

4.3.15 The Inflated Risk Adjusted Cost, or Outturn Cost, is the Risk Adjusted Base Cost with inflation applied (real cost increases). The real cost increase value is calculated in line with TAG Unit A1.2 (May 2022) as follows:

Construction Industry Inflation / Annual GDP Factor

4.3.16 The Annual GDP Factor has been derived from the latest TAG Databook (May 2022).

4.3.17 This construction industry inflation has been calculated using forecast indices from the BCIS General Civil Engineering Cost Index (October 2022). An inflation rate of 10% has been used for calculating the Inflated Risk Adjusted Base Cost for the years 2022 – 2024, and then a reduced rate of 5%[29] has been applied to all costs incurred from 2025 onwards (applying to maintenance costs in the Economic Assessment).

4.3.18 Inflation has been applied in line with the profile shown in the Management Dimension (Chapter 6) and the cost of this is presented in Table 4.7 below.

Table 4.7: Inflated Risk Adjusted Base Cost (2022 Prices)

Calendar Year	Risk Adjusted Base Cost (£)	Cost of Inflation (£)	Total with Inflation (£)
2022	172,996		172,996
2023	7,397,651	739,765.08	8,137,416
2024	2,634,372	553,218.16	3,187,590
2025	10,000	3,310.00	13,310
Total	**10,215,019**	**1,296,293**	**11,511,312**

4.3.19 The cost of inflation is £1,296,293 which is accrued between 2023 and 2025, by when all investment costs have been incurred. The application of inflation brings the Scheme Outturn Cost to £11,511,312. The Outturn Cost represents the amount required by PCC to deliver the scheme.

4.3.20 Note that £518,988 of the Outturn Cost was approved for release at the CPCA Board Meeting on October 19th 2022[30], and therefore the remaining Outturn Cost required is £10,992,324.

[29] Turner & Townsend raises inflation forecast to 8.5% (theconstructionindex.co.uk)

Inflated Risk Adjusted Cost Including Whole Life Costs

4.3.21 Maintenance costs have also been calculated within the 60-year assessment period taking account of inflation. Maintenance costs have been applied from 2034 onwards (ten years after construction completion) which is considered the point at which meaningful maintenance measures would be required.

4.3.22 Maintenance costs have been included for the introduction of additional traffic signals at Junction 3 (on both A1260 approaches), as well as the additional carriageway added for the increased number of lanes on these apparoaches. Maintenance costs have also been incldued for the additional footpath and cycleway associated with the Malborne Way and Shrewsbury Avenue active travel schemes.

4.3.23 A maintenance cost of £78,472 applied every fifteen years has been assumed based on recent traffic signal and highway maintenance costs. These costs have been applied at fifteen year intervals for the years 2034 to 2084.

4.3.24 A breakdown of the maintenance costs by asset type is provided in Table 4.8 beneath.

Table 4.8: Maintenance Costs by Asset Type (2022 Prices)

Asset	Maintenance Cost	Interval
Traffic Signals	£ 50,000	15 Years
Additional C/way	£ 21,354	15 Years
Additional F/path	£ 7,118	15 Years
Total	**£ 78,472**	15 Years

4.3.25 The build-up of maintenance costs is shown in Table 4.9 below.

Table 4.9: Calculation of Annual Maintenance Costs

Whole Life Maintenance Costs	Cost (£)
Maintenance Cost per year	78,472
Maintenance Cost for 60 Assessment Period (without inflation)	313,888
Maintenance Cost for 60 Assessment Period (with inflation)	2,375,633

4.3.26 Table 4.10 below shows the total Inflated Risk Adjusted Cost Including Whole Life Costs.

Table 4.10: Inflated Risk Adjusted Cost Including Whole Life Costs

Inflated Risk Adjusted Cost Including Whole Life Costs	Calendar Years of Cost	Cost (£)
Risk Adjusted Base Cost with Construction Industry Inflation **(Outturn Cost)**	2022 - 2025	11,511,312
Inflated Whole Life Costs	2026 - 2085	2,375,633
Inflated Risk Adjusted Cost Including Whole Life Costs	2022 - 2085	13,886,945

4.3.27 The Inflated Risk Adjusted Cost Including Whole Life Costs over the 60-year assessment period is £13,886,945. Note that only the Outturn Cost is required to deliver the scheme, which is £11,511,312, of which £518,988 has already been approved.

4.3.28 A full cost schedule for the assessment period (2022 – 2085) which shows how the costs have been calculated is presented in Appendix J.

4.4 Budgets and Funding Cover

Developer S106 Contribution

4.4.1 A developer contribution of £50,000 has been secured from a recently approved planning application for the nearby former MARS Petcare Site. The contribution was secured to help deliver the Junction 3 Improvement Schemes, including the active travel improvements to the Shrewsbury Avenue Cycleway. Details on the agreement can be found on Peterborough City Council's online planning portal under planning reference 21/01772/FUL[31].

CPCA Allocation

4.4.2 The CPCA have an infrastructure delivery budget of £20 million per year, allocated for the period 2017 to 2047. This funding is held within the CPCA's Single Investment Fund and is invested to boost growth within the region. This funding pot is then supplemented by further capital budgets.

4.4.3 PCC request the remaining Outturn cost of £10,942,324 to be funded through the CPCA Single Investment Fund using the authority's Transforming Cities Funding (TCF). This is in addition to the £518,988 that was approved for early release in October 2022.

4.4.4 A budget has already been allocated in the CPCA's Medium Term Financial Strategy (MTFS) subject to approval of this FBC.

[31] https://planpa.peterborough.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=R2ANPDML04U00

4.4.5 The TCF funding is time limited, and construction must begin in the 2022 / 2023 financial year and be complete by the of the 2023 / 2024 financial year (31st March 2024) to satisfy the funding requitements. The construciton programme for the Junction 3 Improvment Scheme has been developed to fit within this timeframe. There are not known to be any other financial constraints associated with the funding.

Funding Breakdown

4.4.6 The funding breakdown by year and funding source is shown in Table 4.11 beneath.

Table 4.11: Funding Profile by Source

Funding Source	2022 / 23	2023 / 24	Total
Developer S106 Contribution	£ -	£ 50,000	£ 50,000
CPCA TCF Allocation	£ 518,988	£ 10,942,324	£ 11,461,312
Total	£ 518,988	£ 10,992,324	£ 11,511,312

4.4.7 The value in the 2022 / 23 financial year (shown in grey) has already been approved and released for construction. This is to cover the cost of the active travel schemes being constructed in the current financial year.

4.4.8 Therefore, this Full Business Case requests the release of the remaining CPCA allocation of £10,992,324 to enable delivery of the Junction 3 Improvement Schemes.

5. Commercial Dimension

5.1 Introduction

5.1.1 This chapter demonstrates the commercial viability of the scheme, outlining the procurement strategy and how the scheme can be reliability implemented through existing channels whilst ensuring value for money in its delivery.

5.2 Output Based Specification

5.2.1 The final scheme design has been produced following stakeholder engagement and Detailed Design. Delivery of the scheme will include the following outputs:

- Create a third southbound lane on Nene Parkway from Junction 31 to Junction 3.
- Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a third lane.
- Signalisation of the A1260 Nene Parkway approach to Junction 3, with a 4-lane approach.
- Signalisation of the A1260 The Serpentine approach to Junction 3, with a 4-lane approach.
- Create a third lane on the A1260 The Serpentine northbound approach, extending approximately 200 metres back from Junction 3.
- Addition of 220m of new footpath between Saltmarsh and the Phoenix School.
- Upgrading the Phorpres Way footpath (southern side) to current LNT 1/20 design standards, accompanied by several crossing points at Phorpres Close, Club Way and Cygnet Road.
- Upgrading the Cycleway for approximately 450m between Shrewsbury Avenue and the gated access of the Nature Reserve.

5.2.2 General arrangement drawings for these schemes are included in Appendix C.

5.2.3 As well as the scheme outputs, delivery of the scheme will also ensure that the primary scheme objectives outlined in the Strategic Dimension are realised, including.

1. Outcome 1: Reduced delay at Junction 3.

   Objective 1: Tackle congestion and improve journey times.

2. Outcome 2: Planned employment growth at Hampton continues to be accommodated.

   Objective 2: Support Peterborough's growth agenda.

3. Outcome 3: A 20% biodiversity net gain is provided within the study area.

   Objective 3: Protect and improve biodiversity.

4. Outcome 4: Improved active travel provision, and a reduction in car dependence for trips within the Junction 3 Study area.

   Objective 4: Improve active travel routes to provide a viable alternative to private car travel.

5. Outcome 5: A reduction in personal injury accidents.

   Objective 5: Improve road safety.

5.2.4 Details of how the scheme will be measured against these objectives are provided in the Scheme Evaluation Plan (Appendix K) as discussed within the Management Dimension.

5.2.5 In order to deliver the above scheme outcomes, the procurement strategy will be required to deliver the following outputs:

- **Cost certainty:** Achieve cost certainty, ensuring the Junction 3 improvements can be delivered within the agreed budget.
- **Programme Certainty:** Deliver the schemes on programme to ensure that the scheme is operational by April 2024, ensuring that the funding obligations are met.
- **Quality:** Ensure an appropriate level of quality in the final scheme delivery, matching the scheme promoters' expectations and the user's needs.
- **Continuity of Knowledge:** Maintain project knowledge to support scheme construction and the successful rebuttal of any project challenge. Scheme knowledge generated through the FBC development is an asset and will help enhance the quality of delivery and achievement of programme.

5.3 Procurement Strategy

5.3.1 Delivery and supervision of the Junction 3 Improvement Schemes will be delivered in house by Peterborough Highway Services (PHS), building upon the development and design work that has been undertaken to date.

5.3.2 PHS is a ten-year NEC3 Term Service Contract between Peterborough City Council and Milestone Infrastructure, with responsibility for improving and maintaining Peterborough's highway network. The collaboration began in 2013 and runs until 2028.

5.3.3 The contract is built upon a collaborative and multi-disciplined team capable of developing schemes from policy concept right through to design and construction, and then maintaining them.

5.3.4 The existing subcontractor supply chain is appropriate for undertaking the work associated with the Junction 3 Improvement Schemes, which will be delivered within the contract's lifespan (before 2028).

5.3.5 Procuring the scheme directly through the PHS contract enables PCC to appoint a contractor to construct the scheme (Milestone Infrastructure) in an efficient manner. Using PHS' in-house delivery capability offers the following benefits over alternative procurement routes:

- PHS is reliable and has a **proven track record** of delivering major schemes successfully, and this serves as a positive indicator of future performance.
- The scheme can be procured **far quicker** than would be the case with alternative procurement routes. As well as reducing the procurement costs for the procuring authority, the project benefits will be realised sooner.
- The integrated delivery model creates **a single point of responsibility** and encourages more **effective collaboration** between client, designer, and contractor to reduce costs. As the scheme has been identified, planned, and designed within PHS, continuity can be assured through to construction, and any issues identified on site can be quickly resolved by the design team.
- A well-established supply chain is already in place which provides **Value for Money**. All subcontract packages will be competitively tendered to ensure best value and will be put to a minimum of three tenderers where possible.
- Strong performance is **highly incentivised** as all schemes delivered within the PHS contract contribute to a suite of KPIs which impacts on the term of the contract. Consistent good performance is rewarded with contract term extensions whereas consistently poor performance would see a reduction in the contract term.
- The contract duration and **strong collaborative relationship** encourages both parties to work towards long term gain rather than short term commercial gain.

5.3.6 There are also risks associated with using the PHS contract for delivery, including:

- **Price comparisons cannot be made at a scheme level:** although direct price comparisons cannot be made on individual basis at the scheme delivery level, all work packages within the scheme will be competitively tendered to sub-contractors, ensuring value for money and allowing for price comparisons to be made at a work package level.
- **Different approaches to delivery and risk are not available:** the delivery and risk models are fixed by the contract, meaning that there is no scope to vary these within the context of the PHS contract. However, these models have been used successfully on previous schemes delivered by PHS and all involved are familiar and comfortable operating with them, making scheme delivery more efficient.

5.3.7 On balance, it is considered that the benefits of delivering the schemes through the PHS contract significantly outweigh the risks associated with it.

5.4 Market Maturity

5.4.1 PHS has successfully developed and delivered multiple highway schemes around Peterborough since the beginning of the contract in 2013, including several CPCA schemes. PHS has been responsible for all planning and design work undertaken on the Junction 3 Improvement Schemes to date. All skills and competencies to deliver this scheme are available within the PHS contract, and its established supply chain.

5.4.2 To ensure that the procurement remains commercial, competitive and offers value for money, all subcontract packages will be subject to competitive tendering.

5.4.3 Schemes of a similar value and nature have been successfully procured through PHS in recent years, demonstrating that the local supply chain have the capability and capacity to deliver these works. Some examples of these schemes include:

- Junction 15 Improvement Scheme (£8.1m - 2022) - a highway improvement scheme along Peterborough's Parkway network adding a third lane between Junction 33 and Junction 15, along with associated active travel and environmental improvements.
- A605 Pondersbridge (£5.5m - 2020) – a highway improvement scheme along the A605 connecting Peterborough to the Market Town of Whittlesey which provided additional capacity and reduced an acute congestion hotspot.

5.5 Sourcing Options

5.5.1 The scheme will be delivered by PHS, using sub-contractors to assist with the delivery of the scheme.

5.5.2 A pool of pre-qualified sub-contractors for the provision of key work streams will be selected based on a considered selection criteria including:

- Technical Competence
- Financial Health
- Robustness of HSEQ Management and Risk Management Systems
- Previous Performance
- Ethical Standards
- Collaborative Behaviours
- Commitment to Inclusion
- Diversity and Equality
- Commitment to Community Investment and Social Value.

5.5.3 Supply chain partners are regularly reviewed, including through the undertaking of joint KPI performance reviews, to ensure that PHS has the right supply chain in place to provide healthy competition and delivery resilience for our forward pipeline of work.

5.5.4 For larger projects, such as the Junction 3 Improvement Scheme, individual packages of work are competitively tendered, and quotations are obtained from a minimum of 3 sub-contractors. These quotations are then subjected to a structured tender adjudication with a balanced assessment including, but not limited to, cost, programme, quality, experience and performance to inform selection.

5.5.5 Sub-contracts are let on a NEC Framework contract and individual packages of work awarded under Task Orders, with the use of sub-contractors must be approved prior to appointment.

5.5.6 This process has been used on a number of CPCA funded major transport projects over recent years in Peterborough, including the Junction 15 Scheme which is currently under construction, and has enabled schemes to de delivered successfully and to a high standard. Crucially, management and supervision of the construction works by PHS staff will provide consistency with earlier phases of the project as the Major Projects team (responsible for construction) have been actively involved in the project since the Preliminary Design phase and fully understand the scheme objectives and required outputs.

5.6 Contract and Payment Mechanisms

5.6.1 The scheme will be procured through the existing PHS NEC3 contract. The NEC is an industry-leading suite of contracts which is widely used in the construction sector. The benefits of the NEC3 contract are:

- It provides a stimulus to good project management
- It promotes collaborative working between partners
- It is relatively easy to use
- It provides flexibility.

5.6.2 The following Payment Mechanisms associated with the NEC3 contract will be used:

- Option A (Schedule of Rates) will be used for the completion of the Full Business Case and Detailed Design
- Option C (Target Cost) will be used for construction of the scheme. This incentivises both parties (PCC and M Group Services) to work together to reduce cost through a pain / gain mechanism, which is tapered to ensure that neither party experiences excessive pain nor gain.

5.6.3 Under these commercial arrangements, payment would be monthly based on work done to date. In the case of Option C, closure of the final account would include the proportioning of any pain / gain amount.

5.7 Pricing Framework / Charging Mechanisms

5.7.1 Under the NEC3 contract framework there are performance based KPI's that Milestone Infrastructure are required to achieve. If work is priced as a Target Cost, savings generated from the contract are shared using the contract pain / gain mechanism. All changes to projects (including Risk) are recorded, monitored and communicated promptly using the contractual procedures in place.

5.7.2 Under the operation of Milestone Infrastructure's fully transparent 'Open Book System', all incurred costs and supporting information such as invoices and applications associated with projects, are validated, and presented to the client for review on a monthly basis. All costs are periodically audited, and no cost is processed to PCC unless it is genuine and not a disallowable cost. Forecast end costs and programmes are also updated periodically, typically monthly, in order to ensure PCC remain informed of the latest final forecast spend and completion date.

5.7.3 Milestone Infrastructure have been actively involved in value engineering throughout the design phases and are fully committed to delivering best value to the client and end users.

5.8 Risk Allocation and Management

5.8.1 Because the PHS contract is already established there is limited opportunity to modify the allocation of risk, however the contract does include inherent features that encourage effective risk management and mitigation, such as:

- Each party is required notify each other of any matter which could affect the cost, completion, progress or quality of the project through Early Warning Notices. This is to promote early intervention which could reduce the impact of any potential risk.
- In the case of Option C (Target Price) both parties are incentivised to reduced cost through the pain / gain mechanism.

5.8.2 The above will also be supplemented with good project management practices during the delivery of the scheme. Both parties will maintain a shared Risk Register (Appendix A), which will be reviewed regularly at project progress meetings. Further details on the management of risk are provided in the Management Dimension.

5.8.3 Detail about the allocation of project risk between the CPCA and PCC, and the responsibilities for managing this, can be found within Chapter 6 of the CPCA's Assurance Framework[32]

5.8.4 However, in summary, risk is allocated to the CPCA by default, but the CPCA reserve the right to reallocate this risk to PCC in the event that the risk has not been managed appropriately. The signed Funding Agreement, and Project Initiation Document, will be used to determine whether PCC has managed the project risk appropriately, and therefore where the risk should be allocated.

[32] https://cambridgeshirepeterborough-ca.gov.uk/wp-content/uploads/documents/combined-authority-board/committee-papers-and-minutes/Cambridgeshire-and-Peterborough-Combined-Authority-Assurance-Frameworkv3final-002.pdf

5.9 Contract Length

5.9.1 The PHS contract runs until 2028 and has the relevant skills and competencies to deliver the Junction 3 Improvement Schemes, which will be fully completed within the lifespan of the contract.

5.9.2 The construction programme spans between November 2022 (advanced construction of the active travel schemes) through to March 2024. Construction of the active travel schemes is expected to be complete by April 2023. Construction Programmes for the two schemes due to be built in the 2023 / 2024 financial year are included in Appendix L.

5.9.3 An overview of the project timescales is provided in Table 5.1 beneath. Note that timescales for construction assume CPCA approval and the availability of funding.

Table 5.1: Project Implementation Timescales

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Malborne Way Footpath and Shrewsbury Avenue Cycleway)
November 2022	Construction commences on the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes. Advance works begin for construction of the Junction 3 Highway and Phorpres Way schemes, including vegetation clearance and STATS diversions.
March 2023	Mobilisation and Compound set up.
April 2023	Construction starts on the Junction 3 Highway and Phorpres Way schemes.
March 2024	Construction finishes on the Junction 3 Highway and Phorpres Way schemes, and demobilisation.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

5.10 Contract Management

5.10.1 Project progress meetings and existing governance arrangements such as the Peterborough Highways Project Board have been used to date and has monitored the delivery of the scheme and all commercial arrangements relating to this. The PHS Project Board meets on a monthly basis to discuss progress and matters relating to live and upcoming schemes.

5.10.2 A Project Manager has been appointed by PCC, to oversee the project and take responsibility of the delivery of the scheme. This individual will work closely with the delivery team during the construction of the scheme.

5.10.3 Governance between PCC and the CPCA will be managed through progress meetings and monthly Highlight Reports in line with the CPCA's Assurance Framework. Further details of how PHS will manage the contract are set out within the Management Dimension (Chapter 6).

6. Management Dimension

6.1 Introduction

6.1.1 The Management Dimension explains how the scheme promoter will successfully manage the delivery of the scheme and achieve the expected outcomes.

6.2 Evidence of Similar Projects

6.2.1 Peterborough has a long history of significant growth spanning back to its designation as a New Town in 1967, and consequently the City is used to managing and delivering large highway infrastructure projects.

6.2.2 The Council, through PHS, has completed the following highway improvement schemes in recent years. As with Junction 3, both of these schemes are located on the Parkway Network at strategically sensitive locations and demonstrate PHS' ability to successfully manage and deliver highway schemes of this scale.

Junction 20 Improvement Scheme (A47 Soke Parkway / A15 Paston Parkway) - £5.7m

6.2.3 This scheme was constructed between summer 2016 and spring 2017 and involved fully signalising a grade separated roundabout and adding significant capacity, through the creation of additional lanes on approaches and the circulatory of the roundabout. The scheme was required to address an existing congestion pinch point and to enable nearby housing growth.

6.2.4 Since completion, the scheme has met its objectives and reduced congestion and journey times at a crucial section of the network. It has also provided additional network capacity, enabling the developments of Norwood and Paston Reserve to be progressed.

6.2.5 Junction 20 is a major interchange on Peterborough's network, and at the time of construction up to 4,500 vehicles an hour passed through it. With such a high traffic demand, the careful planning and implementation of the traffic management required to construct the scheme was crucial. Close collaboration between all delivery partners meant that this was achieved with limited disruption to the highway network.

6.2.6 The Junction 20 scheme was completed on time and within the £5.7m budget. Funding for the scheme was secured from the Greater Cambridgeshire and Greater Peterborough Local Enterprise Partnership.

Figure 6.1: Junction 20 Improvement (Post Scheme)

Junction 17 – Junction 2 Improvement Scheme (A1139 Fletton Parkway) - £18m

6.2.7 This scheme was constructed between spring 2014 and summer 2015 and involved the widening of the A1139 Fletton Parkway from two to three lanes, between the A1 (M) and Junction 2 in Peterborough to provide significant and critically needed capacity improvements.

6.2.8 The total cost of the scheme was £18m and it was funded through the Greater Cambridgeshire and Greater Peterborough Local Enterprise Partnership, Developer Funding and Council Capital Funding.

6.2.9 The scheme successfully delivered a major upgrade to Peterborough's Parkway network. Despite extensive ground investigations during the design phase, abnormally high levels of soil contamination were discovered during construction throughout the site, and significant volumes of soil had to be sent for specialist treatment and disposal. However, through careful management and collaborative working amongst all partners, there was minimal impact on the scheme delivery programme, and additional funding was provided by the DfT due to the severity of the contamination which had not been detected despite all of the industry standard Waste and Contamination (WAC) tests being undertaken.

Figure 6.2: Junction 17 Improvement (Post Scheme)

Active Travel Schemes – Various

6.2.10 In addition to highway schemes, PHS has also successfully delivered the following active travel schemes in recent years:

- Haddon Cycleway. Designed in 2021 and constructed in 2022, the scheme improved the footway / cycleway connection between Haddon Hill and Orton Goldhay.
- Toucan Crossings:
    - Bishop's Road toucan crossing upgraded in 2019 to allow for cycle use.
    - Oundle Road toucan crossing by Peterborough High School
    - Lincoln Road / Manor House Road crossing improved to a toucan crossing between 2021 and 2022.

Figure 6.3: Haddon Cycleway Improvement

6.3 Programme / Project Dependencies

6.3.1 The scheme programme considers the following key dependencies:

- **Historic England Consent:** Delivery of the scheme will be dependent on gaining written consent from Historic England to construct within the immediate vicinity of a Scheduled Monument. The Scheduled Monument (Romano-British Settlement SE of Orton Longueville) sits directly under the western side of Junction 3. Once granted, Milestone Infrastructure will adhere to the conditions set out in the Scheduled Monument consent and abide by the methods of working stated within the consent letter in relation to archaeological investigation, recording and supervision (watching brief). Historic England are aware of the scheme and have no objections. Communication has remained throughout the progression of the Detailed Design and will continue throughout the construction phase.
- **Natural England Consent:** Delivery of the scheme will be dependent on Natural England providing consent / agreement to the proposed mitigation measures stated within the Precautionary Method of Works (PMoW), given the proximity of the Orton Pits SAC and SSSI. Given the afforded protection of GCN's, licencing requirements stated by Natural England will be fulfilled and Milestone Infrastructure will adhere to requirements of the licence to compensate for any potential impact on the species such

as changes in timing of operations, capturing and excluding newts, setting aside land for newts, habitat creation, and post-development commitments to ensure the safeguarding of the species population. Natural England are aware of the scheme and have expressed interest in relation to drainage design. Communication has remained throughout the progression of Detailed Design and will continue throughout the construction phase.

- **Programme Constraints:** The construction programme will need to carefully consider any other infrastructure works that may be underway on the highway network during the same period. The programme will be planned to avoid works that may compound the disruption caused to road users as a result of the Junction 3 scheme, although this will be limited through the careful planning of traffic management arrangements. Construction of the scheme will follow the completion of the Junction 15 Improvement Scheme (2 miles north) to avoid exacerbating any disruption caused by that scheme.
- **Construction Disruption:** The Council have significant recent experience of undertaking maintenance and delivering improvements on the Parkway Network and is proficient in mitigating the impact of this.
- **Utility Diversions:** Initial stats searches have identified some utilities within the area of the proposed scheme that will be impacted by the works. The design has taken account of these utilities, and any necessary diversions have been included within the scheme cost estimates and Risk Register. Early engagement with the relevant utility companies began during the Detailed Design phase to ensure that these diversions are factored into the construction programme to mitigate any delay to the delivery of the scheme.

6.4 Governance, Organisational Structures and Roles

6.4.1 The CPCA are the organisation ultimately responsible for the delivery of the Junction 3 Scheme, and PCC are nominated as the delivery partner.

6.4.2 Delivery of the scheme to date has been managed by the PCC Project Manager and wider Project Team, consisting of key project delivery partners. The Project Team have been responsible for the daily running of the project, coordinating with all key stakeholders, and managing the delivery programme.

6.4.3 The existing PHS Project Board will be used to oversee the continued development and delivery of the scheme by the Project Team, and to make key decisions relating to the delivery of the project. The Project Board will be supported by technical specialists, and key stakeholders will be invited to attend as necessary.

Project Management Team

6.4.4 The Project Management Team will report to the Project Board, and ultimately to the CPCA Board.

6.4.5 The Project Team have been responsible for the day-to-day management of the scheme and the coordination of inputs from technical advisors responsible for the delivery of key work streams within an agreed programme, including:

- Stakeholder Engagement
- Design Development
- Transport Modelling
- Environmental Assessment
- Business Case Development
- Scheme delivery.

6.4.6 The key roles and lines of accountability for the development and delivery of the scheme are shown beneath in Figure 6.4.

6.4.7 The team has successfully developed and delivered multiple highway schemes around Peterborough since the beginning of the contract in 2013, including several CPCA schemes. PHS has been responsible for all planning and design work undertaken on the Junction 3 Scheme to date. All skills and competencies to deliver this scheme are available within the local PHS contract.

Figure 6.4: Key Project Roles and Responsibilities

6.5 Programme / Project Reporting

6.5.1 The Project Manager is responsible for reporting project performance against the project objectives and key milestones, using established finance and programme management tools such as Verto, with updates reported on a regular basis to the Project Board.

6.5.2 Every month the Project Manager will also submit a Highlight Report alongside Finance Management Reports to the CPCA recording what progress has been made and whether there are any new risks that could impact the scheme.

6.5.3 Financial progress will be reported to the PHS Dashboard, which monitors the progress of work delivered through the PHS contract, and approval for any key decisions is made by the Project Board.

6.5.4 Regular Project Progress Meetings have been held throughout the duration of the scheme, to allow key staff to discuss important issues that could affect the delivery of the scheme. Delivery of the scheme through the PHS Framework contract ensures that all stages of work are conducted in-house, ensuring a smooth transition of information and communication between the different delivery teams.

6.6 Programme / Project Plan

6.6.1 Key project milestones for progressing to scheme delivery are outlined in Table 6.1 overleaf.

Table 6.1: Project Implementation Timeline

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Malborne Way Footpath and Shrewsbury Avenue Cycleway)
November 2022	Construction commences on the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes. Advance works begin for construction of the Junction 3 Highway and Phorpres Way schemes, including vegetation clearance and STATS diversions.
March 2023	Mobilisation and Compound set up.
April 2023	Construction starts on the Junction 3 Highway and Phorpres Way schemes.
March 2024	Construction finishes on the Junction 3 Highway and Phorpres Way schemes, and demobilisation.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

6.6.2 It should be noted that the dates shown in Table 6.1 are dependent on approval for the release of construction funding at the CPCA's Board Meeting in January 2023.

6.7 Assurance and Approvals

6.7.1 The project has been managed by the Council in line with their existing assurance and approvals process. The daily running of the project has been under the responsibility of the Project Manager, and any approvals required have been provided by the Project Board.

6.7.2 The Cambridgeshire and Peterborough Combined Authority Assurance Framework sets out the fundamental principles in relation to the use and administration of the Cambridgeshire and Peterborough Investment and outlines a culture underpinned by processes, practices and procedures. The Assurance Framework sits alongside a number of other Cambridgeshire and Peterborough Combined Authority documents including the Constitution and Devolution Deal.

6.7.3 Further to the above, the Combined Authority has developed the 10 Point Guide which outlines project management governance requirements which should be followed throughout the life cycle of the project. It details the requirements at project initiation including, establishing a Project Board with the Combined Authority and delivery partners. The purpose of the Project Board is to provide oversight to the project, ensure appropriate governance, risk management and to provide assurance in accordance with the scope, budget and programme. The Project Board should be attended by the Combined Authority's head of Transport and Transport Programme Manager, PCC's Project Manager and by the Group Manager for Highways and Transport. The Project Board should also establish a RACI chart, a copy of the RACI template is in the Combined Authority's 10 Point Guide.

6.7.4 Technical Assurance has also been provided by the CPCA's Assurance Framework, with each stage of the project being reviewed by the CPCA's independent technical reviewer. Once the independent technical reviewer is satisfied, a recommendation is made to the CPCA Board to approve funding for further stages of the project, including construction.

6.8 Communications and Stakeholder Management

6.8.1 Communication and Stakeholder engagement has consisted of:

- Providing regular updates on delivery progress and key activities to the local community, businesses, and key stakeholders
- Engaging with the local community, businesses, and key stakeholders regarding delivery of the scheme, ensuring local needs are considered throughout the duration of the project
- Ensuring information is shared using appropriate methods of communication to all sectors of the community, businesses, and key stakeholders.

Project Liaison Officer

6.8.2 A designated Project Liaison Officer (PLO) was assigned to the scheme throughout the public consultation period and will be present during construction. The PLO will act as a single point of contact for outgoing and incoming communication and will be attached to the scheme delivery team. It is the responsibility of the PLO to issue progress updates via email and social media in the lead up to, and during construction, and coordinate responses to members of the public and key stakeholders when queries are received.

Stakeholders

6.8.3 The key stakeholders for the Junction 3 scheme are:

- CPCA as the Local Transport Authority and funding body for the scheme
- PCC 'The Council' as the Local Highway Authority
- Peterborough City Cabinet Member for Transport, Ward Councillors, and parish clerks
- Natural England in regard to Ecological assessments and licences required for the scheme
- Historic England in regard to Archelogy / Cultural Heritage assessments within the studies footprint
- PCC representatives for the natural and historic environment, Wildlife, Archelogy and Heritage, Water and Drainage and Environmental Health
- Aragon Direct Services as the Local Authority Trading Company responsible for the future maintenance of the cities tree stock and green spaces across Peterborough
- Local Businesses situated in Hampton, affected by changes to the transport network
- Homeowners of properties located within close proximity to Junction 3, including Hedda Drive and Buckthorn Road (Hampton Hargate)
- Emergency services / Cambridgeshire Fire and Rescue Service
- Local Cycle Forum.

Stakeholder Consultation

6.8.4 Stakeholder consultations were undertaken by the Project Team following the approval of the OBC. All key stakeholders were consulted via email or letter for comments on the Preferred scheme design.

6.8.5 Responses to the consultation primarily focused on the environment, including drainage in relation to the close proximity to the Orton Pit SSSI and SAC, biodiversity as Junction 3 is located in a Red Zone for the protected species of Great Crested Newts, as well as the need for wider improvements to active travel.

6.8.6 The environment and biodiversity were discussed with Natural England. As the statutory regulator for the adjacent SSSI and SAC, Natural England were provided with a series of scheme drawings (in March 2022), including vegetation clearance, groundworks, and drainage designs.

6.8.7 Initial concerns set forward by Natural England focused on drainage and the potential of pollution to the sites water courses and soil. As a result of the construction and operation of the Junction 3 works. If pollution were to occur, it would negatively impact the sensitive water chemistry present within the confines of the Orton Pit SSSI and SAC. The recommendation from Natural England was that a Habitat Regulation Assessment (HRA) screening is to be undertaken to further assess if the design is likely to have significant effect on the SSSI and SAC. This has been done, and results from the HRA will be submitted to Natural England and authorisation secured.

6.8.8 Additional comments from Natural England were received in relation to Great Crested Newts, as extensive populations are known within the immediate vicinity of Junction 3. The species are afforded protected status under the Wildlife and Countryside Act 1981 (schedule 5 and 8) and the Conservation of Habitats and Species Regulations 2017 (as amended), and it was advised that the appropriate licences are required prior to construction along with a Precautionary Method of Working (PMoW) for GCN'S. The PMoW states that works will be programmed during GCN active season (March – September) and that any habitat manipulation will be carried out under the supervision of a suitably qualified Ecologist, who either holds a low-class impact licence or a surveying and handling licence for the species.

6.8.9 Stakeholder consultation with active travel groups also emphasised the opportunities to improve active travel connections around Junction 3, and this resulted in the addition of the Malborne Way and Shrewsbury Avenue active travel schemes.

Public Consultation

6.8.10 Public consultation on the concept of a scheme at Junction 3 was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan[33] that was adopted in January 2020. This consultation made residents of the City aware that Junction 3 had been identified as a location for improvements. It should be noted that no details on the form of the scheme were provided at the time of the consultation and that no objections relating to the principle of improvements to Junction 3 were received.

6.8.11 Public perceptions of the Preferred Scheme were then assessed following the approval of the OBC (July 2020) and prior to the commencement of Detailed Design. The online consultation featured on the PCC website and social media for a six-week period (between the 21st October – 4th December 2020), and presented the scheme identified at OBC and Preliminary Design.

6.8.12 In addition to the online consultation exercise, 62 individual properties located within close proximity to Junction 3 (including Hedda Drive and Buckthorn Road in Hampton Hargate) were contacted via letter during the consultation period. The letter provided residents with details of the online consultation and invited them to comment.

6.8.13 One comment was received during the consultation period in relation to the 3rd lane on the A1260 The Serpentine northbound approach, north of Hargate Way', voicing concerns about difficulties faced when exiting Hargate Way, and how proposed changes along the A1260 The Serpentine may impact drivers from the residential area further.

6.8.14 Design changes were made during Detailed Design and the extension of the existing flare on the A1260 is now unlikely to impact the operation of the A1260 The Serpentine / Hargate Way junction as vehicles exiting will experience no change to conditions.

6.8.15 Monitoring of the junction will be undertaken at regular intervals and is included with the scheme monitoring and evaluation plan. If the monitoring identifies an issue at the junction, then further consideration will be given to potential improvements.

6.8.16 It should be noted that the public consultation outlined above did not include the final design for the Phorpres Way active travel improvements, nor did it include the Malborne Way and Shrewsbury Avenue improvements. This was due to design for Phorpres Way being developed during later phases of the design work, and additional active travel improvements being identified as the project has progressed to FBC phase. This is in line with the greater emphasis placed on active travel improvements by both the Council and the CPCA.

6.8.17 Regular communication will be undertaken with residents throughout the construction phase to ensure that residents remain informed of the construction programme and any temporary impacts. Where feedback is provided, both the PLO and PCC Project Manager will work closely with individuals to mitigate any issues raised.

6.9 Risk Management Strategy

6.9.1 A Risk Register was produced during project initiation to identify potential risks and to evaluate factors that could have a detrimental effect on the project.

6.9.2 The Risk Register has been a live document throughout the project and has been used to identify and catalogue any potential risks, consider the impact they may have, the likelihood of them occurring and the measures that can be taken to provide mitigation.

6.9.3 The Risk Register has been reviewed regularly during progress meetings, with updates reported to the CPCA through the monthly Highlight Reports. A copy of the Risk Register has been provided within Appendix A.

6.9.4 In addition to the project Risk Register a construction Risk Register has been produced (also included in Appendix A). This Risk Register is also a live document and will be regularly updated throughout the construction period.

6.10 Scheme Evaluation

6.10.1 The Scheme Evaluation Plan is detailed in Appendix K. This has been prepared in line with the CPCA Assurance Framework and DfT guidance and will follow 'standard monitoring[34] principles.

6.10.2 The Scheme Evaluation Report has been prepared prior to construction and comprises of both the Benefits Realisation Plan and the Monitoring and Evaluation Plan to avoid any duplication of information.

6.10.3 The purpose of the Scheme Evaluation Plan is to determine whether the scheme has been delivered as planned, provides the expected benefits and therefore justifies its investment. Where outcomes are seen to differ from those expected, data collected during the monitoring and evaluation phases will provide an evidence base that will assist in understanding the reasons for this and the lessons that can be learnt.

Benefits Realisation Plan

6.10.4 The objectives and expected outcomes of the scheme are outlined in the Strategic Dimension of this document. Table 6.2 overleaf summarises how the anticipated benefits will be planned for, tracked and realised. It sets out the key activities needed to manage the successful realisation of the benefits in the short, medium and long term, together with the timescales and who is responsible for each activity.

[33] https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf.
[34] Major Scheme Business Cases: Evaluation Guidance for Local Authority Major Schemes (publishing.service.gov.uk).

Table 6.2: Scheme Benefits Realisation Plan Summary

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Benefit Owners	Benefit Enablers
Tackle congestion and improve journey time reliability: Tackle congestion and address journey time reliability on the primary approaches to the junction (A1260 Nene Parkway and (The Serpentine approaches)	• Creation of 4th lane at the A1260 Nene Parkway SB stop line • Creation of 4th lane on the north-eastern corner of the circulatory, between the A1260 Nene Parkway approach and the A1139 eastbound on-slip exit • Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 • Creation of a 4th lane at the A1260 The Serpentine NB stop line, including a flare extension on the left-hand lane • Creation of 3rd lane on the southern half of the circulatory, between the A1260 The Serpentine exit / approach • Creation of 4th lane on the south-western corner of the circulatory, between the A1260 The Serpentine approach and the A1139 WB on-slip exit	• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased operational efficiency of the Junction and wider network • Reduction in stationary / rolling traffic resulting in air quality improvement • More efficient entrance to a major residential / employment sector to the south of the City	• Commuters / Business trips • Local residents • Visitors to the City	CPCA / PCC	• Completion of the scheme • Monitoring of network performance
Support Peterborough's Growth Agenda and encourage homes and jobs: Ensure that the planned employment and housing growth across Peterborough is promoted whilst providing for future demand		• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased network capacity and operational efficiency • Increased attraction of the Hampton Township area, encouraging the retainment of existing businesses and support of prospective future investment	• PCC in regard to fulfilment of the Local Plan • Business within the Hampton Township • Residents / Local Community	CPCA / PCC	• Completion of the scheme • Promotion of the Hampton Township / Business sector and wider City Area
Create wider economic benefits: Provide conditions that encourage inward investment in higher value employment sectors across Peterborough and utilise available employment space		• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased attraction of the Thorpe Wood Business park • Increased attraction of the Hampton Township area, encouraging the retainment of existing businesses and support of prospective future investment	• PCC in regard to fulfilment of the Local Plan • Business within the Hampton Township • Residents / Local Community	CPCA / PCC	• Completion of the scheme • Promotion of the Hampton Township / Business sector and wider City Area
Protect and improve the biodiversity value within the study area: Mitigate any adverse impact of a scheme and enhance biodiversity net gain within the Study Area	• Implementation of environmental / biodiversity scheme elements • Additional planting / compensation planting mitigating the loss of tree coverage associated with construction	• Achievement of minimum 20% biodiversity net gain • Protection of identified species / sites of interest across the study area	• PCC / CPCA in regard to environment and biodiversity • Commuters • Local residents	CPCA / PCC	• Completion of the scheme / soft landscaping designs • Gaining of the necessary licences • Biodiversity Net Gain Calculation
Positively impact traffic conditions on the wider network: Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as Malborne Way	• Creation of 4th lane at the A1260 Nene Parkway SB stop line • Creation of 4th lane on the north-eastern corner of the circulatory, between the A1260 Nene Parkway approach and the A1139 eastbound on-slip exit • Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 • Creation of a 4th lane at the A1260 The Serpentine NB stop line, including a flare extension on the left-hand lane • Creation of 3rd lane on the southern half of the circulatory, between the A1260 The Serpentine exit / approach • Creation of 4th lane on the south-western corner of the circulatory, between the A1260 The Serpentine approach and the A1139 WB on-slip exit	• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased operational efficiency of the Junction and wider network • Increased quality of life for residents of Orton Malborne	• Commuters / Business trips • Local residents	CPCA / PCC	• Completion of the scheme • Monitoring of network performance
Improve road safety: Reduce personal injury accidents and improve personal security amongst all travellers around the junction	• Signalisation of the remaining approaches including both the A1260 Nene Parkway and The Serpentine approaches to Junction 3 • Creation of a footpath between the Medeswell / Saltmarsh junction • Upgrading the walking / cycling facilities on Phorpres Way / Close	• Fewer accidents involving rear end shunts on main approaches • Fewer causalities • Increased sense of safety and security on walking and cycling facilities	• Commuters / Business trips • Local residents • Visitors to the City • Active Mode users	CPCA / PCC	• Completion of the scheme including walking and cycling elements • Road safety audit • Monitoring of accidents
Mitigate the impact of air quality on the local environment: Maintain or improve air quality within the study area as a result of minimising stationary / queuing traffic	• Creation of 4th lane at the A1260 Nene Parkway SB stop line • Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 • Creation of a 4th lane at the A1260 The Serpentine NB stop line, including a flare extension on the left-hand lane	• Reduced peak hour congestion for motorists leading to more reliable journey times • Reduced stationary / queuing traffic	• Commuters / Business trips • Local residents / wider community • PCC / CPCA in regard to air quality control and policy goals	CPCA / PCC	• Completion of the scheme • Air quality monitoring

Monitoring and Evaluation Delivery

6.10.5 The monitoring and evaluation of the Junction 3 Improvement Schemes will be completed at the following stages:

- Pre-construction and during delivery (Monitoring)
    - Baseline data is 2019 surveys, limited surveys / assessments to be undertaken in 2023 before scheme construction commences.
    - Data to monitor scheme delivery will be collected during construction.
- One-year after (Monitoring and Evaluation)
    - Data to monitor scheme performance will be collected at least one year (but less than two years) after scheme opening.
    - An initial “One Year After”’ report will be published within two years of scheme opening, focusing on the scheme’s outcomes.
- Five-years after (Monitoring and Evaluation)
    - Further data will be collected up to approximately five years after scheme opening.
    - A final “Five Years After” report will be published within six years of scheme opening, based on analysis of all the data available, including an assessment of the wider impacts of the scheme.

6.10.6 Based on the above stages, the monitoring and evaluation timescales for the Junction 3 Improvement Schemes are as follows:

Table 6.3: Scheme Monitoring and Evaluation Timescales

Monitoring Activity	Timescale
Prior to scheme build (Baseline)	2018
During Construction	2023
Scheme Opening	2024
One year post scheme opening	2025
Five years post scheme opening	2029

6.10.7 Table 6.5 overleaf summaries the monitoring and evaluation approach for the Junction 3 Scheme, detailing how the objectives will be measured, the data sources to be collected and the timescales for reporting findings of the monitoring and evaluation.

6.10.8 Full details of the Scheme Evaluation Plan are provided in Appendix K.

Table 6.4: Scheme Evaluation Summary

	Measure	Measure of Success	Data Source	Data Collection / Reporting Programme			Ownership	Indicative Cost Estimate
				Baseline	Delivery	Post Completion		
Inputs-	Scheme Costs	CPCA Funding	CPCA Funding submission Final Scheme Cost Data	Planned	January 2023 – October 2023	-	CPCA / PCC	-
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Inspection On-Site	December 2022	January 2023 – October 2023	2024	CPCA / PCC	£2500
Objectives	**Outcomes**							
1 / 5 / 6	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage	November 2018	-	November 2025 / November 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		New Infrastructure for Active Travel	Site Inspection / Usage Data	2022	-	November 2025 / November 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		Reduce the number of KSI incidents at Junction 15	Peterborough Database of Road Traffic Records	Dataset 2015 - 2020	-	November 2025 / November 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
1 / 5	Travel Demand	Enhanced Network Performance, on A1260 Nene Parkway and The Serpentine, and wider network of Junction 31 and Malborne Way	Manual Classified Counts / Site Visits / Video Survey Footage	November 2018	-	November 2025 / November 2029	CPCA / PCC	£6000 for MCC surveys and £1000 for data analysis at both 1 year and 5 year reporting Total = £8,000
2 / 3	Impact on Economy	Realisation of Local Housing and Employment Growth Ambitions	PCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2018	-	November 2025 / November 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
4	Impact on the Local Environment	Ensure a Net Gian of Biodiversity across the Study Area	Biodiversity Calculation / Site Survey and Desk Based Assessment	2022	-	November 2025 / November 2029	CPCA / PCC	£1000 for site inspections and £500 for data analysis at both 1 year and 5 year reporting Total = £2000
7	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / PCC Air Quality Monitoring Sites / Future traffic demand data	October 2021	-	November 2025 / November 2029	CPCA / PCC	£1000 data analysis at both 1 year and 5 year reporting Total = £2000
Reporting	Year 1 reports summarising the outcomes of the monitoring and evaluation work			-	-	2025	CPCA / PCC	£3,000
	Year 5 report summarising local economic growth, scheme impacts and development figures prior and post opening of the scheme			-	-	2029	CPCA / PCC	£3,000
	Total Monitoring and Evaluation Budget							**£25,500**

6.11 Scheme Logic Map

6.11.1 Based on the scheme objectives, the evaluation process will measure outcomes relating to:

- Changes in traffic flow and levels of delay at Junction 3 and along Malborne Way
- Changes in safety including the number and severity of road traffic accidents
- Environmental mitigation measures and improvements to biodiversity
- Planned and realised levels of employment and housing growth within the Hampton area
- Changes to the level and usage of active travel provision within the Junction 3 study area.

6.11.2 The Logic Map in Figure 6.5 highlights the links between the context, inputs, outputs, outcomes and impacts of the scheme and gives a visual representation of the process by which the desired outcomes of the scheme objectives are to be achieved.

Context

- Junction 3 is a partially signalised grade separated roundabout (positioned above the A1139 Fletton Parkway). The Junction provides access to the A1260 Nene Parkway, The A1139 Fletton Parkway and the A1260 The Serpentine.
- The junction is heavily used by trips in the southwest of the City, and a large number of retail facilities, businesses and residential areas are located immediately to the south of the Junction.
- Congestion and delay are increasing at the junction as a consequence of recent and planned housing growth.
- Improvements at Junction 3 are expected to improve peak hour journey times, whilst improving active travel connections to the wider network such as Malborne Way and Shrewsbury Avenue.

Inputs

- CPCA funding and resources
- PCC resources
- Contractor resources
- Sub-contractor resources
- Stakeholder support

Junction 3 Improvement Scheme

Outputs

- Create a third southbound lane on Nene Parkway from Junction 31 to Junction 3.
- Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a third lane.
- Signalisation of the A1260 Nene Parkway approach to Junction 3, with a 4-lane approach.
- Signalisation of A1260 The Serpentine approach to Junction 3, with a 4-lane approach.
- Create a third lane on the A1260 The Serpentine northbound approach, extending approximately 200 metres back from Junction 3.
- Addition of 220m of new footpath between Saltmarsh and the Phoenix School.
- Upgrading the Phorpres Way footpath (southern side) to current LNT 1/20 design standards, accompanied by several crossing points at Phorpres Close, Club Way and Cygnet Road.
- Upgrading the Cycleway for approximately 450m between Shrewsbury Avenue and the gated access of the Nature Reserve.

Transport Outcomes

- Reduced impacts of traffic including congestion and environment particularly A1260 Nene Parkway approach
- Reduced queue length at Junction 3 aiding the operational efficiency during peak hours and reducing emissions of stationary traffic

People, Business, and Place Outcomes

- Early environmental considerations, Improving 20% Biodiversity Net Gain within one year
- Improved Cycle and walking infrastructure will increase connectivity and accessibility between nearby residential and employment areas
- Improve attractiveness of nearby economic centres (Hampton Township)

Impacts

- Economy benefits, including reduced costs, investment and regeneration, and benefits to local businesses
- Society benefits, including improved health and wellbeing, and better connectivity to services
- Environmental benefits, including biodiversity improvements, improved air quality and noise levels, and reduced emissions

Figure 6.5: Junction 3 Logic Map

Appendices

Appendix A – Risk Registers

Date Updated: 11/10/2022

No:	Risk Description	Likelihood	Minimum Cost (£)	Most Likely Cost (£)	Maximum Cost (£)	Project Impact	Comments	Likelihood (%) x Most Likely Cost (£)	Mitigation	Risk Category	Owner
1	Public issues/Access issues	70%	£1,000	£2,000	£5,000	Operational	Risk with PCC, a Provision is made in Target against so that the there will be regular updates and meeting with public .	£1,400	Resident/ business letter drop & advanced warning sign displayed 2 weeks prior to starting.	High	Milestone
2	Weather delays affecting operations	70%	£6,000	£12,000	£24,000	Operational	Risk with Client if weather is over 1 in 10- Normal 1 In 10 Weather conditions and related possible restrictions/ idle time and cancellations etc are allowed in this risk.	£8,400	Check forecasts, manage sites accordingly From weather. Possible stand-down allowed 10 shifts TM/ maintenance.	High	Milestone/ PCC
3	Materials delivery issues	40%	£1,000	£3,000	£5,000	Operational	Sub-contractors to manage risk. Lost time TM & supervision/ welfare costs.	£1,200	Sub-contractors to manage risk. Alternative procurement options to be available.	Low	Milestone
4	Underground utilities and condition	80%	£3,000	£12,000	£20,000	Operational	Extensive underground utilities pr	£9,600	Provision of vacuum excavator.	High	Milestone
5	Take off errors	15%	£1,500	£3,000	£5,000	Operational		£450		Low	Milestone
6	Damages	80%	£3,000	£6,000	£10,000	Operational	Works location in close proximity to known high crime area.	£4,800	Plant/ materials to be stored securely and locked. CCTV/ security on site	High	Milestone
7	Price increase of materials - Steel and other construction materials	90%	£10,000	£25,000	£40,000	Operational		£22,500		High	Milestone
8	No availability of materials- steel and other construction materials	70%	£1,000	£2,000	£4,000	Operational		£1,400		High	Milestone
9	Traffic signal works are sourced by client - traffic signal works under Milestone TM and programme provision	40%	£2,000	£7,000	£12,000	Operational	Delay 5 supervision shifts	£2,800	Allow for supervision element and loss of revenue	Medium	PCC
10	Welfare location reinstatement	100%	£5,000	£10,000	£14,000	Operational		£10,000	Aragon to reinstate compound area	High	Milestone
11	Hazardous substance during excavation - asphalt/ soil	60%	£2,000	£10,000	£15,000	Operational	Contaminated soil/ planings identified. Segregation & specialist disposal required	£6,000	Testing to be carried out prior to works starting.	Low	Milestone
12	Works adjacent to mature trees. Multiple mature trees and other vegetation require removal	100%	£10,000	£20,000	£30,000	Operational	Early contractor involvement	£20,000	Aragon to carry out works before construction start date.	High	Milestone
13	Various utility diversion works	50%	£10,000	£50,000	£100,000	Operational	Programme delays	£25,000	PCC to pay C4 costs so that utility companies can carry out works that do not negatively affect Milestone construction programme	High	PCC/ Milestone
14	Streetwork Clashes with National Highway Projects	50%	£2,000	£10,000	£20,000		Dialog meetings with National Highways to avoid clashes	£5,000			PCC
								£ -			Milestone
								£ -			Milestone
								£ -			Milestone
								£ -			Milestone
	Total							£118,550			
								0			

Date Updated: 03/11/2022

No:	Risk Description	Likelihood	Minimum Cost (£)	Most Likely Cost (£)	Maximum Cost (£)	Project Impact	Comments	Likelihood (%) x Most Likely Cost (£)	Mitigation	Risk Category	Owner
1	Public issues/Access issues	90%	£500	£1,000	£2,500	Operational	Risk with PCC, a Provision is made in Target against so that the there will be regular updates and meeting with public .	£ 900.00	Resident/ business letter drop & advanced warning sign displayed 2 weeks prior to starting.	High	Milestone/ PCC
2	Weather delays affecting operations	50%	£1,500	£3,000	£7,500	Operational	Risk with Client if weather is over 1 in 10- Normal 1 In 10 Weather conditions and related possible restrictions/ idle time and cancellations etc are allowed in this risk.	£ 1,500.00	Check forecasts, manage sites accordingly From weather. Possible stand-down allowed 5 shifts TM/ maintenance.	Low	Milestone/ PCC
3	Materials delivery issues	50%	£250	£1,000	£2,500	Operational	Sub-contractors to manage risk. Lost time TM & supervision/ welfare costs.	£ 500.00	Sub-contractors to manage risk. Alternative procurement options to be available.	Low	Milestone
4	Underground utilities and condition	95%	£1,200	£7,000	£14,000	Operational	Extensive underground utilities present.	£ 6,650.00	Provision of vacuum excavator.	High	Milestone
5	Take off errors	15%	£1,500	£3,000	£5,000	Operational		£ 450.00		Low	Milestone
6	Damages	60%	£200	£500	£5,000	Operational	Works location in close proximity to known high crime area.	£ 300.00	Plant/ materials to be stored securely and locked. CCTV/ security on site	High	Milestone
7	Price increase of materials - Steel and other construction materials	95%	£100	£150	£200	Operational	Inflation is a client risk	£ 142.50	EWN to be issued to client where material prices rise above that submitted in the TC.	High	PCC
8	No availability of materials- steel and other construction materials	70%	£100	£300	£1,000	Operational	Sub-contractors to manage risk.	£ 210.00	Sub-contractors to manage risk. Alternative procurement options to be available.	High	Milestone/ PCC
9	Welfare location, cost and its reinstatement	75%	£500	£750	£1,500	Operational		£ 562.50	Aragon to reinstate compound area	Low	Milestone
10	Hazardous substance during excavation - asphalt/ soil	60%	£700	£1,400	£7,000	Operational	Contaminated soil/ planings identified. Segregation & specialist disposal required	£ 840.00	Testing to be carried out prior to works starting.	Low	Milestone
	Total							£ 12,055.00			
								0			

Appendix B – Sensitivity Testing Technical Note

Technical Note

Description:	Junction 3 FBC Economic Sensitivity Testing	To:	
Reference:		From:	Steven Percy
Date:	25/11/2022	cc:	Richard Jones

Introduction

The Economic Dimension for the Fengate Access Study FBC includes several sensitivity tests that have been recorded in full detail here.

Sensitivity tests have been undertaken to confirm the robustness of the business case in a number of eventualities. These eventualities can affect the benefits (such as changes to forecast trips from high and low levels of growth), or the costs (such as a greater proportion of risk being realised).

The sensitivity tests can be summarised as follows:

- Cost Sensitivity
- Low Growth Scenario
- High Growth Scenario
- Reduced Accident benefits COBALT
- No Accident Benefits
- Low Active Travel Uptake
- High Active Travel Uptake
- Reduced AMAT Appraisal Periods
- Increased AMAT Appraisal Periods
- Low Environment Values
- High Environment Values

The rest of this document describes the details of the sensitivity tests.

Cost Sensitivity

Table 1 below demonstrates the VFM category that various PVCs would result in.

The current core scenario PVC of £7,543,000 falls into the "Very High" category and could increase by £4,705,000 before it falls into the "High" Value for Money Category.

Table 1: Value for Money Categories and the Associated Present Value of Costs (£,000s)

VfM Category	Description	PVB	PVC required to achieve VfM statement
Poor	BCR between 0 and 1	£ 48,992	>=£48,992
Low	BCR between 1 and 1.5	£ 48,992	£48,992 to £32,661
Medium	BCR between 1.5 and 2	£ 48,992	£32,661 to £24,496
High	BCR between 2 and 4	£ 48,992	£24,496 to £12,248
Very High	BCR greater than or equal to 4	£ 48,992	<=£12,248

This test demonstrates that the Junction 3 Improvement schemes will still offer value for money in the event of large cost increases.

High and Low Growth Scenarios

Sensitivity testing has been undertaken to determine whether or not the proposed scheme could still achieve a High Value for Money if the expected road traffic growth differs from current predictions. High and Low Growth scenarios have been developed in line with TAG Unit M4 (August 2022)

The process of generating high and low growth scenarios is as follows:

- Calculate the proportion of base year demand to be added based on parameter *p,* which varies by mode. For one year after the base year (2019), proportion *p* of base year demand is added to the core scenario. For 36 or more years after the base year, proportion 6*p* of base year demand is added to the core scenario. Between one and 36 years after the base year, the proportion of base year demand rises from *p* to 6*p* in proportion with the square root of the years. For example, 16 years after the base year the proportion is 4*p.*
- The value of *p* is set to 2.5% for highway demand, which reflects uncertainty around annual forecasts from the National Transport Model (NTM).
- The core scenario matrix is adjusted on a cell-by-cell basis by taking the appropriate proportion of the model base year matrix and adding it or subtracting it from the future year core scenario matrix.
- The low growth should be based on the same ranges below the core scenario as the high growth scenario is above it.
- Local growth assumptions have been accounted for within the high and low growth scenarios. The most likely sources of growth (Reasonably Foreseeable) that had not been included in the core scenario have been included within the high growth scenario. The less likely sources of

growth (More than Likely) that had been included in the core scenario have been excluded from the low growth scenario. Total growth has been constrained to the levels calculated in the previous steps.

- Local assumptions about supply have not been changed from the core scenario, with the exception of access roads to additional developments that have been included and minor changes to the core scenario network needed to accommodate growth in demand.

Table 2 below shows the AM Peak, Inter-Peak, and PM peak hour matrix sizes for the High and Low growth scenarios compared to the Central growth assumption. These are also represented in line graph Figure 1 to Figure 3 below.

Table 2: Matrix sizes for High, Low and Central growth scenarios

Total number of trips by Scenario (PCUs)			
AM	Low	Central	High
2019	87,476	87,476	87,476
2026	93,640	98,089	104,049
2031	99,027	105,496	113,508
2036	103,797	112,234	121,848
IP	Low	Central	High
2019	72,308	72,308	72,308
2026	77,840	81,984	86,817
2031	82,881	88,555	95,014
2036	87,528	94,701	102,456
PM	Low	Central	High
2019	90,937	90,937	90,937
2026	96,587	101,691	107,788
2031	101,805	109,032	117,205
2036	106,811	115,924	125,765

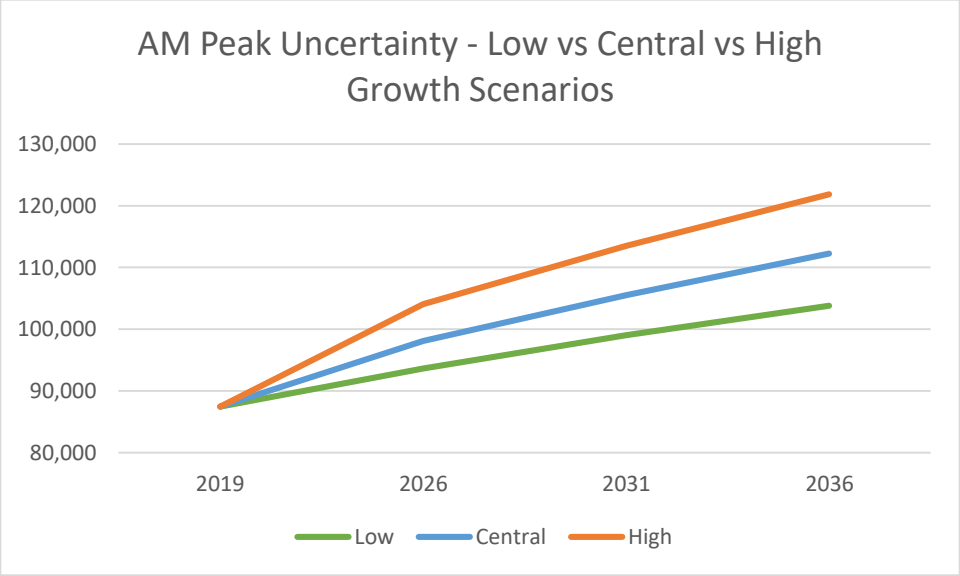


Figure 1: AM Peak Hour: Total Number of Trips in Model

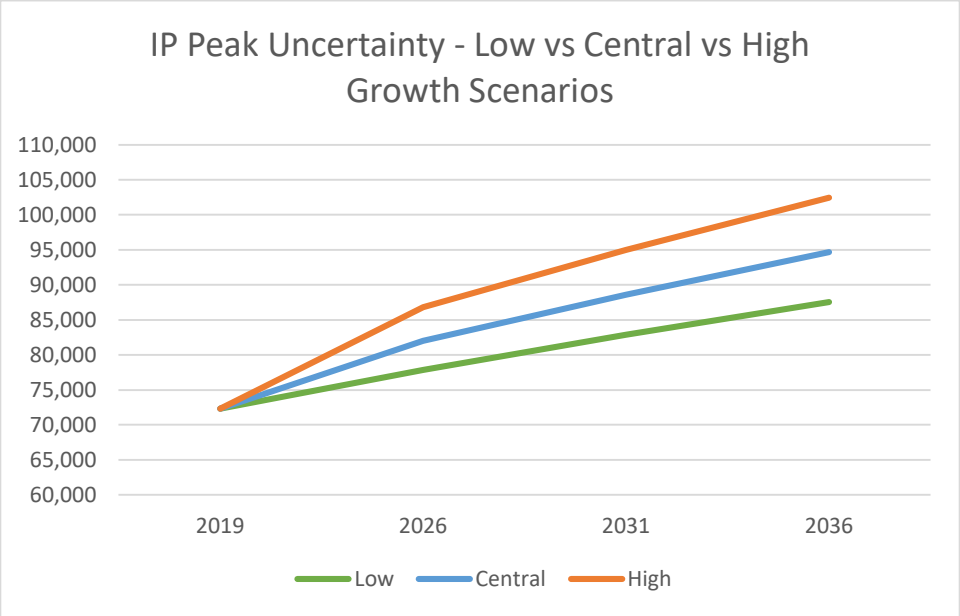


Figure 2: Inter-Peak Hour: Total Number of Trips in Model

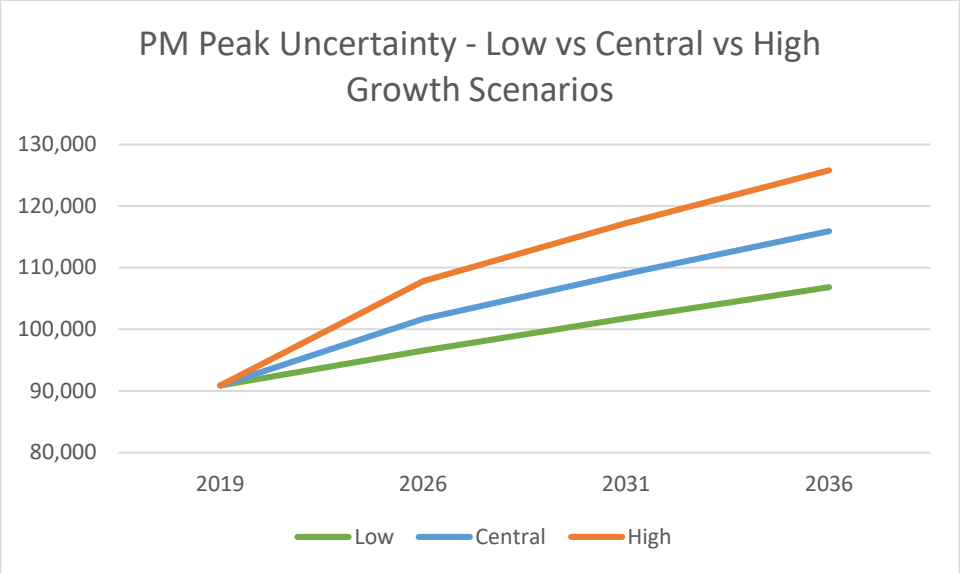


Figure 3: PM Peak Hour: Total Number of Trips in Model

Once the low and high growth scenarios had been assigned within the SATURN model, the outputs were used within TUBA and COBALT to determine if the scheme would still operate well and offer value for money if lower or higher than anticipated traffic growth occurred.

A summary of the benefits for each of the growth ranges used in the sensitivity test is presented in Table 3 beneath.

Table 1: Changes in Benefits under Different Growth Scenarios

Software	Benefit Type	Low	Core	High
TUBA (£,000s)	Greenhouse Gases	329	143	494
	Consumer Users (Commuting)	6,630	1,759	6,427
	Consumer Users (Other)	9,270	8,160	20,149
	Business Users / Providers	4,517	3,572	7,955
	Indirect Taxes	-327	-163	-471
	Present Value of Benefits (PVB)	20,419	13,471	34,554
COBALT (£,000s)	Accident Benefits	32,411.70	33,607.90	33,326.30
Summary	Total (£,000s)	52,831	47,079	67,880
	BCR	7.26	6.49	9.25

The Transport User Benefits increase in both the High and Low Growth Scenarios. Given the strategic location of the junction, and its proximity to sites with high levels of growth planned, this is likely because the low growth and high growth scenarios establish delay more clearly to certain approaches. The core scenario would therefore give more balanced delay across the junction, which is more difficult to effectively address due to the limited capabilities of signals in SATURN models.

The results from the sensitivity test show that the scheme would still offer Very High Value for Money in both a low and high growth scenario and demonstrates robustness against traffic growth uncertainty.

Accident Benefits reduced or removed

A sensitivity test was undertaken to demonstrate how robust the BCR is when the benefits identified using COBALT (v2.3) are reduced. The benefits identified in COBALT form the majority of the scheme benefits and are driven by the introduction of traffic signals.

Reducing the COBALT PVB by 50% decreases the accident savings from £33,607,900 to £16,803,950, and the total scheme PVB from £48,991,640 to £32,187,690. This results in an overall scheme BCR of 4.267, which still represents Very High Value for Money.

A further test was undertaken to demonstrate the effect of removing the accident benefits altogether. The overall scheme PVB would reduce from £48,991,640 to £15,383,740, resulting in a BCR of 2.039, which represents High Value for Money.

These tests are summarised in Table 4 below, and demonstrate that the accident savings benefits, although providing a large proportion of monetised benefits, are not necessary for the scheme to demonstrate a successful BCR.

Table 4: Changes in Benefits under Different Growth Scenarios

Test	Accident Savings Benefits (£,000s)	Total Scheme Benefits (£,000s)	Scheme Costs	BCR	Vfm Category
Core	33,607.90	48,991.64	7,543.00	6.495	Very High
50% Reduced	16,803.95	32,187.69	7,543.00	4.267	Very High
No accident benefits	0.00	15,383.74	7,543.00	2.039	High

High and Low Active Travel Uptake

A sensitivity test was undertaken to demonstrate how robust the BCR is against varied levels of Active Travel Uptake that comes about as a result of the schemes.

The core Active Travel Uptake has been predicted using Census 2011 Method of Travel to Work data, by finding a similar Land Use LSOA with better active travel infrastructure and applying the Walking and Cycling mode share of the similar zone to the scheme relevant zones.

The High and Low active travel uptake sensitivity tests increase and reduce this change in trips by 50%.

The predicted daily future trips in each of the scenarios is outlined in Table 5 below.

Table 5: Active Travel trips used in Sensitivity Tests

Walking				
Scheme Location	Trips			
	Base	Low	Core	High
Malborne Way	235	258	281	304
Shrewsbury Avenue	156	171	186	201
Phorpres Way	209	252	295	338
Total	600	681	762	843
Cycling				
Scheme Location	Trips			
	Base	Low	Core	High
Malborne Way	-	-	-	-
Shrewsbury Avenue	159	213	266	320
Phorpres Way	243	293	342	392
Total	402	505	608	712

Table 6 below shows the benefits and resultant BCRs that come about as a result of the changes in trips.

Table 6: Changes in Benefits under Active Travel Uptake Scenarios

Active Mode Appraisal Benefits	PVB (£,000s)		
	Low	Core	High
Malborne Way	73	141	208
Shrewsbury Avenue	384	821	1,203
Phorpres Way	509	973	1,444
Total	966	1,935	2,856
BCR	6.367	6.495	6.617

Table 6 demonstrates that the scheme BCR varies from 6.36 to 6.62 under the different Active Mode Uptake assumptions. These are categorised as Very High Value for Money.

Active Mode Appraisal Period

A sensitivity test has been undertaken to demonstrate how robust the BCR is against a reduced active mode appraisal period.

Reducing and increasing the appraisal period demonstrates the value of the scheme over different numbers of years. The results can indicate the value of the scheme should the built infrastructure have a reduced or increased life.

Table 7 below demonstrates how the active mode benefits and costs change over reduced appraisal periods of 10 and 30 years.

Table 7: Active Mode Appraisal Period Sensitivity test outputs

Active Mode Appraisal Benefits	PVB (£,000s)		
	10 Years	20 Years (Core)	30 Years
Malborne Way	67	141	207
Shrewsbury Avenue	386	821	1,209
Phorpres Way	461	973	1,430
Total	914	1,935	2,846
BCR	6.360	6.495	6.616

The reduced appraisal period test demonstrates that the scheme would still provide at least very high value for money in the short-term with a BCR of 6.36. The increased appraisal period test demonstrates that the scheme would provide very high value for money in the longer term with a BCR of 6.62.

Both BCRs remain in the Very High Value for Money category and demonstrate that the scheme is robust even if the life of the active mode infrastructure is reduced.

Environmental Values Sensitivity Test

A sensitivity test has been undertaken to demonstrate how robust the BCR is against varying values of changes in Air Quality.

The High and Low values are provided by the DfT's Air Quality Valuation Workbook (Updated 30th May 2022), in addition to the core output.

The Air Quality Valuation Workbook estimates an Upper net present value of change in air quality of £642,370, and a Lower net present value of change in air quality of £21,910.

These result in a BCR of 6.56 for the higher air quality change values scenario and a BCR of 6.47 for the lower air quality change values scenario. Both BCRs fall into the High Value for Money category.

Summary of Sensitivity Tests

Figure 4 below demonstrates the range of BCRs indicated by the sensitivity tests.

The figure demonstrates that the Junction 3 Improvement Schemes offer at least High Value for Money in all scenarios assessed, and that there is a strong cluster of BCR values in the 6.0 - 7.0 range, confirming that the Value for Money of the schemes is robust.

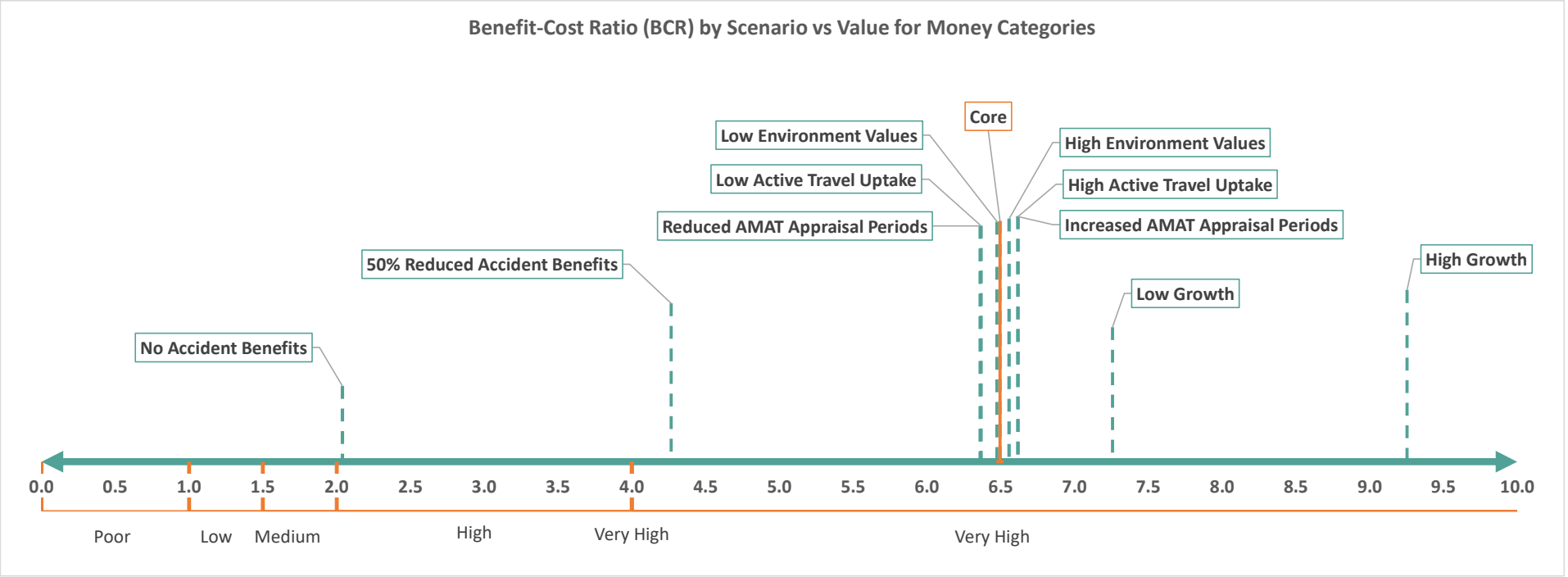
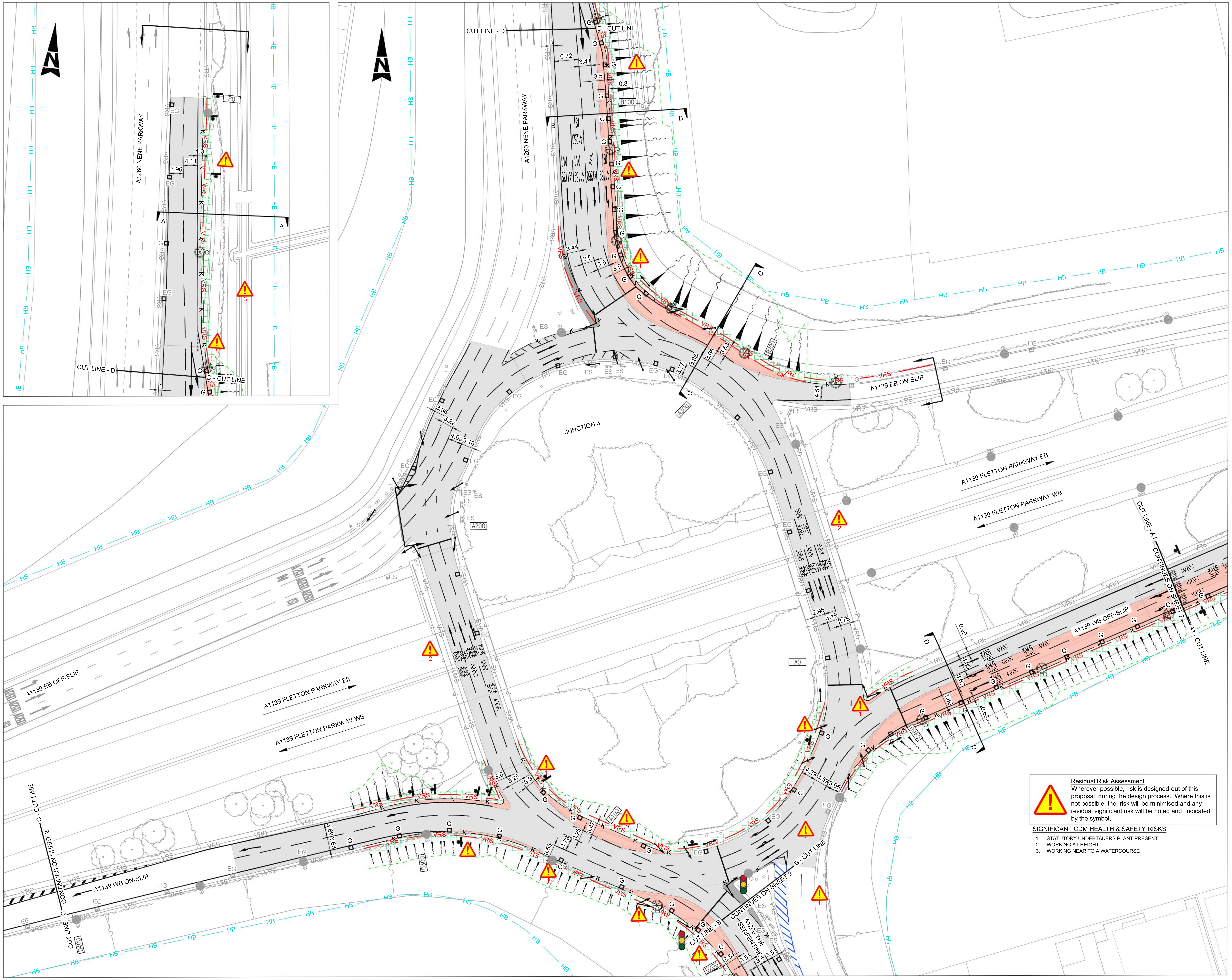


Figure 4: Sensitivity Testing BCR Range

Appendix C – General Arrangement Drawings



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- HB — HIGHWAY BOUNDARY
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- A — CROSS SECTION. REFER TO 5101127-MIL-HGN-ZZ-CH-0109

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13. FOR STREET LIGHTING DESIGN REFER TO 5080752-MIL-HLG-OR-DR-EO-1301 TO 1302.
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1. STATUTORY UNDERTAKERS PLANT PRESENT
2. WORKING AT HEIGHT
3. WORKING NEAR TO A WATERCOURSE

Rev	Date	Description	Drn	Chk'd	App
P01		FIRST ISSUE			

Revisions

Drawing Originator

Peterborough Highway Services
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Project Name
FLETTON PARKWAY
J3 IMPROVEMENTS

Title
GENERAL ARRANGEMENT
SHEET 1 OF 2

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Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:500	Drawn Date	Checked Date	Approved Date

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5101127-MIL-HGN-ZZ-DR-CH-0101	S2	P01

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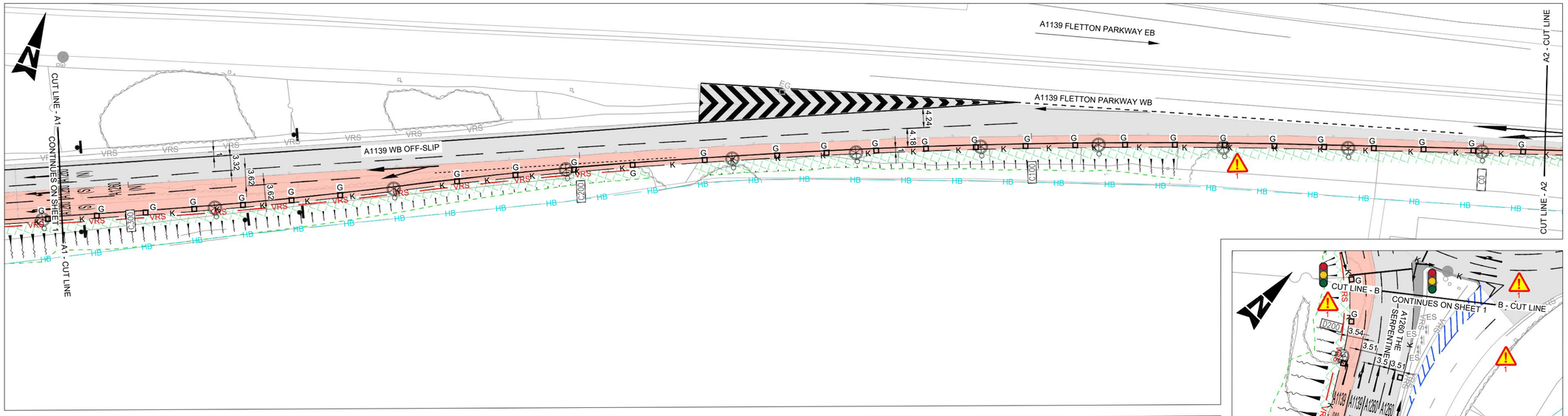

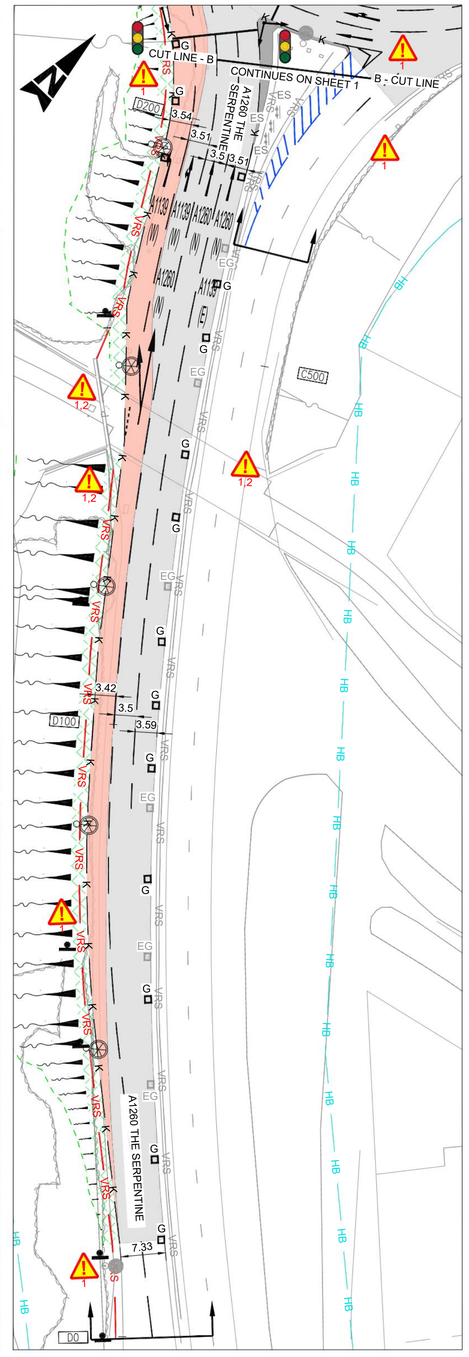

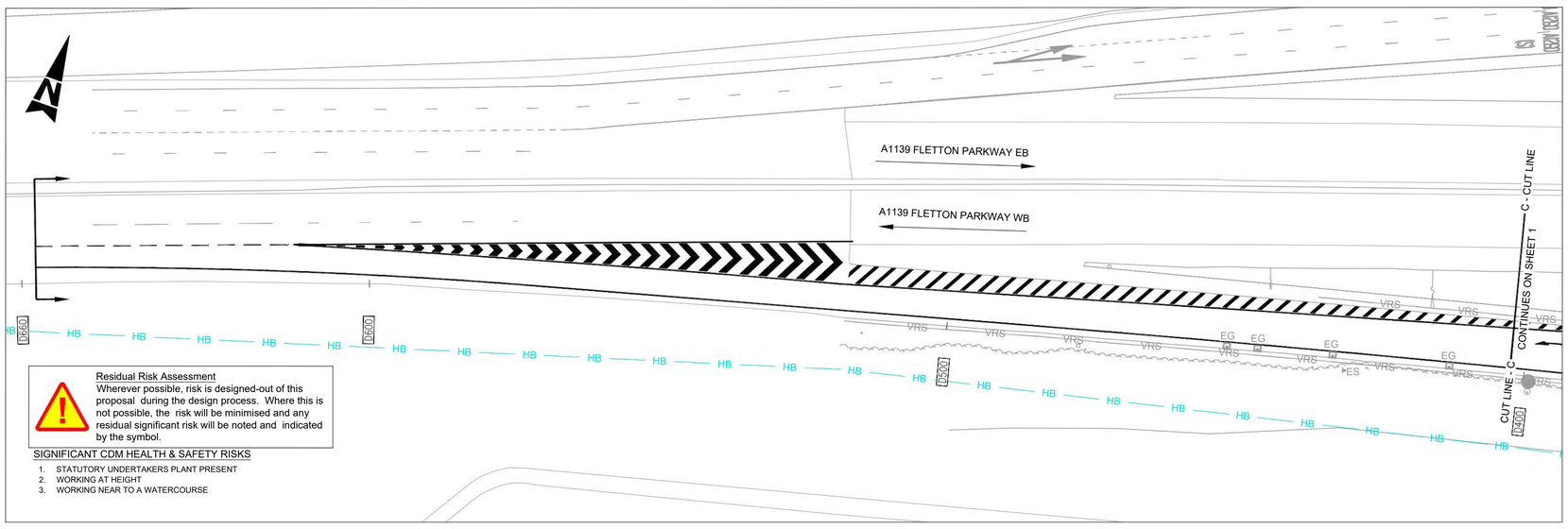

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Rev	Date	Description	Drn	Chkd	App
P01		FIRST ISSUE			

Revisions

Drawing Originator

Peterborough Highway Services
Delivered by Milestone Infrastructure — Peterborough City Council

Drawing Status

DETAILED DESIGN

Project Name

FLETTON PARKWAY
J3 IMPROVEMENTS

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GENERAL ARRANGEMENT
SHEET 2 OF 2

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Drawing Number	Status	Rev
5101127-MIL-HGN-ZZ-DR-CH-0102	S2	P01

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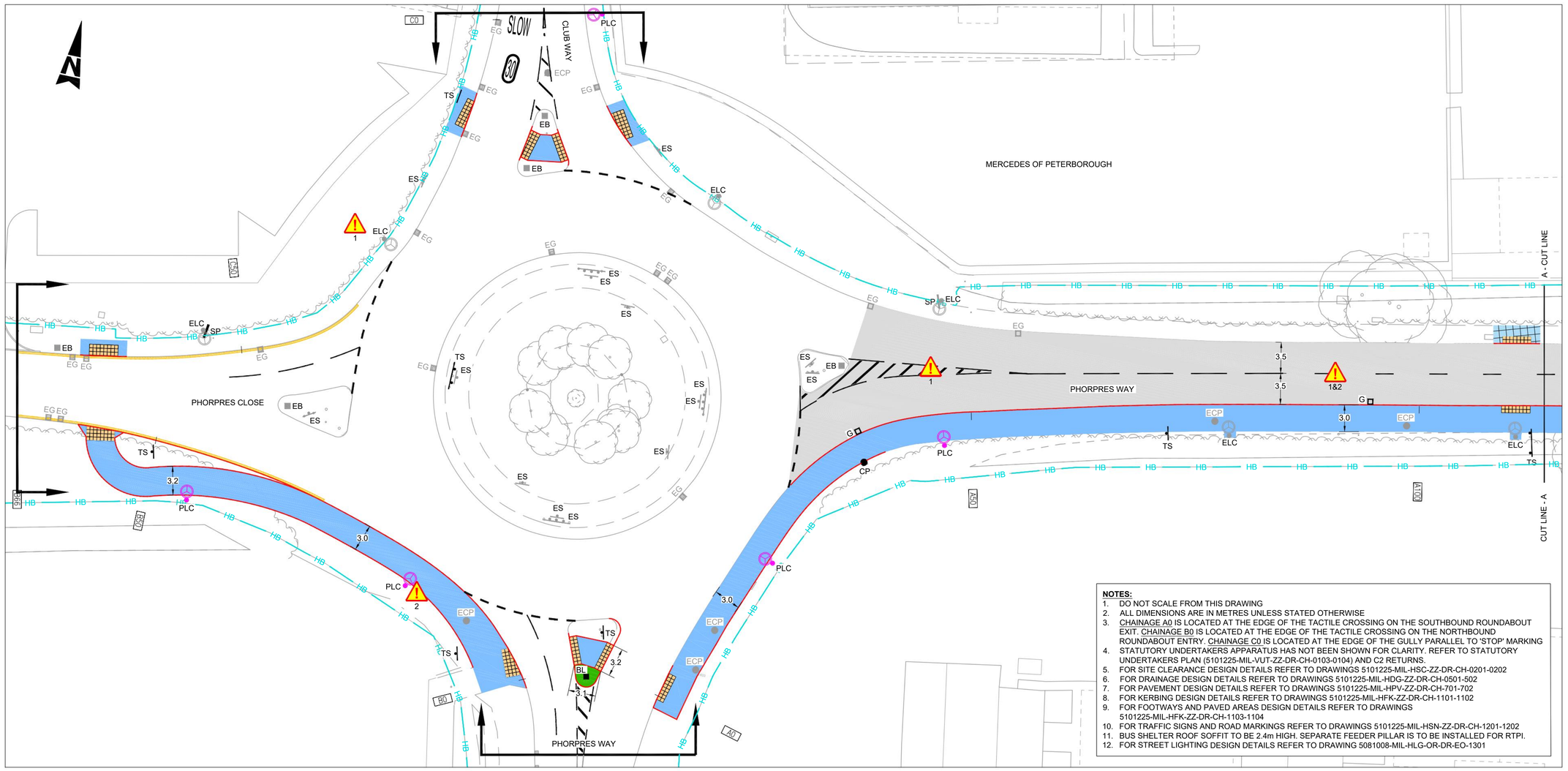

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P02	14/10/2022	UPDATED IN-LINE WITH RSA 1 AND CLIENT COMMENTS	HC	JC	ARPT
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Revisions

Drawing Originator

Peterborough Highway Services
Delivered by Milestone and Peterborough City Council

Drawing Status

PRELIMINARY DESIGN

Project Name

PHORPRES WAY
FOOTWAY/CYCLEWAY IMPROVEMENTS

Title

GENERAL ARRANGEMENT
SHEET 1 OF 2

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:250	HC	JC	ARPT
		Drawn Date 19/08/22	Checked Date 19/08/22	Approved Date 19/08/22

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5101225-MIL-HGN-ZZ-DR-CH-0101	S2	P02

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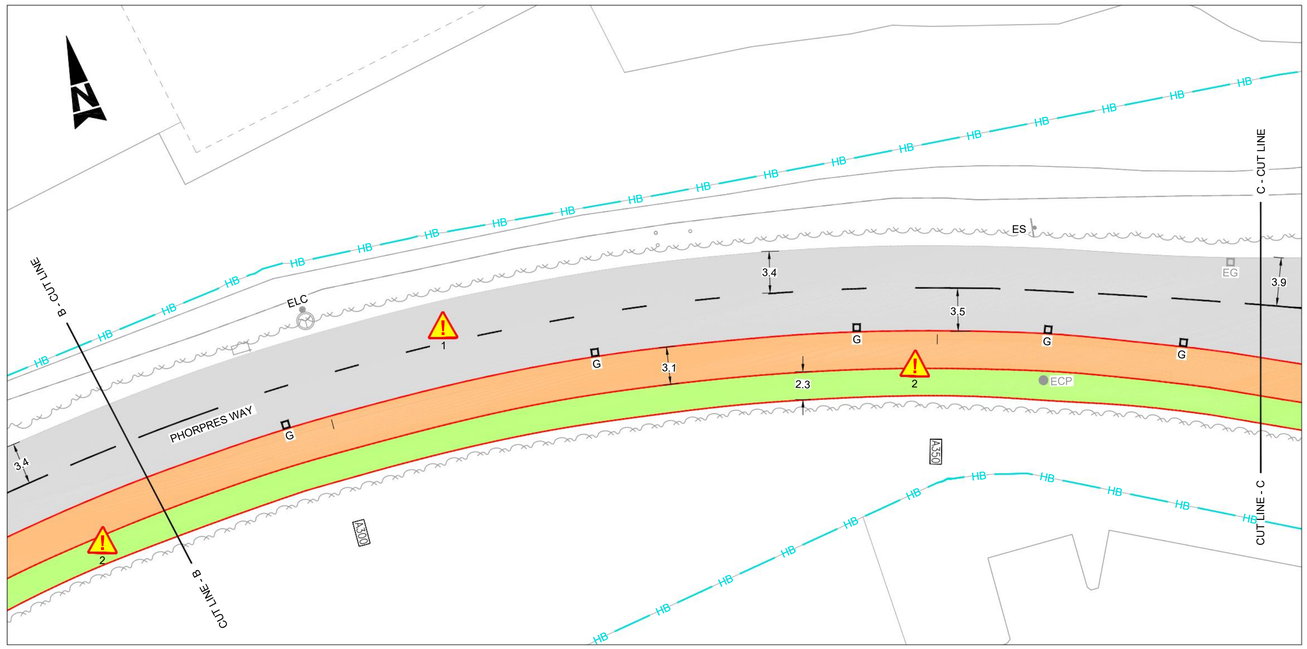

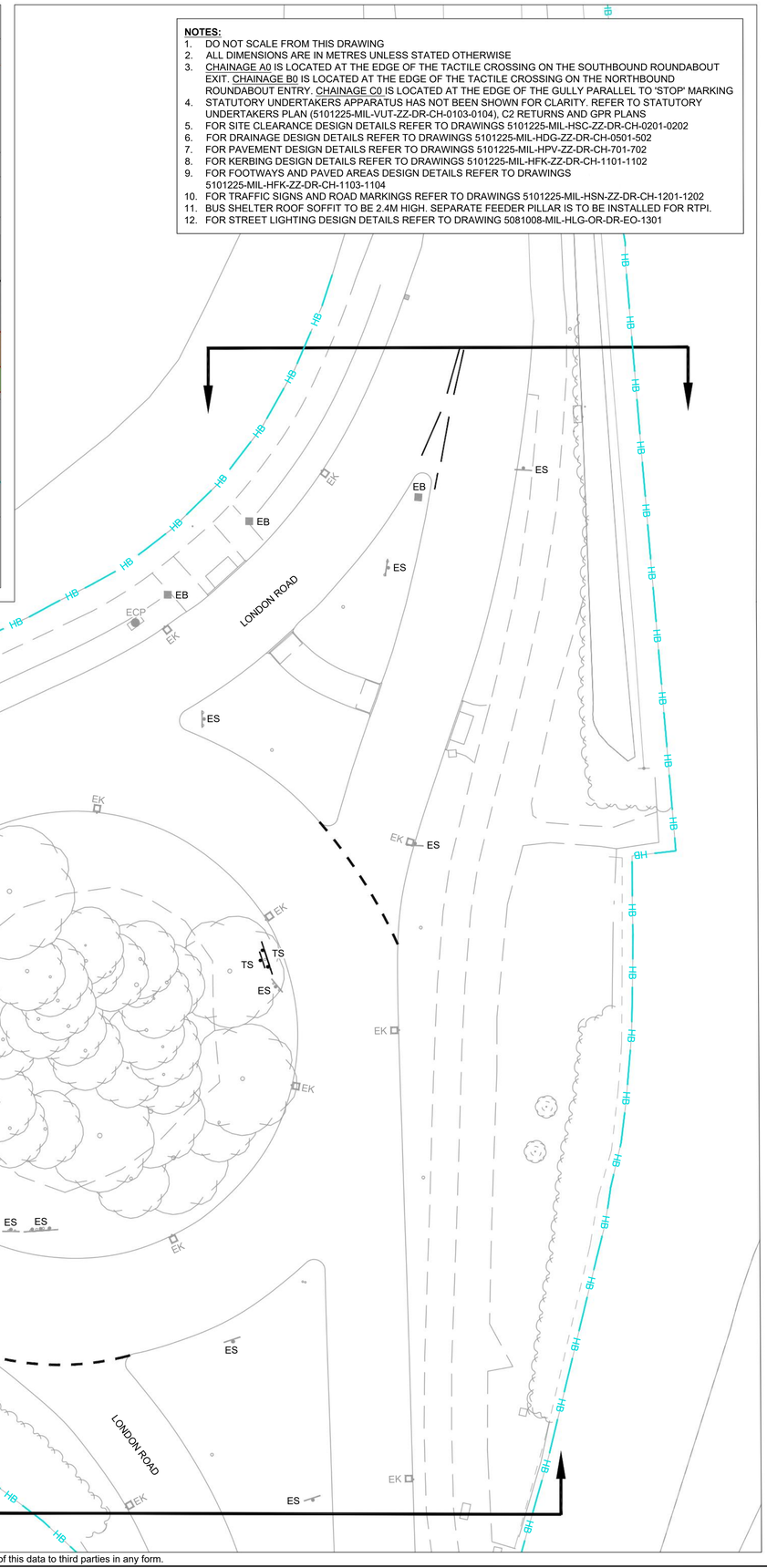

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Appendix D – 60 Year Cost Profile: Economic Dimension

Junction 3 - Do Something Scheme Costs in 2010 Market Prices for Input into Economc Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)						(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Risk Adjusted Base Cost (2022 Prices)		(4) Total Contribution of Optimism Bias		(5) Rebased to 2010 Price Base	(6) Discounted to 2010 Prices			(7) Adjusted to Market Prices
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Quantified Risk Adjustment	Risk Adjusted Cost	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£114,958	£0	£0	£35,459	£0	**£150,418**	0.000	£0.00	**£150,418**	£0	**£150,418**	£30,084	**£180,501**	**£141,495**	1.035	0.662	**£93,639**	**£111,430.52**
2023	2	£5,249,195	£0	£0	£1,026,812	£518,727	**£6,794,734**	1.060	£406,913.52	**£7,201,648**	£0	**£7,201,648**	£1,440,330	**£8,641,977**	**£6,774,463**	1.035	0.639	**£4,331,620**	**£5,154,627.24**
2024	3	£1,882,229	£0	£0	£348,460	£194,523	**£2,425,212**	1.146	£353,345.92	**£2,778,558**	£0	**£2,778,558**	£555,712	**£3,334,270**	**£2,613,740**	1.035	0.618	**£1,614,721**	**£1,921,518.29**
2025	4	£0	£0	£0	£10,000	£0	**£10,000**	1.234	£2,341.26	**£12,341**	£0	**£12,341**	£2,468	**£14,810**	**£11,609**	1.035	0.597	**£6,929**	**£8,246.02**
2026	5	£0	£0	£0	£0	£0	**£0**	1.273	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.577	**£0**	**£0.00**
2027	6	£0	£0	£0	£0	£0	**£0**	1.315	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.557	**£0**	**£0.00**
2028	7	£0	£0	£0	£0	£0	**£0**	1.357	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.538	**£0**	**£0.00**
2029	8	£0	£0	£0	£0	£0	**£0**	1.401	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.520	**£0**	**£0.00**
2030	9	£0	£0	£0	£0	£0	**£0**	1.446	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.503	**£0**	**£0.00**
2031	10	£0	£0	£0	£0	£0	**£0**	1.494	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.486	**£0**	**£0.00**
2032	11	£0	£0	£0	£0	£0	**£0**	1.543	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.469	**£0**	**£0.00**
2033	12	£0	£0	£0	£0	£0	**£0**	1.595	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.453	**£0**	**£0.00**
2034	13	£0	£0	£0	£0	£0	**£0**	1.649	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.438	**£0**	**£0.00**
2035	14	£0	£0	£0	£0	£0	**£0**	1.705	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.423	**£0**	**£0.00**
2036	15	£0	£0	£0	£0	£0	**£0**	1.763	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.409	**£0**	**£0.00**
2037	16	£0	£0	£0	£0	£0	**£0**	1.822	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.395	**£0**	**£0.00**
2038	17	£0	£0	£0	£0	£0	**£0**	1.882	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.382	**£0**	**£0.00**
2039	18	£0	£0	£0	£0	£0	**£0**	1.944	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.369	**£0**	**£0.00**
2040	19	£0	£0	£0	£0	£0	**£0**	2.009	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.356	**£0**	**£0.00**
2041	20	£0	£0	£0	£0	£0	**£0**	2.077	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.344	**£0**	**£0.00**
2042	21	£0	£0	£0	£0	£0	**£0**	2.147	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.333	**£0**	**£0.00**
2043	22	£0	£0	£0	£0	£0	**£0**	2.221	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.321	**£0**	**£0.00**
2044	23	£0	£0	£0	£0	£0	**£0**	2.297	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.310	**£0**	**£0.00**
2045	24	£0	£0	£0	£0	£0	**£0**	2.377	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.300	**£0**	**£0.00**
2046	25	£0	£0	£0	£0	£0	**£0**	2.460	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.290	**£0**	**£0.00**
2047	26	£0	£0	£0	£0	£0	**£0**	2.546	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.280	**£0**	**£0.00**
2048	27	£0	£0	£0	£0	£0	**£0**	2.637	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.271	**£0**	**£0.00**
2049	28	£0	£0	£0	£0	£0	**£0**	2.731	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.261	**£0**	**£0.00**
2050	29	£0	£0	£0	£0	£0	**£0**	2.828	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.253	**£0**	**£0.00**
2051	30	£0	£0	£0	£0	£0	**£0**	2.930	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.035	0.244	**£0**	**£0.00**
2052	31	£0	£0	£0	£0	£0	**£0**	3.035	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.289	**£0**	**£0.00**
2053	32	£0	£0	£0	£0	£0	**£0**	3.143	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.281	**£0**	**£0.00**
2054	33	£0	£0	£0	£0	£0	**£0**	3.256	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.272	**£0**	**£0.00**
2055	34	£0	£0	£0	£0	£0	**£0**	3.373	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.264	**£0**	**£0.00**
2056	35	£0	£0	£0	£0	£0	**£0**	3.493	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.257	**£0**	**£0.00**
2057	36	£0	£0	£0	£0	£0	**£0**	3.618	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.249	**£0**	**£0.00**
2058	37	£0	£0	£0	£0	£0	**£0**	3.747	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.242	**£0**	**£0.00**
2059	38	£0	£0	£0	£0	£0	**£0**	3.880	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.235	**£0**	**£0.00**
2060	39	£0	£0	£0	£0	£0	**£0**	4.018	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.228	**£0**	**£0.00**
2061	40	£0	£0	£0	£0	£0	**£0**	4.160	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.221	**£0**	**£0.00**
2062	41	£0	£0	£0	£0	£0	**£0**	4.306	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.215	**£0**	**£0.00**
2063	42	£0	£0	£0	£0	£0	**£0**	4.457	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.209	**£0**	**£0.00**
2064	43	£0	£0	£0	£0	£0	**£0**	4.612	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.203	**£0**	**£0.00**
2065	44	£0	£0	£0	£0	£0	**£0**	4.772	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.197	**£0**	**£0.00**
2066	45	£0	£0	£0	£0	£0	**£0**	4.937	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.191	**£0**	**£0.00**
2067	46	£0	£0	£0	£0	£0	**£0**	5.104	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.185	**£0**	**£0.00**
2068	47	£0	£0	£0	£0	£0	**£0**	5.273	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.180	**£0**	**£0.00**
2069	48	£0	£0	£0	£0	£0	**£0**	5.451	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.175	**£0**	**£0.00**
2070	49	£0	£0	£0	£0	£0	**£0**	5.636	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.170	**£0**	**£0.00**
2071	50	£0	£0	£0	£0	£0	**£0**	5.828	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.165	**£0**	**£0.00**
2072	51	£0	£0	£0	£0	£0	**£0**	6.025	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.160	**£0**	**£0.00**
2073	52	£0	£0	£0	£0	£0	**£0**	6.232	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.155	**£0**	**£0.00**
2074	53	£0	£0	£0	£0	£0	**£0**	6.448	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.151	**£0**	**£0.00**
2075	54	£0	£0	£0	£0	£0	**£0**	6.677	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.146	**£0**	**£0.00**
2076	55	£0	£0	£0	£0	£0	**£0**	6.917	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.142	**£0**	**£0.00**
2077	56	£0	£0	£0	£0	£0	**£0**	7.169	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.138	**£0**	**£0.00**
2078	57	£0	£0	£0	£0	£0	**£0**	7.430	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.134	**£0**	**£0.00**
2079	58	£0	£0	£0	£0	£0	**£0**	7.702	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.130	**£0**	**£0.00**
2080	59	£0	£0	£0	£0	£0	**£0**	7.987	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.126	**£0**	**£0.00**
2081	60	£0	£0	£0	£0	£0	**£0**	8.285	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.123	**£0**	**£0.00**
2082	61	£0	£0	£0	£0	£0	**£0**	8.590	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.119	**£0**	**£0.00**
2083	62	£0	£0	£0	£0	£0	**£0**	8.902	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.116	**£0**	**£0.00**
2084	63	£0	£0	£0	£0	£0	**£0**	9.225	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.112	**£0**	**£0.00**
2085	64	£0	£0	£0	£0	£0	**£0**	9.559	£0.00	**£0**	£0	**£0**	£0	**£0**	**£0**	1.030	0.109	**£0**	**£0.00**
Total		**£7,246,383**	**£0**	**£0**	**£1,420,731**	**£713,249**	**£9,380,364**		**£762,601**	**£10,142,965**	**£0**	**£10,142,965**	**£2,028,593**	**£12,171,558**	**£9,541,307**			**£6,046,909**	**£7,084,392**

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2021 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	**£9,380,364**
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	**£10,142,965**
(3)	Following the real cost adjustment a quantified risk contribution has been applied.	**£10,142,965**
(4)	The next stage is to apply optimism bias.	**£12,171,558**
(5)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	**£9,541,307**
(6)	Costs have been discounted to 2010 present values by applying a discount rate of 3.5% per year for 30 years and 3.0% thereafter (WebTAG A1.2).	**£6,046,909**
(7)	The final stage in preparing the scheme costs is to convert them from the factor cost to the market price unit of account using the indirect tax correction factor of 1.19	**£7,084,392**

Junction 3 - Do Something Scheme Costs in 2010 Market Prices for Input into Economic Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate (2022 Prices)		(2) Base Cost Estimate Including Real Cost Increases (2022 Prices)			(3) Risk Adjusted Base Cost (2022 Prices)		(4) Total Contribution of Optimism Bias		(5) Rebased to 2010 Price Base	(6) Discounted to 2010 Prices			(7) Adjusted to Market Prices
		Maintenance Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Quantified Risk Adjustment	Risk Adjusted Cost	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£0	**£0**	0.000	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.662	**£0**	**£0.00**
2023	2	£0	**£0**	1.100	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.639	**£0**	**£0.00**
2024	3	£0	**£0**	1.210	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.618	**£0**	**£0.00**
2025	4	£0	**£0**	1.331	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.597	**£0**	**£0.00**
2026	5	£0	**£0**	1.398	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.577	**£0**	**£0.00**
2027	6	£0	**£0**	1.467	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.557	**£0**	**£0.00**
2028	7	£0	**£0**	1.541	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.538	**£0**	**£0.00**
2029	8	£0	**£0**	1.618	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.520	**£0**	**£0.00**
2030	9	£0	**£0**	1.699	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.503	**£0**	**£0.00**
2031	10	£0	**£0**	1.784	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.486	**£0**	**£0.00**
2032	11	£0	**£0**	1.873	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.469	**£0**	**£0.00**
2033	12	£0	**£0**	1.966	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.453	**£0**	**£0.00**
2034	13	£78,472	**£78,472**	2.065	£83,558.39	**£162,030**	£0	**£162,030**	£0.00	**£162,030**	**£127,016**	1.035	0.438	**£55,628**	**£66,196.76**
2035	14	£0	**£0**	2.168	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.423	**£0**	**£0.00**
2036	15	£0	**£0**	2.276	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.409	**£0**	**£0.00**
2037	16	£0	**£0**	2.390	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.395	**£0**	**£0.00**
2038	17	£0	**£0**	2.510	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.382	**£0**	**£0.00**
2039	18	£0	**£0**	2.635	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.369	**£0**	**£0.00**
2040	19	£0	**£0**	2.767	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.356	**£0**	**£0.00**
2041	20	£0	**£0**	2.905	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.344	**£0**	**£0.00**
2042	21	£0	**£0**	3.051	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.333	**£0**	**£0.00**
2043	22	£0	**£0**	3.203	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.321	**£0**	**£0.00**
2044	23	£0	**£0**	3.363	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.310	**£0**	**£0.00**
2045	24	£0	**£0**	3.532	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.300	**£0**	**£0.00**
2046	25	£0	**£0**	3.708	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.290	**£0**	**£0.00**
2047	26	£0	**£0**	3.894	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.280	**£0**	**£0.00**
2048	27	£78,472	**£78,472**	4.088	£242,337.08	**£320,809**	£0	**£320,809**	£0.00	**£320,809**	**£251,483**	1.035	0.271	**£68,042**	**£80,969.61**
2049	28	£0	**£0**	4.293	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.261	**£0**	**£0.00**
2050	29	£0	**£0**	4.507	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.253	**£0**	**£0.00**
2051	30	£0	**£0**	4.733	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.035	0.244	**£0**	**£0.00**
2052	31	£0	**£0**	4.969	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.289	**£0**	**£0.00**
2053	32	£0	**£0**	5.218	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.281	**£0**	**£0.00**
2054	33	£0	**£0**	5.479	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.272	**£0**	**£0.00**
2055	34	£0	**£0**	5.753	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.264	**£0**	**£0.00**
2056	35	£0	**£0**	6.040	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.257	**£0**	**£0.00**
2057	36	£0	**£0**	6.342	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.249	**£0**	**£0.00**
2058	37	£0	**£0**	6.659	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.242	**£0**	**£0.00**
2059	38	£0	**£0**	6.992	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.235	**£0**	**£0.00**
2060	39	£0	**£0**	7.342	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.228	**£0**	**£0.00**
2061	40	£0	**£0**	7.709	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.221	**£0**	**£0.00**
2062	41	£78,472	**£78,472**	8.094	£556,708.04	**£635,180**	£0	**£635,180**	£0.00	**£635,180**	**£497,919**	1.030	0.215	**£107,059**	**£127,400.12**
2063	42	£0	**£0**	8.499	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.209	**£0**	**£0.00**
2064	43	£0	**£0**	8.924	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.203	**£0**	**£0.00**
2065	44	£0	**£0**	9.370	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.197	**£0**	**£0.00**
2066	45	£0	**£0**	9.839	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.191	**£0**	**£0.00**
2067	46	£0	**£0**	10.331	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.185	**£0**	**£0.00**
2068	47	£0	**£0**	10.847	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.180	**£0**	**£0.00**
2069	48	£0	**£0**	11.390	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.175	**£0**	**£0.00**
2070	49	£0	**£0**	11.959	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.170	**£0**	**£0.00**
2071	50	£0	**£0**	12.557	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.165	**£0**	**£0.00**
2072	51	£0	**£0**	13.185	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.160	**£0**	**£0.00**
2073	52	£0	**£0**	13.844	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.155	**£0**	**£0.00**
2074	53	£0	**£0**	14.536	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.151	**£0**	**£0.00**
2075	54	£0	**£0**	15.263	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.146	**£0**	**£0.00**
2076	55	£78,472	**£78,472**	16.026	£1,179,141.03	**£1,257,613**	£0	**£1,257,613**	£0.00	**£1,257,613**	**£985,845**	1.030	0.142	**£140,137**	**£166,762.69**
2077	56	£0	**£0**	16.828	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.138	**£0**	**£0.00**
2078	57	£0	**£0**	17.669	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.134	**£0**	**£0.00**
2079	58	£0	**£0**	18.552	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.130	**£0**	**£0.00**
2080	59	£0	**£0**	19.480	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.126	**£0**	**£0.00**
2081	60	£0	**£0**	20.454	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.123	**£0**	**£0.00**
2082	61	£0	**£0**	21.477	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.119	**£0**	**£0.00**
2083	62	£0	**£0**	22.551	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.116	**£0**	**£0.00**
2084	63	£0	**£0**	23.678	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.112	**£0**	**£0.00**
2085	64	£0	**£0**	24.862	£0.00	**£0**	£0	**£0**	£0.00	**£0**	**£0**	1.030	0.109	**£0**	**£0.00**
Total		**£313,888**	**£313,888**		**£2,061,745**	**£2,375,633**	**£0**	**£2,375,633**	**£0**	**£2,375,633**	**£1,862,263**			**£370,865**	**£441,329**

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2021 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£313,888
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£2,375,633
(3)	Following the real cost adjustment a quantified risk contribution has been applied.	£2,375,633
(4)	The next stage is to apply optimism bias.	£2,375,633
(5)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (WebTAG A1.2).	£1,862,263
(6)	Costs have been discounted to 2010 present values by applying a discount rate of 3.5% per year for 30 years and 3.0% thereafter (WebTAG A1.2).	£370,865
(7)	The final stage in preparing the scheme costs is to convert them from the factor cost to the market price unit of account using the indirect tax correction factor of 1.19	£441,329

Appendix E – TAG Worksheets

Air Quality Valuation Workbook - Worksheet 3

Scheme Name:	J3 Peterborough
Present Value Base Year	2010
Current Year	2022
Proposal Opening year:	2026
Project (Road/Rail or Road and Rail):	Road Transport (RT)

Overall Assessment Score:

Damage Costs Approach (Emissions)

Present value of change in NOx emissions (£):	£129,618
Present value of change in PM2.5 emissions (£):	£47,031
OR	
Present value of change in PM10 emissions (£):	£0

Impact Pathways Approach (Concentrations)

Present value of change in NO2 concentrations (£):	£0
Of which:	
Concentration costs:	£0
Other impacts:	£0
Present value of change in PM2.5 concentrations (£):	£0
Of which:	
Concentration costs:	£0
Other impacts:	£0

Total Change

Total value of change in air quality (£):	£176,649

*positive value reflects a **net benefit** (i.e. air quality improvement)

Quantitative Assessment:

Impact Pathways Approach (Concentrations)

Change in NO2 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	0.00
Change in PM2.5 assessment scores over 60 year appraisal period: (between 'with scheme' and 'without scheme' scenarios)	0.00

Damage Costs Approach (Emissions)

Change in NOX emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	-33
Change in PM2.5 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	-1
OR	
Change in PM10 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0

Qualitative Comments:

Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):	£642,365
Lower estimate net present value of change in air quality (£):	£21,903

Data Sources:

Noise Workbook - Worksheet 1

Proposal Name: Fletton Parkway Junction 3 Improvements

Present Value Base Year	2010
Current Year	2022
Proposal Opening year:	2026
Project (Road, Rail or Aviation):	road

Net present value of change in noise (£):	-£198,892

positive value reflects a **net benefit** (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):	-£95,890
Net present value of impact on amenity (£):	-£69,320
Net present value of impact on AMI (£):	-£17,050
Net present value of impact on stroke (£):	-£6,630
Net present value of impact on dementia (£):	-£10,001

Quantitative results

Households experiencing increased daytime noise in forecast year:	36
Households experiencing reduced daytime noise in forecast year:	0
Households experiencing increased night time noise in forecast year:	35
Households experiencing reduced night time noise in forecast year:	0

Qualitative Comments:

The Do-Something results do not include the effects of the noise fence 1.8m high and 160m long tested in the "Fletton Parkway Junction 3 Improvements, GH006692-GLH-R-NV-001 P02 Noise Impact Assessment" for the enhancement of the Noise Important Area NIA 5371. In case that the proposed fence was included in the design, this worksheet should be replaced by the Do-Something results with the fence.

Data Sources:

Road traffic model produced by Capita.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	**Description of feature/ attribute**	**Scale (at which attribute matters)**	**Importance (of attribute)**	**Trend (in relation to target)**	**Biodiversity and earth heritage value**	**Magnitude of impact**	**Assessment Score**
Orton Pit SSSI, SAC	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	International	High - Great crested newt, charophyte species (stoneworth)	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	Very high	Neutral - Likely Significant Effects (LSE) report concluded that the development works will not have a likely significant effect on the interest features or condition of any of the designated site providing: •A conservatory/precautionary approach is adopted in respect to protected species, particularly GCN and nesting. This will be captured within a Precautionary Method of Working (PMW). •Suitable noise mitigation measures are incorporated into the Construction Environmental Management Plan (CEMP). •Additional testing is undertaken to fully understand the extent of any contaminated land so that suitable soil, surface water and dust control measures can be incorporated into the CEMP.	Neutral
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High	Neutral - This site is not within the area where works are proposed and is located approx. 3km north-east of the proposed development site. No identified connectivity between this site and the area of proposed works.	Neutral
Great Crested Newt (GCN)	Protected Species	International	Very High - european protected species which covers great created newts, their eggs, breeding sites and resting places	Great crested newt are protected by the Wildlife and Countryside Act (1981) (as amended) and the Conservation of Habitats and Species Regulations (2017) (as amended).	Very high	Neutral - GCN should not be affected by works given the distance (>1km) from suitable ponds with know presence of GCN. Nonetheless, vegetation and ground clearance will be undertaken under a PMW to further mitigate this risk. Ground clearance of root systems will be avoided outside the period March-October inclusive.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral
Reptiles	Protected Species	National	High - national protection from intentional killing, injury or sale	All British reptiles are protected from intentional killing, injuring and sale under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)	High	Neutral - Reptiles should not be affected by works as vegetation and ground clearance will be undertaken under a PMW. Such works will also be undertaken during the active season (April to mid-October inclusive) to further mitigate this risk.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
MAGIC website
OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

Potential impacts on Orton Pit SSSI/SAC will be mitigated by implementing a PMW and other industry best practice control measures to manage both direct and indirect impacts. Pre-start checks will also be undertaken for other protected species and PMWs implemented as appropriate to further mitigate the risk of disturbance and/or harm.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	**Description of feature/ attribute**	**Scale (at which attribute matters)**	**Importance (of attribute)**	**Trend (in relation to target)**	**Biodiversity and earth heritage value**	**Magnitude of impact**	**Assessment Score**
Orton Pit SSSI, SAC	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	International	High - Great crested newt, charophyte species (stoneworth)	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	Very high	Neutral - There is no connectivity between the development site and Orton Pit SSSI/SAC, especially considering the intervening development.	Neutral
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High	Neutral - This site is not within the area where works are proposed and is located approx. 3km north-east of the proposed development site. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
MAGIC website
OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

Potential direct and indirect impacts on protected species will be mitigated by implementing a PMW and other industry best practice control measures. Designated sites are located too far away for there to be any impacts. There is also intervening infrastructure disrupting any connectivity between the proposed development and these receptors.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	**Description of feature/ attribute**	**Scale (at which attribute matters)**	**Importance (of attribute)**	**Trend (in relation to target)**	**Biodiversity and earth heritage value**	**Magnitude of impact**	**Assessment Score**
Orton Pit SSSI, SAC	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	International	High - Great crested newt, charophyte species (stoneworth)	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	Very high	Neutral - There is no connectivity between the development site and Orton Pit SSSI/SAC, especially considering the intervening A1139 Fletton Parkway and other development.	Neutral
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High	Neutral - This site is not within the area where works are proposed and is located approx. 3km north-east of the proposed development site. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
MAGIC website
OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

Potential direct and indirect impacts on protected species will be mitigated by implementing a PMW and other industry best practice control measures. Designated sites are located too far away for there to be any impacts. There is also intervening infrastructure disrupting any connectivity between the proposed development and these receptors.

TAG Biodiversity Impacts Worksheet

Step 2		Step 3				Step 4	Step 5
Area	**Description of feature/ attribute**	**Scale (at which attribute matters)**	**Importance (of attribute)**	**Trend (in relation to target)**	**Biodiversity and earth heritage value**	**Magnitude of impact**	**Assessment Score**
Orton Pit SSSI, SAC	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	International	High - Great crested newt, charophyte species (stoneworth)	Disused ridge-and-furrow created from clay extraction for the brick-making industry inhabited by the largest known population of great crested newt in the UK and possibly in Europe. The site is also characterised by alkaline water low in nutrients and supports ten species of charophyte including on of the main English populations of bearded stonewort.	Very high	Neutral - There is no connectivity between the development site and Orton Pit SSSI/SAC, especially considering the intervening A1139 Fletton Parkway and other development.	Neutral
Nene Washes SPA, SSSI and Ramsar	Washland habitat which supports international populations of wildfowl and waders.	International	High - Wildfowl, waders and associated botanical species	The Nene Washes site represents one of the country's few remaining areas of washland habitat which is essential to the survival nationally and internationally of populations of wildfowl and waders. Several nationally scarce plants and vulnerable, rare or relict fenland invertebrates are represented.	Very High	Neutral - This site is not within the area where works are proposed and is located approx. 3km north-east of the proposed development site. No identified connectivity between this site and the area of proposed works.	Neutral
Birds	Protected species	National	High - national protection for nesting bird species from direct harm and disturbance	All nesting birds are protected under The Wildlife and Countryside Act 1981 (as amended) and therefore the disturbance of their nesting places is considered an offence.	High	Neutral - The areas of existing vegetation will require removal and therefore the proposed works may disturb nesting birds. However, mitigation measures such as scheduling vegetation works outside the nesting bird season and implementing pre-works ecological checks will be implemented.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
MAGIC website
OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

Potential direct and indirect impacts on protected species will be mitigated by implementing a PMW and other industry best practice control measures. Designated sites are located too far away for there to be any impacts. There is also intervening infrastructure disrupting any connectivity between the proposed development and these receptors.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Scheduled Monument (NHLE 1006833) “Romano-British Settlement SE of Orton Longueville” - This site is located directly underneath the current junction’s roundabout and an area heading westwards from the junction. This site was scheduled following the archaeological excavations which were undertaken in the 1970s prior to the construction of the Fletton Parkway. The excavation revealed the remains of a building, with ceramic building material such as flue tile suggesting a high-status Roman building. The pottery dated the structure to the 2nd to 3rd century. The site identified that the medieval furrows across the area were extensive and had impacted much of the earlier (Roman) remains. It is unclear what archaeological remains may survive within the area following the construction of the parkway. Other archaeological remains - more recent archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.	Romano-British Settlement SE of Orton Longueville Scheduled Monument - National: This monument is scheduled under the Ancient Monuments and Archaeological Areas Act 1979 as amended as it appears to the Secretary of State to be of national importance. Other archaeological remains - considered likely to be of local or regional importance.	Romano-British Settlement SE of Orton Longueville Scheduled Monument - the Scheduled Monument designation is evidence for highly significant archaeological remains, particularly from the Roman period. Other archaeological remains - Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	Romano-British Settlement SE of Orton Longueville Scheduled Monument - The current archaeological baseline suggests that the area has been well settled since late prehistory, with numerous finds and features being recorded within the PHER. Similarly, the Scheduled Monuments (NHLE 1006833 and 1006860) are both evidence for potentially high-status Romano-British settlement and military activity within the vicinity south of the River Nene. Other archaeological remains - It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - The current setting of this Scheduled Monument is a busy highways interchange which will not change as a result of the scheme. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument’s heritage significance, which is based upon its archaeological interest. The scheme is unlikely to impact on previously undisturbed land, particularly considering the impact of previous development and land use. Engagement with the PCC Archaeologist is on-going to provide additional design information and confirm mitigation requirements. A Scheduled Monument Consent will need to be obtained for the works regardless due to the proximity of the underlying feature.
Survival	When considering the known heritage assets within the study area, there is a high potential for archaeological remains to be present within the region of the proposed works. This would be in areas which have not previously been disturbed by post-medieval to modern quarrying or modern development. However, previous archaeological work has shown that the historic land-use of the area (the brickworks and their associated clay pits) may have significantly impacted any potential archaeological remains that could have been present. Similarly, the construction of Fletton Parkway and Nene Parkway themselves would likely have impacted buried archaeological remains which were not excavated as part of the 1970s pre-construction excavations.				
Condition	Romano-British Settlement SE of Orton Longueville Scheduled Monument - estimate general condition as 'Poor' = <40% remains due to disturbance/removal from previous land use and development. Other archaeological remains - estimate general condition as 'Poor' = <40% remains due to disturbance/removal from previous land use and development.				
Complexity	Scheduled Monument (NHLE 1006833) “Romano-British Settlement SE of Orton Longueville” - Previous archaeological excavation revealed the remains of a building, with ceramic building material such as flue tile suggesting a high-status Roman building. The pottery dated the structure to the 2nd to 3rd century. The site identified that the medieval furrows across the area were extensive and had impacted much of the earlier (Roman) remains. It is unclear what archaeological remains may survive within the area following the construction of the parkway. Other archaeological remains - more recent archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.				
Context	The current setting of this Scheduled Monument is dominated by a busy highways interchange with residential properties to the north-west and south-west and industrial/commercial facilities to the north-east and south-east. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument’s heritage significance, which is based upon its archaeological interest.				
Period	Scheduled Monument (NHLE 1006833) “Romano-British Settlement SE of Orton Longueville” - Roman. Other archaeological remains - PHER records indicate artefacts from Medieval, Roman, Neolithic, Iron Age.				

Reference Sources

Peterborough City Historic Environment Record
National Record of the Historic Environment
National Heritage List for England (online)
Historic Ordnance Survey maps & photographs (online)
Royal HaskoningDHV 2020 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The current setting of this Scheduled Monument is a busy highways interchange which will not change as a result of the scheme. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument’s heritage significance, which is based upon its archaeological interest.

The scheme is unlikely to impact on previously undisturbed land, particularly considering the impact of previous development and land use. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). Engagement with the PCC Archaeologist is on-going to provide additional design information and confirm mitigation requirements.

A Scheduled Monument Consent will need to be obtained for the works regardless due to the proximity of the underlying feature.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Survival	Unknown - previous archaeological work has shown that the historic land-use of the area (the brickworks and their associated clay pits) may have significantly impacted any potential archaeological remains that could have been present. Similarly, construction of Phorpres Way and the surrounding development would likely have impacted buried archaeological remains which were not excavated as part of any mitigation works.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.				
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	Other archaeological remains - PHER records indicate artefacts from Medieval, Roman, Neolithic, Iron Age.				

Reference Sources

Peterborough City Historic Environment Record
National Record of the Historic Environment
National Heritage List for England (online)
Historic Ordnance Survey maps & photographs (online)
Royal HaskoningDHV 2020 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways boundary, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Survival	Unknown - previous archaeological work has shown that the historic land-use of the area (the brickworks and their associated clay pits) may have significantly impacted any potential archaeological remains that could have been present. Similarly, construction of Malborne Way and the surrounding development would likely have impacted buried archaeological remains which were not excavated as part of any mitigation works.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.				
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	Other archaeological remains - PHER records indicate artefacts from Medieval, Roman, Neolithic, Iron Age.				

Reference Sources

Peterborough City Historic Environment Record
National Record of the Historic Environment
National Heritage List for England (online)
Historic Ordnance Survey maps & photographs (online)
Royal HaskoningDHV 2020 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways boundary, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Historic Environment Impacts Worksheet

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.	Any potential archaeological remains are considered likely to be of local or regional importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	It is anticipated that most finds are likely to be relatively 'common' for the region.	Neutral - There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity and scope of the proposed works.
Survival	Unknown - previous archaeological work has shown that the historic land-use of the area (the brickworks and their associated clay pits) may have significantly impacted any potential archaeological remains that could have been present. Similarly, construction of the existing footpath and the surrounding development would likely have impacted buried archaeological remains which were not excavated as part of any mitigation works.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations in the immediate areas surrounding the scheme (e.g. for Cygnet Park located directly south-east and an Anglian Water main located directly south) have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east in the area of the "Old Brickworks" which revealed Roman artefacts and finds.				
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of any archaeological remains/features will be negligible.				
Period	Other archaeological remains - PHER records indicate artefacts from Medieval, Roman, Neolithic, Iron Age.				

Reference Sources

Peterborough City Historic Environment Record
National Record of the Historic Environment
National Heritage List for England (online)
Historic Ordnance Survey maps & photographs (online)
Royal HaskoningDHV 2020 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains, however, this risk is dramatically reduced considering the scale of modern development within the vicinity. Buried archaeological remains would likely have been removed by the previous developments (either through pre-development archaeological mitigation, or due to construction work itself). As the proposed works are of a minor scale in terms of location and depth of excavation within the existing highways boundary, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Landscape Impacts Worksheet

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	This area is defined by its position south of the city centre, surrounded by residential properties to the north-west and south-west, and a predominance of commercial/industrial facilities to the north-east and south-east. There are woodland belts of mature vegetation surrounding the Hampton Roundabout (A1139, Fletton Parkway) and its approaches. Trees are also present within the centre of the roundabout and island sites between the slip roads and main dual carriageway.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - mature tree belts will have to be removed to accommodate the embankments on the north-east and south-west sides of the roundabout. There will also be an impact on mature trees between the A1139 westbound onslip and the main carriageway, south of the A1139 westbound offslip, and within the central island area. The receptors directly impacted from a landscape perspective are residential receptors to the south-west, and industrial/commercial facilities in other areas. This will reduce screening of the existing road highways infrastructure. Options for replacement planting on site are also being explored and other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Consultation with local stakeholders will also be undertaken.
Tranquillity	Low - this is a busy highways interchange surrounded by commercial and light industrial facilities.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There is a Scheduled Ancient Monument (Romano-British settlement SE of Orton Longueville) located immediately beneath the Hampton Roundabout (A1139, Junction 3).	National	Rare	High	Not substitable	Neutral - the current setting of this Scheduled Monument is dominated by a busy highways interchange with residential properties to the north-west and south-west and industrial/commercial facilities to the north-east and south-east. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument's heritage significance, which is based upon its archaeological interest.
Landcover	Woodland belts of mature vegetation surrounding the Hampton Roundabout (A1139, Fletton Parkway) and its approaches. Trees are also present within the centre of the roundabout and island sites between the slip roads and main dual carriageway.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - mature tree belts will have to be removed to accommodate the embankments on the north-east and south-west sides of the roundabout. There will also be an impact on mature trees between the A1139 westbound onslip and the main carriageway, south of the A1139 westbound offslip, and within the central island area. The receptors directly impacted from a landscape perspective are residential receptors to the south-west, and industrial/commercial facilities in other areas. This will reduce screening of the existing road highways infrastructure. Options for replacement planting on site are also being explored and other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Consultation with local stakeholders will also be undertaken.
Summary of character	This area is defined by its position south of the city centre, surrounded by residential properties to the north-west and south-west, and a predominance of commercial/industrial facilities to the north-east and south-east. There are woodland belts of mature vegetation surrounding the Hampton Roundabout (A1139, Fletton Parkway) and its approaches. Trees are also present within the centre of the roundabout and island sites between the slip roads and main dual carriageway. These woodland belts and trees provide an important screening function for residential properties, specifically to the south-west of the junction.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - The proposed scheme will result in the loss of 16 semi-mature and mature trees in addition to 4 very minor saplings. However, from a landscape perspective, the receptors directly impacted are commercial and light industrial facilities which are less likely to be concerned by such losses. Other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Replacement planting is being carefully planned to provide further mitigation. The essential character of the area will be maintained in the long term and the setting of the nearby Flag Fen Bronze Centre Scheduled Monument will remain unaffected.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Slight adverse (negative) effect

Qualitative Comments

The proposed scheme will result in the loss of significant woodland belts within the immediate areas surrounding the junction. The impact is more significant from a landscape perspective to the south-west side of the junction where residential properties are situated. Other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Replacement planting is being carefully planned to provide further mitigation. The essential character of the area will be maintained in the long term and the setting of the Scheduled Ancient Monument beneath the junction will remain unaffected.

TAG Landscape Impacts Worksheet

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	The proposed scheme footprint is set within an urban commercial/industrial area. There is a relatively dense population of commercial buildings to the south with larger commercial and industrial facilities requiring more space to the north. There are existing woodland belts both sides of Phorpres Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Tranquillity	Low - Phorpres Way is an existing road with activity linked to the commercial and industrial facilities.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	There is a relatively dense population of commercial buildings to the south with larger commercial and industrial facilities requiring more space to the north. There are existing woodland belts both sides of Phorpres Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Summary of character	The character of this area is commercial and light industrial with no residential properties in the immediate vicinity. There are existing woodland belts both sides of Phorpres Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

TAG Landscape Impacts Worksheet

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	The proposed scheme footprint is set within a residential area to the north of the A1139 Fletton Parkway. There is a school at the southern extent of the scheme (Lime Academy Orton). There is evidence that the existing eastern grass verge where the new footway is proposed is already used informally as an active travel route. There are woodland belts on both sides of Malborne Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a new footway in the eastern verge. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Tranquillity	Low - Malborne Way is an existing road with surrounding residential properties and the A1139 Fletton Parkway located immediately south.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	There is a relatively dense population of residential buildings east, west and north of the scheme footprint, and the A1139 Fletton Parkway located immediately south. There are existing woodland belts both sides of Malborne Way.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a new footway in the eastern verge. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Summary of character	The character of this area is residential. There are existing woodland belts both sides of Malborne Way. The A1139 Fletton Parkway is located immediately south.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a the new footway in the eastern verge. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a new footway in the eastern verge. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

TAG Landscape Impacts Worksheet

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	The proposed scheme footprint is bound by the A1139 Fletton Parkway to the south, Stillwell Nature Reserve to the east, and industrial/commercial facilities to the north and west. The area of the former Mars Pet Care site is currently used for storage of shipping containers and lorries. There is an existing footway running from the south-west corner of Stillwells Nature Reserve, along the eastern and northern boundaries of the former Mars Pet Care site, before tying in with the southern end of Shrewsbury Avenue. This footway is lined with trees and hedgerows on both sides.	Local and Regional	Moderate	High	Trees and hedgerows - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a shared use facility. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Tranquillity	Low - the area is characterised by commercial and industrial activity with the A1139 Fletton Parkway located immediately south.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the tranquillity of this area considering the existing activity levels and proposed works.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Landcover	The proposed scheme footprint is bound by the A1139 Fletton Parkway to the south, Stillwell Nature Reserve to the east, and industrial/commercial facilities to the north and west. There is an existing footway running from the south-west corner of Stillwells Nature Reserve, along the eastern and northern boundaries of the former Mars Pet Care site, before tying in with the southern end of Shrewsbury Avenue. This footway is lined with trees and hedgerows on both sides.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a shared use facility. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Summary of character	The character of this area is commercial and light industrial with no residential properties in the immediate vicinity. There are existing woodland belts both sides of the existing footway.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral – the scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a shared use facility. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will have virtually no effect on the landscape character of this area considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a shared use facility. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.

TAG Townscape Impacts Worksheet

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	This area is a busy interchange where Junction 3 of the A1139 Fletton Parkway links with both the A1260 Nene Parkway to the north, and A1260 The Serpentine to the South. There is a relatively high density of residential properties to the north-west and south-west of the junction, set back from the woodland vegetation in the immediate area surrounding the junction. Conversely, land to the north-east and south-east is dominated by commercial and industrial land uses. There is an existing active travel route (Phorpres Lane) which passes under the A1260 where it meets the Hampton Roundabout (A1139, Junction 3) to the south.	Local	Common	Low	Substitutabile - no significant material changes as part of the proposed scheme.	No impact - existing active travel routes will also be maintained and improved in the wider townscape to the north-east, north-west, and south-east of the A1139, Junction 3.	Neutral – the scheme will maintain the existing townscape as a busy, urban highways interchange with the intention of alleviating congestion and improving active travel routes within the wider townscape.
Density and mix	Immediate surrounding area dominated by residential (north-west and south-west) and commercial / light industrial facilities (north-east and south-east). The main townscape is set back from the immediate surroundings of the junction which is dominated by woodland, shrubs and grassland areas.	Local	Common	Low	Substitutabile - no significant material changes as part of the proposed scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works, which is limited to increasing the capacity of the existing highways infrastructure.
Scale	The junction is already elevated within the townscape but surrounded by woodland trees and shrubs which provide an important screening function. The embankment works required to accommodate additional lanes will expose more of the highways infrastructure to the surrounding townscape which could mean it is perceived as a more dominant feature.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will require removal of woodland trees and shrubs which could make the highways infrastructure be perceived as a more prominent feature in the surrounding townscape, particularly to the south-west of the junction. Replacement tree planting will be undertaken but this will take long time periods to re-establish existing baseline conditions. However, this has been assessed as a landscape impact and will not affect the actual townscape character.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will increase the footprint and prominence of highways infrastructure within the wider townscape, but new assets will match existing character.	Local	Common	Low	Substitutabile - no significant material changes as part of the proposed scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering that new highways assets will match the existing character of the surrounding townscape.
Human interaction	There is an existing active travel route (Phorpres Lane) which passes under the A1260 where it meets the Hampton Roundabout (A1139, Junction 3) to the south. The proposed scheme will retain this provision and provide improvements to active travel routes within the wider townscape to the north-east, north-west, and south-east.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There is a Scheduled Ancient Monument (Romano-British settlement SE of Orton Longueville) located immediately beneath the Hampton Roundabout (A1139, Junction 3).	National	Rare	High	Not substitutable	No impact	Neutral - the current setting of this Scheduled Monument is dominated by a busy highways interchange with residential properties to the north-west and south-west and industrial/commercial facilities to the north-east and south-east. No remains of the monument are visible above ground, and its current setting cannot be considered to contribute to the monument's heritage significance, which is based upon its archaeological interest.
Land use	Busy, urban highways interchange with a relatively high density of residential properties to the north-west and south-west of the junction, set back from the woodland vegetation in the immediate area surrounding the junction. Conversely, land to the north-east and south-east is dominated by commercial and industrial land uses.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will maintain the existing townscape as a busy, urban highways interchange with the intention of alleviating congestion and improving active travel routes within the wider townscape.
Summary of character	The location is a busy, urban highways interchange which is surrounded by residential, industrial and commercial land uses. There is an existing active travel route which will be retained as part of the scheme, with improvements to the footway/cycleway network within the wider townscape proposed.	Local	Common	Low	Substitutabile - no significant material changes to townscape as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS
Fengate Access Improvements - Heritage Appraisal Report (for cultural townscape aspects)

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The dominant townscape character as a busy, urban highways interchange will be maintained as part of the scheme. Although highways infrastructure may become more prominent within the wider townscape, this has been assessed as a landscape impact and will not affect the townscape character. Retention of existing active travel routes and improvements within the wider area will improve human interaction with the townscape.

TAG Townscape Impacts Worksheet

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	The proposed scheme footprint is set within an urban, commercial and light industrial area south of the A1139 Fletton Parkway. There is a relatively dense population of commercial buildings to the south with larger commercial and industrial facilities requiring more space to the north.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by commercial and light industrial buildings.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Phorpres Way is lined by trees on both sides of the carriageway. Adjacent buildings protrude much higher into the surrounding townscape than any assets associated with the proposed improvements, which will primarily entail groundworks.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	There are existing footpaths on both sides of Phorpres Way. The proposed scheme will improve this provision by upgrading sections to shared use facilities. Connectivity and safety will also be improved by enhancing existing crossing points and providing new ones.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	Existing road and adjacent footpaths surrounding by commercial and light industrial facilities. Existing active travel routes will be improved as part of the proposed works. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	The character of this area is commercial and light industrial with no residential properties in the immediate vicinity. Existing trees will largely be retained as part of the proposed scheme with only minor pruning and very localised clearance required to accommodate new assets which will improve interaction with the townscape.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Slight beneficial (positive) effect

Qualitative Comments

The dominant townscape character as an urban highway surrounded by commercial and industrial facilities will be maintained as part of the scheme. Improvements to existing active travel routes will improve human interaction with the townscape, albeit on a relatively small scale. Any impacts associated with very localised vegetation clearance has been assessed as a landscape impact.

TAG Townscape Impacts Worksheet

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	The proposed scheme footprint is set within a residential area to the north of the A1139 Fletton Parkway. There is a school at the southern extent of the scheme (Lime Academy Orton). There is evidence that the existing eastern verge where the new footway is proposed is already used informally as an active travel route.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by residential buildings.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	Malborne Way is lined by trees on both sides of the carriageway. Adjacent buildings protrude much higher into the surrounding townscape than any assets associated with the proposed improvements, which will primarily entail groundworks.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	The proposed scheme will improve footpath provision along the eastern verge of Malborne Way. There is evidence that the existing grassed verge is used informally by pedestrians and cyclists but this scheme will provide a purpose built footpath to make this a safer and more formal arrangement, encouraging active travel.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	Existing road surrounded by residential buildings. Existing active travel routes will be improved as part of the proposed works. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	The character of this area is residential. Existing trees will largely be retained as part of the proposed scheme with only minor pruning and very localised clearance required to accommodate new assets which will improve interaction with the townscape.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Slight beneficial (positive) effect

Qualitative Comments

The dominant townscape character as an urban highway surrounded by residential buildings will be maintained as part of the scheme. Improvements to existing active travel routes will improve human interaction with the townscape, albeit on a relatively small scale. Any impacts associated with very localised vegetation clearance has been assessed as a landscape impact.

TAG Townscape Impacts Worksheet

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	The proposed scheme footprint is bound by the A1139 Fletton Parkway to the south, Stillwell Nature Reserve to the east, and industrial/commercial facilities to the north and west. The area of the former Mars Pet Care site is currently used for storage of shipping containers and lorries. There is an existing footway running from the south-west corner of Stillwells Nature Reserve, along the eastern and northern boundaries of the former Mars Pet Care site, before tying in with the southern end of Shrewsbury Avenue.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Neutral – the scheme will have virtually no effect on the layout of the townscape considering the scope of works.
Density and mix	Immediate surrounding area dominated by industrial/commercial facilities to the north and west, with Stillwells Nature Reserve to the east, and the A1139 Fletton Parkway to the south. The area of the former Mars Pet Care site is currently used for storage of shipping containers and lorries.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the density and mix of the townscape considering the scope of works.
Scale	The existing footpath is lined by trees, hedgerows and shrubs on both sides. Adjacent buildings protrude much higher into the surrounding townscape than any assets associated with the proposed improvements, which will primarily entail groundworks.	Local and Regional	Rare	High	Trees and hedgerows - not substitutable over short timeframes.	No impact	Neutral – the scheme will have virtually no effect on the scale of the townscape considering the scope of works. Any vegetation clearance will be minimal and localised, involving mainly pruning back to accommodate a wider footway/cycleway. Measures will be implemented to ensure protection of retained vegetation, particularly where there are potential interfaces with root protection areas.
Appearance	There is no obvious distinctiveness of surrounding buildings and structures. The proposed works will replace existing highways assets on a like-for-like basis.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on the appearance of the townscape considering the scope of works.
Human interaction	The proposed scheme will upgrade the existing footpath to a shared use facility, encouraging active travel.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact, but the scheme will help to promote active travel through the townscape.	Slight beneficial (positive) effect - the scheme will help to promote active travel through the townscape.
Cultural	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	There are no cultural or historic features in close proximity to this location.	Neutral - there are no cultural or historic features in close proximity to this location.
Land use	Existing footpath surrounded by industrial/commercial buildings and Stillwells Nature Reserve. Existing active travel routes will be improved as part of the proposed works. Land use within the scheme footprint and surrounding areas will not change as a result of the scheme.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral – the scheme will have virtually no effect on land use considering the scope of works.
Summary of character	The existing footpath denotes the boundary between an urban industrial/commercial area in the west, and a more rural setting in the east with the presence of Stillwells Nature Reserve. Existing trees will largely be retained as part of the proposed scheme with only minor pruning and very localised clearance required to accommodate new assets which will improve interaction with the townscape.	Local	Common	Low	Substitutabile - no significant material changes as part of the scheme.	No impact	Neutral - The proposed scheme will not alter the essential townscape character of this area.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Slight beneficial (positive) effect

Qualitative Comments

The dominant townscape character will be maintained as part of the scheme. Upgrading the existing footpath to a shared use facility will improve human interaction with the townscape, albeit on a relatively small scale, and provide an important active travel connection between the industrial/commercial area of Shrewsbury Avenue and residential properties east of Stillwells Nature Reserve. Any impacts associated with very localised vegetation clearance has been assessed as a landscape impact.

Appendix F – Appraisal Summary Table (AST)

Appraisal Summary Table

Date produced:	28/11/2022

Contact:	
Name	Lewis Banks
Organisation	Peterborough City Council
Role	PCC Promoter

Name of scheme:	Junction 3 Improvement Scheme
Description of scheme:	Full signalisation of Junction 3, including additional lanes and flares, as well as active travel infrastructure in the vicinity.

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	The Scheme will result in a net reduction in journey times for business users and transport providers over a 60-year appraisal period for all time periods. However, the time savings generally fall into the 0 to 2 minute range, with journey time changes greater than 2 being net negative.	Net journey time savings (£,000s): 0 to 2min: 4,186; 2 to 5min: -511; > 5min: -102	-	£3,573,000	
	Reliability impact on Business users	Not Assessed	-	-	-	
	Regeneration	Not Assessed	-	-	-	
	Wider Impacts	Not Assessed	-	-	-	
Environmental	Noise	The Junction 3 Improvements have been assessed as having a net disbenefit of -£198,892 linked to operational increases in noise levels over the 60-year appraisal period. This is linked to both daytime and nightime increases in noise levels for some receptors, likely due to the increased capacity of the improved junction increasing travel speeds through the junction and projected increases in traffic levels. An additional assessment was also undertaken to assess the benefit of strategically installing a 1.8m high and 160m long noise barrier as part of the proposed works, which generated a net benefit of +£223,351 over the 60-year appraisal period. This is linked to the enhancement of the Noise Important Area (NIA) 5371, however, the option of installing such a barrier has been discounted. No receptors have been assessed as experiencing noise levels in excess of 69dB LAeq 16h and no properties qualify for insulation under the Noise Insulation Regulations 1975.	Households experiencing increased daytime noise in forecast year: 36 Households experiencing reduced daytime noise in forecast year: 0 Households experiencing increased night time noise in forecast year: 35 Households experiencing reduced night time noise in forecast year: 0	-	Net present value of change in noise (£): **-£198,892**	
	Air Quality	The Junction 3 Improvements have been assessed as having a net benefit of +£176,649 linked to operational reductions in emission levels over the 60-year appraisal period. This is based on the 'Damage Costs Approach' and is likely due to the increased capacity of the improved junction reducing congestion and idling traffic. The DEFRA emission factor toolkit does not predict emissions for any year after 2030. Emissions are unlikely to increase beyond this time period due to use of alternative energy vehicles (Hydrogen and Electric) and increased engine efficiency. As a result, the future 2036 has been modelled as 2030. The proposed scheme does not lie within an Air Quality Management Area.	Change in NOx emissions over 60 year appraisal period (tonnes): -33 (between 'with scheme' and 'without scheme' scenarios) Change in PM2.5 emissions over 60 year appraisal period (tonnes): -1 (between 'with scheme' and 'without scheme' scenarios)	-	Net present values of changes (£): **+£176,649** This can be broken down as follows: NOx emissions: +£129,618 PM2.5 emissions: +£47,031	
	Greenhouse gases	The Scheme will result in a reduction in non-traded carbon and traded carbon dioxide emissions over a 60-year appraisal period. An additional £5,650 GHG saving is identified in the AMATs for a 20 year appraisal period.	Change in non-traded carbon over 60y (CO2e): 1,711 Change in traded carbon over 60y (CO2e): -7	-	£149,000	
	Landscape	The Junction 3 Improvements have been assessed as having a slight adverse (negative) effect on the surrounding landscape. Mature tree belts will have to be removed to accommodate the increased junction capacity and associated construction works. From a landscape perspective, these trees provide an important screening function for residential receptors to the south-west. The increased exposure of the highways infrastructure is also likely to lead to a perceived increase in noise levels and reduced tranquility. Options for retaining more trees/vegetation and replacement planting on site are being carefully explored. Other trees and vegetation will be retained in accordance with the Arboricultural Method Statement. Consultation with local stakeholders will also be undertaken.	-	Slight adverse (negative) effect	-	
	Townscape	The Junction 3 Improvements have been assessed as having a slight beneficial (positive) impact on the surrounding townscape. The twnscape character is a busy, active and urban highways interchange to the south of the city centre. Typically, there is a presence of significant development within the surrounding area consisting of residential, commercial, and/or light industrial buildings and facilities. The proposed schemes (including Phorpres Way, Malborne Way, and Shrewsbury Avenue) will retain the essential townscape character of the area whilst promoting active travel by expanding the pedestrian and cycleway network and improving safety and connectivity.	-	Slight beneficial (positive) effect	-	
	Historic Environment	The Junction 3 Improvements have been assessed as having a neutral impact on the historic environment. The greatest risks of adverse effects are linked to the underlying Scheduled Monument beneath the junction. The Heritage Impact Appraisal for the scheme concluded that the proposed development would not impact on the setting of the Scheduled Monument, especially considering that this does not contribute to it's heritage significance. Buried archaeological remains associated with the Scheduled Monument are not expected to fall within the footprint of the proposed scheme (location or depth) considering they would most likely have been removed by previous pre-development archaeological mitigation, or due to the original construction of the A1139 Fletton Parkway. A Scheduled Monument Consent will need to be obtained for the works regardless due to the proximity of the underlying feature. More recent archaeological investigations in the immediate areas surrounding the scheme have produced no significant archaeological features or artefacts. The nearest finds were from investigations undertaken 700m east which revealed Roman artefacts and finds. Engagement with the PCC Archaeologist is on-going to provide additional design information and confirm mitigation requirements.	-	Neutral	-	
	Biodiversity	The Junction 3 Improvements have been assessed as having a neutral impact on biodiversity. The nearest designated site is Orton Pit SSSI/SAC which is located circa 60m west of Junction 3. A Likely Significant Effects (LSE) assessment has been undertaken and concluded that there will be no significant effects on the interest features or condition providing suitable Precautionary Methods of Working are implemented. Assent will also be obtained from Natural England, prior to the start of works. Potential protected species which may be encountered include nesting birds, great crested newts, and reptiles. Precautionary Methods of Working have been developed with further pre-works checks planned to enable any additional mitigation measures to be implemented as required. Suitable stakeholder engagement and planning will be undertaken to achieve 20% net gain in biodiversity through on-site and off-site habitat management initiatives, but this will be subject to agreement and suitable provision of land from PCC.	-	Neutral	-	
	Water Environment	The Junction 3 Improvements have been assessed as having a neutral impact on the water environment. The scheme footprints are generally underlayed by an unproductive 'Secondary A' aquifer which is low risk. Groundwater vulnerability is mostly low with some small pockets of medium-high sensitivity, but this will be managed through standard control measures implemented through the Construction Environmental Management Plan (CEMP). Although there is potential for existing watercourses and waterbodies to be impacted, these are generally artificial drainage ditches and attenuation ponds with low geomorphological value. Existing water quality within nearby surface water features is generally poor based on current WFD status. Nonetheless, pollution prevention measures have been incorporated into the design from an operational perspective, and will be implemented through the CEMP during the construction phase. The risk of flooding during both construction and operational phases is low considering. The whole area is outside Flood Zones 2 and 3 and increased runoff associated with larger areas of hardstanding will be accounted for in the finalised drainage design.	-	Neutral	-	
Social	Commuting and Other users	The scheme will result in a net reduction in journey times for Commuting and Other users across all time periods for the 60 year appraisal period.	Net journey time changes (£,000s): 0 to 2min: 10,315; 2 to 5min: -376; > 5min: -332	-	£9,607,000	
	Reliability impact on Commuting and Other users	Not Assessed	-		-	
	Physical activity	Positive Impact identified in AMAT	-	Positive	1,571,370	
	Journey quality	Positive Impact identified in AMAT	-	Positive	£227,330	
	Accidents	Accident savings have been assessed in COBALT for the study area using default accident rate values and modelled 24 Hr AADT flows. The scheme has been estimated to reduce the number of Personal Injury Accidents	Reduction of 975.7 accidents over 60-year appraisal period, equating to a reduction of 2.1 fatal, 82.6 serious and 1204.0 slight casualties.	Positive	£33,607,900	
	Security	Not Assessed	-	-	-	
	Access to services	Not Assessed	-	-	-	
	Affordability	Not Assessed	-	-	-	
	Severance	Positive Impact likely as a result of new footways on desire lines.	-	Positive	-	
	Option and non-use values	Not Assessed	-	-	-	
Public Account	Cost to Broad Transport Budget	The Scheme PVC has been identified as £7,543,000. The BCR is 6.49.	-	-	£7,543,000	
	Indirect Tax Revenues	Indirect taxes values from TUBA and AMAT.	-	-	-£170,000	

Appendix G – Environment Impact Assessment Report

REPORT

A1139 Junction 3 - Environmental Screening Report

Client: Milestone Infrastructure Ltd

Reference: PB2649-ZZ-XX-RP-Z-0001

Status: S0/P01.01

Date: 15 September 2021

Royal HaskoningDHV

Enhancing Society Together

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Document title: A1139 Junction 3 - Environmental Screening Report

Document short title:
Reference: PB2649-ZZ-XX-RP-Z-0001
Status: P01.01/S0
Date: 15 September 2021
Project name:
Project number: PB2649
Author(s): Claire Smith

Drafted by: Claire Smith

Checked by: Carina Agnew

Date: 15/09/2021

Approved by: Claire Smith

Date: 16/09/2021

Classification
Project related

Royal HaskoningDHV

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Appendices

1 Introduction

This report has been prepared on behalf of Milestone Infrastructure Ltd ('the Applicant') and accompanies a request to Peterborough City Council to provide a screening opinion to determine whether the proposed development constitutes an Environmental Impact Assessment (EIA) development.

This report reflects the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended (the 'EIA Regulations') and in accordance with Regulation 6 of the EIA Regulations, this report contains:

- A plan sufficient to identify the site.
- A description of the proposed development, including in particular:
  - A description of the physical characteristics of the development.
  - A description of the location of the proposed development, including reference to any environmental sensitivity of the areas likely to be affected.
- A description of the aspects of the environment likely to be significantly affected by the proposed development.
- To the extent the information is available, a description of any likely significant effects of the proposed development on the environment resulting from:
  - The expected residues and emissions and the production of waste, where relevant.
  - The use of natural resources, in particular soil, land, water and biodiversity.
- Any other information or representations as the person making the request may wish to provide or make, including any features of the proposed development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment.

2 Requirement of EIA

In order to determine whether the proposed development is considered an 'EIA development', considerations of the EIA Regulations and supporting Planning Practice Guidance (PPG) must be made.

EIA development is defined by the EIA Regulations as development: *"likely to have significant effects on the environment by virtue of factors such as its nature, size or location"*.

EIA development falls into two Schedules of the EIA Regulations. EIA is mandatory for developments listed within Schedule 1. Schedule 2 development require EIA if they would lead to likely significant effects on the environment.

In deciding whether a Schedule 2 development is EIA development, Regulation 5(4) states: "*Where a relevant planning authority….has to decide under these Regulations whether Schedule 2 development is EIA development, the relevant planning authority….must take into account in making that decision (a) any information provided by the applicant; (b) the results of any relevant EU environmental assessment which are reasonably available to relevant planning authority…; and (c) such of the selection criteria set out in Schedule 3 as are relevant to the development"*.

To enable Peterborough City Council to determine the need for EIA, this report provides a description of the site and proposed development, a review of the EIA Screening Criteria based on the EIA Regulations, a completed EIA Screening Checklist and a site location plan.

3 Site description

The proposed development is located on Junction 3 of the A1139 in Peterborough, Cambridgeshire. The central Ordnance Survey (OS) grid reference is TL 1774 9562. A site location plan is provided in **Appendix A1**.

The proposed development comprises a grade-separated junction formed by the uninterrupted ground level roadway of Fletton Parkway running west to east, and a raised roundabout interchange overhead which is fed by slip roads from Fletton Parkway, the Nene Parkway to the north and The Serpentine to the south.

The proposed development is not located within, or within proximity of, an Area of Outstanding Natural Beauty (AONB). The interchange is characterized by linear groups of screening trees and modest embankments along parts of Fletton Parkway and the northbound side of the Nene Parkway; and ornamental planting to the South toward the commercial areas around the Serpentine Green Shopping Centre. The landscape to the South of the junction is typical of the road infrastructure setting in areas of commercial activity. Long shelterbelts of mature trees serving a screening function are also typical of the roadside landscape in Peterborough.

There are no statutory designated nature conservation sites within the proposed development boundaries; however, Orton Pit Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) is approximately 60m at its closest point to the proposed development. This site is afforded protection for its population of great crested newt, network of meso-eutrophic standing water and nationally rare and scarce stonewort plant species.

The closest designated heritage asset is a Scheduled Monument, located directly under the western side of the proposed development. Approximately 750m to the north-west of the proposed development is Orton Longueville's Conservation Area. A total of twelve Listed Buildings are located within the Conservation Area which falls within 1km of the proposed development. Of these, one is Grade I listed; the Church of the Holy Trinity (NHLE 1166191). There are no Listed Heritage Parks and Gardens within the proposed development boundaries.

The proposed development is not located within an Air Quality Management Area (AQMA).

4 Proposed development

Junction 3 is a partially signalised grade separated roundabout (positioned above the A1139 Fletton Parkway), which is situated on the southern edge of Peterborough's urban area. The junction provides access to the A1260 Nene Parkway, A1139 Fletton Parkway, and A1260 The Serpentine. It is heavily used by trips in the southwest of Peterborough, and a large number of facilities, businesses, and residences are immediately to the south of the junction.

To date Peterborough's transport network, which was fundamentally redesigned in the 1970s to accommodate the then "Peterborough New Town", has served the city well. However, as a consequence of recent and planned housing and employment growth, capacity issues are now emerging on the road network, resulting in congestion and delay. As congestion increases on the Parkway network, and queues form at key junctions, the potential for delivering new homes and jobs in the area becomes increasingly constrained. Peterborough City Council are committed to addressing these highway constraints to ensure that its full growth aspirations can be realised.

The proposed development will provide the necessary increase in highway capacity to unlock congestion and significantly reduce delay at Junction 3, which is a major pinch-point on the network. This will improve

the capacity and operational performance of the Peterborough Parkway system which is crucial to supporting further growth.

Additionally, improvements at Junction 3 are expected to have wider network benefits beyond the Parkway system, particularly to Malborne Way which experiences congestion as vehicles rat-run in order to avoid queues during the peak hours.

The proposed development comprises:

- Add a flare to A1260 Nene Parkway approach to Junction 3 to create a 4-lane approach;
- Add a 4th lane to the north east circulatory between A1260 Nene Parkway southbound approach and A1139 Fletton Parkway eastbound exit;
- Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a 3rd lane;
- Add a 3rd lane to circulatory between A1260 The Serpentine southbound exit and A1260 The Serpentine northbound approach;
- Add a 3rd lane on the A1260 The Serpentine northbound approach, to the north of Hargate Way;
- Add a flare to the A1260 The Serpentine northbound approach to create a 4-lane approach;
- Add a 4th lane to circulatory between A1260 The Serpentine northbound approach and A1139 Fletton Parkway westbound on-slip;
- Install traffic signals on the A1260 Nene Parkway southbound approach to Junction 3;
- Install traffic signals on the A1260 The Serpentine approach to Junction 3; and
- Create an off-road cycle way on Phorpres Close and Phorpres Way.

5 Screening Assessment

In determining whether a proposed development constitutes EIA development, consideration should be had to the following:

- If the proposed development is of a type listed in Schedule 1;
- If not, whether it is listed in Schedule 2;
- Is it located within a sensitive area;
- It meets any of the relevant thresholds and criteria set out in Schedule 2; and/or
- Would it lead to likely significant effects on the environment.

5.1 Schedule 1 Projects

EIA is mandatory for projects listed in Schedule 1 of the EIA Regulations. Schedule 1 developments are large scale projects for which significant effects are predicted and typically comprise developments such as new airports and power stations. The proposed development is not of a type listed in Schedule 1.

5.2 Schedule 2 Projects

EIA is discretionary for projects listed in Schedule 2. If the proposed development is of a type listed in Schedule 2, it may be classified as EIA development depending on its location (i.e. it is within a sensitive area) and/or whether it meets any of the relevant thresholds or criteria detailed in Column 2.

Sensitive areas are defined in the EIA Regulations as:

- Sites of Special Scientific Interest (SSSI) and European designated sites.
- National Parks, the Broads and AONBs.
- World Heritage Sites and Scheduled Monuments.

The proposed development falls within category 10 of Schedule 2, ‘Infrastructure Projects’, sub section (f) ‘construction of roads’. The site is not located within a sensitive area and therefore the thresholds should be applied. The threshold for the construction of roads category is “the area of works exceeds 1 hectare”. The

proposed development does exceed 1 hectare. Accordingly, this screen assessment has been prepared to determine whether the proposed development would be likely to result in significant environmental effects. To achieve this, Schedule 3 of the EIA Regulations need to be considered, as presented below.

5.3 Schedule 3 Projects

Schedule 3 of the EIA Regulations sets out criteria that requires considerations, such as but not limited to the characteristics of the development, the location of the proposed development and the characteristics of the potential impact. These factors should be considered as part of the screening process and include:

- Characteristics:
  - The size and design of the entire development.
  - Cumulation with other existing development and/or approved developments.
  - The use of natural resources, in particular land, soil, water and biodiversity.
  - The production of waste.
  - Pollution and nuisances.
  - The risk of major accidents and/or disasters relevant to the development concerned, including those caused by climate change, in accordance with scientific knowledge.
  - The risks to human health (e.g. water contamination or air pollution).
- Location:
  - The existing and approved land use.
  - The relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground.
  - The absorption capacity of the natural environment.
- Potential impact:
  - The magnitude and spatial extent of the impact.
  - The nature of the impact.
  - The transboundary nature of the impact.
  - The intensity and complexity of the impact.
  - The likelihood of the impact.
  - The predicted duration, frequency and reversibility of the impact.
  - The cumulation of the impact with the impact of other existing and/or approved development.
  - The potential to reduce the impact.

5.4 Consideration of cumulative effects

Schedule 4 of the EIA Regulations requires consideration of a proposed development cumulatively with other existing and/or approved development. Guidance on the consideration of cumulative effects in the EIA screening process is set out in the PPG which states:

“each application (or request for a screening opinion) should be considered on its own merits. There are occasions where other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a Proposed Development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development.”

A check of the Peterborough City Council planning portal has been undertaken and where proposed or consented developments within or adjacent to the proposed development have bene identified, these have been considered in the EIA screening assessment of the proposed development detailed in **Table 1**.

5.5 Outcome of Screening Assessment

Table 1 presents the outcome of the screening assessment of the proposed development against the EIA screening criteria.

Table 1 – Summary of Screening Assessment

Screening criteria	Yes/No or N/A	Is a significant effect likely?
1. Natural Resources		
1.1 Will construction, operation or decommissioning of the project involve actions which will cause physical changes in the topography of the area?	No	The existing land use of the proposed development is hardstanding associated with the current road network. The land use will not change from existing as a result of the proposed development given that the proposed development is to improve the existing road network. Therefore, there will be no material change to topography. The proposed construction and operational phases of the proposed development will use resources such as land, water and energy. The Applicant will include measures in a Construction Environmental Management Plan (CEMP) to minimise the consumption of natural resources wherever possible to do so, particularly those which are non-renewable.
1.2 Will construction or operation of the project use natural resources above or below ground such as land, soil, water, materials/minerals or energy which are non-renewable or in short supply?	Yes	
1.3 Are there any areas on/around the location which contain important, high quality or scarce resources which could be affected by the project, e.g. forestry, agriculture, water?	No	
2. Waste		
2.1 Will the project produce solid wastes during construction or operation or decommissioning?	Yes	The proposed development will require excavations to be undertaken. The material within these locations have been tested for their waste classification and has been classified as non-hazardous material. The proposed development will result in the generation of waste materials. Construction waste (i.e. soils) will be reused and recycled wherever possible. Significant quantities of construction waste are not anticipated as a result of the proposed development. Construction waste will be managed in accordance with all relevant legislation and disposed of in line with industry accepted guidance, requirements of which will be included (and enforced) within the CEMP. No waste is anticipated during the operational phase of the proposed development.

Screening criteria	Yes/No or N/A	Is a significant effect likely?
3. Pollution and nuisances		
3.1 Will the project release pollutants or any hazardous, toxic or noxious substances to air?	Yes (dust generation and emissions)	During the construction phase of the proposed development, dust will be generated. Dust generation will be managed in accordance with industry guidance, with good practice measures being enforced through the implementation of a CEMP. Through the adoption of these measures and the CEMP, it is anticipated that dust generated will not result in significant adverse effects. There will be emissions associated with site machinery and vehicles during the construction phase of the proposed development. Appropriate measures to manage the access and egress of site vehicles, deliveries etc will be included within the CEMP that will subsequently be implemented during the proposed development. As the proposed development is a road improvements scheme, there will be emissions associated with the operational phase of the proposed development. These emissions will be associated with the number of vehicles using the road network. A transport assessment has been undertaken as part of the Business Case for the proposed development for which no significant effects are anticipated. No hazardous substances or toxic emissions to air are anticipated. In addition, there is no requirement to store large volumes of hazardous materials on site. However, if required, these would be stored and handled in accordance with the relevant and most up-to-date legislation.
3.2 Will the project cause noise and vibration or release of light, heat, energy or electromagnetic radiation?	Yes (limited to noise and vibration only)	It is likely that during the construction phase of the proposed development there will be noise and vibration effects. A noise and vibration monitoring assessment has been undertaken and the findings of which used to inform the mitigation measures that will be implemented (and secured through the CEMP) as part of the proposed development. The nearest sensitive receptors are those properties within the adjacent Hampton and Orton Malborne suburbs. It is anticipated that the majority of these residential properties will experience negligible increased noise levels and no

Screening criteria	Yes/No or N/A	Is a significant effect likely?
		significant residual operational effects have been identified. All construction works associated with the proposed development will be undertaken during daylight hours and no night-time working will be required. All construction effects will be managed in accordance with industry accepted guidance and implemented through the adoption of a noise and vibration management plan that will form part of the CEMP. Consequently, it is anticipated that any noise and/or vibration effects will not be significant. During the construction and operational phases of the proposed development, the potential exists for light pollution. A Preliminary Ecological Appraisal (PEA) has been undertaken and no evidence or potential evidence of protected species sensitive to light (e.g. bats) has been recorded. However, all lighting that is required for the proposed development will be designed in accordance with the relevant British Standards and Institute of Lighting Professionals. No electromagnetic radiation, heat or energy releases are expected. However, if any releases do occur, they would be controlled appropriately using current legislation and controls.
3.3 Will the project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal waters or the sea?	Yes	There are no significant surface waters within or adjacent to the proposed development. There are a number of ponds within the Hampton suburb to the south of the proposed development. However, given their distance from the proposed development it is unlikely effects on these will occur. The proposed development will affect the existing road drainage ditches and consent from the Local Planning Authority will be sought where identified as being required. The proposed development is not underlain by an area designated as a Principal Aquifer and is not located within a Source Protection Zone (SPZ) and no effects to controlled waters are anticipated. Surface water run-off and drainage will be managed on site during the construction and operational phases. If required,
3.4 Are there any areas on or around the location which are already subject to pollution or environmental damage, e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No	

Screening criteria	Yes/No or N/A	Is a significant effect likely?
		a flood risk assessment will be undertaken and provided to the Local Planning Authority. Hydrocarbons including vehicle fuel and lubricants will be used during the construction phase. These will be stored and used in accordance with the appropriate guidance and measures included in the CEMP to manage and minimise potential releases of pollutants. Appropriate measures in accordance with industry guidance will be incorporated into the proposed development to prevent accidental spillages of contaminants during the construction of the proposed development. The land uses within and adjacent to the proposed development are unlikely to be contaminated. Consequently, the proposed development is considered unlikely to result in any significant adverse effects to land or water related to contamination.
4. Population and human health		
4.1 Will there be any risk of major accidents (including those caused by climate change, in accordance with scientific knowledge) during construction, operation or decommissioning?	No	The proposed development is not located within an Air Quality Management Area (AQMA). Dust and emissions generated during the construction phase of the proposed development would be minimised and managed in accordance with industry accepted guidance, enforced through the CEMP, although they are not anticipated to generate adverse effects to human health. The CEMP will also set out the guidelines to ensure that construction workers adopt good practice measures to prevent land and water contamination, as well as effects on themselves. No significant risk of water contamination as a result of the proposed development has been identified. The land use within the proposed development is not contaminated and therefore it is not expected that there is a high risk of contaminants being released into the environment. Consequently, the proposed development is considered unlikely to result in any significant adverse effects on the local population and/or human health.
4.2 Will the project present a risk to the population (having regard to population density) and their human health during construction, operation or decommissioning?	No	

Screening criteria	Yes/No or N/A	Is a significant effect likely?
5. Water resources		
5.1 Are there any water resources including surface waters, e.g. rivers, lakes/ponds, coastal or underground waters on or around the location which could be affected by the project, particularly in terms of their volume and flood risk?	Yes	There are no significant surface waters within or adjacent to the proposed development; however, the proposed development will affect existing road drainage ditches and consent from the Local Planning Authority will be sought where identified as being required. The proposed development is not underlain by an area designated as a Principal Aquifer and is not located within a Source Protection Zone (SPZ) and no effects to controlled waters are anticipated. Surface water run-off and drainage will be managed on site during the construction and operational phases. If required, a flood risk assessment will be undertaken and provided to the Local Planning Authority.
6. Biodiversity (species and habitats)		
6.1 Are there any protected areas which are designated or classified for their terrestrial, avian and marine ecological value, or any non-designated / non-classified areas which are important or sensitive for reasons of their terrestrial, avian and marine ecological value, located on or around the location and which could be affected by the project? (e.g. wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests or woodlands, undesignated nature reserves or parks. (Where designated indicate level of designation (international, national, regional or local))).	Yes	A Preliminary Ecological Appraisal of the proposed development has been undertaken. The majority of the proposed development is within areas of hardstanding (roads and associated infrastructure). The roadside verges are typically poor semi-improved and/or amenity grassland, with areas of plantation woodland and scrub. No designated sites are within the proposed development and the closest non-statutory designated site is the Orton Pits SAC and SSSI which is approximately 60m from its boundaries at the closest point.
6.2 Could any protected, important or sensitive species of flora or fauna which use areas on or around the site, e.g. for breeding, nesting, foraging, resting, over-wintering, or migration, be affected by the project?	Yes	The trees and areas of scrub were noted as providing potential habitat for nesting birds and therefore vegetation clearance works will be programmed to be undertaken outside of the nesting bird season (which is typically between March-September). The proposed development is assessed as providing limited opportunities to support common reptile species, although given the presence of suitable habitat (i.e. areas of dense

Screening criteria	Yes/No or N/A	Is a significant effect likely?
		scrub adjacent to areas of open grassland), there does remain the possibility that they could be encountered. Therefore, it is recommended that the proposed development is undertaken during the reptile active season (which is typically between March to September). However, should this not be possible, it is recommended that habitat manipulation works (i.e. removal of any areas of loose debris and scrub root systems) is removed during the reptile active season, in accordance with a reptile precautionary method of working. No waterbodies will be lost as a result of the proposed development; however, works will be required within terrestrial habitat for which great crested newts may use. Given the nature of the proposed development, a great crested newt precautionary method of work will be prepared and subsequently implemented during the works. All works associated with the proposed development will be programmed to be undertaken during the great crested newt active season (typically between March and September) but where this is not possible, similarly to reptiles, habitat manipulation works will be undertaken to ensure the proposed development area is unsuitable for great crested newts prior to the commencement of any construction related works. This approach will be undertaken under the supervision of a suitably qualified ecologist who either holds a low-class impact licence or a surveying and handling licence for great crested newts. No evidence or suitable habitat for legally protected and/or notable species was noted during the survey and therefore no further surveys and/or mitigation measures, other than those for nesting birds, reptiles and great crested newts have been identified. The mitigation measures in respect to nesting birds, reptiles and great crested newts will be included within the CEMP and adopted during the proposed development to ensure the legal protection afforded to birds is not infringed. Consequently, the proposed development is considered

Screening criteria	Yes/No or N/A	Is a significant effect likely?
		unlikely to result in any significant adverse effects on ecological receptors (habitats and/or species).
7. Landscape and visual		
7.1 Are there any areas or features on or around the location which are protected for their landscape and scenic value, and/or any non-designated / nonclassified areas or features of high landscape or scenic value on or around the location which could be affected by the project? Where designated indicate level of designation (international, national, regional or local).	No	The proposed development is not located within a statutory or non-statutory designated site for landscape character or quality. The potential for local views of the proposed development exists from adjacent and nearby roads and residential properties. There are no longer distance views likely to be affected. Consequently, the proposed development is considered unlikely to result in any significant adverse effects on the landscape and visual amenity value of the local area.
7.2 Is the project in a location where it is likely to be highly visible to many people? (If so, from where, what direction, and what distance?)	No	
8. Cultural heritage/archaeology		
8.1 Are there any areas or features which are protected for their cultural heritage or archaeological value, or any non-designated / classified areas and/or features of cultural heritage or archaeological importance on or around the location which could be affected by the project (including potential impacts on setting, and views to, from and within)? Where designated indicate level of designation (international, national, regional or local).	Yes	There are no Registered Parks and Gardens within the proposed development. The closest designated heritage asset is a Scheduled Monument, located directly under the western side of the proposed development. The proposed development is not located within a Conservation Area, nor are there any listed buildings within the boundaries of the proposed development. The land take required for the proposed development is within previously developed and disturbed land, therefore the potential to discover archaeological features is unlikely. Consequently, the proposed development is considered unlikely to result in any significant adverse effects on the cultural heritage/archaeology of the local area.
9. Transport and access		
9.1 Are there any routes on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	Yes	During construction of the proposed development, a CEMP will be implemented that will ensure all vehicle movements

Screening criteria	Yes/No or N/A	Is a significant effect likely?
9.2 Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?	No	will be via agreed and designated routes to manage and minimise any disruption to local routes or nearby facilities. Appropriate measures to ensure public safety during the construction phase of the proposed development will be identified and detailed within the CEMP. Consequently, the proposed development is considered unlikely to result in any significant adverse effects on the local transport network and/or recreational users.
10. Land use		
10.1 Are there existing land uses or community facilities on or around the location which could be affected by the project? E.g. housing, densely populated areas, industry / commerce, farm/agricultural holdings, forestry, tourism, mining, quarrying, facilities relating to health, education, places of worship, leisure /sports / recreation.	No	The proposed development is located within an area of existing hardstanding associated with the existing road network. There are no areas of agricultural land within or adjacent to the proposed development. As such, the proposed development will not result in the loss of agricultural land and therefore no significant effects are considered likely.
10.2 Are there any plans for future land uses on or around the location which could be affected by the project?	No	
11. Land stability and climate		
11.1 Is the location susceptible to earthquakes, subsidence, landslides, erosion, or extreme /adverse climatic conditions, e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	No	The proposed development is located within Flood Zone 1 and is at low risk of flooding. The proposed development is not located within a groundwater SPZ. No significant effects on land stability are anticipated as a result of the proposed development.
12. Cumulative effects		
12.1 Could this project together with existing and/or approved development result in cumulation of impacts together during the construction/operation phase?	No	It is considered unlikely that there would be potentially significant cumulative impacts during the construction phase of the proposed development when mitigation measures, implemented through the CEMP are in place. It is also considered unlikely that there would be a significant cumulative impact once the proposed development is operational.

Screening criteria	Yes/No or N/A	Is a significant effect likely?
13. Transboundary effects		
13.1 Is the project likely to lead to transboundary effects?	No	All works associated with the proposed development will be contained within its boundaries and appropriate mitigation measures, implemented through the CEMP will be adopted. Consequently, it is unlikely that there would be any mechanism for transboundary effects to occur.

6 Conclusion

The EIA screening assessment has considered whether the proposed development is likely to give rise to significant effects on the environment.

The proposed development falls within Schedule 2, 10(f) of the EIA Regulations as a construction of roads development project. The proposed development is not located within a sensitive area as defined by the EIA Regulations, but it does fall above the screening threshold as being over 1 hectare in area. The proposed development would be in keeping with the existing nature and scale of the surrounding area and would not result in significant effects.

The EIA screening assessment has identified that no significant effects on the environment are considered likely either alone or in combination with other developments. The proposed development would be of a sufficiently limited scale that effects could be managed in accordance with industry guidance and standards. The proposed development is therefore not considered to require a formal EIA development as defined by the EIA Regulations.

The design of the proposed development has been informed by a suite of environmental appraisals and the findings of which have informed the required mitigation measures. These mitigation measures will be included within a CEMP that will be implemented throughout the construction and operational phases of the proposed development. Consequently, it is considered that through the implementation of the CEMP, there would be no significant effects on environmental receptors as a result of the proposed development.

A1 Site Location Plan

Appendix H – Ecology Surveys

MILESTONE INFRASTRUCTURE
A part of MGroupServices

Ecology Constraints Report

Scheme Name: A1139 Fletton Parkway, Junction 3 Improvements	**Site Address:** Junction 3, Peterborough, Cambridgeshire, PE7 3LA	
Milestone Reference: AS-MIL-ENV-ECO_CONSTRAINTS -001	**Milestone Project Code:** **TP0020/9990021**	
Survey Dates: 28th February,11th March & 17th May 2022	**Surveyor/s**: Ann Sherwood	**Title and Qualifications**: Principal Ecologist BSc (Hons) MCIEEM
Date of Report: 18 July 2022 2022		
Author: Ann Sherwood MCIEEM 	**Peer Reviewer:** Jackson Smith MEnv (Hons) PIEMA REnvP 	
Quality Assurance/Authorised by: Oliver Beech PIEMA 		
Date of Issue: 26/07/2022		
Revision Number: 02		

Summary of potential ecological constraints & recommendations

Potential ecological constraints identified include the following:

- Great crested newts
- Nesting birds
- Common reptiles

The following recommendations are made:

Great crested newts

It has been concluded that the proposed works are unlikely to impact great crested newts given the distance (more than 1km) from suitable ponds with known presence of high populations of newts in Orton Pit SAC. However, given the sensitivity of the site, it is recommended that vegetation removal should be undertaken under a Precautionary Method of Working (PMW) under a separate bespoke method statement.

This is likely to include phased vegetation removal and hand searches. The works must be overseen by a suitably qualified Ecological Clerk of Works who holds either a Low Impact Class licence or a Surveying and Handling licence for great crested newts.

If tree removal is undertaken during the winter period, which also have the benefit of minimising nesting bird risk, stumps/root systems should be left in-situ until the spring when most newts are expected to be in ponds breeding.

Ground level vegetation and stump removal should be removed during the newt active season (usually March to October) and where possible this should be timed when peak numbers of newts can be expected to be in ponds (usually between **April and May)**.

These two activities should be included in the construction programmes as separate items.

The approach to minimise risk to great crested newts should also be discussed and agreed with Natural England and this should be led by a suitably qualified ecologist.

Nesting Birds
Vegetation clearance i.e. the bramble scrub and any tree removal should be undertaken over the winter period (October-February inclusive) to avoid the main bird nesting season.

If this is not possible, then vegetation clearance should be preceded by a nesting bird check undertaken by a suitable qualified ecologist immediately before clearance works take place. If nesting birds are found, then active nests must be left undisturbed with a minimum of a 5m buffer around them, where possible, until the chicks have fledged, and the nest is no longer in use.

The habitats adjacent to the road infrastructure are unlikely ot support birds listed under Schedule 1 of the Wildlife and Countryside Act (1981 (as amended) and no special measures are considered necessary.

Common reptiles
There is a low risk of encountering common lizards anywhere in the grassy / scrub vegetation in and adjacent to the works footprint. The PMW that will be in place for great crested newts will also cover common reptiles.

The following recommendations are provided for habitats on the northwest side of Junction 3 or other areas;

- Ground cover vegetation should be strimmed in phases during the active season (April to potentially mid-October) ensuring that vegetation is cut to no lower than 150mm initially. This should be left for a few days to allow reptiles, if present, to move away into uncut vegetation. The vegetation can then be cut to 50mm and maintained as short vegetation, until it is stripped off.

- Strimming should ideally be undertaken in sunny conditions and with temperatures above 12°C.

- The vegetation should be directionally strimmed towards uncut vegetation/cover that is outside the works footprint.

- All arisings should be removed out of the works footprint. The arisings can be left in situ provided it is placed outside the works footprint in heaps that would provide habitat for grass snakes to use as egg-laying sites, should these be present, although there is no evidence to support this.

Background

Works are proposed on Junction 3 on the A1139 (Fletton Parkway) to improve the flow and capacity of traffic at the junction.

An initial field survey was conducted by Royal Haskoning on 23rd March 2021. This survey is now out of date and this report is an updated assessment of the current ecological status of the site.

In addition to the field survey, a desk study was undertaken to identify designated nature conservation sites (national and international sites) and Priority Habitats within 2km from Magic https://magic.defra.gov.uk/MagicMap.aspx.

Biological records from the Cambridgeshire and Peterborough Environmental Records (CPERC) office were obtained but these had not been provided in full by Royal Haskoning.

Therefore, a data search was conducted using information available through the National Biodiversity Network (NBN) https://nbn.org.uk.

A 500m search for ponds and other suitable waterbodies to assess potential constraints in respect of great crested newts was undertaken using web-based Ordnance Survey map sites such as 'Where's the Path' https://wtp2.appspot.com/wheresthepath.htm

Proposed works (if known)

The proposed development comprises of a grade-separated junction formed by the uninterrupted ground level roadway of Fletton Parkway running west to east, and a raised roundabout interchange overhead which is fed by slip roads from Fletton Parkway A1139, the Nene Parkway A1260 to the north, and The Serpentine A1260 to the south.

The proposed development will provide the necessary increase in highway capacity to unlock congestion and significantly reduce delay at Junction 3, which is a major pinch-point on the network. This will improve the capacity and operational performance of the Peterborough Parkway system, which is crucial to supporting further growth.

Key improvements to the existing junction include:

- Adding a flare to A1260 Nene Parkway approach to Junction 3 to create a 4-lane approach;
- Adding a 4th lane to the north east circulatory between A1260 Nene Parkway southbound approach and A1139 Fletton Parkway eastbound exit;
- Adding a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a 3rd lane;
- Adding a 3rd lane to circulatory between A1260 The Serpentine southbound exit and A1260 The Serpentine northbound approach;
- Adding a 3rd lane on the A1260 The Serpentine northbound approach, to the north of Hargate Way;
- Adding a flare to the A1260 The Serpentine northbound approach to create a 4-lane approach;
- Adding a 4th lane to circulatory between A1260 The Serpentine northbound approach and A1139 Fletton Parkway westbound on-slip;
- Installing traffic signals on the A1260 Nene Parkway southbound approach to Junction 3;
- Installing traffic signals on the A1260 The Serpentine approach to Junction 3.

The general design arrangement is shown in 5101127-MIL-HEW-ZZ-DR-CH-0605_PO1_S2 in Appendix 1.

There will also be a requirement to clear vegetation and re-profile embankments within the Highway boundary to enable the construction works to commence, as shown in drawing 5101127-MIL-HSC-ZZ-DR-CH-0201-0202_P01-S2 and shown in Appendix 2.

Site Description

The site is located on and immediately adjacent to Junction 3 of the A1139 in Peterborough, Cambridgeshire. The central Ordnance Survey (OS) grid reference is TL 1774 9562, as shown in Figure 1 below.

Figure 1. Location of the proposed works and surrounding landscape (Ref: Google maps).

Survey Constraints

Access was available to all areas where works are proposed, except for an area of scrub located on the northeast corner of the roundabout, and the southeast corner of the roundabout. However, these could be viewed visually from a distance.

Desk Study Results

Statutory designated sites

The site lies within 60m east of the boundary of Orton Pit SAC (Special Area for Conservation) & SSSI (Site of Special Scientific Interest).

This site is designated for its high populations of Annex II species great crested newt *Triturus cristatus* and a population of Annex I Habitat, namely a network of mesotrophic standing water and nationally rare and scarce plants which include stoneworts *Chara* spp.

In addition, the Nene Washes Special Protection Area (SPA), SAC, Ramsar site and SSSI lies approximately 3km north-east of the proposed development site.

It supports seasonally flooded wet grassland (washland) of importance for international and national populations of wintering waders and wildfowl. It has also been used in summer as a breeding area for several nationally important migratory species. The site is also notable for the diversity of plant and animal life associated with its network of dykes. The SAC is designated for the presence of the Annex II species spined loach *Cobitis taenia.*

It is unlikely that the proposed works will significantly impact the Nene Washes SAC given its distance from the proposed works.

Woodston Ponds LNR lies 2.3km north of the proposed works. The site (8.94 ha) supports old sugar beet settling ponds that have developed into wildlife rich ponds and reedbeds. It is separated from the proposed works by residential and industrial units and therefore will not be impacted by the proposed works.

It is also considered unlikely that the proposed works will significantly impact the special feature interests of Orton Pit SAC/SSSI given that works are highly localised and lie outside the boundary of the site. Although within 60m, the proposed development is unlikely to affect waterbodies where the feature interests are likely to be concentrated.

Non-statutory designated sites

There are six County Wildlife sites within 2km of the proposed works:

- Fletton Lake CWS 1.0 km east
- Nene Park CWS 1.4 km north-west
- Nene Valley Railway CWS 1.4 km north-west
- River Nene CWS 1.9 km north-west
- Stanground Newt Ponds CWS 1.7 km north-west
- Woodston Ponds CWS 2.3 km east

Stillwell's Nature Reserve and Stillwell's Lake lie to the northeast of the roundabout and the proposed works, although it is not clear where the boundary of the nature reserve is. This site has no formal nature conservation designation at national or county level but is designated as a Semi-Natural Open Green Space.

None of the non-statutory sites are likely to be impacted by the proposed works.

Protected Species

Bats

There were three records of common pipistrelle *Pipistrellus pipistrellus* bats from NBN centred around Junction 3 of the proposed works. Other species of bat have also been recorded within 2km of the former Mars Pet Care Site (Swift Ecology Ltd 2020) shown on Figure 1. These included soprano pipistrelle *P. pygmaeus*, noctule *Nyctalus noctula* and brown long-eared bat *Plecotus auritus*, as well as records of indeterminate species.

Great crested newt

Great crested newts *Triturus cristatus* are known to be present in high numbers within Orton Pit SAC west of the proposed works. According to the District Level Licensing (DLL) risk map, the site falls within the red risk zone for great crested newts, suggesting that there is a risk of encountering great crested newts within the works footprint (**Figure 2).**

Figure 2. Great crested newts risk zone from DLL.

There was one pond located within 500m of the proposed works. However, given the known high populations of great crested newts in Peterborough, particularly around Hampton Vale and Orton, other ponds/waterbodies were also considered in the assessment beyond 500m.

One pond (P7 – Appendix 3) was located on the 500m boundary (**Figure 3**).

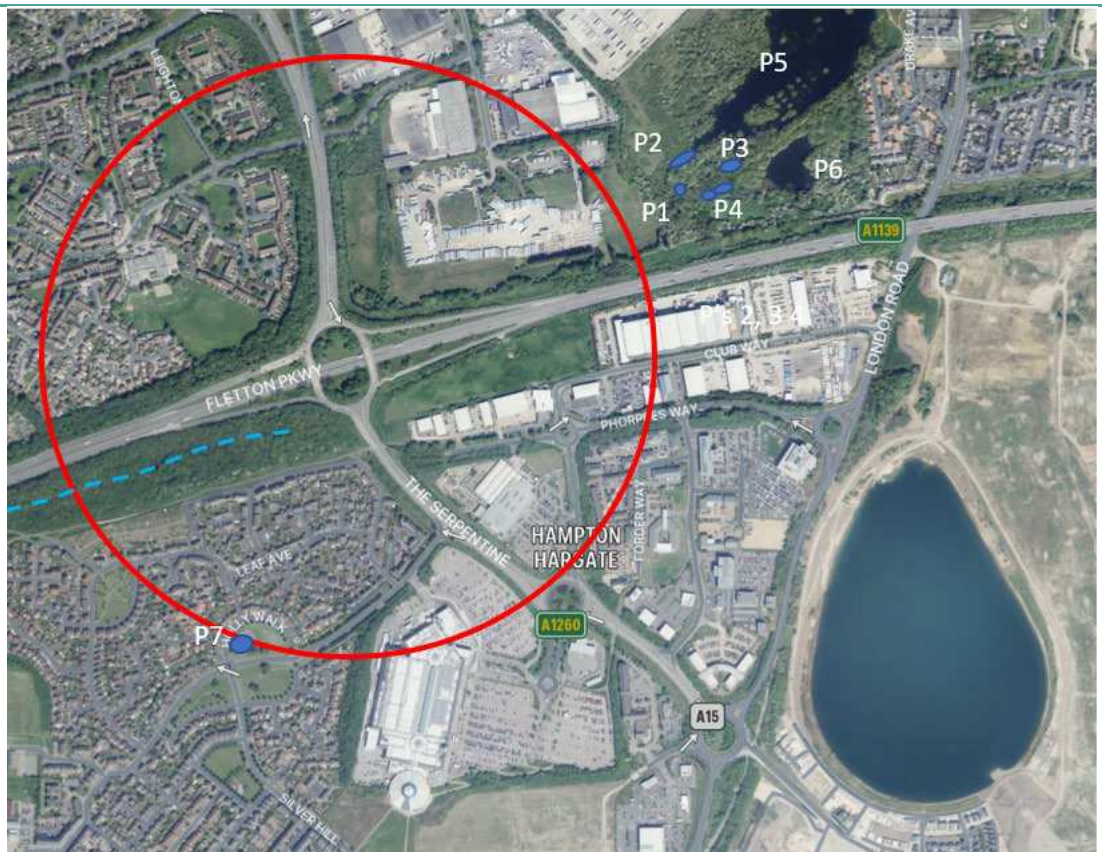

Figure 3. Ponds located within 500m of the works area
Dry Ditch - - - -

There were 11 records of great crested newts from NBN and GCN licence returns, and pond survey results between 2015 and 2019 from Magic. These were located 1.1km northwest of the proposed works. A further record of a survey located 944m northwest from the proposed works indicated that great crested newts were absent in 2019. GCN licence returns data is shown in Figure 4 below.

The closest known record of great crested newts was recorded over 800m southeast of the proposed works on the opposite side of the A15. This population is separated from the proposed works by industrial and residential development and a busy road network, which is a significant barrier to dispersal.

A further six ponds (P1- P6 Appendix 3) were considered in the assessment. Ponds 2-7 were subjected to a Habitat Suitability Index (HSI) assessment (Appendix 4). Pond 1 was scoped out due to its very large size, considering populations of waterfowl and likely presence of fish.

Figure 4. GCN Licence returns ● and pond surveys 2017-2019 (present = ● absent = ● inconclusive = ●

Swift Ecology undertook a great crested newt HSI and eDNA water sample survey of four ponds in Stillwell's Nature Reserve in August 2020. Three of the samples were tested for eDNA. The results indicated that these were negative for great crested newts, and one was indeterminate. These were sampled in August which is outside the recommended survey season. However, where ponds support great crested newts, it is still possible to find DNA in waterbodies even up to October provided there is a reasonable population of newts. The HSI assessment conducted by Swift Ecology classified the ponds as having poor suitability for newts ranging between 0.46 and 0.48 suggesting that they are unsuitable for breeding newts.

The results of the eDNA surveys support these findings.

Otters and Water voles

There was one record of otter *Lutra lutra* from NBN dated 2022. No grid reference was provided but likely to be associated with the River Nene.

Aerial maps indicate that there are no habitats on and immediately adjacent to the site that could support otter or water vole *Arvicola amphibius*. Otter could utilise the larger waterbodies (P5 & P6) on Stillwells Nature Reserve but these are over 700m from the proposed works and there are no obvious watercourses nearby suggesting that access to the site is limited. Therefore, these species are not considered further in this report.

Badgers

There were no records of badger *Meles meles* from NBN within 1km of the proposed works.

Common reptiles

There was one record of a grass snake *Natrix helvetica* from NBN. Reptile surveys were conducted by Swift Ecology in 2020 on the former Mars Pet Care Site located in suitable

habitats within 122m of the proposed works on the northeast side of the junction. A low population of common lizard *Zootoca vivipara* were recorded. There are good connective habitats between this site and the proposed works.

Birds

There were 12 records of bird species reported on NBN within 1km of the proposed works. Records of Cetti's Warbler *Cettia cetti,* barn owl *Tyto tyto* and kingfisher *Alcedo atthis*, all Schedule 1 species, were returned. None were recorded within the proposed works area. Other records included several Principal Species of Conservation Concern including house sparrow, tree sparrow and song thrush which all could be found within the trees and shrubs recorded on site.

Other protected species

The habitats within proposed works area do not provide potential for species such as hazel dormouse *Muscardinus avellanarius* or white clawed crayfish *Austropotamobius pallipes.* Hazel dormice are only known to be present in one site in Cambridgeshire.

Field Survey Results

Habitats

The habitats on site largely comprised mature plantation broadleaved woodland (UK Habs W1f7) dominated by Ash *Fraxinus excelsior* to the west of The Serpentine which forms part of Orton Pit SAC, hard surfaces comprising the main road network (UK Habs U1b), poor semi-improved grassland verges (UK Habs G3, 80, 161), and dense scrub (UK Habs h3a6).

The woodland had very little in the way of a shrub layer or ground layer with only thin layers of loose leaves and bare ground throughout (Photo 1, Appendix 3). Towards the road network on the embankment, tree and shrub species including hawthorn *Crataegus monogyna,* field maple *Acer campestris*, lime *Tilia* sp, sycamore *Acer pseudoplatanus,* Alder *Alnus glutinosa* and hazel *Corylus avellana* were present. There were also groups of landscaping shrubs on the embankment adjacent to the residential area which included species such as Pyracantha and Laurustinus *Viburnum tinus.*

The dry ditch did not have any evidence of wetland vegetation suggesting it remains dry throughout much of the year (Photo 2, Appendix 3).

Grassland was restricted to narrow strips of coarse grassland verges alongside the main road networks (Photos 3 and 4, Appendix 3).

Some areas of dense blackthorn scrub (H3a6 -UkHabs) were present on the northeast side of Junction 3 (Photo 5, Appendix 3).

Mixed scrub 9h3h -UK Habs) and young trees typical of former landscaping schemes were also present (Photos 6 & 7, Appendix 3)

Protected Species

Bats

Numerous trees are to be removed within the Highways boundary to accommodate the works and the arboricultural assessment report classified most of the trees as in reasonable condition or good condition which suggests there are limited opportunities for roosting bats. A single ash tree in Group J on the A1139 west bound off-slip had heart rot and has been recommended for removal. This may require further checks for potential opportunities for roosting bats prior to removal.

A daytime assessment carried out by Royal Haskoning in March 2021 within the survey area classified trees as having negligible potential to support roosting bats. However, it is not clear whether trees in some areas such as the on-and off-slips could be accessed.

Bats may forage along the tree lines, but the site is considered to have low suitability for bats generally given the nature of the site and the presence of lighting along the Highway network.

Bats are therefore unlikely to be a constraint to the works and are not considered further in this assessment.

Great crested newts

Habitat Suitability Index (HSI) Assessment

The area around Hampton Vale and Orton supports high populations of great crested newts. However, there are no suitable ponds or any waterbodies within 250m of the proposed works. Since the area is known for its high population of newts and much of the area is designated as a red risk zone, ponds identified beyond 250m were included in the assessment.

In total seven waterbodies were considered in the assessment. The full results of the Habitat Suitability Index assessment are presented in Appendix 4.

The formal HSI Assessment method (Oldham et al. (2000)) is promoted by the Statutory Nature Conservation Organisations as a statistical method of assessing habitat suitability for supporting great crested newts. Assessments using this method are required to be used for Licence applications for developments affecting great crested newts.

The following HSI scores define the corresponding pond suitability for great crested newts:

HSI Pond suitability

- <0.5 = poor
- 0.5 – 0.59 = below average
- 0.6 – 0.69 = average
- 0.7 – 0.79 = good
- 0.8 = excellent

Descriptions of the waterbodies are shown below along with their respective HSI assessment scores.

Pond 1 was a small, shaded pond with shallow water in woodland on Stillwell's Nature Reserve located at approximately NGR: TL 18349 95945 (Figure 3, Photo 8, Appendix 3). It had no aquatic or marginal vegetation and water quality looked poor. The HSI assessment classified the pond as poor for great crested newts (HSI = 0.33, Appendix 4).

Pond 2 was a tributary of Stillwell's Lake located approximately at NGR: TL 18343 95998 at the southwest end of the lake (Figure 3, Photo 9, Appendix 4) which potentially provided some shelter from fish and waterfowl. It supported some marginal vegetation providing some cover for newts. The HSI assessment classified the pond as below average for newts (HSI = 0.51, Appendix 4).

Pond 3 was also a tributary of Stillwell's Lake as above but not as obviously linked to the lake located at approximately NGR: TL 18364 96002 (Figure 3, Photo 10, Appendix 3). There was no marginal or aquatic vegetation in this waterbody. The HSI assessment classified this pond as poor for newts (HSI = 0.48, Appendix 4).

Pond 4 was a shaded hour-glass shaped pond with shallow water located at approximately NGR: TL 18363 95983 (Figure 3, Photo 11, Appendix 3). No aquatic or marginal vegetation was present. The HSI assessment classified this pond as poor for newts (HSI = 0.33, Appendix 4).

Pond 5 was a very large lake in Stillwell's Nature Reserve located at NGR:TL 18535 96207 (Figure 3, Photo 12, Appendix 3) which was also scoped out for further assessment given its size, populations of waterfowl and likely presence of fish.

Pond 6 was a moderately large fishing lake in Stillwell's Nature Reserve located at NGR: TL 18515 95979 (Figure 3, Photo 13, Appendix 3). There was little marginal or aquatic vegetation with only a small area of common reed *Phragmites australis* located at the southern end of the lake.

Pond 7 lies within 500m (Figure 3, Photo 14, Appendix 3) located at NGR:TL 17592 95143. The HSI assessment classified the pond as having poor suitability for great crested newts (HSI = 0.40, Appendix 4). It was located within a residential area surrounded by regularly mown amenity grassland (UK Habs G4 -modified grassland), concrete edges and no aquatic or emergent vegetation. The pond was scoped out for further assessment.

Similarly, Pond 6 was also scoped out as this was also a large lake supporting fish with very limited emergent vegetation present and shaded around the whole of the water's edge.

<u>eDNA assessment</u>

The purpose of the survey is to test for Environmental DNA (eDNA) in suitable waterbodies. Four ponds were selected for eDNA water sampling located in Stillwell's Nature Reserve. Two ponds were scoped out due to size and likely moderate/large populations of waterfowl and/or and fish. One ditch was also present linked to Stillwell's Lake, but water was too shallow to sample and overall the ditch was considered unsuitable for great crested newt. This was also confirmed by Swift Ecology who also scoped out the ditch which was dry when they assessed the site.

eDNA is a highly sensitive technique and is a nationally accepted method for the determination of GCN presence or absence within a waterbody. Twenty water samples evenly spaced along or around each waterbody were taken following standard methodology and procedures. The 20 samples were added together and thoroughly mixed before taking 50ml sub-samples which were added to ethanol in each of the 6 sample tubes and then mixed thoroughly.

The water samples were collected from each of the waterbodies on 17 May 2022. The samples were sent to ADAS, a certified laboratory, for analysis.

The results of the eDNA analysis are shown In Appendix 5.

Common reptiles

There are suitable habitats within the scheme footprint that could support populations of common reptiles such as the grassland verges and mosaics of grass and scrub especially on the northeast side of the roundabout near Stillwell's Nature Reserve.

However, Swift Ecology conducted extensive surveys for common reptiles in the former Mars Pet Care Site only 122m from the proposed works and only a low population of common lizard was recorded.

Overall, reptiles are unlikely to be a significant constraint to the works, however, there is potential for them to turn up on site in suitable habitats and this will need to be considered.

Badger

There were no records of badger from NBN.

A large active main badger sett was recorded in the broadleaved woodland west of the proposed works during and extended survey beyond the works footprint (Photo 15, Appendix 3). This comprised at least 14 active holes at approximately NGR: TL17382 953729 (Appendix 3). The main sett was located on the southern boundary of the woodland adjacent to open grassland along Phorpes Lane.

In addition, 11 disused holes were recorded in the dry ditch in a long section of the ditch opposite the main sett. The closest of these to the proposed works was located approximately 188m from the proposed works at NGR: TL 17564 95492 (Photo 16, Appendix 3).

No evidence of badger activity was recorded in the embankment immediately adjacent to The Serpentine and in the proposed works footprint. No setts were present and no other signs such as latrines or foraging were observed.

Currently, badgers are not a constraint to the works, but this could change and the embankment provides a suitable habitat for digging new setts.

Nesting birds

Nesting birds are likely to be a constraint to the works when tree, shrub and scrub removal takes place if undertaken during the main bird nesting season usually considered to be March to August inclusive.

Other protected species

There was no habitat in or immediately adjacent to the works footprint that could support hazel dormouse *Muscardinus avellanarius*. The watercourse does not provide suitable habitat for white-clawed crayfish *Austropotamobius pallipes.*

Invasive Species

No non-native invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were noted during the walk-over survey.

Potential Ecological Constraints

Great crested newts

There were several ponds and waterbodies in the area, mainly associated with Orton Pit SAC but these were all 500m or more form the proposed works, with those in Orton Pit more than 1km away. Ponds and waterbodies on the northeast side of Junction 3 were generally considered poor for great crested newts or below average and some eDNA analysis tests were negative for this species although this could not be confirmed when re-tested in 2022.

Given the above, it is considered unlikely that great crested newts are a constraint to the works. However, given the location and the proximity of Orton Pit SAC which is designated for its high population of great crested newts, the works should still be conducted under a Precautionary Method of Working (PMW).

Nesting birds

Nesting birds are highly likely to utilise the trees and scrub within the scheme footprint during spring and summer (March to August inclusive) and are therefore a potential constraint to the works if vegetation clearance is carried out during this period.

Common reptiles

Reptiles are known to be present in habitats associated with the former Mars Pet Care site, namely common lizard. The habitats surrounding and within the proposed works footprint form a continuous area of habitat to this site and therefore they could support common lizard but only likely at low populations (as shown from surveys conducted on the former Mars Pet Care site).

Common reptiles are therefore a potential constraint, although low risk as low populations can be expected, this can be managed through habitat manipulation.

Relevant Legislation

Great crested newts

Great crested newts are protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017 and (EU Exit) amendments 2020 and under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).
It is an offence to:

- Intentionally or deliberately capture or kill, or intentionally injure great crested newts.
- Deliberately disturb great crested newts or intentionally or recklessly disturb them in a place used for shelter or protection,
- Damage or destroy a breeding site or resting place,
- Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection,
- Possess a great crested newt, or any part of it, unless acquired lawfully,
- Sell, barter, exchange or transport or offer for sale great crested newts or parts of them.

Nesting birds

Nesting birds are protected under the Wildlife & Countryside Act 1981 (as amended). This applies to all wild birds where it is an offence:

- to kill, injure or take any wild bird (subject to certain exceptions).
- to take, damage or destroy a nest whilst it is in use or being built.
- to take or destroy the egg of any wild bird.

NB. Some species are afforded additional protection under this Act where it is also an offence to disturb any wild bird listed on Schedule 1.
It is considered unlikely that any Schedule 1 species would be present in the scheme footprint or immediately adjacent.

Common reptiles

There are six-native species of reptile found in the UK. These are common lizard *Zootoca vivipara*, slow worm *Anguis fragilis*, sand lizard *Lacerta agilis*, grass snake, adder *Vipera berus* and smooth snake *Coronella austriaca*.

All species are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), making it an offence to intentionally or recklessly kill or injure any reptile species. Sand lizard and smooth snake are afforded additional protection, but these species are not present in Cambridgeshire.

Conclusions and Recommendations

Great crested newts

The proposed works are highly localised being confined to largely hard surfaces and narrow roadside verges. However, removal of trees and scrub is required within the Highway boundary. It is likely that some embankment areas will also need to be reprofiled to accommodate the works.

There are no ponds within 250m of the proposed works, and the ditch that runs through the woodland block and Orton Pit SAC/SSSI was dry in March and did not support any aquatic vegetation suggesting that it remains dry most of the time particularly during the critical breeding season for newts (Figures 3 & 4).

However, the habitats beyond 500m especially in relation to Orton Pit SAC/SSSI do provide some connectivity to waterbodies with known populations of great crested newt, albeit over 1km away. There was one pond (P7) located on the west side of the junction located 500m from the proposed works, and a further six ponds/waterbodies within 750m on the northeast side of the junction in Stillwell's Nature Reserve.

No records of great crested newts have been recorded within 500m of the proposed works and eDNA surveys of some waterbodies in Stillwell's Nature Reserve conducted in 2020 did not identify presence, albeit water samples were taken outside the sampling period.

Further eDNA samples were taken in May 2022 from four waterbodies in Stilwell's Nature Reserve and two of these were taken from the same ponds sampled in 2020 (Ponds 3 and 4), but these proved to be indeterminate. Given that the HSI results generally indicated poor or below average suitability in 2020 and 2022, it is reasonable to assume that great crested newts are not present in the waterbodies in Stillwell's Nature Reserve and therefore not a constraint to the works, particularly northeast side of Junction 3.

The population of great crested newts in Orton Pit SAC are generally likely to be confined to ponds and surrounding habitat surrounding located over 1km away from the proposed works area. Habitats immediately adjacent to the works and within the works footprint, while potentially suitable for great crested newts, are small in area and not optimal.

As stated in Natural England's mitigation licence advice, *newts tend to be present at increasingly low densities the further one looks from ponds. Further from ponds there is also a corresponding reduction in the scale of impact on populations. The probability of an offence outside the core breeding and resting places is often rather small, and even if an offence takes place, the effect on the population may be negligible*.
The Natural England Rapid Risk Assessment Tool was used to determine the likelihood of committing an offence. The results suggest that an offence is highly unlikely even with relatively large areas of land are lost assuming that newts are highly unlikely to be present in the habitats to be damaged / lost in this case given its significant distance from known populations of newts.

Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	No effect	0
Land >250m from any breeding pond(s)	1 - 5 ha lost or damaged	0.04
Individual great crested newts	No effect	0
	Maximum:	0.04
Rapid risk assessment result:	GREEN: OFFENCE HIGHLY UNLIKELY	

Figure 5. Risk Assessment Results

Therefore, it is concluded that a mitigation licence will not be required.

However, it is recommended that the works are undertaken under a PMW to reduce any likelihood of killing, injuring or disturbing newts in the unlikely event that a newt is encounte This is likely to require phased habitat removal carried out under the supervision of a suitab qualified ecologist who either holds a low-class impact licence or a surveying and handling licence for great crested newts.

It is also recommended that any proposed works should be programmed to be undertaken the great crested newt active season (the active season is typically between March to September). Ideally, if ground level vegetation can be removed during the period **April to M** this reduces the risk further since peak numbers of adult newts will be in ponds breeding, a this case, a significant distance from the proposed works.

Should works be unable to be undertaken during the great crested newt active season, i.e. their hibernation season, it is recommended that any areas of loose debris/tall ruderals are removed during their active season (i.e. March to September) and under ecological superv

In addition, where trees and shrubs are to be removed, these should be cut down in the wi period (to avoid the bird nesting season), but roots and stumps must not be removed at thi

A PMW should be prepared as a separate working document.

This approach (along with the proposed mitigation measures) may need to be discussed a agreed with Natural England given the proximity of the Orton Pits SAC and SSSI to the pro works. This should be undertaken by a suitably qualified ecologist.

Nesting birds

Nesting birds are a potential constraint to the works. The following recommendations are provided:

- Vegetation clearance, siding up, cutting back etc. including works affecting trees and scrub should only be undertaken outside the main bird nesting season i.e., autumn and winter.

- If this is not possible and vegetation clearance is undertaken in the main bird nesting season, usually considered to be March to August inclusive, then a nesting bird check must be conducted immediately prior to vegetation removal by a suitable qualified ecologist. If an active nest is discovered, then this must be left undisturbed with at least a 5m buffer around the nest until the chicks have fledged and the nest is no longer in use.

Common Reptiles

The PMW that will be put in place to ensure that great crested newts are not impacted southwest of the Junction adjacent to Orton Pit SAC will also cover common reptiles, at least on this side of Junction 3.

In the habitats northwest of Junction 3, then habitat manipulation should be undertaken as follows;

- Ground cover vegetation should be strimmed in phases during the active season (April to potentially mid-October) ensuring that vegetation is cut to no lower than 150mm initially. This should be left for a few days to allow reptiles, if present, to move away into uncut vegetation. The vegetation can be cut to 50mm and maintained as short vegetation, until it is stripped off.
- Strimming should ideally be undertaken in sunny conditions and with temperatures above 12°C.
- The vegetation should be directionally strimmed towards uncut vegetation/cover that is outside the works footprint.

All arisings should be removed out of the works footprint. The arisings can be left in situ provided it is placed outside the works footprint in heaps that would provide habitat for grass snakes to use as egg-laying sites, should these be present, although there is no evidence to support this.

Appendix 1. General Design Arrangement (5101127-MIL-HEW-ZZ-DR-CH-0605_PO1_S2).

Appendix 2. Earthworks Design (5101127-MIL-HSC-ZZ-DR-CH-0201-0202_P01-S2).

Appendix 3. Photo References

Photo 1. Ash dominated woodland with loose leaf litter and bare ground - February 2022. Potential for nesting birds in the trees. Low potential for great crested newts due to lack of cover.

Photo 2. Dry ditch in woodland block.

Photo 3. Tall, tussocky unmanaged species-poor grassland on verge, March 2022. Potential for reptiles and nesting birds in adjacent scrub. March 2022.

Photo 4. Tall, tussocky, unmanaged species-poor grassland adjacent to The Serpentine (A1260). Potential for reptiles.

	
Photo 5. Dense blackthorn scrub and coarse grassland adjacent to The Serpentine (A1260) looking north. Potential for nesting birds and reptiles.	**Photo 6.** Low scrub and occasional young trees with coarse grass verges adjacent to the Serpentine (A1260)
	
Photo 7. Scrub on the off-slip off the A1139 Fletton Parkway. Potential for nesting birds.	**Photo 8.** Pond 1 Stillwell's Nature Reserve HSI = 0.33

Photo 9. Pond 2 Stillwell's Nature Reserve, Tributary of Stillwell's Lake HSI = 0.51

Photo 10. Pond 3, Tributary of Stillwell's Lake HSI= 0.48

Photo 11. Pond 4, Stillwell's Nature Reserve HSI = 0.33 Poor

Photo 12. Pond 5. Stillwell's Lake - scoped out for any further assessments

Pond 13. Stillwell's Lake- HSI = 0.47 scoped out for eDNA.

Pond 14. Man-made pond in housing development. HSI = 0.13 Poor, scoped out for eDNA.

	
Photo 15. Active main sett.	**Photo 16.** Old disused sett entrances in dry ditch.

Appendix 4. Habitat Suitability Index Assessment Results 17-5-22

HSI Suitability Index						
Criteria	Pond 1	Pond 2	Pond 3	Pond 4	Pond 6	Pond 7
Geographic location	1.0	1.0	1.0	1.0	1.0	1.0
Pond area	0.01	0.3	0.4	0.1	0.8	0.9
Pond permanence	0.5	0.9	0.9	0.9	1.0	0.9
Water quality	0.33	0.67	1.0	0.67	1.0	0.33
Shade	0.2	0.2	0.2	0.2	0.4	1
Waterfowl impact	1.0	0.67	0.67	1.0	0.67	0.01
Fish presence	1.0	0.33	0.1	1.0	0.01	0.67
Pond density	0.72	0.72	0.72	0.72	0.72	0.01
Terrestrial habitat	0.67	0.67	0.67	0.67	0.67	0.01
Macrophyte cover	0.1	0.3	0.3	0.01	0.35	0.01
HSI Score	0.33	0.51	0.48	0.33	0.47	0.13
Pond suitability	**Poor**	**Below average**	**Poor**	**Poor**	**Poor**	**Poor**

Appendix 5. EDNA Analysis Results - ADAS

Client: John Birkenhead,
Milestone Infrastructure

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172 Chester Road
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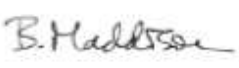
Sample ID: ADAS-4789	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Pond 3 Stillwells	Description: pond water samples in preservative	
Date of Receipt: 25/05/2022	Material Tested: eDNA from pond water samples	

Determinant	Result	Method	Date of Analysis
Inhibition Control†	2 of 2	Real Time PCR	26/05/2022
Degradation Control§	Evidence of degradation	Real Time PCR	26/05/2022
Great Crested Newt*	Indeterminate	Real Time PCR	26/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)#	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	26/05/2022	Date of issue:	26/05/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

† Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

§ No degradation is expected within time frame of kit preparation, sample collection and analysis.

#Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

MILESTONE INFRASTRUCTURE
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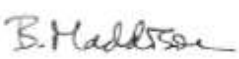
Sample ID: ADAS-4790	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Pond 2 Stillwells	Description: pond water samples in preservative	
Date of Receipt: 25/05/2022	Material Tested: eDNA from pond water samples	

Determinant	Result	Method	Date of Analysis
Inhibition Control†	2 of 2	Real Time PCR	26/05/2022
Degradation Control§	Evidence of degradation	Real Time PCR	26/05/2022
Great Crested Newt*	Indeterminate	Real Time PCR	26/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)#	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	26/05/2022	Date of issue:	26/05/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

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† Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

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#Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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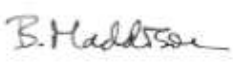
Sample ID: ADAS-4792	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Pond 1 Stillwells	Description: pond water samples in preservative	
Date of Receipt: 25/05/2022	Material Tested: eDNA from pond water samples	

Determinant	Result	Method	Date of Analysis
Inhibition Control[†]	2 of 2	Real Time PCR	26/05/2022
Degradation Control[§]	Evidence of degradation	Real Time PCR	26/05/2022
Great Crested Newt*	Indeterminate	Real Time PCR	26/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	26/05/2022	Date of issue:	26/05/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

† Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

§ No degradation is expected within time frame of kit preparation, sample collection and analysis.

#Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-4793	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Pond 4 Stillwells	Description: pond water samples in preservative	
Date of Receipt: 25/05/2022	Material Tested: eDNA from pond water samples	

Determinant	Result	Method	Date of Analysis
Inhibition Control[†]	2 of 2	Real Time PCR	26/05/2022
Degradation Control[§]	Evidence of degradation	Real Time PCR	26/05/2022
Great Crested Newt*	Indeterminate	Real Time PCR	26/05/2022
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	26/05/2022	Date of issue:	26/05/2022

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Appendix I – Technical Note For Early Release of Funding

Technical Note

Description:	Junction 3 Active Travel Early Funding Release	To:	Nathan Bunting, Emma White
Reference:		From:	Ross Percy-Jones
Date:	23/08/2022	cc:	Lewis Banks, Richard Jones, Tamara Lanoix, Sally Savage

Introduction

Peterborough City Council (PCC) is requesting the early release of part of the construction funding for the Junction 3 Improvement Scheme from the Cambridgeshire and Peterborough Combined Authority (CPCA).

This is to accelerate the construction of two active travel schemes, which form part of the Junction 3 project, ahead of the main highways works which are scheduled to commence in Spring 2023 (subject to CPCA Board approval in January 2023). The schemes identified for accelerated delivery are:

- Malborne Way Footpath
- Shrewsbury Avenue Cycleway.

Peterborough City Council and the CPCA have been considering opportunities to accelerate scheme delivery as the scheme is funded by the Transforming Cities Fund (TCF). The TCF is time limited and must be spent by 31st March 2024.

Including the Junction 3 project, there is approximately £17m of TCF funded transport infrastructure to deliver in the 2023 / 2024 financial year in Peterborough. Bringing forward some of the active travel schemes for delivery into the third and fourth quarters of the 2022 / 2023 financial year will reduce the pressure on the wider construction programme, and specifically reduce the risk to funding availability caused by any programme delays.

A Full Business Case (FBC) is required for the approval of construction funding by the CPCA Board. The Junction 3 Improvement Scheme FBC is due to be submitted in December 2022, ahead of the January 2023 Board meeting. This technical note provides a summary of the business case dimensions in relation to the two active travel schemes introduced above and demonstrates that the schemes offer very high value for money, and there is a strong strategic case for investment as well as the necessary measures in place to successfully deliver the schemes.

As stated in the Department for Transport (DfT) Cycle Infrastructure Design Local Transport Note 1/20 (LTN 1/20), funding for local highways investment where the main element is not cycling or walking will be provided where schemes deliver or improve cycling infrastructure to the standards in LTN 1/20.

Schemes

The Junction 3 active travel schemes are designed and are ready to be delivered.

The Malborne Way Footpath scheme, which completes a missing link along an existing route, consists of the following:

- 1.6m wide dropped crossing over the Saltmarsh approach to the Malborne Way / Saltmarsh priority junction
- 2.5m wide footway for 220m between the Malborne Way / Saltmarsh priority junction in the north and the footpath ramp adjacent to the Lime Academy Orton access junction.
- 1.2m wide dropped crossing over the Lime Academy Orton access junction.

The Shrewsbury Avenue Cycleway scheme consists of the following:

- A 3.5m wide cycleway for 450m from the southernmost point of Shrewsbury Avenue to the south-west corner of Stillwells Nature Reserve.
- Resurfacing to make the existing route more attractive, comfortable, and safer.

The scheme drawings for each scheme are available upon request.

Figure 1 overleaf shows the location of the schemes in the Junction 3 study area, which is situated between the Ortons and Hampton areas in the south of Peterborough.

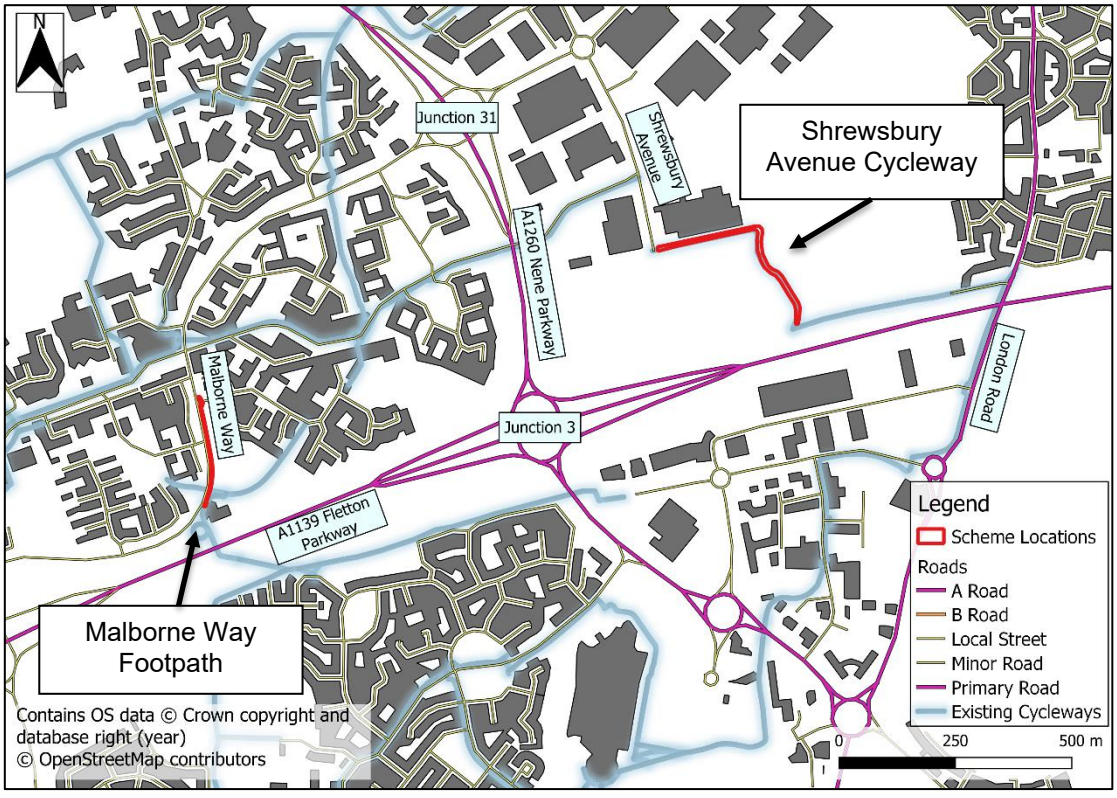

Figure 1: Junction 3 Active Travel Scheme Locations

Strategic Dimension

The Strategic Dimension considers the policy context in which the schemes have been developed. As well as policy, the need for intervention is explained, which includes the requirement to overcome the peak hour congestion and delay that compromises local growth aspirations.

Policy Context

A policy review of the following, in conjunction with a review of existing and future issues, has been undertaken as part of the Junction 3 FBC to identify scheme objectives:

- National:
    - Department for Transport Single Departmental Plan (June 2019)
    - Department for Transport Gear Change: One Year On (November 2020)
    - Department for Transport Cycle Infrastructure Design Local Transport Note 1/20 (LTN 1/20) (July 2020)
    - The Environment Act 2021
- Regional:
    - Combined Authority Annual Report & Business Plan 2021 / 22
    - Cambridgeshire and Peterborough Independent Economic Review (CPIER) (September 2018)
    - Mayor's Growth Ambition Strategy
    - Cambridgeshire and Peterborough Local Industrial Strategy (June 2019)
    - Cambridgeshire and Peterborough Combined Authority Local Transport Plan (January 2020)
    - Forthcoming Cambridgeshire and Peterborough Combined Authority Local Transport and Connectivity Plan
    - Natural Cambridgeshire Doubling Nature Vision
    - Cambridgeshire and Peterborough Independent Commission on Climate – Fairness, Nature and Communities: Addressing Climate Change in Cambridgeshire and Peterborough (October 2021)
- Local:
    - Peterborough City Council Strategic Priorities
    - Peterborough City Council Local Plan (July 2019)
    - Peterborough City Council – Trees and Woodland Strategy (2018)

Existing and Future Conditions

Evidence of existing and future conditions demonstrates the following issues that need to be overcome for growth to be realised:

- Extensive peak hour queues on the A1260 Nene Parkway
- Peak hour queueing on the A1260 The Serpentine
- High accident rate, particularly rear end shunts
- Poor pedestrian / cycle facilities and connectivity.

Pedestrian and cycle facilities within the immediate vicinity of Junction 3 are primarily situated to the south of Junction 3, with pathways and an underpass connecting the residential area of Hampton Hargate to the business park area along Phorpres Way (east of the A1260 The Serpentine).

A non-motorised user (NMU) audit was conducted as part of the Junction 3 FBC to inform active travel scheme designs. The audit included a review the quality of the walking and cycling facilities present at Junction 3 and the wider study area and identified any improvements that could be made alongside construction of the Junction 3 highway scheme. During the audit the following points were considered:

- Quality of the pedestrian / cycle footpaths
- Location of crossing points and the ease of crossing
- Extent of street lighting
- Perceived safety of the underpass.

Wider pedestrian and cycle facilities within the study area, such as the Malborne Way and Shrewsbury Avenue schemes, would help facilitate north-south active user trips across the A1139 Fletton Parkway.

It is expected that providing improved active travel infrastructure will encourage residents to travel by foot or bicycle instead of by car, and therefore help reduce existing and future year peak hour congestion and delay.

Local employment areas to the north, south, and east of Junctions 31 and 3 are particularly car-dependent, as shown in Figure 2 below. However, car availability for residents is lower in the Ortons and Hampton, where the schemes are located, than other areas of Peterborough as shown in Figure 3 overleaf. Improving the quality of strategic active travel corridors such as Malborne Way and the Shrewsbury Avenue Cycleway is expected to reduce the need to travel by car to local employment sites and increase the appeal of active travel.

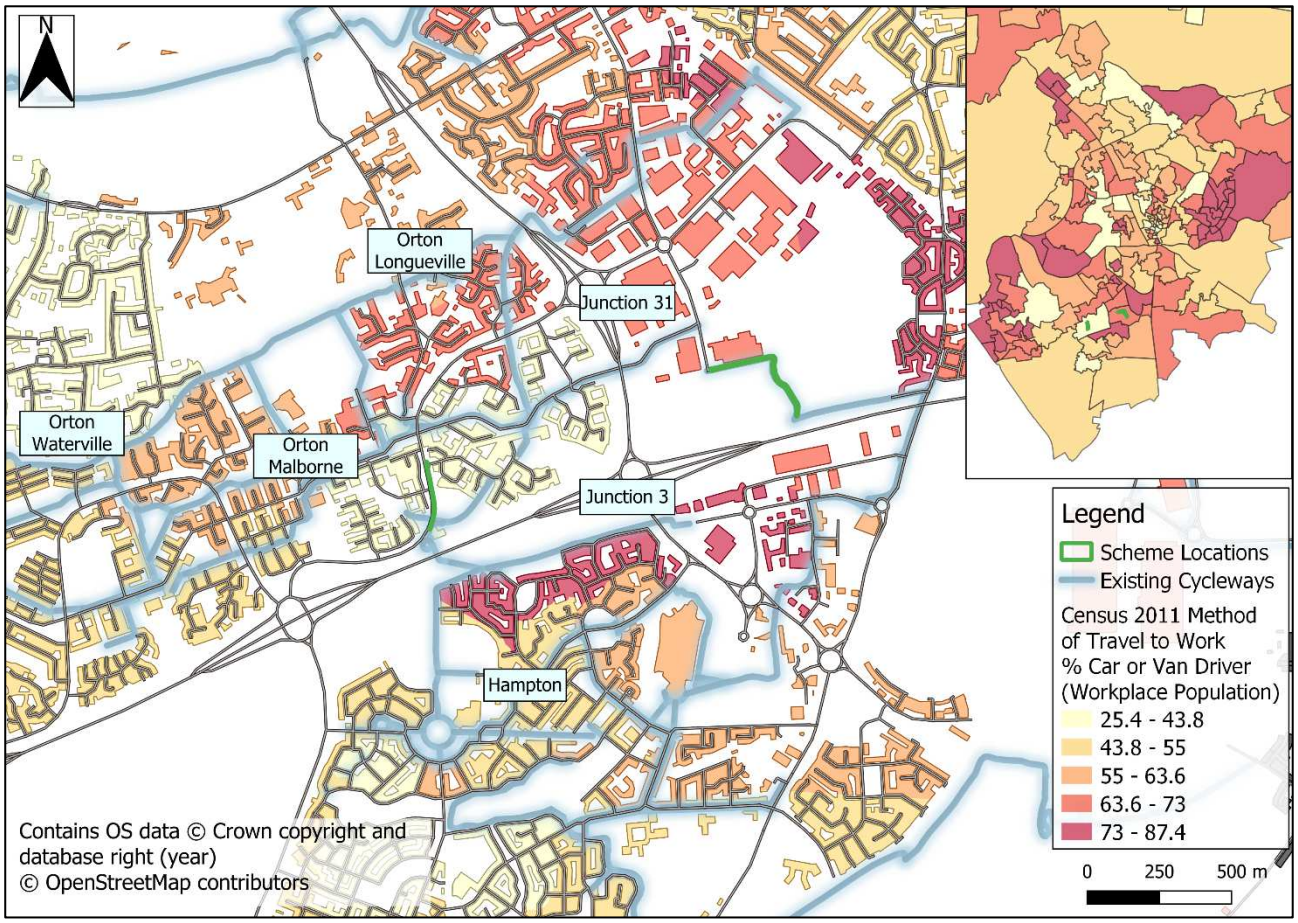

Figure 2: Census 2011 Method of Travel to Work – Percentage Car or Van Driver within Workplace Population

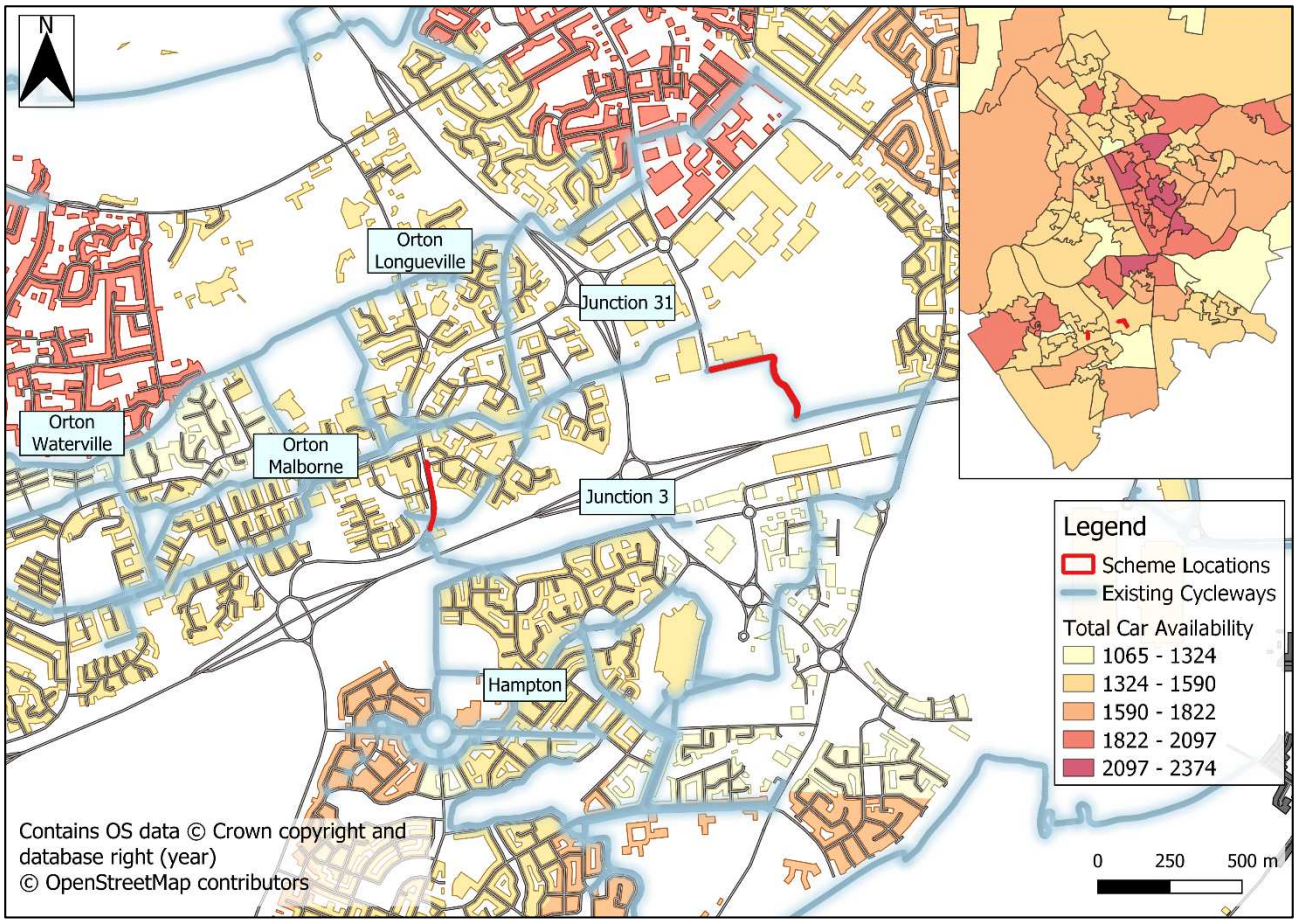

Figure 3: Census 2011 Total Car Availability by LSOA

The average car travel to work mode share for the Ortons and Hampton is 62%, whereas the whole of Peterborough is 61%. Whilst local car driver levels to workplaces are representative of overall Peterborough levels and local car availability is lower than the rest of the city, there is still potential to reduce car driver trips from local residential areas and increase the number of walking and cycling commuter trips.

Figure 4 shows the ratio of the local propensity to cycle under the Government Target Equality scenario of the Propensity to Cycle Tool (PCT) to Census 2011 cycle commuting levels.

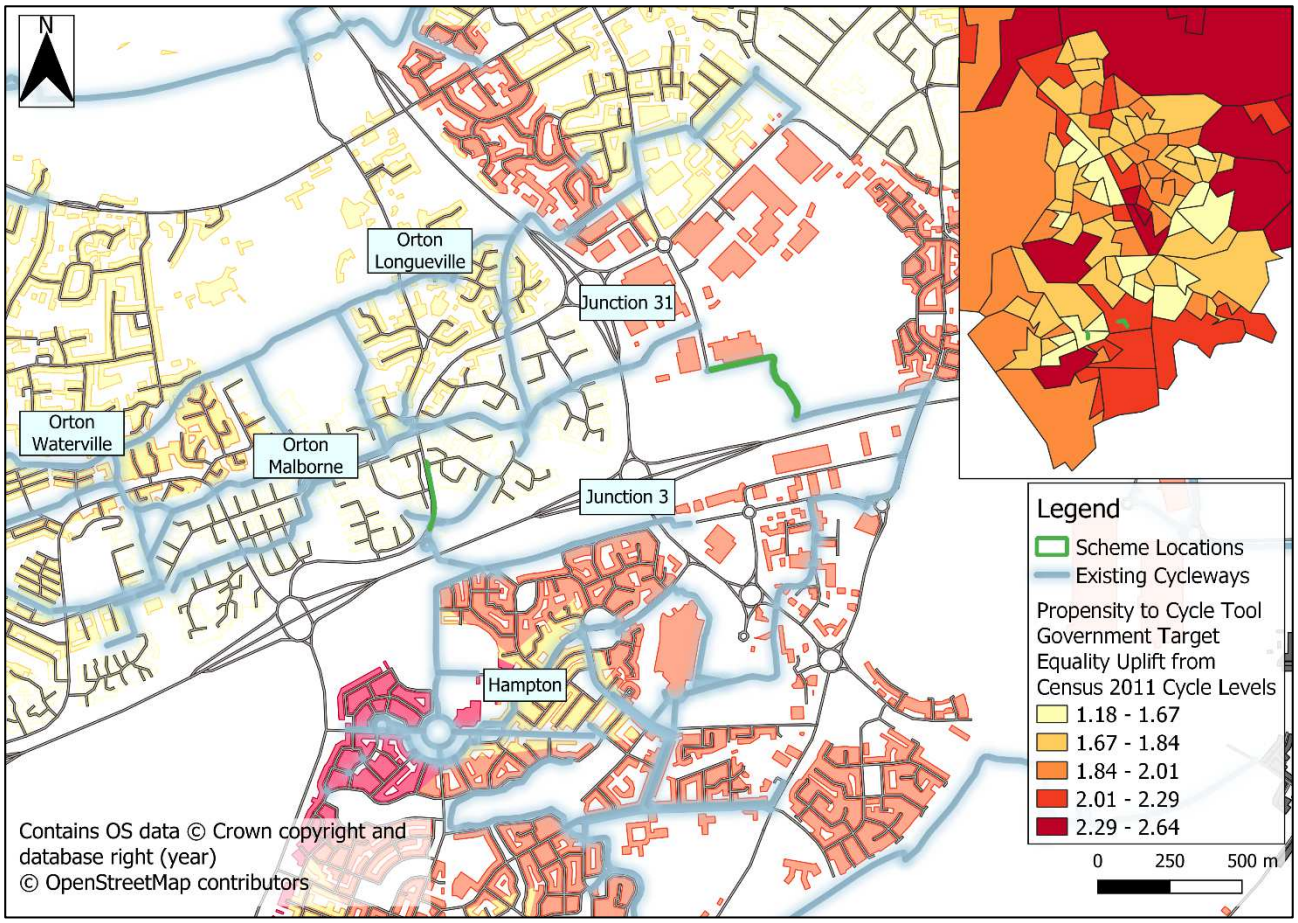

Figure 4: Ratio of Propensity to Cycle Tool Government Target Equality to Census 2011 Cycle Commuting Trips

There is the potential to uplift cycling from Census 2011 levels as follows:

- In the Ortons to the west of Junction 31 by a factor of between 1.18 and 1.67
- In Hampton by a minimum factor of 1.67 and a maximum factor of 2.64
- In the Ortons to the east of Junction 41 by a factor of between 2.01 and 2.29.

The Census 2011 Method of Travel to Work data has also been analysed to identify the number of car driver trips that are undertaken within a walkable distance through the study area and could feasibly use the routes that would be improved as shown in Figure 5 overleaf.

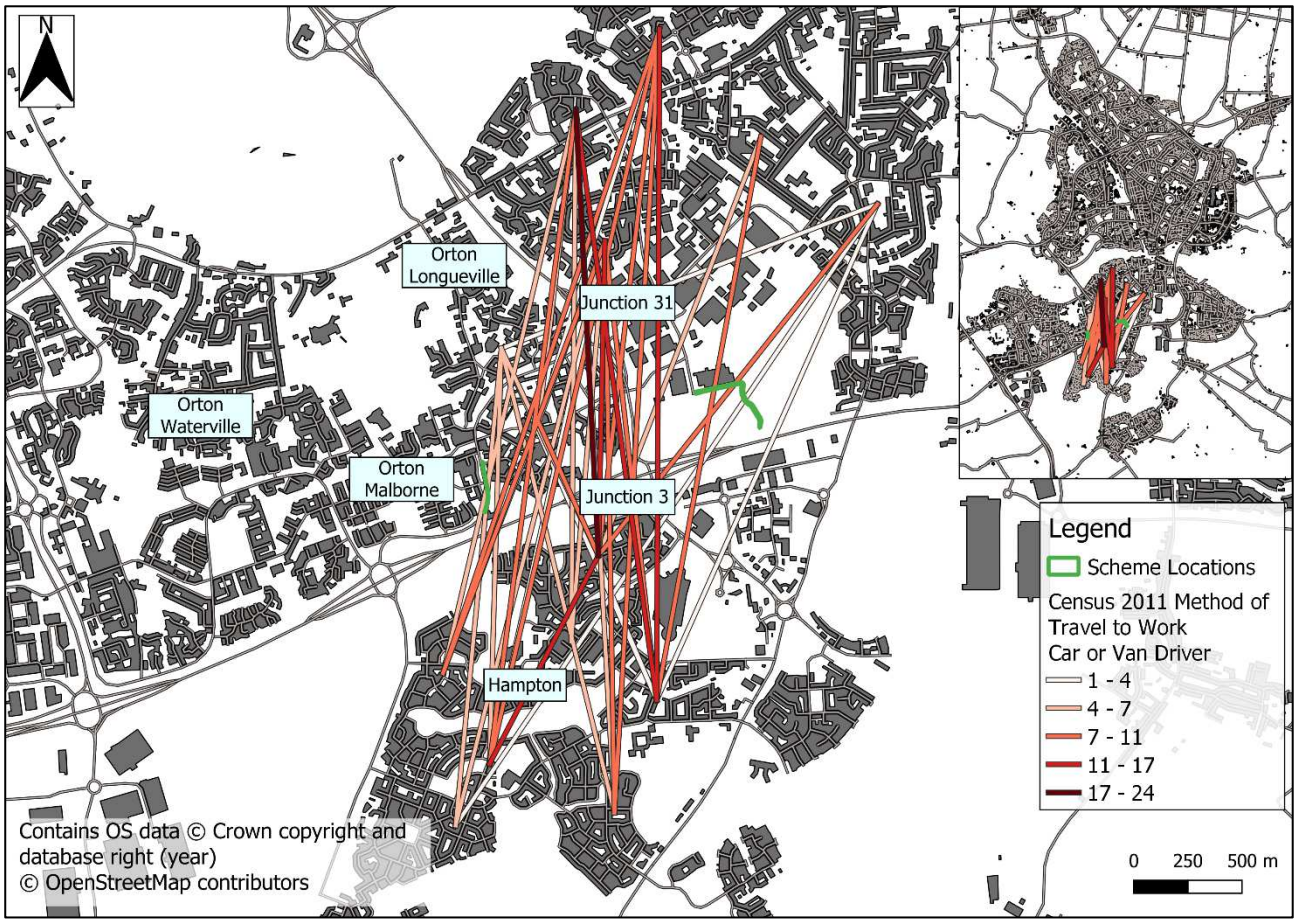

Figure 5: Census 2011 Method of Travel to Work - Car or Van Driver Trips Undertaken Over a Walkable Distance

There are 353 daily car or van driver home to work trips in 2011 that are undertaken within a walkable distance through the study area. If 10% of these car or van trips shifted to walking, the number of local home to work walking trips would increase to about 94 from 59 which equates to a ratio of 1.60. If 25% of these car or van trips shifted to walking, the number of local home to work walking trips would increase to about 147 which equates to a ratio of 2.50.

Without an improvement in active travel infrastructure, the study area will remain a car-dependent destination with untapped potential for walking and cycling.

Local Growth Aspirations

Peterborough is forecast to experience significant employment and population growth over the next few decades, reflecting a continuation of past trends. The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities and objectives for Peterborough for the period up to 2036. The updated strategy identifies the required delivery of 19,440 new homes and 17,600 new jobs by 2036. This level of growth will in turn further strengthen the City's economy, contribute to regional growth, and increase the demand for travel on the local network.

Peterborough strives to become a 'destination of choice', to be continually recognised as a regional centre and economic partner with Cambridge. With the attractiveness of the City set to increase as a place to live, work and travel, this in turn creates pressure in relation to housing and employment growth, which in turn increases the strain on the transport infrastructure. Improving the transport infrastructure to enable Peterborough's strong history of growth to continue is the main internal driver for change at Junction 3.

The Local Transport Plan identifies Junction 3 as a key scheme for introducing infrastructure requirements that are needed to address existing capacity constraints on the network and those that are required to cater for the travel demand arising from the growth ambitions of the City.

Junction 3, London Road, and the A1139 Fletton Parkway footbridge are gateways to a large residential and employment area known as Hampton. The Hampton Township has been developed over the past 25 years and is identified for a significant proportion of residential and employment growth in the Local Plan for the next 15 years.

Table 1 shows the developments by land use that are proposed for the Hampton area, respectively.

Table 1: Development in the Hampton Area

Site Name	Residential Units	Employment (GFA m^2)	Retail (GFA m^2)	Leisure (GFA m^2)	Jobs
British Sugar Offices	-	6,922	-	-	590
Serpentine Green Extension	-	-	12,335	11,866	257
Great Haddon (Core + Employment)	5,350	324,500	11,500	-	10,686
Alwalton Gateway	-	17,200	-	-	2,250
Hampton Heights	350	-	-	-	-
Hampton Leys	1,700	-	-	-	-

Local residential and employment growth will be compromised if no changes are made to existing congestion and delay. An increase in local active travel within the Junction 3 study area and a reduction in car travel will alleviate congestion and delay.

The October 2021 Cambridgeshire and Peterborough Independent Commission on Climate report recommends a reduction in car miles driven by 15% to 2030 relative to baseline levels to help the region mitigate and adapt to the impacts of climate change. The schemes will provide quality active travel infrastructure that would encourage walking and cycling as a more sustainable alternative to car travel.

Scheme Objectives

The project scope is to construct schemes within the Junction 3 study area that achieve each of the primary objectives of the Junction 3 FBC.

The primary scheme objectives, as outlined in the Junction 3 FBC, are as follows:

- Tackle congestion and improve journey time reliability
- Support Peterborough's Growth Agenda
- Create wider economic benefits
- Protect and improve the biodiversity value within the study area
- Reduce dependence on car travel and increase travel by healthier, more sustainable modes.

The secondary scheme objectives, as outlined in the Junction 3 FBC, are as follows:

- Positively impact traffic conditions on the wider network
- Improve road safety.

The Junction 3 FBC schemes were developed and shortlisted against the scheme objectives using the DfT's Early Assessment and Sifting Tool (EAST) assessment. An option development workshop was held on 4th December 2018 and attended by representatives from various disciplines within Peterborough Highway Services (PHS). The workshop used EAST to review existing and future issues at Junction 3 and the surrounding network.

As stated in the Department for Transport (DfT) Cycle Infrastructure Design Local Transport Note 1/20 (LTN 1/20), funding for local highways investment where the main element is not cycling or walking will be provided where schemes deliver or improve cycling infrastructure to the standards in LTN 1/20.

The Benefits Realisation Plan for the Junction 3 FBC will measure the success of the schemes against the scheme objectives.

Key Risks

A project Risk Register is available as part of the Junction 3 FBC that identifies each of the key risks and mitigation measures. The Risk Register is a live document, which is managed by PCC and is reviewed regularly by the CPCA in monthly Project Board meetings.

A construction Risk Register for each scheme has been produced and is available upon request. The Risk Register is a live document and will be regularly updated throughout the ten-week construction period.

Economic Dimension

The Economic Dimension provides evidence of how the proposed improvements are predicted to perform in relation to the stated objectives, identified problems, and targeted outcomes. The Economic Dimension determines whether the proposed improvements are likely to provide good value for money, with benefits outweighing its costs.

This section sets out the approach taken to initially assess the Economic Dimension for the Junction 3 Active Travel schemes and demonstrates that the proposed schemes would offer Very High Value for Money.

The scheme appraisal in this report focuses on the impacts that can be monetised and these include:

- Mode Shift
- Health
- Journey Quality.

A full appraisal of other economic, environmental, social and distributional impacts that cannot be monetised will be assessed quantitatively and qualitatively within the FBC going to the CPCA January Board.

Present Value of Benefits

The active travel Present Value of Benefits (PVB) of each scheme has been assessed using the Active Mode Appraisal Toolkit (AMAT).

AMAT requires the following intervention-specific details for calculating active travel benefits:

- Appraisal year – 2022
- Intervention opening year – 2023
- Final year of funding – 2023
- Appraisal period – 20 years
- Area type – Other Urban
- Number of daily walking and / or cycling trips without the proposed intervention
- Number of daily walking and / or cycling trips with the proposed intervention
- Percentage of an average walking or cycling trip that will use the intervention
- Current walking and cycling infrastructure for the route
- Proposed walking and cycling infrastructure for the route.

The number of walking and cycling trips without the proposed interventions have been sourced from Strava Metro, Census 2011 Method of Travel to Work, Vivacity AI sensors, and historic Automatic Traffic Counts (ATC).

It was estimated in the Strategic Dimension that there is a potential for walking commuter trips to increase by a factor of 1.600 if 10% of short distance car or van driver trips that could use the proposed infrastructure made the switch to walking. However, the Transport for Quality of Life Overview of Evidence on Increasing Active Travel report (September 2019) identified that improvements to network and flagship routes could generate 18% new walking / cycling trips after only one year, which equates to an uplift factor of 1.180.

A separate exercise has been undertaken to estimate the potential uplift in walking trips from improving walking connectivity in an area such as Fengate where there is low footpath provision to match the level of provision along Shrewsbury Avenue in Orton Longueville. This was achieved by calculating the ratio of walking mode share along Shrewsbury Avenue to the walking mode share in Fengate. Shrewsbury Avenue was found to have a travel to work by walking mode share of 5.33%, whereas Fengate had a mode share of 4.45%. The uplift factor for walking would therefore be 1.198, which is similar to the new trip generation factor observed in the Transport for Quality of Life report.

An uplift factor of 1.198 has therefore been used as the core assumption to provide a conservative estimate of the number of walking trips with the proposed interventions.

A sensitivity test has also been undertaken that assesses the impact of using the Strategic Dimension uplift factor of 1.600.

The number of cycling trips with the proposed improvements to the Shrewsbury Avenue Cycleway has been calculated by:

- Identifying the PCT Government Target (Equality) Ratio (Scenario / Baseline) for the existing route at the scheme location
- Applying the ratio as an uplift factor to the number of cycling trips without the proposed intervention

Government Target (Equality) is the most conservative of all PCT scenarios and is representative of the Department for Transport's Cycling Delivery Plan (October 2014) target of doubling cycling from 2013 levels nationally. Nearly all PCT scenarios are calculated using a function based on trip distance and hilliness. Not all areas experience the same trip distances and hilliness, and this therefore results in increases that can be below or above a doubling of cycling nationally.

PCT is a measure of cycling potential and not an exact estimate of the impact of a specific scheme or intervention. However, a site visit to the Shrewsbury Avenue Cycleway has shown that the scheme is integral to delivering a better-connected network that improves safety and journey quality for cycling. Without any infrastructure improvements, the study area would not be appropriate for increased cycling.

TEMPro v8.0 Core Scenario 2019 to 2023 walk and cycle growth factors for Peterborough have been applied to the average weekday trips for all scenarios.

Table 2 overleaf shows the number of walking and cycling trips by scenario for each scheme.

Table 2: Do Nothing and Do Something Daily Walking Trips by Scheme

Scheme	Daily Walking Trips			Daily Cycling Trips		
	Without Scheme (2023)	With Scheme – Core (2023)	With Scheme – Sensitivity Test (2023)	Without Scheme (2023)	With Scheme – Core (2023)	With Scheme – Sensitivity Test (2023)
Shrewsbury Avenue Cycleway	156	186	249	159	266	
Malborne Way Footpath	233	280	376			

Table 4 below summarises the benefits for each scheme for the Core Scenario.

Table 3: Summary of Benefits by Scheme – Core Scenario

Benefit Type	Benefit Item	Benefits ('000s)		
		Shrewsbury Avenue Cycleway	Malborne Way Footpath	**Total**
Mode Shift	Congestion Benefit	£32.45	£2.98	£41.59
	Infrastructure Maintenance	£0.18	£0.02	£0.23
	Accident	£5.58	£0.51	£7.15
	Local Air Quality	£0.79	£0.07	£1.01
	Noise	£0.37	£0.03	£0.47
	Greenhouse Gases	£2.65	£0.24	£3.4
Health	Reduced Risk of Premature Death	£688.73	£108.29	£1,020.67
	Absenteeism	£91.56	£22.53	£160.62
Journey Quality	Journey Ambience	£2.24	£6.60	£10.06
Indirect Taxation	Indirect Taxation	£-3.33	£-0.31	£-4.27
Total		**£790.00**	**£140.96**	**£930.96**

The benefits over a 20-year appraisal period for the Shrewsbury Avenue and Malborne Way schemes are £790,000 and £140,960, respectively. Health forms most of the benefits for the Shrewsbury Avenue and Malborne Way schemes, with 95.0% and 92.8%, respectively.

Table 4 below summarises the benefits for each scheme for the Sensitivity Test.

Table 4: Summary of Benefits by Scheme – Sensitivity Test

Benefit Type	Benefit Item	Benefits ('000s)		
		Shrewsbury Avenue Cycleway	Malborne Way Footpath	**Total**
Mode Shift	Congestion Benefit	£36.53	£9.14	£45.67
	Infrastructure Maintenance	£0.21	£0.05	£0.26
	Accident	£6.28	£1.57	£7.85
	Local Air Quality	£0.89	£0.22	£1.11
	Noise	£0.42	£0.10	£0.52
	Greenhouse Gases	£2.98	£0.75	£3.73
Health	Reduced Risk of Premature Death	£837.04	£331.94	£1,168.98
	Absenteeism	£122.41	£69.06	£191.48
Journey Quality	Journey Ambience	£2.65	£7.82	£10.47
Indirect Taxation	Indirect Taxation	-£3.75	-£0.94	-£4.69
Total		**£977.35**	**£419.66**	**£1,397.01**

The benefits over a 20-year appraisal period for the Shrewsbury Avenue and Malborne Way schemes are £977,350 and £419,660, respectively. Health forms most of the benefits for the Shrewsbury Avenue and Malborne Way schemes, with 95.4% and 95.5%, respectively.

Present Value of Costs

The Present Value of Costs (PVC) used within the economic assessment are based on initial base investment costs and Optimism Bias (OB) that have been rebased and discounted to 2010 prices and adjusted to market prices using AMAT. No inflation has been applied because the scheme costs will be incurred within the same price year. A developer contribution of £50,000 for the Shrewsbury Avenue Cycleway has been included within the Economic Dimension costs.

The OB rate has been sourced from TAG Unit A1.2 Scheme Costs (May 2022) and uses the Stage 3 Road OB of 20% to reflect the final stage (FBC) that the Junction 3 Business Case is currently at.

The conversion to market prices is undertaken by applying a market price factor of 1.19 to the discounted costs.

Table 5 below shows the scheme costs used within the economic assessment.

Table 5: Economic Dimension Costs

Cost Type	Shrewsbury Avenue Cycleway	Malborne Way Footpath	Total
Base Investment Cost	£223,948	£227,305	£451,253
Base Cost and Optimism Bias	£268,738	£272,766	£541,504
Rebased and Discounted to 2010, and Adjusted to Market Prices (PVC)	**£135,547**	**£169,237**	**£304,784**

Net Present Value and Benefit Cost Ratio

The Net Present Value (NPV) has been calculated by subtracting the PVC from the PVB.

The Benefit Cost Ratio (BCR) has been calculated by dividing the PVB by the PVC.

The BCR is used to determine the Value for Money category that each scheme falls within, as shown in Table 6 overleaf. The Value for Money categories have been sourced from the Department for Transport Value for Money Framework: Moving Britain Ahead (2017) document.

Table 6: Value for Money Categories

Value for Money Category	Benefit Cost Ratio (BCR) Range
Very Poor	BCR <= 0.0
Poor	1.0 < BCR > 0.0
Low	1.5 < BCR >= 1.0
Medium	2.0 < BCR >= 1.5
High	4.0 < BCR >= 2.0
Very High	BCR >= 4.0

The scheme should provide a BCR of at least 1.5 (Medium Value for Money) to be considered of good value for money. It should be noted that the CPCA state in its Local Assurance Framework (2021) that a scheme with a BCR less favourable than other alternatives but best delivers on a project's strategic objectives may be the best value way of delivering a project. However, it is for the CPCA Board to judge whether the achievement of the strategic objectives is worth the cost to the CPCA.

Table 7 provides the Analysis of Monetised Costs and Benefits (AMCB) Table.

Table 7: Analysis of Monetised Costs and Benefits Table – Core Scenario

Benefit Item	Value (£'000s)		
	Shrewsbury Avenue	Malborne Way	Total
Noise	0.37	0.03	0.40
Local Air Quality	0.79	0.07	0.86
Greenhouse Gases	2.65	0.24	2.89
Journey Quality	2.24	6.60	8.84
Physical Activity (Health)	780.29	130.82	911.11
Accidents	5.58	0.51	6.09
Congestion Benefit	32.45	2.98	35.43
Infrastructure Maintenance	0.18	0.02	0.20
Indirect Taxation	-3.33	-0.31	-3.64
Present Value of Benefits (PVB)	**790.00**	**140.96**	**930.96**
Broad Transport Budget	135.55	169.24	304.79
Present Value of Costs (PVC)	**135.55**	**169.24**	**304.79**
Net Present Value (NPV)	**654.45**	**-28.28**	**626.17**
Initial Benefit to Cost Ratio (BCR)	**5.83**	**0.83**	**3.05**

The Shrewsbury Avenue scheme provides a PVB of £790,000, NPV of £654,450, and a BCR of 5.83, which equates to Very High Value for Money.

The Malborne Way scheme provides a PVB of £140,960, NPV of £-28,280, and a BCR of 0.83, which equates to Poor Value for Money.

Combining both schemes together provide a PVB of £930,960, NPV of £626,170, and a BCR of 3.05, which equates to High Value for Money.

A sensitivity test has also been undertaken that assesses the impact of using the Strategic Dimension uplift factor of 1.600. Applying the high uplift resulted in a combined PVB of £1,397,010, NPV of £1,092,280, and a BCR of 4.58, which equates to Very High Value for Money.

The most significant difference in the sensitivity test is that Malborne Way scheme goes from a BCR of 0.83 to 2.48, which is High Value for Money.

Non-monetised Impacts

Impacts that have not been monetised for active travel include:

- Journey time savings for active users (Social and Economy)
- Security (Social)
- Personal Affordability (Social)
- Accessibility (Social).

The distributional impacts of security and personal affordability have been quantitatively assessed. Accessibility has not been assessed on the basis that the guidance within TAG Unit A4.2 focuses solely on public transport.

The following environmental impacts are to be considered in full within the Junction 3 FBC:

- Landscape
- Townscape
- Historic Environment
- Biodiversity
- Water Environment.

Security

Security impact appraisal is recommended for road users, public transport passengers or freight, or a combination of these as stated in TAG Unit A4.1 Social Impact Appraisal. Whilst there is no specific guidance for the security of active mode users, the process as outlined within TAG Unit A4.2 Distributional Impact Appraisal has been used. Indicators such as surveillance, lighting and visibility, and landscaping were noted during site visits and used to inform the appraisal.

The security distributional impact appraisal found that each scheme would not deliver any change in terms of security for older people, females, or young people.

Personal Affordability

Personal Affordability appraisal considers how the monetary costs of travel can be a major barrier to mobility for certain groups of people and their ability to access key destinations. The more deprived groups of society typically spend less money on travel, but the cost of travel will account for a greater proportion of their income.

The most significant impacts of the costs of travel are on younger and older groups, and low-income households.

Figures 5 and 6 show the distribution of younger (0 to 15) and older (65 plus) age groups across Peterborough in relation to key services that would likely be used, respectively.

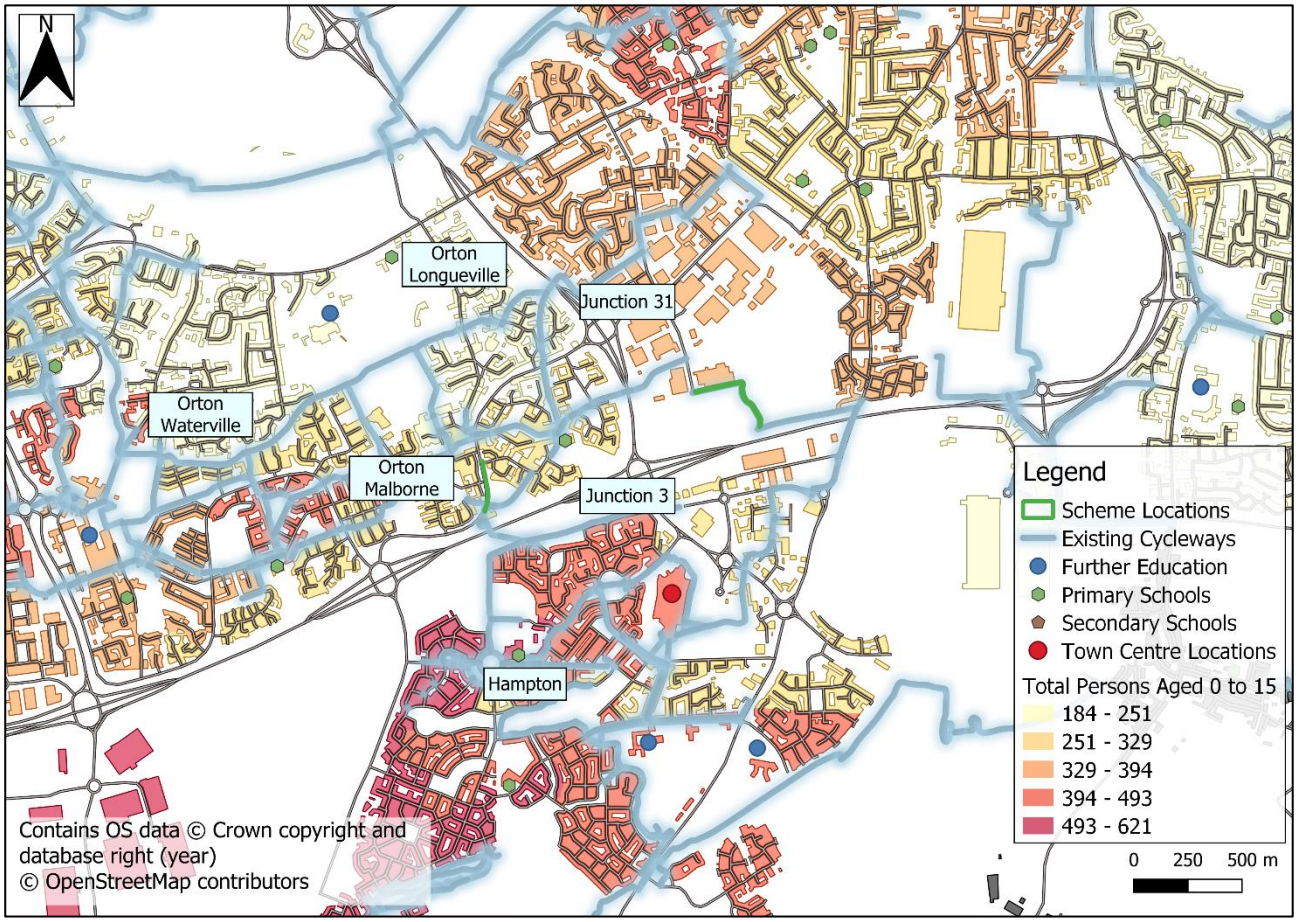

Figure 6: Number of Persons Aged 0 to 15 at LSOA Level across Peterborough in Relation to Key Services

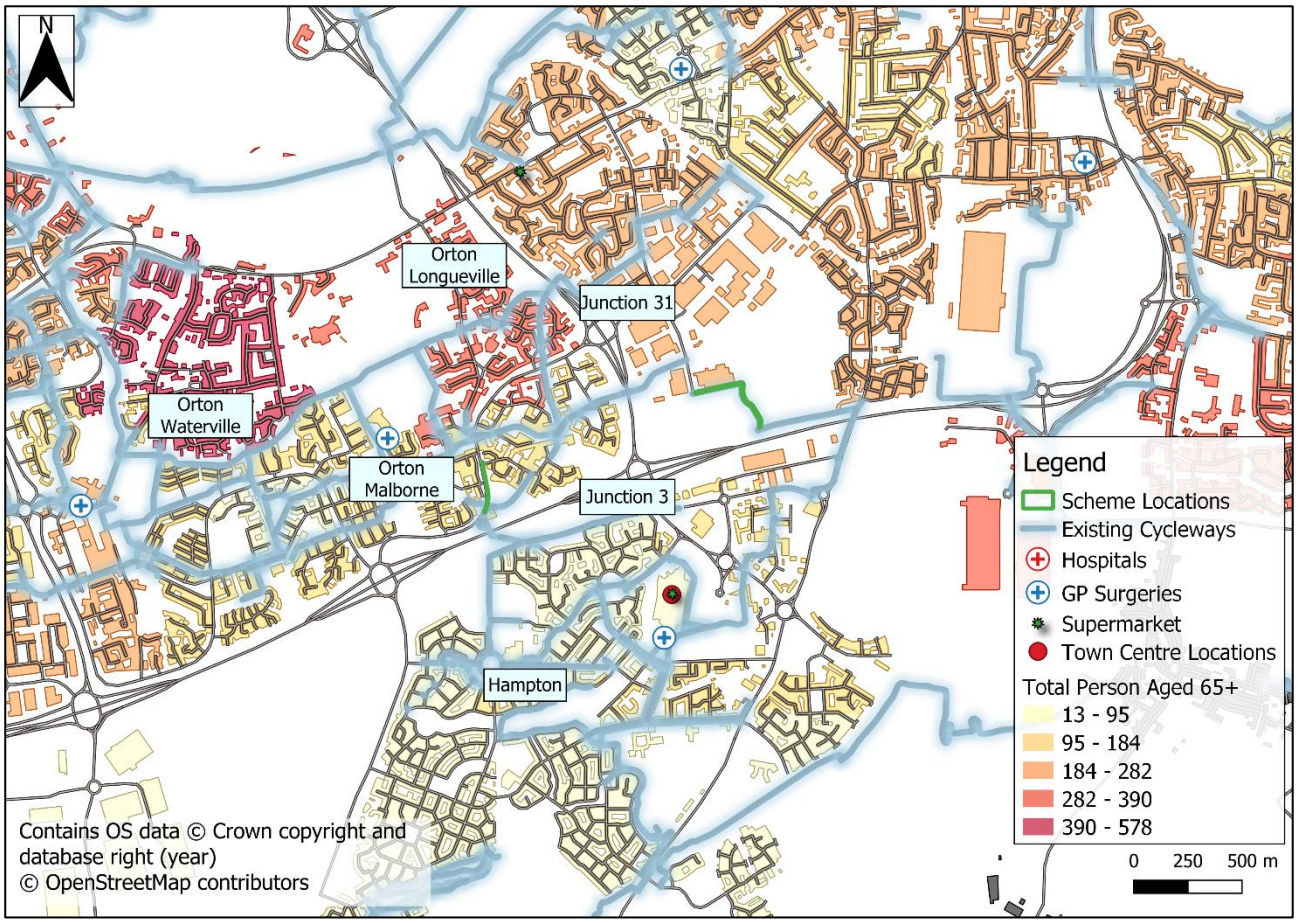

Figure 7: Number of Persons Aged 65+ at LSOA Level in Relation to Key Services

The Malborne Way Footpath will likely be used by young people travelling to Nene Park Academy and St. Botolph's C of E Primary School from residential areas in Orton Malborne and Hampton. There is a particularly high number of persons aged 0 to 15 in Hampton and would likely represent the greatest proportion of young people using the footpath. There is currently no marked footpath that connects the footbridge over Fletton Parkway and the footpath north of Saltmarsh. Without a footpath, the north-south route between Hampton and the schools in Orton Longueville will not be considered desirable for walking to school and will therefore encourage more costly escort education car driver trips.

The Malborne Way Footpath will likely be used by people aged 65 and above living in the Ortons and Hampton to and above travelling to GP surgeries in Orton Malborne and Hampton, and the retail outlets at Serpentine Green in Hampton. Whilst bus travel is free for senior citizens, there is no suitable bus between Hampton and

Orton Longueville or Orton Malborne. The lack of a quality footpath will make walking to local key services less desirable for senior citizens and overall travel less affordable.

Figure 7 shows the Income Deprivation Domain of the English Indices of Multiple Deprivation dataset for the study area.

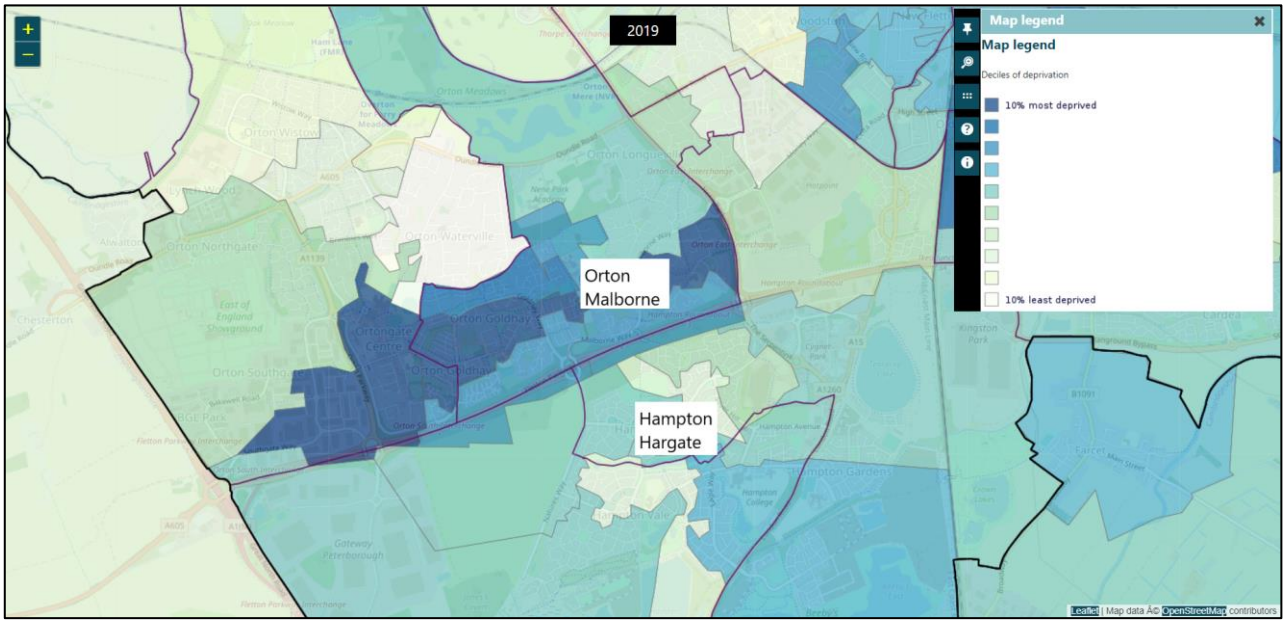

Figure 8: Income Deprivation Domain by LSOA

The Malborne Way and Shrewsbury Avenue study areas have LSOAs within the 10% most deprived deciles for England. An improvement in the walking and cycling infrastructure within the study area would help make walking to work or other local key services a more realistic alternative to car and bus travel for those in income deprived areas that are more greatly affected by the cost of travel for reaching work.

Areas along Malborne Way and Shrewsbury Avenue, and in Hampton are particularly car-dependent employment destinations, as previously shown in Figure 2 of the Strategic Dimension, and there is potential to improve the local walking and cycling network to a higher standard.

The average car travel to work mode share for the Ortons and Hampton is 62%, whereas the whole of Peterborough is 61%. Whilst local car driver levels to workplaces are representative of overall Peterborough levels and local car availability is lower than the rest of the city, there is still potential to reduce car driver trips from local residential areas and increase the number of walking and cycling commuter trips. This is particularly important in residential areas suffering with high income deprivation levels where residents will be struggling with the costs of travel.

Without an improvement in active travel infrastructure, the study area will remain a car dependent destination that is less accessible for those who cannot afford to travel by car.

Value for Money Statement

Delivering the Shrewsbury Avenue Cycleway and Malborne Way Footpath active travel schemes together will provide an overall PVB of £961,980, NPV of £626,170, and a BCR of 3.05 (High Value for Money) based on physical activity, journey quality, accidents, noise, local air quality, greenhouse gases, and congestion benefits in the core scenario.

The schemes are not expected to deliver any change in security impacts for vulnerable active travel users.

The removal of a barrier to travel along Malborne Way is expected to make walking a more realistic and affordable alternative to car travel to key services within the study area for groups most affected by personal affordability. The schemes would also benefit nearby residential areas that are currently in the top 10% most income deprived deciles for England.

Financial Dimension

The Financial Dimension focuses on the affordability of the proposed schemes, funding arrangements, and technical accounting issues.

The scheme cost estimates for the Financial Dimension have been prepared in line with guidance set out in TAG Unit A1.2 Scheme Costs (May 2022).

The estimates have been costed based on a bill of quantities produced from the preliminary designs and a schedule of construction activities. These costs have been peer reviewed, and include:

- Detailed design costs and additional surveys where required
- Land acquisition and planning costs
- Ecology surveys, and specialist environmental advice
- Staff and legal fees, including local overheads and consultation costs
- Third party costs
- Construction costs, including mobilisation, supervision, and costs associated with statutory undertakers works
- Risk Allowance.

It should be noted that Optimism Bias is not applied within the Financial Dimension and is only for use within the Economic Dimension.

Project costs incurred to date have been omitted from the costs presented in this section as “sunk costs”, which is in line with TAG Unit A1.2.

The cost profile is based upon the milestone activities set out in the Management Dimension, and the dates used to calculate the scheme costs, including the application of inflation, are shown in Table 8.

Table 8: Milestone Activities

Timescale	Activity
August 2022	Present Active Travel Schemes Business Case Technical Note to CPCA
September 2022	CPCA Sponsors present papers to CPCA Board to request approval of funding. Raising Work Orders and mobilising works
October 2022 – December 2022	Malborne Way scheme construction undertaken
October 2022 – November 2022	Shrewsbury Avenue scheme construction undertaken
January 2023	CPCA Board to make funding decision for the main Junction 3 project. This was the original CPCA Board date for the Junction 3 active travel schemes.

Table 9 below shows the Financial Dimension Scheme Cost Estimates.

Table 9: Financial Dimension Scheme Cost Estimates

Description of Cost Type	Shrewsbury Avenue	Malborne Way
Base Investment Cost	£223,948	£227,305
Risk Adjusted Base Cost	£255,958	£263,029
Risk Adjusted Base Cost with Industry Inflation (**Outturn Cost**)	**£255,959**	**£263,029**
Inflated Risk Adjusted Costs Incorporating Whole Life Costs (60-year assessment period).	£255,958	£263,029

The costs calculated for use within the Economic Assessment are presented in the Economic Dimension.

The Outturn cost represents the amount required to deliver the scheme, and is the amount requested for early release.

The schemes will be delivered within the same year as the cost estimates and therefore inflation has not been applied. Therefore, the outturn costs for Shrewsbury Avenue and Malborne Way are £255,959 and £263,029, respectively.

Budgets and Funding Cover

It is anticipated that the full combined Outturn Cost of £518,988 will be funded from the Transforming Cities Fund (TCF). The TCF is time limited and must be spent by 31st March 2024.

A £50,000 developer contribution has been secured as a contribution towards the Shrewsbury Avenue Cycleway and must be paid prior first occupation of the development (currently under construction). Once received, this contribution will be used in the delivery of the Junction 3 project (which includes the Shrewsbury Avenue Cyclway scheme).

There are not known to be any financial constraints beyond the availability of funding from the TCF, which is currently considered adequate to cover the scheme costs.

Commercial Dimension

The Commercial Dimension serves to demonstrate that the Junction 3 active travel schemes can be reliably procured and implemented through existing channels whilst ensuring value for money in delivery of the scheme.

Construction and site supervision will be delivered by Peterborough Highway Services (PHS). All skills and competencies to deliver this scheme are available within the PHS contract and its supply chain.

The scheme construction will be procured using a Target Cost payment mechanism. This incentivises both parties to work together to reduce cost through a pain / gain mechanism. To ensure that the procurement remains commercially competitive and offers value for money, all subcontract packages will be subject to competitive tendering.

Management Dimension

The Management Dimension demonstrates that the Council, through the PHS Framework, has the necessary experience and governance structure to successfully manage the delivery of the Junction 3 active travel schemes.

PHS has successfully delivered the following active travel schemes in recent years:

- Pop-up cycleways:
    - Between Midland Road and Bourges Boulevard along Thorpe Road on the eastbound carriageway. Installed during the first COVID-19 lockdown in 2020.
    - Along the southbound side of Priestgate. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by ‘Rediweld One Piece Wand Orca’ units. Cones were taken down in 2022.
    - Between St. Johns Street and Cattle Market Road along City Road. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by ‘Rediweld One Piece Wand Orca’ units. Cones were taken down in 2022.
    - Westbound between the Junction 39 roundabout and Cattle Market Road. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by ‘Rediweld One Piece Wand Orca’ units. Cones were taken down in 2022.
    - In both directions along Broadway. Designed in 2020 and installed in late 2021, the cycleway consisted of a cycle lane delineated by ‘Rediweld One Piece Wand Orca’ units. Cones were taken down in 2022.
- Haddon Cycleway. Designed in 2021 and constructed in 2022, the scheme improved the footway / cycleway connection between Haddon Hill and Orton Goldhay.
- Toucan Crossings:

- Bishop's Road toucan crossing upgraded in 2019 to allow for cycle use.
- Oundle Road toucan crossing by Peterborough High School
- Lincoln Road / Manor House Road crossing improved to a toucan crossing between 2021 and 2022.

To date, the delivery of the scheme has been managed by a Project Team, led by a PCC Project Manager. The Project Team consists of all the key project delivery partners and has been responsible for the daily running of the project. The Project Team includes key stakeholders such as the CPCA.

The existing PHS Project Board has overseen the continued development and delivery of the schemes to date by the Project Team and has made key decisions relating to the delivery of the project. The Project Board has been supported by technical specialists, with key stakeholders invited to attend as necessary.

Key project milestones for progressing to scheme delivery are outlined in Table 10.

Table 10: Key Project Milestones

Timescale	Activity
August 2022	Present Active Travel Schemes Business Case Technical Note to CPCA
September 2022	CPCA Sponsors present papers to CPCA Board to request approval of funding. Raising Work Orders and mobilising works
October 2022 – December 2022	Malborne Way scheme construction undertaken
October 2022 – November 2022	Shrewsbury Avenue scheme construction undertaken
January 2023	CPCA Board to make funding decision for the main Junction 3 project. This was the original CPCA Board date for the Junction 3 active travel schemes.

Stakeholder engagement was undertaken by the Project Team following approval of the SOC and were in line with the timings of the Public Consultation (October 2020 to November 2020). All stakeholders were consulted via email or letter for comments on the Preferred Scheme of the Junction 3 business case prior to the completion of the designs.

Communication with stakeholders was maintained throughout the project and feedback from stakeholders largely centred on the environment, biodiversity, and sustainable travel elements of the Junction 3 preferred scheme. All feedback has been incorporated into the Detailed Design where appropriate.

A construction Risk Register for each scheme has been produced and is available upon request. The Risk Register is a live document and will be regularly updated throughout the ten-week construction period.

The schemes will be monitored and evaluated in line with the CPCA Assurance Framework and DfT guidance. The monitoring and evaluation will include a range of qualitative and quantitative data collection methods that will be undertaken one year and five years post scheme completion.

Outputs from the monitoring and evaluation stage will be summarised within a Scheme Evaluation Report to determine whether the schemes have been delivered as planned and justify the investment. Where outcomes differ from what is expected, data collected during the monitoring and evaluation phases will be used to form an evidence base that will assist in understanding the reasons for this and any lessons that can be learnt.

Appendix J – 60 Year Cost Profile: Financial Dimension

Junction 3 - Do Something Scheme Costs for Input into Financial Case (FBC)

Calendar Year	Assessment Year	(1) Base Cost Estimate 2022 Prices						(2) Risk Adjusted Cost		(3) Risk Adjusted Cost Estimate Including Construction Price Inflation			(4) Inflated Risk Adjusted Cost Including Whole Life Costs		
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Quantified Risk Adjustment	Risk Adjusted Cost	Inflation Rate	Cost of Inflation	Total (Including Inflation)	Whole Life Costs	Inflated Whole Life Costs	Total (Including Whole Life Costs)
2022	1	£114,958	£0	£0	£35,459	£0	**£150,418**	£22,578	**£172,996**	0.000	£0.00	**£172,996**	£0	£0	**£172,996**
2023	2	£5,249,195	£0	£0	£1,026,812	£518,727	**£6,794,734**	£602,917	**£7,397,651**	1.100	£739,765.08	**£8,137,416**	£0	£0	**£8,137,416**
2024	3	£1,882,229	£0	£0	£348,460	£194,523	**£2,425,212**	£209,160	**£2,634,372**	1.210	£553,218.16	**£3,187,590**	£0	£0	**£3,187,590**
2025	4	£0	£0	£0	£10,000	£0	**£10,000**	£0	**£10,000**	1.331	£3,310.00	**£13,310**	£0	£0	**£13,310**
2026	5	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.398	£0.00	**£0**	£0	£0	**£0**
2027	6	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.467	£0.00	**£0**	£0	£0	**£0**
2028	7	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.541	£0.00	**£0**	£0	£0	**£0**
2029	8	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.618	£0.00	**£0**	£0	£0	**£0**
2030	9	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.699	£0.00	**£0**	£0	£0	**£0**
2031	10	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.784	£0.00	**£0**	£0	£0	**£0**
2032	11	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.873	£0.00	**£0**	£0	£0	**£0**
2033	12	£0	£0	£0	£0	£0	**£0**	£0	**£0**	1.966	£0.00	**£0**	£0	£0	**£0**
2034	13	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.065	£0.00	**£0**	£78,472	£162,030	**£162,030**
2035	14	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.168	£0.00	**£0**	£0	£0	**£0**
2036	15	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.276	£0.00	**£0**	£0	£0	**£0**
2037	16	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.390	£0.00	**£0**	£0	£0	**£0**
2038	17	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.510	£0.00	**£0**	£0	£0	**£0**
2039	18	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.635	£0.00	**£0**	£0	£0	**£0**
2040	19	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.767	£0.00	**£0**	£0	£0	**£0**
2041	20	£0	£0	£0	£0	£0	**£0**	£0	**£0**	2.905	£0.00	**£0**	£0	£0	**£0**
2042	21	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.051	£0.00	**£0**	£0	£0	**£0**
2043	22	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.203	£0.00	**£0**	£0	£0	**£0**
2044	23	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.363	£0.00	**£0**	£0	£0	**£0**
2045	24	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.532	£0.00	**£0**	£0	£0	**£0**
2046	25	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.708	£0.00	**£0**	£0	£0	**£0**
2047	26	£0	£0	£0	£0	£0	**£0**	£0	**£0**	3.894	£0.00	**£0**	£0	£0	**£0**
2048	27	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.088	£0.00	**£0**	£78,472	£320,809	**£320,809**
2049	28	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.293	£0.00	**£0**	£0	£0	**£0**
2050	29	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.507	£0.00	**£0**	£0	£0	**£0**
2051	30	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.733	£0.00	**£0**	£0	£0	**£0**
2052	31	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.969	£0.00	**£0**	£0	£0	**£0**
2053	32	£0	£0	£0	£0	£0	**£0**	£0	**£0**	5.218	£0.00	**£0**	£0	£0	**£0**
2054	33	£0	£0	£0	£0	£0	**£0**	£0	**£0**	5.479	£0.00	**£0**	£0	£0	**£0**
2055	34	£0	£0	£0	£0	£0	**£0**	£0	**£0**	5.753	£0.00	**£0**	£0	£0	**£0**
2056	35	£0	£0	£0	£0	£0	**£0**	£0	**£0**	6.040	£0.00	**£0**	£0	£0	**£0**
2057	36	£0	£0	£0	£0	£0	**£0**	£0	**£0**	6.342	£0.00	**£0**	£0	£0	**£0**
2058	37	£0	£0	£0	£0	£0	**£0**	£0	**£0**	6.659	£0.00	**£0**	£0	£0	**£0**
2059	38	£0	£0	£0	£0	£0	**£0**	£0	**£0**	6.992	£0.00	**£0**	£0	£0	**£0**
2060	39	£0	£0	£0	£0	£0	**£0**	£0	**£0**	7.342	£0.00	**£0**	£0	£0	**£0**
2061	40	£0	£0	£0	£0	£0	**£0**	£0	**£0**	7.709	£0.00	**£0**	£0	£0	**£0**
2062	41	£0	£0	£0	£0	£0	**£0**	£0	**£0**	8.094	£0.00	**£0**	£78,472	£635,180	**£635,180**
2063	42	£0	£0	£0	£0	£0	**£0**	£0	**£0**	8.499	£0.00	**£0**	£0	£0	**£0**
2064	43	£0	£0	£0	£0	£0	**£0**	£0	**£0**	8.924	£0.00	**£0**	£0	£0	**£0**
2065	44	£0	£0	£0	£0	£0	**£0**	£0	**£0**	9.370	£0.00	**£0**	£0	£0	**£0**
2066	45	£0	£0	£0	£0	£0	**£0**	£0	**£0**	9.839	£0.00	**£0**	£0	£0	**£0**
2067	46	£0	£0	£0	£0	£0	**£0**	£0	**£0**	10.331	£0.00	**£0**	£0	£0	**£0**
2068	47	£0	£0	£0	£0	£0	**£0**	£0	**£0**	10.847	£0.00	**£0**	£0	£0	**£0**
2069	48	£0	£0	£0	£0	£0	**£0**	£0	**£0**	11.390	£0.00	**£0**	£0	£0	**£0**
2070	49	£0	£0	£0	£0	£0	**£0**	£0	**£0**	11.959	£0.00	**£0**	£0	£0	**£0**
2071	50	£0	£0	£0	£0	£0	**£0**	£0	**£0**	12.557	£0.00	**£0**	£0	£0	**£0**
2072	51	£0	£0	£0	£0	£0	**£0**	£0	**£0**	13.185	£0.00	**£0**	£0	£0	**£0**
2073	52	£0	£0	£0	£0	£0	**£0**	£0	**£0**	13.844	£0.00	**£0**	£0	£0	**£0**
2074	53	£0	£0	£0	£0	£0	**£0**	£0	**£0**	14.536	£0.00	**£0**	£0	£0	**£0**
2075	54	£0	£0	£0	£0	£0	**£0**	£0	**£0**	15.263	£0.00	**£0**	£0	£0	**£0**
2076	55	£0	£0	£0	£0	£0	**£0**	£0	**£0**	16.026	£0.00	**£0**	£78,472	£1,257,613	**£1,257,613**
2077	56	£0	£0	£0	£0	£0	**£0**	£0	**£0**	16.828	£0.00	**£0**	£0	£0	**£0**
2078	57	£0	£0	£0	£0	£0	**£0**	£0	**£0**	17.669	£0.00	**£0**	£0	£0	**£0**
2079	58	£0	£0	£0	£0	£0	**£0**	£0	**£0**	18.552	£0.00	**£0**	£0	£0	**£0**
2080	59	£0	£0	£0	£0	£0	**£0**	£0	**£0**	19.480	£0.00	**£0**	£0	£0	**£0**
2081	60	£0	£0	£0	£0	£0	**£0**	£0	**£0**	20.454	£0.00	**£0**	£0	£0	**£0**
2082	61	£0	£0	£0	£0	£0	**£0**	£0	**£0**	21.477	£0.00	**£0**	£0	£0	**£0**
2083	62	£0	£0	£0	£0	£0	**£0**	£0	**£0**	22.551	£0.00	**£0**	£0	£0	**£0**
2084	63	£0	£0	£0	£0	£0	**£0**	£0	**£0**	23.678	£0.00	**£0**	£0	£0	**£0**
2085	64	£0	£0	£0	£0	£0	**£0**	£0	**£0**	24.862	£0.00	**£0**	£0	£0	**£0**
Total		**£7,246,383**	**£0**	**£0**	**£1,420,731**	**£713,249**	**£9,380,364**	**£834,655**	**£10,215,019**		**£1,296,293**	**£11,511,312**	**£313,888**	**£2,375,633**	**£13,886,945**

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is	**£9,380,364**
(2)	The base costs have been adjusted to incorporate risk.	**£10,215,019**
(3)	The risk adjusted costs have been adjusted to incorporate increases in construction costs.	**£11,511,312**
(4)	The inflated risk adjusted costs have been adjusted to incorporate whole life costs.	**£13,886,945**

Appendix K – Scheme Evaluation Plan

MILESTONE INFRASTRUCTURE

A part of MGroupServices

Junction 3 Improvement Scheme

Scheme Evaluation Plan

Delivering what we **promise**

Document Control

Job Number: 5080646						
Document ref: Junction 3 Scheme Evaluation Plan					Authorisation	
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
1.0	FBC Issue	NP	SP	RMJ	RMJ	25.11.2022

MILESTONE INFRASTRUCTURE
A part of MGroupServices

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1. Introduction

1.1.1 This document is the Scheme Evaluation Plan for the proposed Junction 3 Improvement Scheme. The report has been produced in conjunction with the Junction 3 Full Business Case (FBC) submitted to the Cambridge and Peterborough Combined Authority (CPCA).

1.1.2 To avoid duplication of information, this report includes both a Benefits Realisation Plan and the Monitoring and Evaluation Plan.

1.1.3 The aim of this report is to provide context of the Junction 3 Improvement Scheme, whilst setting out the expected benefits and outcomes alongside the methods in which will be used to monitor and evaluate these both pre and post construction.

1.2 Monitoring and Evaluation Guidance

1.2.1 The CPCA Assurance Framework[1] sets out the fundamental principles in relation to the use and administration of funding from the CPCA and their proposed approach to monitoring and evaluation of projects.

1.2.2 The Assurance Framework states that all transport schemes (over £5m) will follow the DfT Monitoring and Evaluation Guidance for Local Authority Major Schemes. The DfT Monitoring and Evaluation Guidance (2012)[2] identifies three tiers of Monitoring and Evaluation:

- **Standard Monitoring** –schemes are required to be monitor and reported on a standard set of measures
- **Enhanced Monitoring** – for schemes costing more than £50m or are anticipated to have a significant impact on particular indicators
- **Fuller Evaluation** – for DfT- specified selection of schemes.

1.2.3 The cost of the Junction 3 Improvement Scheme is significantly less than £50m and the study has not been specified for Fuller Evaluation, resulting in Junction 3 falling under the Standard Monitoring tier.

[1] Local-Assurance-Framework-.pdf .

[2] Major Scheme Business Cases: Evaluation Guidance for Local Authority Major Schemes (publishing.service.gov.uk)

1.3 Report Structure

- Chapter 2: Scheme Background and Context
- Chapter 3: Scheme Objectives and Outcomes
- Chapter 4: Benefits Realisation Plan
- Chapter 5: Monitoring and Evaluation Approach
- Chapter 6: Data Requirements and Collection Methods
- Chapter 7: Evaluation Resources and Governance
- Chapter 8: Dissemination Plan

2. Scheme Background and Context

2.1 Scheme Location

2.1.1 Junction 3 is a large, grade separated junction between two of Peterborough's busiest strategic roads. The junction is a crucial cornerstone of the Parkway Network, connecting the A1139 Fletton Parkway and A1260 Nene Parkway, thus providing the majority of access to south-west Peterborough.

2.1.2 The junction provides access to the A1260 Nene Parkway and The Serpentine, providing access to nearby residential areas and a major employment / leisure centre (Serpentine Green). The junction is used by vehicles from across the Peterborough area, and accommodates a large number of peak hour commuter trips to and from this location.

2.1.3 Figure 2.1 beneath highlights the location of Junction 3 in relation to the Parkway Network and Peterborough City Centre.

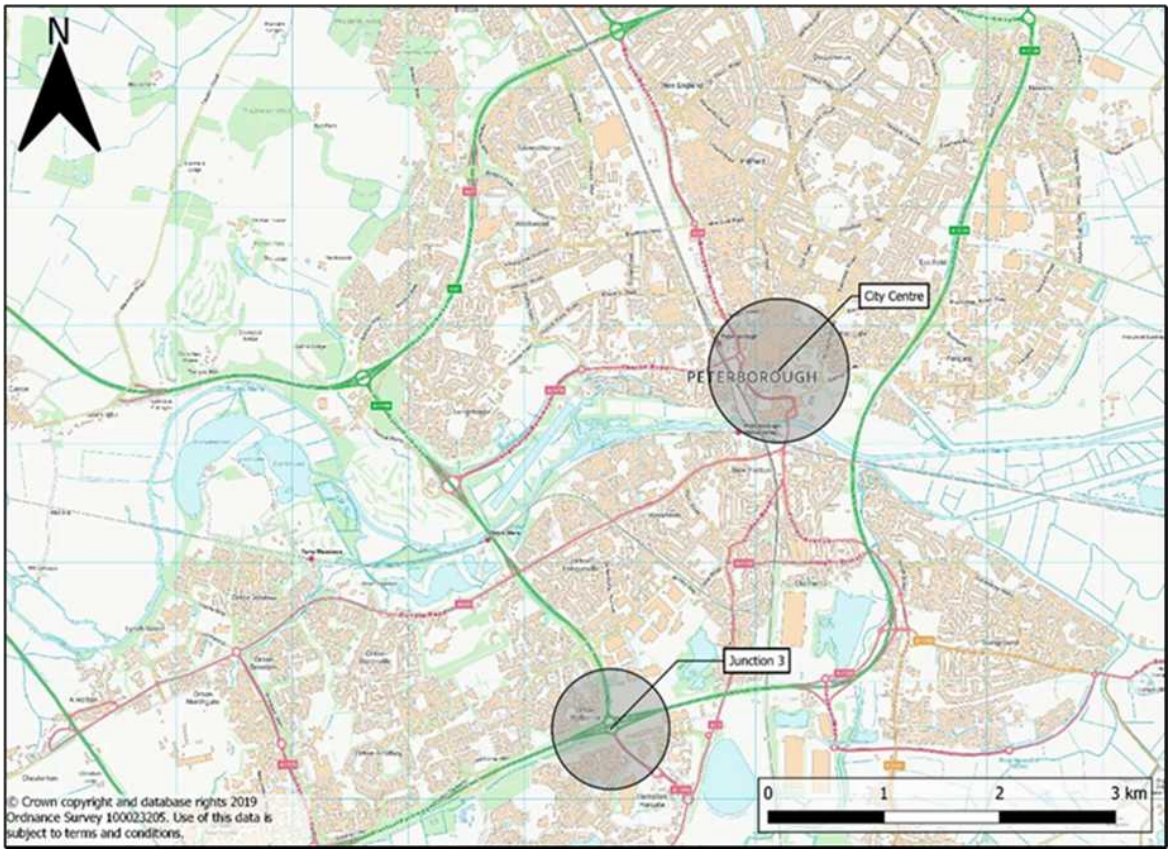


Figure 2.1: Junction 3 Location

2.1.4 On average 56,000 vehicles pass through Junction 3 on a typical weekday, of which 5% are classified as commercial vehicles[3]. The junction is used by trips from all over the Peterborough area, and experiences significant peak hour congestion particularly southbound on the A1260 Nene Parkway, where queues regularly extend back to Junction 31 during the PM peak hour, as well as along the A1260 The Serpentine where queues exceed 500m reaching the Tesco roundabout. Such issues currently compromise the surrounding road network.

2.1.5 To date Peterborough's transport network has served the City well, which was fundamentally redesigned in the 1970s to accommodate the then Peterborough New Town. However, as a consequence of recent and planned housing and employment growth, capacity issues are now emerging on the road network, resulting in congestion and delay. As congestion increases on the Parkway Network, and queues form at key junctions, the potential for delivering new homes and jobs in the area will become increasingly constrained.

2.1.6 The proposed scheme will address severe levels of congestion and delay that are currently compromising the operational efficiency of junction 3 and surrounding road network. By addressing existing issues, and building in additional capacity, the scheme is expected to unlock the wider network and assist in delivering growth aspirations for the City.

2.2 Scheme Description

2.2.1 Construction of the scheme will address significant issues of congestion and delay at a crucial cornerstone of Peterborough's Parkway Network, providing much needed capacity for Peterborough City Council (PCC) and the CPCA to meet their agenda for growth in Peterborough.

2.2.2 A breakdown of the scheme components are detailed overleaf.

[3] Manual Traffic Survey Data: November 2018

2.2.3 Scheme elements include:

- Create a third southbound lane on Nene Parkway from Junction 31 to Junction 3.
- Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a third lane.
- Signalisation of the Nene Parkway approach to Junction 3, with a 4-lane approach.
- Signalisation of The Serpentine approach to Junction 3, with a 4-lane approach.
- Create a third lane on the A1260 The Serpentine northbound approach, extending approximately 200 metres back from Junction 3.
- Addition of 220m of new footpath between Saltmarsh and the Phoenix School.
- Upgrading the Phorpres Way footpath (southern side) to current LNT 1/20 design standards, accompanied by several crossing points at Phorpres Close, Club Way and Cygnet Road.
- Upgrading the Cycleway for approximately 450m between Shrewsbury Avenue and the gated access of the Nature Reserve

2.2.4 Figure 2.2 overleaf highlights the final Junction 3 scheme.

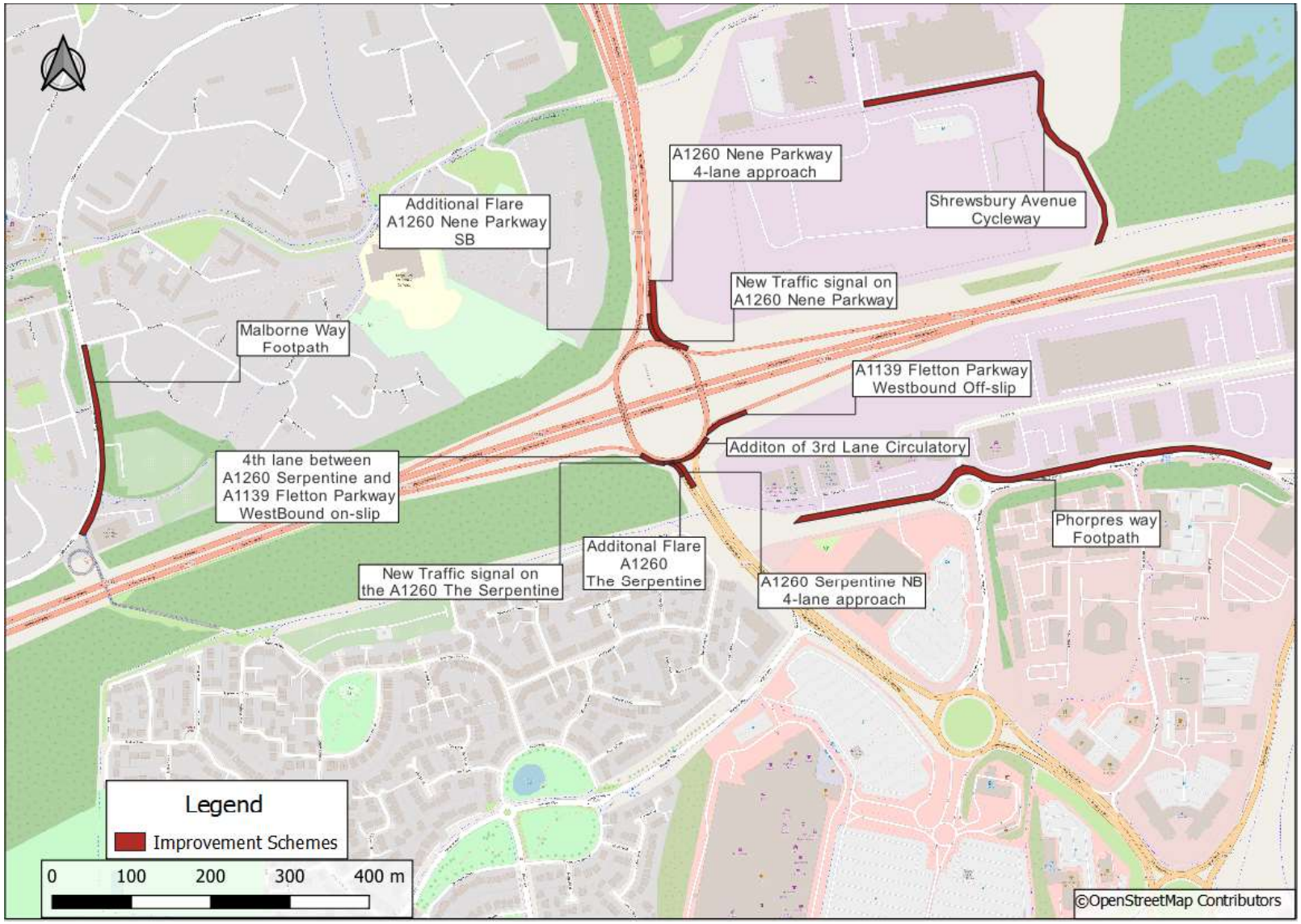


Figure 2.2: Junction 3 Final Scheme

2.3 Scheme Costs and Funding

2.3.1 The forecast Outturn cost of the scheme is £11,511,312.

2.3.2 The scheme is to be funded by the CPCA, with funding already identified within the Transforming Cities Fund (TCF), and through a £50,000 developer contribution.

2.3.3 The scheme costs (excluding operating costs) can be summarised as:

- Base Investment Cost = £9,380,364
- Risk Adjusted Base Cost = £10,215,019
- Risk Adjusted Base Cost with Inflation (**Outturn Cost**) = £11,511,312

2.4 Delivery and Timeframes

2.4.1 Key project milestones to scheme delivery are outlined in the table beneath.

Table 2.1: Key Project Milestones

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Malborne Way Footpath and Shrewsbury Avenue Cycleway)
November 2022	Construction commences on the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Malborne Way Footpath and Shrewsbury Avenue Cycleway schemes. Advance works begin for construction of the Junction 3 Highway and Phorpes Way schemes, including vegetation clearance and STATS diversions.
March 2023	Mobilisation and Compound set up.
April 2023	Construction starts on the Junction 3 Highway and Phorpes Way schemes.
March 2024	Construction finishes on the Junction 3 Highway and Phorpes Way schemes, and demobilisation.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

3. Scheme Objectives and Outcomes

3.1 Scheme Objectives

3.1.1 A transport scheme can have both primary and secondary objectives. The primary objectives are the fundamental outputs required from the scheme and therefore must be achieved. Secondary objectives are other outputs that may be achieved but are not necessary to the success of the scheme.

3.1.2 The objectives for the Junction 3 Improvement Schemes were developed ahead of the option development workshop to provide a framework for participants of the workshop, through which the relative benefits and disadvantages of the proposed options could be discussed. The objectives are based on the goals and outcomes from local policy documents such as the Peterborough Local Plan.

3.1.3 Although these objectives pre-date those of the CPCA as previously discussed in this chapter, work has been undertaken to build upon the objectives and ensure they align with those of the CPCA. The primary and secondary objectives for the Junction 3 scheme are listed beneath.

Primary objectives include:

1. **Tackle congestion and improve journey times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3.
2. **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth within Hampton is promoted whilst providing for future demand.
3. **Protect and improve the biodiversity value within the study area:** Mitigate any adverse impact of a scheme and ensure biodiversity net gain within the study area.
4. **Improve active travel routes to provide a viable alternative to private car travel**: Ensure that the scheme provides a comprehensive network of pedestrian and cycling routes where needed.
5. **Improve road safety:** Reduce accidents and improve personal security for all travellers around the junction.

Secondary objectives include:

6. **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as the A1260 Nene Parkway and Malborne Way

3.1.4 The Junction 3 Improvement Scheme will aim to satisfy all primary objectives and as many of the secondary.

SMART Objectives

3.1.5 It is valuable to further establish Specific, Measurable, Achievable, Relevant and Time-constrained (SMART) objectives based on the Strategic Objectives, to act as measures of success and provide a clear basis for post-implementation evaluation. The following SMART objectives have been defined for the Junction 3 Improvement Scheme:

3.1.6 The Primary SMART objectives are:

1. **Tackle congestion and improve journey times:** To ensure that non-transient delay at Junction 3 remains beneath following 30 seconds on both A1260 approaches within the monitoring period (to 2029).
2. **Support Peterborough's growth agenda:** to provide sufficient highway capacity at Junction 3 (determined by a Degree of Saturation (DoS) of less than 90%) to support the creation of 7,400 dwellings across the Hamptons within the current Local Plan period (to 2036).
3. **Protect and improve the biodiversity value within the study area:** To deliver a 20% Biodiversity Net Gain Mitigate through the delivery of the scheme.
4. **Improve Road Safety**: to achieve a 50% per year reduction in personal injury accidents at the A1260 Nene Parkway and A1260 The Serpentine approaches following completion of the scheme.
5. **Improve road safety:** to achieve a 50% per year reduction in personal injury accidents at the A1260 Nene Parkway and A1260 The Serpentine approaches following completion of the scheme.

3.1.7 Secondary objectives include:

6. **Positively impact traffic conditions on the wider network:** To ensure that peak hour traffic flows along Malborne Way remain beneath 500 vehicles per hour peak within the monitoring period (to 2029).

3.4 Scheme Outcomes

3.4.1 The proposed scheme is expected to achieve its objectives in the following ways:

- It will create additional highway capacity, resulting in reduced congestion and delay, more reliable journey times for road users, particularly on the A1260 Nene Parkway and The Serpentine approaches
- It will reduce queuing at the junction in the AM and PM peak periods, reducing emissions of stationary traffic, and aiding the operational efficiency of the City and improving air quality
- It will address conflicts between movements at the Junction, aiding the reduction in accident rates
- It will introduce cycle and pedestrian facilities increasing connectivity and accessibility between nearby residential areas to areas of employment
- It will reduce congestion and delay at a cornerstone Junction, helping the visitor and retail economy
- It will incorporate environment elements into the scheme from an early stage, achieving the required minimum 10% net gain calculation

3.5 Scheme Logic Map

3.5.1 Based on the objectives set for the scheme, the evaluation process will measure outcomes relating to:

- Changes in traffic flow and journey time reliability, at Junction 3 and the wider network
- Changes in safety including the number and severity of road traffic accidents
- Monitoring whether environmental mitigation measures and improvements to biodiversity have been implemented as in the approved scheme design
- Whether increased capacity on the Parkway Network has improved Council Aspirations

3.5.2 The Logic Map in Figure 3.2 highlights the links between the context, inputs, outputs, outcomes and impacts of the scheme and gives a visual representation of process by which the desired outcomes of the scheme objectives are to be achieved.

Context

- Junction 3 is a partially signalised grade separated roundabout (positioned above the A1139 Fletton Parkway). The Junction provides access to the A1260 Nene Parkway, The A1139 Fletton Parkway and the A1260 The Serpentine.
- The junction is heavily used by trips in the southwest of the City, and a large number of retail facilities, businesses and residential areas are located immediately to the south of the Junction.
- Congestion and delay are increasing at the junction as a consequence of recent and planned housing growth.
- Improvements at Junction 3 are expected to improve peak hour journey times, whilst improving active travel connections to the wider network such as Malborne Way and Shrewsbury Avenue.

Inputs

- CPCA funding and resources
- PCC resources
- Contractor resources
- Sub-contractor resources
- Stakeholder support

Junction 3 Improvement Scheme

Outputs

- Create a third southbound lane on Nene Parkway from Junction 31 to Junction 3.
- Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a third lane.
- Signalisation of the Nene Parkway approach to Junction 3, with a 4-lane approach.
- Signalisation of The Serpentine approach to Junction 3, with a 4-lane approach.
- Create a third lane on the A1260 The Serpentine northbound approach, extending approximately 200 metres back from Junction 3.
- Addition of 220m of new footpath between Saltmarsh and the Phoenix School.
- Upgrading the Phorpres Way footpath (southern side) to current LNT 1/20 design standards, accompanied by several crossing points at Phorpres Close, Club Way and Cygnet Road.
- Upgrading the Cycleway for approximately 450m between Shrewsbury Avenue and the gated access of the Nature Reserve

Transport Outcomes

- Reduced impacts of traffic including congestion and environment particularly A1260 Nene Parkway approach
- Reduced queue length at Junction 3 aiding the operational efficiency during peak hours and reducing emissions of stationary traffic

People, Business, and Place Outcomes

- Early environmental considerations, Improving 20% Biodiversity Net Gain within one year
- Improved Cycle and walking infrastructure will increase connectivity and accessibility between nearby residential and employment areas
- Improve attractiveness of nearby economic centres (Hampton Township)

Impacts

- Economy benefits, including reduced costs, investment and regeneration, and benefits to local businesses
- Society benefits, including improved health and wellbeing, and better connectivity to services
- Environmental benefits, including biodiversity improvements, improved air quality and noise levels, and reduced emissions

Figure 3.1: Junction 3 Logic Map

4. Benefits Realisation Plan

4.1 Benefits Realisation Strategy

4.1.1 Table 4.1 provides the framework against which the anticipated benefits will be planned for, tracked and realised. It sets out the key activities needed to manage the successful realisation of the benefits in the short, medium and long term, together with the timescales and who is responsible for each activity.

4.1.2 The strategy starts with the scheme objectives and follows a logical progression:

- **Scheme objectives** – as set out in the Strategic Case of the FBC
- **Enabling changes** – what the scheme will deliver in order to achieve each objective
- **Benefits experienced** – the benefits that will occur as a result of successful delivery of change
- **Key beneficiaries** – who will experience the benefits
- **Benefit owners** – who has responsibility for delivering the benefits
- **Benefit enablers** - an outline of actions to be taken, and additional actions which could be taken to help achieve the benefits.

Table 4.1: Benefits Realisation Strategy

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Benefit Owners	Benefit Enablers
Tackle congestion and improve journey time reliability: Tackle congestion and address journey time reliability on the primary approaches to the junction (A1260 Nene Parkway and (The Serpentine approaches)	• Creation of 4th lane at the A1260 Nene Parkway SB stop line • Creation of 4th lane on the north-eastern corner of the circulatory, between the A1260 Nene Parkway approach and the A1139 eastbound on-slip exit • Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 • Creation of a 4th lane at the A1260 Serpentine NB stop line, including a flare extension on the left-hand lane • Creation of 3rd lane on the southern half of the circulatory, between the A1260 Serpentine exit / approach • Creation of 4th lane on the south-western corner of the circulatory, between the A1260 Serpentine approach and the A1139 WB on-slip exit	• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased operational efficiency of the Junction and wider network • Reduction in stationary / rolling traffic resulting in air quality improvement • More efficient entrance to a major residential / employment sector to the south of the City	• Commuters / Business trips • Local residents • Visitors to the City	CPCA / PCC	• Completion of the scheme • Monitoring of network performance
Support Peterborough's Growth Agenda and encourage homes and jobs: Ensure that the planned employment and housing growth across Peterborough is promoted whilst providing for future demand		• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased network capacity and operational efficiency • Increased attraction of the Hampton Township area, encouraging the retainment of existing businesses and support of prospective future investment	• PCC in regard to fulfilment of the Local Plan • Business within the Hampton Township • Residents / Local Community	CPCA / PCC	• Completion of the scheme • Promotion of the Hampton Township / Business sector and wider City Area
Create wider economic benefits: Provide conditions that encourage inward investment in higher value employment sectors across Peterborough and utilise available employment space		• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased attraction of the Thorpe Wood Business park • Increased attraction of the Hampton Township area, encouraging the retainment of existing businesses and support of prospective future investment	• PCC in regard to fulfilment of the Local Plan • Business within the Hampton Township • Residents / Local Community	CPCA / PCC	• Completion of the scheme • Promotion of the Hampton Township / Business sector and wider City Area
Protect and improve the biodiversity value within the study area: Mitigate any adverse impact of a scheme and enhance biodiversity net gain within the Study Area	• Implementation of environmental / biodiversity scheme elements • Additional planting / compensation planting mitigating the loss of tree coverage associated with construction	• Achievement of minimum 20% biodiversity net gain • Protection of identified species / sites of interest across the study area	• PCC / CPCA in regard to environment and biodiversity • Commuters • Local residents	CPCA / PCC	• Completion of the scheme / soft landscaping designs • Gaining of the necessary licences • Biodiversity Net Gain Calculation
Positively impact traffic conditions on the wider network: Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as Malborne Way	• Creation of 4th lane at the A1260 Nene Parkway SB stop line • Creation of 4th lane on the north-eastern corner of the circulatory, between the A1260 Nene Parkway approach and the A1139 eastbound on-slip exit • Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 • Creation of a 4th lane at the A1260 Serpentine NB stop line, including a flare extension on the left-hand lane • Creation of 3rd lane on the southern half of the circulatory, between the A1260 Serpentine exit / approach • Creation of 4th lane on the south-western corner of the circulatory, between the A1260 Serpentine approach and the A1139 WB on-slip exit	• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased operational efficiency of the Junction and wider network • Increased quality of life for residents of Orton Malborne	• Commuters / Business trips • Local residents	CPCA / PCC	• Completion of the scheme • Monitoring of network performance
Improve road safety: Reduce personal injury accidents and improve personal security amongst all travellers around the junction	• Signalisation of the remaining approaches including both the A1260 Nene Parkway and The Serpentine approaches to Junction 3 • Creation of a footpath between the Medeswell / Saltmarsh junction • Upgrading the walking / cycling facilities on Phorpres Way / Close	• Fewer accidents involving rear end shunts on main approaches • Fewer causalities • Increased sense of safety and security on walking and cycling facilities	• Commuters / Business trips • Local residents • Visitors to the City • Active Mode users	CPCA / PCC	• Completion of the scheme including walking and cycling elements • Road safety audit • Monitoring of accidents
Mitigate the impact of air quality on the local environment: Maintain or improve air quality within the study area as a result of minimising stationary / queuing traffic	• Creation of 4th lane at the A1260 Nene Parkway SB stop line • Creation of a 3rd lane (150m) on the A1139 WB off-slip approach to Junction 3 • Creation of a 4th lane at the A1260 Serpentine NB stop line, including a flare extension on the left-hand lane	• Reduced peak hour congestion for motorists leading to more reliable journey times • Reduced stationary / queuing traffic	• Commuters / Business trips • Local residents / wider community • PCC / CPCA in regard to air quality control and policy goals	CPCA / PCC	• Completion of the scheme • Air quality monitoring

5. Monitoring and Evaluation Approach

5.1.1 The Monitoring and Evaluation Plan for the Junction 3 Improvement Scheme takes a proportionate and targeted approach and aims to demonstrate how the scheme has performed in relation to its objectives and intended outcomes.

5.1.2 The monitoring plan is designed to determine whether the Junction 3 Improvement Scheme:

- Has been designed and delivered efficiently and effectively
- Has met the requirements of the stated scheme objectives
- Has achieved the desired outcomes and impacts
- Represents value for money
- Resulted in any unintended outcomes and impacts (both positive and negative)

5.2 Types of Measures

5.2.1 The following types of measure will be monitored, as defined in the DfT framework:

- Inputs – what is being invested to deliver the Scheme
- Outputs – what has been delivered, and how it is being used
- Outcomes – intermediate effects of the Scheme, such as changes in traffic flow
- Impacts – longer-term effects on wider social and economic outcomes, such as economic growth

5.3 Stages of Monitoring and Evaluation

5.3.1 Monitoring and Evaluation is required both during the development and construction, as well as in the years following implementation of the improvement scheme, in order to meet the stated evaluation objectives and effectively assess any scheme outcomes and impacts.

5.3.2 As per the DfT standard monitoring guidance, the monitoring process will be split into three stages:

- **Pre-construction and during delivery (monitoring)**
  - Baseline data is 2018 surveys, limited surveys / assessments to be undertaken in 2022 before scheme construction commences as part of FBC
  - Data to monitor scheme delivery will be collected during construction

- **One-year after (Monitoring and Evaluation)**
  - Data to monitor scheme performance will be collected at least one year (but less than two years) after scheme opening.
  - An initial "One Year After"' report will be published within two years of scheme opening, focusing on the scheme's outcomes

- **Five-years after (Monitoring and Evaluation)**
  - Further data will be collected up to approximately five years after scheme opening
  - A final "Five Years After" report will be published within six years of scheme opening, based on analysis of all the data available, including an assessment of the wider impacts of the scheme

5.3.3 Monitoring timescales for Junction 3 are summarised in Table 5.1 beneath.

Table 5.1: Monitoring and Evaluation Timescales

Monitoring Activity	Timescale
Prior to scheme build (Baseline)	2018
During Construction	2023
Scheme Opening	2024
One year post scheme opening	2025
Five years post scheme opening	2029

5.4 Measures to be Monitored

5.4.1 The measures which will be monitored for evaluation of the scheme, as stated within the DfT standard monitoring guidance, are set out in Table 5.2 overleaf.

Table 5.2: Standard Monitoring Measures

Item	Type of Measure	Data Collection Timing	Rationale
Scheme Build	Input	During Delivery	Knowledge
Delivered Scheme	Output	During Delivery Post Opening (1 Year)	Accountability
Scheme Costs	Input	During Delivery Post Opening (1 Year)	Accountability
Scheme Objectives	Output / Outcome / Impact	Pre-Delivery Post Opening (up to 5 years)	Accountability
Travel Demand	Outcome	Pre-Delivery Post Opening (1 year and up to 5 Years)	Accountability / Knowledge
Travel Time and Reliability	Outcome	Pre-Delivery Post Opening (1 year and up to 5 Years)	Accountability / Knowledge
Impact on Economy	Impact	Pre-Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge
Impact on Local Environment / air quality	Impact	Pre-Delivery During Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge
Carbon	Impact	Pre-Delivery Post Opening (1 Year and up to 5 Years)	Accountability / Knowledge

5.4.2 In addition, an assessment will be undertaken to determine the extent to which the Junction 3 Improvement Scheme has delivered the Value for Money (VfM) that was anticipated in the appraisal set out in the FBC. This will be done by re-calculating the benefit-cost ratio (BCR) in both the "One Year After"' and "Five Years After" reports and comparing it to the BCR calculated in the FBC.

5.4.3 The following chapter describes how data will be collected and analysed to monitor the scheme's performance in each of these areas.

6. Data Requirements and Collection Methods

6.1.1 Data collection for the scheme is required at various stages through scheme development to ensure effective monitoring and evaluation takes place.

6.1.2 Table 6.1 beneath sets out the data that will be collected to monitor and evaluate the Junction 3 Improvement Scheme, along with the rational for its inclusion, the proposed data collection method, and the proposed frequency of data collection.

Table 6.1: Monitoring and Evaluation Data Requirements

Measure	Data to be used	Rationale for inclusion	Data Collection Method	Frequency of Data Collection
Scheme Build	• Progress of construction against key milestones • Qualitative feedback from the Project Team • Information from the Risk Register • Project programme / disruptions to delivery	To gain knowledge and understanding of the level of effectiveness of the scheme build processes and to learn lessons for future projects.	• Analysis of key project documents by the scheme's Project Team, inlcuding Risk Register, Review of Early Warnings etc, Interviews with key staff	On-going throughout the construction and delivery of the scheme, reporting on monthly basis
Delivered Scheme	• Scheme definition at full funding approval • Scheme design drawings • Logged design iterations • Information from project change control log	To assess the impact of change during construction, and realisation of scheme objectives.	• Desk study / site visits • Analysis of key project documents by the schemes Project Board	During construction and 1 year after scheme opening
Scheme Costs	• Forecast scheme costs at time of funding approval (FBC) • Actual outturn costs once scheme is completed	Cost analysis enables 'performance to budget' to be monitored and corrective actions to be implemented. Lessons Learnt to be realised and implemented for other similar projects, alongside having potential to refine contractural arrangements where necessary.	• Financial monitoring of the scheme costs from approval to scheme completion • Project Manager's monthly reports to Project Board • Interviews with key staff	On going throughout constructionand delivery of the scheme, reporting on a monthly basis.
Travel Demand	• Daily traffic flows classified into vehicle types and by movement	To monitor changes in traffic flows at Junction 3, more specifically the volume of traffic on key approaches	• Desk study / site visits • Collated data from 12 hour manual classified counts	Baseline 2018 before scheme completion, 1 year after scheme opening and 5 year after scheme opening. ATC - continuous monitoring
Travel times and reliability	• TomTom or Traffic Master data	To monitor changes in travel times and queuing at Junction 3 on key approaches	• Desk study / site visits • Survey footage review • Journey time dataset for a month period	Baseline 2018 before scheme completion, 1 year after scheme opening and 5 year after scheme opening.
Impact on Economy	• Local employment statistics	To assess the economic impact of the scheme on the wider City	• Desk Study of economic data provided by PCC • Review of Local Plan goals for economic growth	Baseline 2018, before scheme completion, 1 year after scheme opening and 5 year after scheme opening
Impact on the Local Environment / Air Quality	• Carbon emission workshops / calculations • Biodiversity calulations – completed scheme maps	To monitor and assess the emissions as a result of the Junction 3 scheme and any impact on the environment	• Desk study / site visits • Analysis of key project documents by the schemes Project Board	Baseline 2018, during construction, before scheme completion, 1 year after scheme opening and 5 year after scheme opening
Carbon	• Carbon emission workshops / calculations • Traffic flows and speeds within the Junction 15 study area	To monitor carbon emission within the Junction 3 study area as a result of the scheme	• Desk Study analysis FBC calculation for carbon • Analysis of key project documents by the schemes Project Board	Baseline 2018, before scheme completion, 1 year after scheme opening and 5 year after scheme opening

6.2 Data Collection

6.2.1 Data collection for the measures of 'travel demand' and 'journey times and reliability' as stated in Table 6.1 includes:

- Manual Classified Counts (MCC)
- Satellite Navigation Data

6.2.2 Survey data collected as part of the scheme monitoring and evaluation will be a replication of data collected in the original 2018 baseline dataset, enabling a direct comparison to be made.

Manual Classified Turning Counts / Queue Length Data

6.2.3 MCC's will be used to monitor changes in traffic demand at Junction 3 at both 1 year and 5 years after scheme completion.

6.2.4 MCC surveys will include the five locations listed below and data will be classified into Car, Light Goods Vehicles (LGV), Other Goods Vehicles (OGV1 and OGV2), Bus, and Motorcycle classifications. Surveys will cover a 12-hour period between 07:00 and 19:00 and should be conducted in November reflecting the collection period of the baseline data.

6.2.5 MCC survey locations are detailed below and shown in Figure 6.1 overleaf:

1. A1260 Nene Parkway / Malborne Way / Morley Way roundabout (Junction 31)
2. A1260 Nene Parkway / A1139 Fletton Parkway / A1260 The Serpentine roundabout (Junction 3)
3. A1260 The Serpentine / Phorpres Way / Serpentine Green roundabout
4. A1260 The Serpentine / Hargate Way (left-in, left-out)
5. A1139 Fletton Parkway / Natures Way / Goldhay Way / Malborne Way roundabout (Junction 2)

6.2.6 An ATC survey will also be conducted at the following location as per the baseline dataset:

- Malborne Way 20m south of Bodesway in both a northbound and southbound direction

6.2.7 The ATC survey will be conducted for a 2 week period, including the day of the MCC sites above.

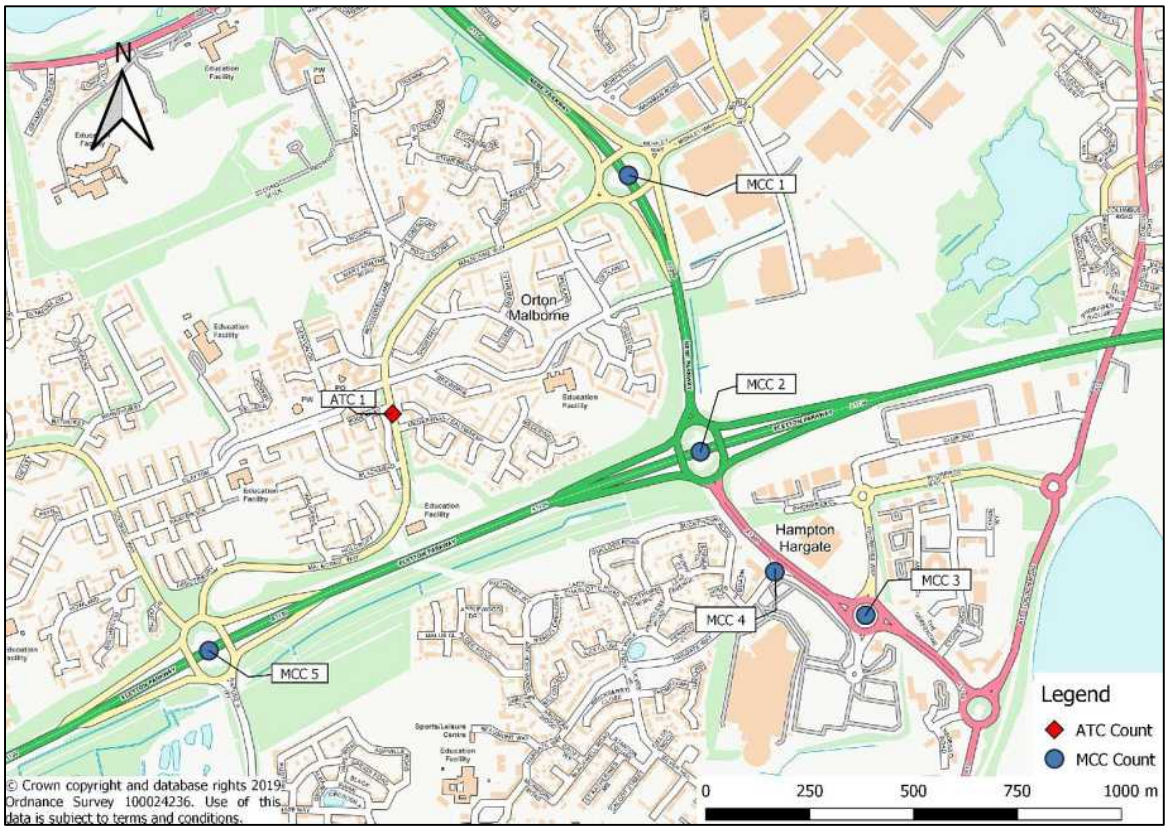


Figure 6.1: Monitoring and Evaluation Survey Locations

Satellite Navigation / Journey Time Data

6.2.8 Satellite Navigation data will be used to monitor changes in journey times at Junction 3 at both 1 year and 5 years after scheme completion.

6.2.9 Journey time data will be obtained for a month period (Oct / Nov) for the routes shown in Figure 6.2 which were used in the original 2018 baseline data set. Survey data will be collected for the AM (08:00 – 09:00) and PM (17:00 – 18:00) peak hours and the month period should exclude non-neutral days such as weekends, holidays, and any period relating to major roadworks / incidents.

6.2.10 Journey time routes which will be covered in the dataset include:

- A1260 Nene Parkway Northbound / Southbound
- Malborne Way Northbound / Southbound
- The Serpentine Northbound / Southbound
- Junction 3 to A1139 Fletton Parkway Eastbound / Westbound
- A1139 Fletton Parkway to Junction 3 Eastbound / Westbound
- A1139 Fletton Parkway Eastbound / Fletton Parkway Westbound.

Figure 6.2: Monitoring and Evaluation Journey Time Routes

7. Evaluation Resource and Governance

7.1 Monitoring and Evaluation Plan Costs

7.1.1 Table 7.1 overleaf provides a summary of the monitoring and evaluation plan for Junction 3, highlighting data collection, reporting programme and indicative costs.

7.1.2 The necessary monitoring and evaluation budget is estimated to be £25,500, based on survey data, analysis and reporting. A breakdown of costs is provided beneath in Table 7.1 beneath.

Table 7.1: Monitoring and Evaluation Plan

	Measure	Measure of Success	Data Source	Data Collection / Reporting Programme			Ownership	Indicative Cost Estimate
				Baseline	Delivery	Post Completion		
Inputs-	Scheme Costs	CPCA Funding	CPCA Funding submission Final Scheme Cost Data	Planned	January 2023 – October 2023	-	CPCA / PCC	-
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Inspection On-Site	December 2022	January 2023 – October 2023	2024	CPCA / PCC	£2500
Objectives	**Outcomes**							
1/ 5 / 6	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage	November 2018	-	November 2025 / November 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		New Infrastructure for Active Travel	Site Inspection / Usage Data	2022	-	November 2025 / November 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		Reduce the number of KSI incidents at Junction 15	Peterborough Database of Road Traffic Records	Dataset 2015 - 2020	-	November 2025 / November 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
1 / 5	Travel Demand	Enhanced Network Performance, on A1260 Nene Parkway and The Serpentine, and wider network of Junction 31 and Malborne Way	Manual Classified Counts / Site Visits / Video Survey Footage	November 2018	-	November 2025 / November 2029	CPCA / PCC	£6000 for MCC surveys and £1000 for data analysis at both 1 year and 5 year reporting Total = £8,000
2 / 3	Impact on Economy	Realisation of Local Housing and Employment Growth Ambitions	PCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2018	-	November 2025 / November 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
4	Impact on the Local Environment	Ensure a Net Gian of Biodiversity across the Study Area	Biodiversity Calculation / Site Survey and Desk Based Assessment	2022	-	November 2025 / November 2029	CPCA / PCC	£1000 for site inspections and £500 for data analysis at both 1 year and 5 year reporting Total = £2000
7	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / PCC Air Quality Monitoring Sites / Future traffic demand data	October 2021	-	November 2025 / November 2029	CPCA / PCC	£1000 data analysis at both 1 year and 5 year reporting Total = £2000
Reporting	Year 1 reports summarising the outcomes of the monitoring and evaluation work			-	-	2025	CPCA / PCC	£3,000
	Year 5 report summarising local economic growth, scheme impacts and development figures prior and post opening of the scheme			-	-	2029	CPCA / PCC	£3,000
	Total Monitoring and Evaluation Budget							**£25,500**

7.2 Governance

7.2.1 The CPCA have the responsibility for ensuring Value for Money from the Junction 3 Improvement Scheme. Under the CPCA, PCC will be responsible for ensuring the Scheme Evaluation Plan is undertaken as outlined within this report.

7.2.2 Monitoring during construction and post scheme opening is likely to be undertaken by PHS under commission from CPCA and PCC. However, owners for each monitoring task should be defined following the approval of the FBC.

7.2.3 To ensure the successful delivery of the scheme throughout construction, the following resource used to date will continue:

- Project Delivery Team
- PHS Project Board

7.2.4 Delivery of the scheme to date has been managed by the PCC Project Manager and wider Project Team, consisting of key project delivery partners. The Project Team have been responsible for the daily running of the project, and will continue to meet on a monthly basis throughout the construction period. The main responsibilities being to:

7.2.5 The delivery team will continue to meet on a monthly basis throughout the construction phase of the project. Its main responsibilities are to:

- Comment on delivery and ensure sufficient resource is allocated to scheme delivery
- Monitor overall delivery against programme to ensure key activities / milestones are completed
- Consider project costs and risks and review and advise on any impacts to project delivery
- Provide governance for the project and initiate corrective action where necessary
- Provide updates, including written progress reports

7.2.6 The existing PHS Project Board will be used to oversee the continued delivery of the scheme by the Project Team, and to make key decisions relating to the delivery of the project. The Project Board will be continue to meet on a monthly basis until the scheme is completed. After which arrangements will be agreed for the on-going resource / schedule for reporting associated with the monitoring and evaluation plan of the scheme.

7.2.7 Figure 7.1 provides an outline of the overall governance structure highlighting key roles and lines of accountability for the development and delivery of the scheme.

Figure 7.1: Organisational Governance Structure

7.3 Quality Assurance

7.3.1 The project to date has been managed by PCC in line with their existing assurance and approvals processes, namely the CPCA Assurance Framework. The CPCA Assurance Framework sits alongside a number of Combined Authority documents including the '10-point guide' mentioned above and details the fundamental principles in relation to the use, administration and evaluation of Cambridgeshire and Peterborough Investments.

7.3.2 Under the management of The Council, a Project Manager was assigned and has been responsible for the daily running of the project. In instances where approval was required, the Project Manager would be advised and then provided by the Project Board.

7.3.3 The Project Manager will also be responsible for quality assurance for the MEP. Development and ongoing maintenance of the scheme evaluation plan will ensure that it reflects the programme and key milestones.

7.3.4 The Project Manager will also:

- Arrange for the undertaking of quality checks by internal peer review to ensure high quality
- Record proceedings at meetings with the project board, project team and technical specialists, and reporting them in the form of meeting minutes including a clear record of actions and action dates
- Ensure compliance with the consistency in approach / assessment / presentation of documents and output
- Contribute to project close out and post project appraisal exercises for the task.

7.4 Risk Management

7.4.1 The risk management strategy for the evaluation process is in line with the strategy for the project delivery. Risk areas identified in relation to evaluation of the project are:

- **Baseline data** – transport data issues (completeness, correctness, accuracy and relevance), impacting on processing.
- **Baseline data collection** – unable to collect data before site opens e.g. weather or resourcing constraints.
- **Data processing** – inaccuracy of data analysis, impacting on evaluation. •
- **Future year data** – funding issues prevent future data survey collection.
- **Evaluation** – post analysis realisation that baseline data will be insufficient for purpose or potential newly identified factors.

7.4.2 Table 7.2 below highlights the calculated likelihood and severity of the risk identified for the project evaluation, as well as mitigation measures that can be taken.

Table 7.2: Monitoring and Evaluation Data Requirements

Risk	Likelihood Score (1-5)	Impact Score (1-5)	RAG Score (Likelihood x Impact)	Mitigations
Baseline Data Accuracy	1	2	2	Baseline data has been used throughout the business case lifespan of the project. Baseline data has been reassessed in prepartion for the required monitoring and evaluation, and is suffiecient for future data comparisons.
Baseline Data Collection	3	2	6	Construction programme is known, careful planning / weather monitoring to be undertaken when arranging surveys.
Data Processing	1	1	2	Once data is recieved from survey companies, rigourous reviewing to be undertaken to highlight any inconsistencies / issues at the earliest point.
Future Year Data	2	5	10	Funding required for the monitoring and evaluation of the project has been costed prior to construction and will be recieved with the construction funding (approval January 2023). Funding will be separated for future use.
Evaluation	1	2	2	See above comments.

8. Dissemination Plan

8.1.1 This Scheme Evaluation Plan will be agreed with PCC and CPCA prior to the submission of the FBC. Costs for monitoring and Evaluation will be included within the final funding request from the CPCA for construction costs.

8.2 Dissemination Reporting

8.2.1 Monitoring will be undertaken before and during construction, and after the opening of the Scheme. A “One Year After”’ evaluation report will be produced within two years of the Scheme opening, followed by a “Five Years After” report within six years of the Scheme opening. The reports associated with this Monitoring and Evaluation will be published on the PCC website.

8.3 Stakeholder Engagement

8.3.1 PCC and the Project Team have engaged with key stakeholders throughout the development of the Scheme, and this will continue during the delivery phase. The list of stakeholders who received communication regarding the scheme can be found in the Strategic Case of the FBC.

8.3.2 Communication with stakeholders throughout the delivery phase will be via email or letter (as per previous communications) as well as via the scheme PLO who will keep stakeholders informed with the progression of the scheme build throughout the construction phase.

8.3.3 Stakeholders where necessary will also be invited to the continue project team monthly meetings and receive the formal reporting associated with the Scheme Evaluation Plan.

8.4 Lessons Learnt

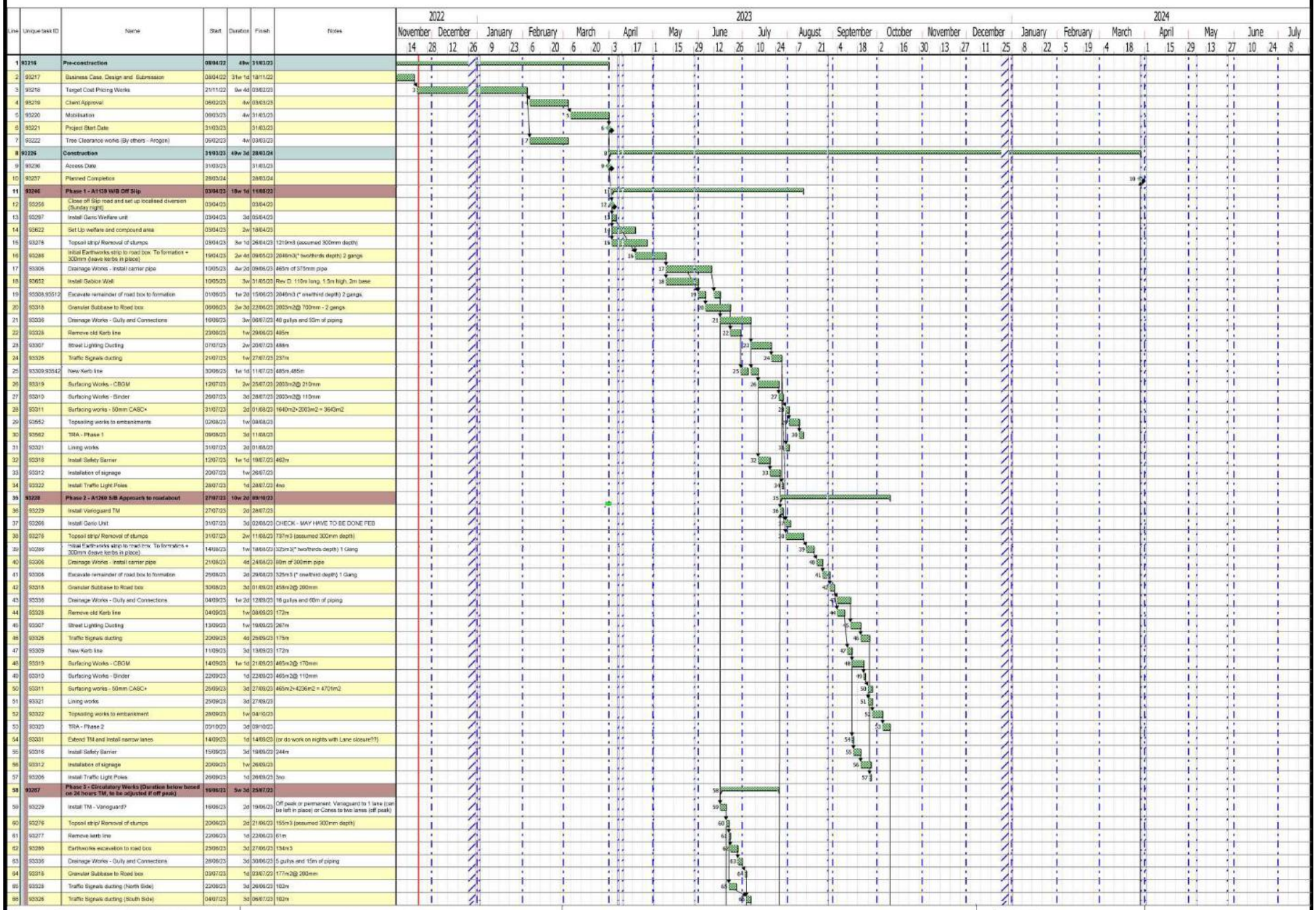
8.4.1 The Scheme will represent a significant investment of public money for the City by the CPCA. Monitoring and evaluation is therefore essential, not only to demonstrate that the scheme investment has been delivered as planned with the desired impacts, but also to inform and enlighten future decision makers, both locally and nationally. In this way, future investment can be targeted, to provide the best value for money.

8.4.2 Lessons will be learnt by seeking answers to the following research questions

- **Delivery**: Has the Scheme been delivered as intended and to the expected timetable? If any internal and external factors affected delivery, what impact did these have? Could they have been foreseen or avoided? What went well and what went less well?
- **Cost:** How accurate were the cost estimates? If out-turn costs were different from expectations, why was this, and what actions were taken? Were the allowances for quantified risk and optimism bias reasonable, or should a different approach be taken in future?
- **Traffic / Journey Reliability:** Has the scheme produced the expected changes to congestion and journey time reliability at and surrounding Junction 3, and were there any unintended changes? If not, what are the reasons? If there are differences, are they due to Scheme specific, or external factors affecting traffic demand. Are there implications for similar schemes in future?
- **Economy:** Has the Scheme enhanced the position of Peterborough in relation to policies and growth aspirations? Has it altered the perception of the City as a place to work, better attracting new investors as a place of opportunity? Have there been any unintended consequences?
- **Value for money:** Did the traffic model provide a realistic forecast of future growth and the effects of the Scheme? If there are differences, are they enough to raise questions about the VfM category attributed to the Scheme?
- **Environment:** Were the environmental impacts of the Scheme in line with expectations? Is mitigation perceived to have been effective? Have there been any unintended impacts, and, if so, how might they have been foreseen, or avoided with future schemes?

Appendix L – Construction Programmes

Junction 3 - Nov 22 Pre Tender Programme Rev D1 inc Phase 4 Off Peak



Line	Unique Task ID	Name	Start	Duration	Finish	Notes
1	93216	**Pre-construction**	08/04/22	49w	31/03/23	
2	93217	Business Case, Design and Submission	08/04/22	31w 1d	18/11/22	
3	93218	Target Cost Pricing Works	21/11/22	9w 4d	03/02/23	
4	93219	Client Approval	06/02/23	4w	03/03/23	
5	93220	Mobilisation	06/03/23	4w	31/03/23	
6	93221	Project Start Date	31/03/23		31/03/23	
7	93222	Tree Clearance works (By others - Arcgon)	06/02/23	4w	03/03/23	
8	93225	**Construction**	31/03/23	49w 3d	28/03/24	
9	93236	Access Date	31/03/23		31/03/23	
10	93237	Planned Completion	28/03/24		28/03/24	
11	93240	**Phase 1 - A1139 WB Off Slip**	03/04/23	18w 1d	11/08/23	
12	93256	Close off Slip road and set up localised diversion (Sunday night)	03/04/23		03/04/23	
13	93297	Install Genc Welfare unit	03/04/23	3d	05/04/23	
14	93622	Set Up welfare and compound area	03/04/23	2w	18/04/23	
15	93276	Topsoil strip/ Removal of stumps	03/04/23	3w 1d	26/04/23	1210m3 (assumed 300mm depth)
16	93286	Initial Earthworks strip to road box. To formation + 300mm (leave kerbs in place)	19/04/23	2w 4d	09/05/23	2046m3(* twothirds depth) 2 gangs
17	93306	Drainage Works - Install carrier pipe	10/05/23	4w 2d	09/06/23	465m of 375mm pipe
18	93652	Install Gabion Wall	10/05/23	3w	31/05/23	Rev D: 110m long, 1.5m high, 2m base
19	93308,93512	Excavate remainder of road box to formation	01/06/23	1w 2d	15/06/23	2046m3 (* one/third depth) 2 gangs
20	93318	Granular Subbase to Road box	09/06/23	2w 3d	23/06/23	2052m2@ 700mm - 2 gangs
21	93336	Drainage Works - Gully and Connections	19/06/23	3w	06/07/23	40 gullys and 50m of piping
22	93328	Remove old Kerb line	23/06/23	1w	29/06/23	485m
23	93307	Street Lighting Ducting	07/07/23	2w	20/07/23	488m
24	93326	Traffic Signals ducting	21/07/23	1w	27/07/23	237m
25	93309,93542	New Kerb line	30/06/23	1w 1d	11/07/23	485m,485m
26	93319	Surfacing Works - CBGM	12/07/23	2w	25/07/23	2033m2@ 210mm
27	93310	Surfacing Works - Binder	20/07/23	3d	28/07/23	2033m3@ 110mm
28	93311	Surfacing works - 50mm CASC+	31/07/23	2d	01/08/23	1640m2+2003m2 = 3643m2
29	93552	Topsoiling works to embankments	02/08/23	1w	09/08/23	
30	93562	TRA - Phase 1	09/08/23	3d	11/08/23	
31	93321	Lining works	31/07/23	2d	01/08/23	
32	93318	Install Safety Barrier	12/07/23	1w 1d	19/07/23	462m
33	93312	Installation of signage	20/07/23	1w	26/07/23	
34	93322	Install Traffic Light Poles	26/07/23	1d	28/07/23	4no
35	93228	**Phase 2 - A1260 SIB Approach to roundabout**	27/07/23	10w 2d	03/10/23	
36	93229	Install Vanlguard TM	27/07/23	2d	28/07/23	
37	93266	Install Genc Unit	31/07/23	3d	02/08/23	CHECK - MAY HAVE TO BE DONE PEB
38	93276	Topsoil strip/ Removal of stumps	31/07/23	2w	11/08/23	737m3 (assumed 300mm depth)
39	93286	Initial Earthworks strip to road box. To formation + 300mm (leave kerbs in place)	14/08/23	1w	18/08/23	325m3(* twothirds depth) 1 Gang
40	93306	Drainage Works - Install carrier pipe	21/08/23	4d	24/08/23	60m of 300mm pipe
41	93308	Excavate remainder of road box to formation	25/08/23	2d	29/08/23	325m3 (* one/third depth) 1 Gang
42	93318	Granular Subbase to Road box	30/08/23	3d	01/09/23	458m2@ 200mm
43	93336	Drainage Works - Gully and Connections	04/09/23	1w 2d	12/09/23	16 gullys and 60m of piping
44	93328	Remove old Kerb line	04/09/23	1w	09/09/23	172m
45	93307	Street Lighting Ducting	13/09/23	1w	19/09/23	287m
46	93326	Traffic Signals ducting	20/09/23	4d	25/09/23	175m
47	93309	New Kerb line	11/09/23	3d	13/09/23	172m
48	93319	Surfacing Works - CBGM	14/09/23	1w 1d	21/09/23	465m2@ 170mm
49	93310	Surfacing Works - Binder	22/09/23	1d	22/09/23	465m2@ 110mm
50	93311	Surfacing works - 50mm CASC+	25/09/23	3d	27/09/23	465m2+4236m2 = 4701m2
51	93321	Lining works	25/09/23	3d	27/09/23	
52	93322	Topsoiling works to embankment	28/09/23	1w	04/10/23	
53	93323	TRA - Phase 2	02/10/23	2d	03/10/23	
54	93331	Extend TM and Install narrow lanes	14/09/23	1d	14/09/23	(or do work on nights with Lane closure??)
55	93316	Install Safety Barrier	15/09/23	3d	19/09/23	244m
56	93312	Installation of signage	20/09/23	1w	26/09/23	
57	93206	Install Traffic Light Poles	26/09/23	1d	26/09/23	3no
58	93207	**Phase 3 - Circulatory Works (Duration below based on 24 hours TM, to be adjusted if off peak)**	19/06/23	5w 3d	25/07/23	
59	93229	Install TM - Vanguard?	19/06/23	2d	19/06/23	Off peak or permanent. Vanlguard to 1 lane (can be left in place) or Cones to two lanes (off peak)
60	93276	Topsoil strip/ Removal of stumps	20/06/23	2d	21/06/23	155m3 (assumed 300mm depth)
61	93277	Remove kerb line	22/06/23	1d	22/06/23	61m
62	93286	Earthworks excavation to road box	23/06/23	3d	27/06/23	134m3
63	93336	Drainage Works - Gully and Connections	28/06/23	3d	30/06/23	5 gullys and 15m of piping
64	93318	Granular Subbase to Road box	03/07/23	1d	03/07/23	177m2@ 200mm
65	93328	Traffic Signals ducting (North Side)	22/06/23	3d	26/06/23	102m
66	93326	Traffic Signals ducting (South Side)	04/07/23	3d	06/07/23	102m

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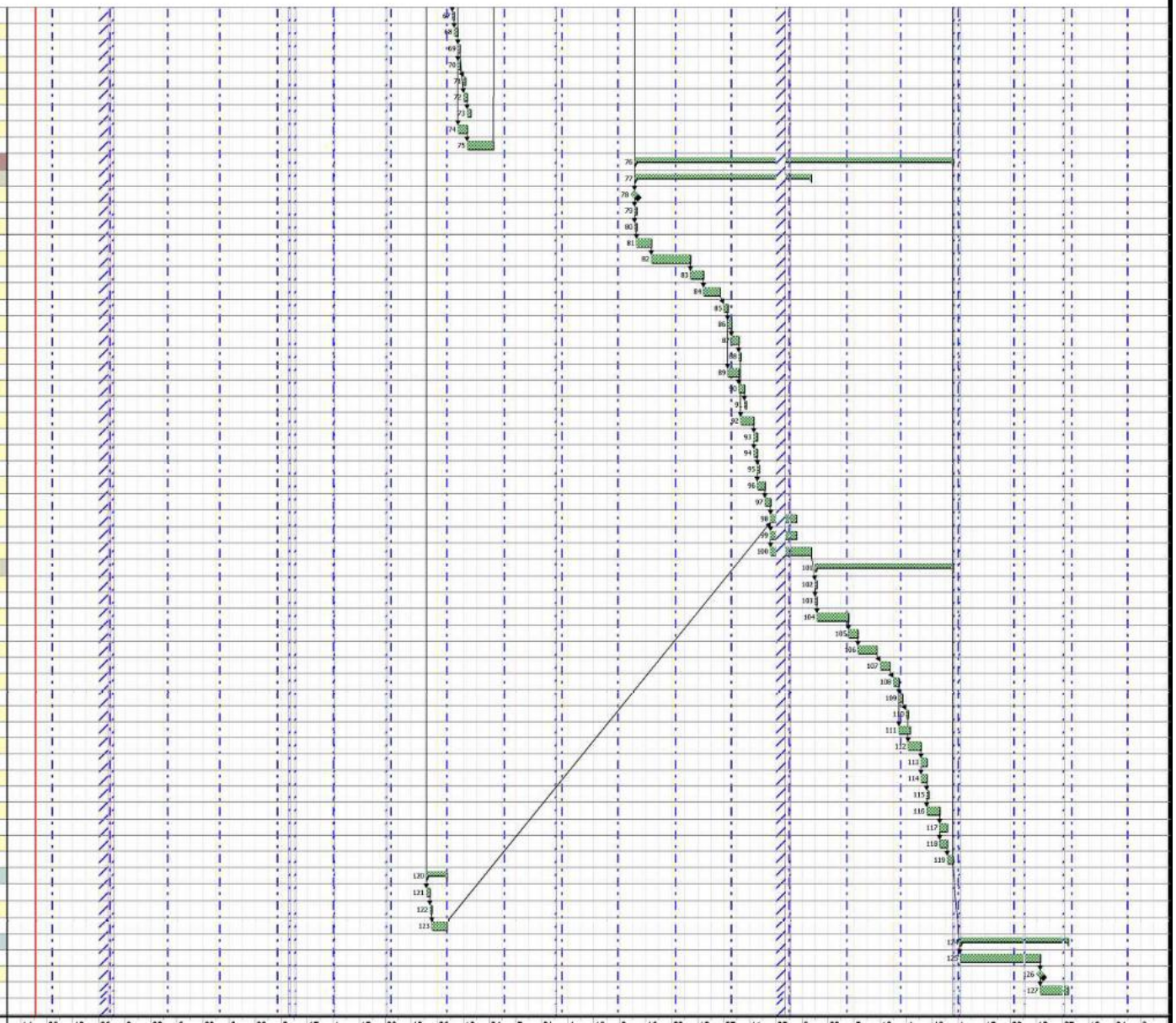
MILESTONE INFRASTRUCTURE

Junction 3 - Nov 22 Pre Tender Programme Rev D1 inc Phase 4 Off Peak

Line	Unique task ID	Name	Start	Duration	Finish	Notes
67	93309	New Kerb line	04/07/23	1d	04/07/23	61m
68	93319	Surfacing Works - CBGM	05/07/23	2d	06/07/23	177m2@ 380mm
69	93310	Surfacing Works - Binder inc sacrificial surface course	07/07/23	1d	07/07/23	177m2@ 110mm
70	93321	Temp Lining works	07/07/23	1d	07/07/23	
71	93322	Topsoiling works to embankment	10/07/23	1d	10/07/23	
72	93316	Install Safety Barrier	10/07/23	2d	11/07/23	120m
73	93312	Installation of signage	12/07/23	2d	13/07/23	
74	93346	Install Traffic Light Poles	07/07/23	3d	11/07/23	13 no
75	93347	Phase 5a (Details TBC)	12/07/23	2w	25/07/23	Arbitary period added to to tidied up
76	**93356**	**Phase 4 - Serpentine N/B approach to roundabout**	**10/10/23**	**23w 2d**	**25/03/24**	
77	**93366**	**Section 4a - North of Phorpes Underpass**	**10/10/23**	**12w 3d**	**12/01/24**	
78	93256	Set up TM - Variaguard for removal of Lane 1	10/10/23		10/10/23	
79	93257	Install Garic Welfare unit ??	10/10/23	1d	10/10/23	
80	93267	Remove existing VRS and dispose	10/10/23	1d	10/10/23	145m
81	93276	Topsoil strip/ Removal of stumps	11/10/23	1w 1d	18/10/23	418m3 (assumed 300mm depth)
82	93286	Earthworks excavation to road box	19/10/23	3w	09/11/23	397m3 1 Gang
83	93318	Granular Subbase to Road box	09/11/23	1w	15/11/23	397m3@ 700mm - 1 gangs
84	93332	Install New Drainage run and gullys	15/11/23	1w 2d	24/11/23	70m of 375mm pipe and 8 gullys with 20m of 150mm piping
85	93328	New Kerb line	27/11/23	2d	28/11/23	158m
86	93319	Surfacing Works - CBGM	29/11/23	2d	30/11/23	65m3@ 160mm
87	98542	Remove Old Kerb line	01/12/23	2d	04/12/23	158m
88	93310	Surfacing Works - Binder	05/12/23	1d	05/12/23	781m2@ 70mm to 270mm
89	93307	Street Lighting Ducting	29/11/23	4d	04/12/23	135m
90	93326	Traffic Signals ducting	05/12/23	3d	07/12/23	150m
91	93322	Install Traffic Light Poles	08/12/23	1d	08/12/23	4no
92	93327	Topsoiling to embankments	09/12/23	1w	12/12/23	145m
93	93357	Install Safety Barrier	13/12/23	2d	14/12/23	
94	93338	Installation of signage	13/12/23	2d	14/12/23	
95	93302	Remove TM to Lane 1 and Install to Lane 2	15/12/23	1d	15/12/23	
96	93336	Drainage Works - Gully and Connections (lane 2)	15/12/23	2d	18/12/23	2 gullys and 4m of piping
97	93331	TRA - Phase 4a	19/12/23	3d	21/12/23	
98	93311	Surfacing works - 50mm CASC+ (Phase 4a and Roundabout)	22/12/23	4d	04/01/24	6688m2
99	93321	Lining works	22/12/23	4d	04/01/24	
100	93206	Traffic Signal commissioning	22/12/23	2w	12/01/24	
101	**93642**	**Section 4b - South of Phorpes Underpass (off Peak work 9.30am to 3.30pm)**	**15/01/24**	**10w 4d**	**28/03/24**	
102	93257	Install Garic Welfare unit ??	15/01/24	1d	15/01/24	
103	93267	Remove existing VRS and dispose	15/01/24	1d	15/01/24	143m
104	93268	Mobilisation, installation of Sheet Piles (Silken method) and demob works	16/01/24	2w 3d	01/02/24	Approx 143m length, approx 4m embedment
105	93276	Topsoil strip/ Removal of stumps	02/02/24	3d	06/02/24	351m2 (assumed 300mm depth)
106	93286	Earthworks excavation to road box	07/02/24	1w 3d	16/02/24	392m3 1 Gang
107	93318	Granular Subbase to Road box	19/02/24	1w	23/02/24	239m3@ 600mm - 1 gangs
108	93328	New Kerb line	26/02/24	3d	28/02/24	139m
109	93542	Remove Old Kerb line	29/02/24	2d	01/03/24	139m
110	93310	Surfacing Works - Binder	04/03/24	1d	04/03/24	584m2@ 70mm
111	93307	Street Lighting Ducting	29/02/24	4d	05/03/24	109m
112	93327	Topsoiling to embankments	05/03/24	1w	11/03/24	
113	93357	Install Safety Barrier	12/03/24	3d	14/03/24	
114	93338	Installation of signage	12/03/24	3d	14/03/24	
115	93302	Remove TM to Lane 1 and Install to Lane 2	15/03/24	1d	15/03/24	
116	93336	Drainage Works - Gully and Connections (lane 2)	15/03/24	1w	21/03/24	8 gullys and 16m of piping
117	93315	Surfacing works - 50mm CASC+ (Phase 4b)	22/03/24	2d	25/03/24	1335m2
118	93326	Lining Works	22/03/24	2d	25/03/24	
119	93317	TRA Phase 4b (inc Demob works)	26/03/24	3d	28/03/24	Includes basic setup demob works
120	**93337**	**Works to Other Phases and Completion works**	**20/06/23**	**1w 4d**	**30/06/23**	
121	93349	Phase 5 - Eastbound Off Slip Traffic Signal Ducting (To be programmed to suit)	20/06/23	2d	21/06/23	101m including night road crossing (1 no)
122	93356	Phase 6 - Eastbound On Slip Traffic Signal Ducting (To be programmed to suit)	22/06/23	1d	22/06/23	17m including night road crossing (1 no)
123	93366	Circulatory Works - Traffic Signal ducting	23/06/23	1w 1d	30/06/23	75m including night road crossings (4 no)
124	**93238**	**Post-construction**	**02/04/24**	**8w**	**29/05/24**	
125	93240	Terminal Float	02/04/24	6w	14/05/24	
126	93239	Completion Date	14/05/24		14/05/24	
127	93256	HS File	15/05/24	2w	29/05/24	



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