Fengate Access Study

Full Business Case

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Document Control

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Contents

Figures

Tables

Executive Summary

This Full Business Case (FBC) demonstrates that there is a strong strategic and economic case for investment in the Fengate Access 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 4.95 whilst facilitating further growth in the Fengate 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 the scheme has been developed. As well as policy, the need for intervention is explained, which includes the requirement to overcome the following challenges which will compromise local growth aspirations if left unaddressed:

- High levels of peak hour congestion and delay
- High accident rates
- Poor active travel provision within the Fengate area.

The policy review and data on the existing and future issues was used to identify scheme objectives, and a long list of potential improvement options were assessed against these objectives using the DfT's Early Assessment Sifting Tool (EAST). This was then refined to a short list of schemes which was then assessed in greater detail, as reported in the Fengate Access Study Option Appraisal Report (OAR).

The scheme objectives have been updated throughout the life of the project to reflect changes to transport policy and priorities during this time. The Primary objectives are set out beneath:

1. **Tackle congestion and reduce delay:** Tackle congestion at key pinch points across the Study Area and reduce delay in to the Fengate area.
2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** Help to bring about the planned employment growth at Red Brick Farm.
3. **Protect the local environment and improve biodiversity:** Ensure a 20% biodiversity net enhancement within the study area.
4. **Improve Road Safety:** Reduce personal injury accidents and improve personal security amongst all travellers.
5. **Improve Active Travel Provision with Fengate:** Improve active travel provision with the Fengate Access Study area.

In addition to the above, secondary objectives were identified and are set out within the Strategic Dimension.

The Strategic Dimension concludes with details of the modelling and assessment work undertaken to identify the Preferred package of schemes. Full details of this phase of work can be found in the Fengate Access Study Option Assessment Report (October 2020). The Strategic Dimension also explains changes made to the Preferred Package of schemes in light of consultation feedback and changes in transport policy.

The Fengate Access Study Improvement Schemes include:

1. Traffic signal improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road, on the Vicarage Farm Road and Storey's Bar Road northbound approaches.
2. Traffic signal improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road)
3. Creation of a mini roundabout at Oxney Road / Newark Road
4. Improvements to Newark Road footpath.
5. Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.

The scheme locations are shown in the Figure beneath.

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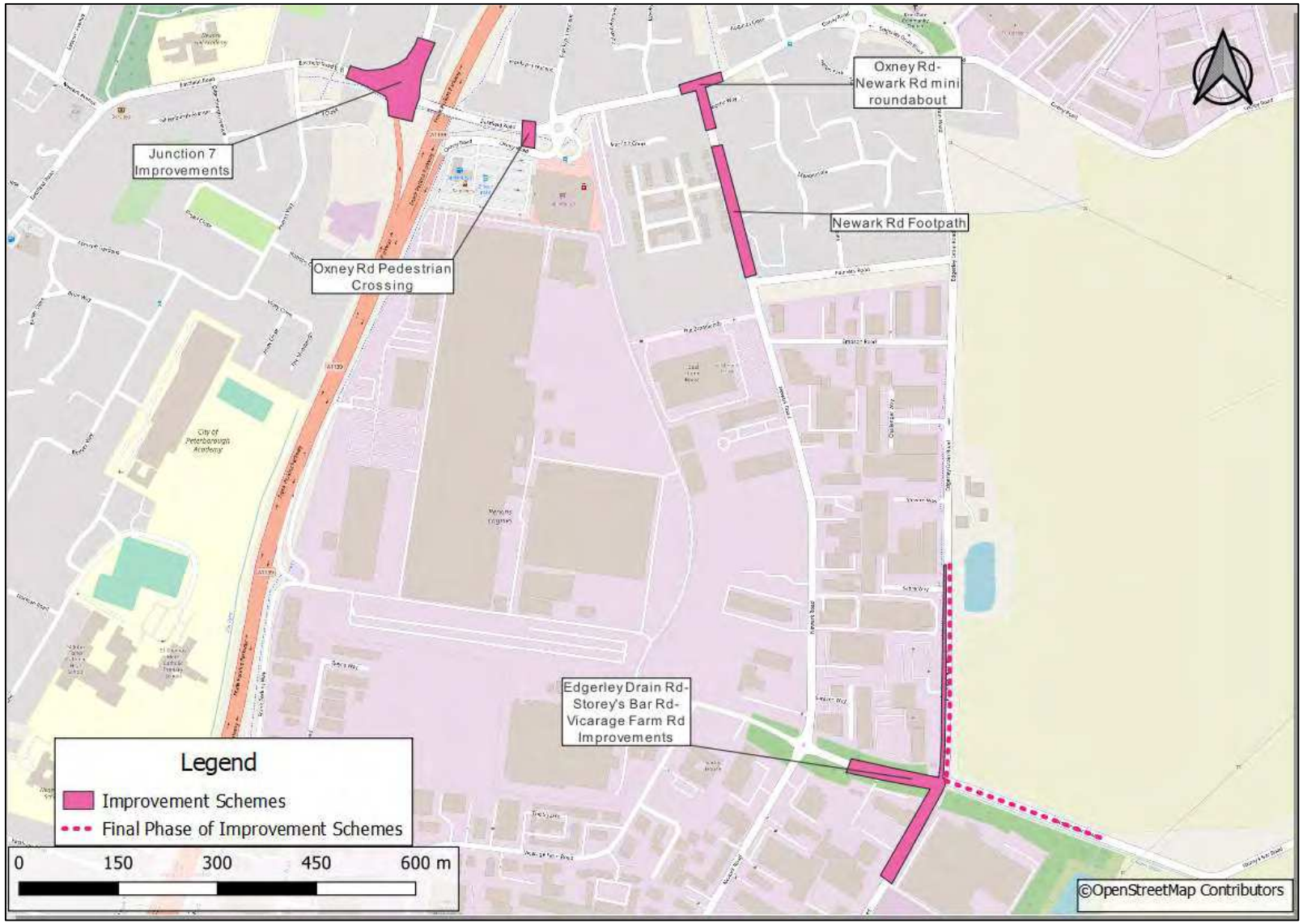

Economic Dimension

The Economic Dimension demonstrates that the Fengate Access Study Improvement schemes achieve a Benefit to Cost Ratio of 4.95 and offers **Very High Value for Money**.

The economic assessment is based upon a robust scheme cost estimate 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 schemes.

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

Fengate Access Study Improvement Schemes AMCB	
Present Value of Benefits (PVB)	£22,540,000
Present Value of Costs (PVC)	£4,551,000
Net Present Value (NPV)	£17,989,000
Benefit to Cost Ratio (BCR)	4.95
Value for Money	**Very High**

The Present Value of Benefits for the Fengate Access Improvement Schemes is £22,540,000. These are achieved against the Present Value of Costs (PVC) of £4,551,000 generating a scheme BCR of 4.95 (Very High Value for Money). Please note that these figures are in 2010 prices and the Present Value of Cost is not the cost of constructing the scheme, but a figure used within the economic assessment. The Outturn Cost, which is the cost required by Peterborough City Council to deliver this scheme, is discussed in the summary of the Financial Dimension provided beneath.

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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 fits with the funding allocation available. The cost estimates for the scheme are summarised in the table beneath.

Description of Cost Type	Cost (£) Total
Base Investment Cost	5,772,149
Risk Adjusted Base Cost	6,790,497
Risk Adjusted Base Cost with Construction Industry Inflation (**Outturn Cost**)	**7,531,120**
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	8,376,966

The scheme Outturn Cost is £7,531,120 which includes risk allowance and inflation costs through to the end of construction in 2024 (with post scheme monitoring to begin in 2025). This figure represents the funding needed by Peterborough City Council to deliver this scheme.

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Note that £865,424 of the Outturn Cost was approved for release at the CPCA Board Meeting on October 19th 2022, and therefore Peterborough City Council request the balance of £6,665,696 subject to the approval of this FBC.

The Inflated Risk Adjusted Costs incorporating Whole Life Costs (£8,376,966) 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 currently have an allocation of £11,000,000 in the Medium-Term Financial Strategy (MTFS) to support delivery of this scheme, which exceeds the required scheme Outturn Cost.

Commercial Dimension

The Commercial Dimension demonstrates that the Fengate Access Study Improvement Schemes can be reliably procured and implemented through existing channels whilst ensuring value for money.

Delivery and supervision of the Fengate Access Study Improvement Schemes 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 Peterborough Highway Services (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.

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Management Dimension

The Management Dimension demonstrates that Peterborough City Council, through the PHS Framework, has the necessary experience and governance structure to successfully manage the delivery of the Fengate Access Study Improvement Schemes.

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.

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

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Newark Road Footpath and Oxney Road Pedestrian Crossing)
November 2022	Construction commences on the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes. Advance works begin for construction of the remaining three schemes, including vegetation clearance and STATS diversions.
May 2023	Construction starts on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road and Junction 7 schemes.
July 2023	Construction finishes on the Junction 7 scheme. Construction starts on the Oxney Road / Newark Road scheme.
September 2023	Construction finishes on the Oxney Road / Newark Road scheme.
March 2024	Construction finishes on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

Public consultation on the concept of a scheme at Fengate was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan[1] that was adopted in January 2020. A further round of public consultation took place between February and March 2021 based on the concept designs. No comments were received relating the scheme designs themselves, however some feedback was received regarding the poor level of pedestrian infrastructure currently within Fengate. Two additional schemes were included in the package of works to address this.

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

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Stakeholder consultations were undertaken by the Project Team following approval of the SOBC and at the time of the Public Consultation (February 2021 – March 2021). All stakeholders were consulted via email or letter for comments on the Preferred scheme prior to the completion of Detailed Design. Key aspects of the Stakeholder discussions have focused on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme, and specifically it's interaction with the Red Brick Farm site and nearby drainage infrastructure.

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.

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1. Introduction

1.1 Background

1.1.1 This document sets out the Full Business Case for the Fengate Access Study Improvement Schemes in Peterborough.

1.1.2 The package of schemes will improve active travel connections across Fengate, and add highway capacity to unlock congestion at several critical junctions within the study area. Addressing existing issues and building in additional capacity at appropriate locations will allow the package of schemes to facilitate imminent planned employment growth within the Fengate area, and improve sustainable travel options for those that live and work in Fengate.

1.1.3 This Full Business Case is the final stage of the decision-making process based on HM Treasury's 5 Case Model. 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 list of potential schemes is refined, and a Preferred Scheme is identified.

1.1.4 An SOBC and an Optional Appraisal Report (OAR) were approved by the Cambridgeshire and Peterborough Combined Authority (CPCA) in October 2020. At the time that the SOBC was approved, planning for a large development site within Fengate (known as Red Brick Farm) was progressing at pace, and the decision was made by the CPCA to deliver the Preliminary Design and Detailed Design tasks in a single phase to accelerate the scheme designs and provide the devlopers with greater certainty of the councils infrastrucutre plans in the area. Consequenly, there is now the package of schemes is now developed enough to progress from SOBC to FBC, and this document is based on the final Detailed Designs and Target Costs.

1.2 Study Area

1.2.1 The Fengate Access Study area focuses on the north of Fengate. The study area is shown in Figure 1.1 beneath and includes Junction 7 and Junction 8 of the A1139 Fletton Parkway (key access to / from the parkway system for Fengate), access routes into Fengate such as Parnwell Way and Oxney Road, and internal roads and footways within Fengate such as Edgerley Drain Road and Storeys Bar Road.

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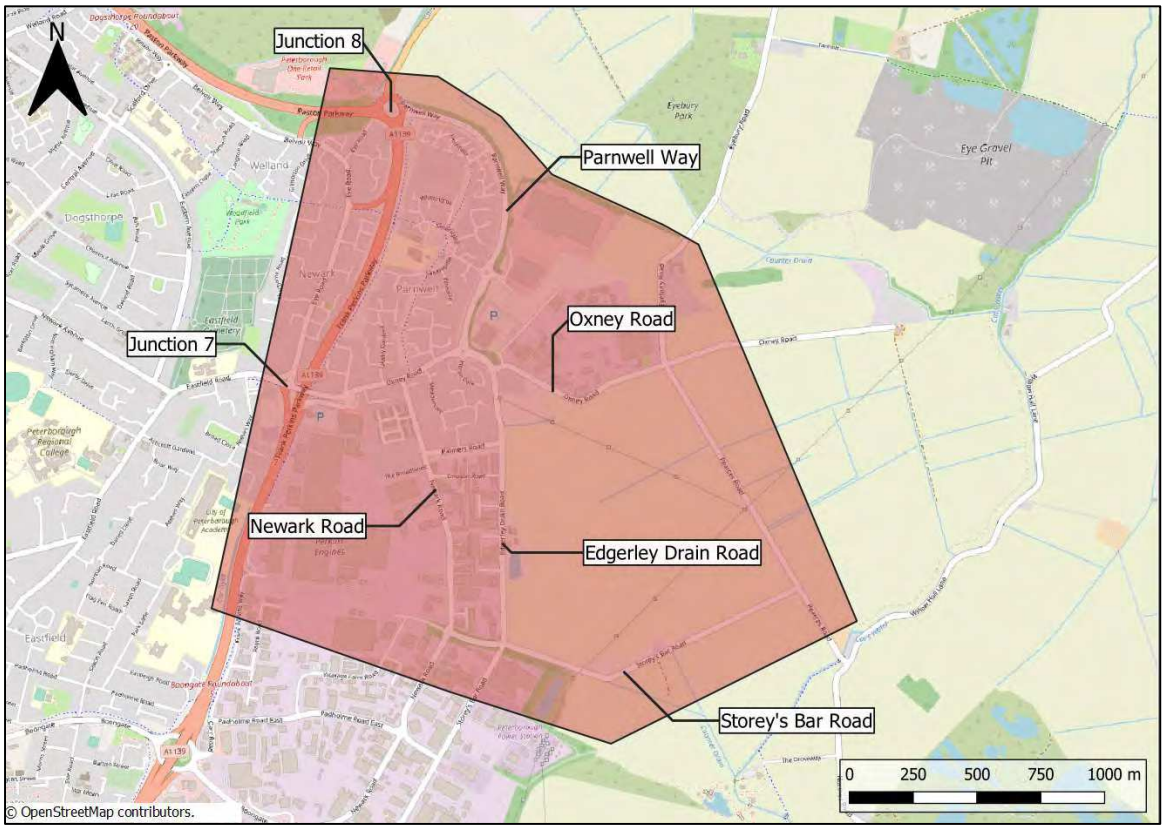

Figure 1.1: Fengate Access Study Area

1.3 Fengate Context

Landuse and Access

1.3.1 Fengate is a large, predominantly industrial area to the east of Peterborough, it is bordered to the west by the A1139 Frank Perkins Parkway, and to the east by the Fens.

1.3.2 It is predominantly industrial at the southern end and residential at the northern end. The eastern part of the study area currently consists of agricultural fields; however, these are due to be developed, and outline planning permission has been granted for the Red Brick Farm site which will convert the land use here to office, industrial and logistical use[2].

1.3.3 The industrial area has a wide variety of businesses ranging from Small to Medium Enterprises (SME's) to large national retail chains. Perkins Engines is also based in the area and has its own access junction from the A1139 Frank Perkins Parkway.

[2] Planning Reference 18/00080/OUT

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1.3.4 Figure 1.2 beneath highlights the location of Fengate within Peterborough, and in relation to the Parkway Network.

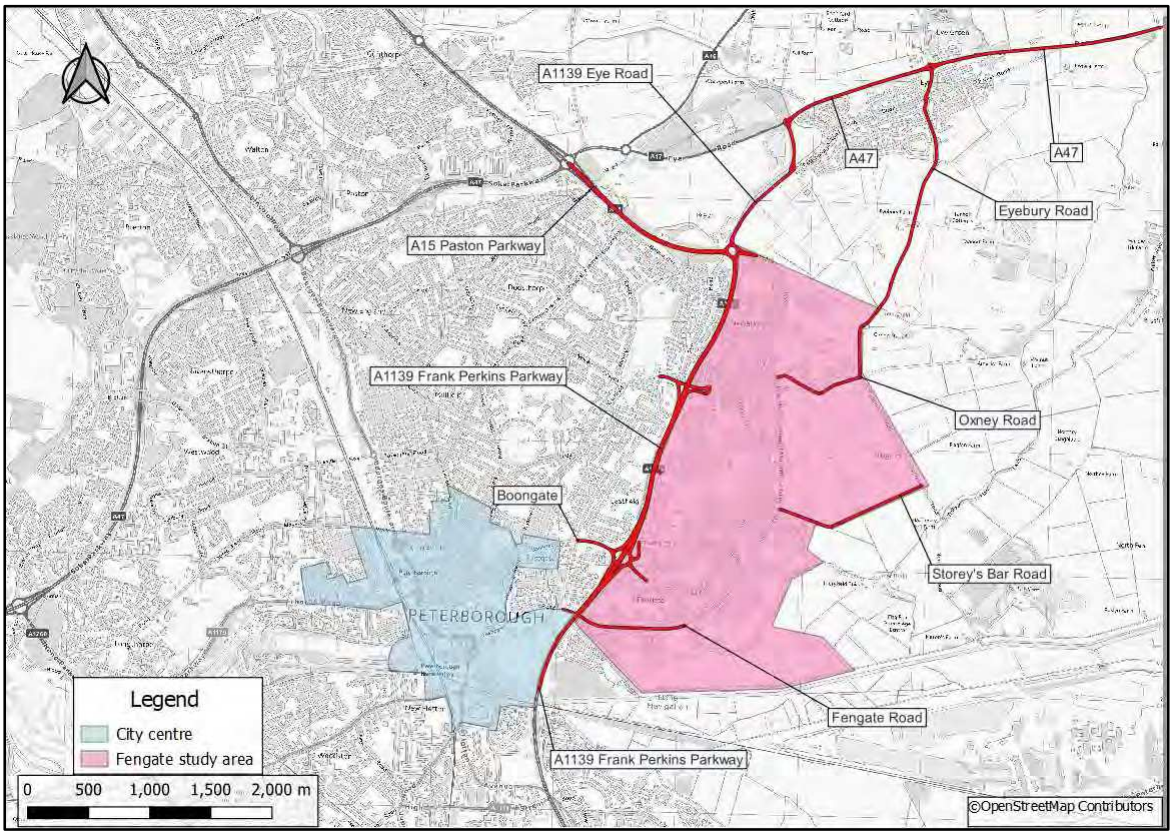

Figure 1.2: Location of Fengate within Peterborough

1.3.5 The main entry points to Fengate are via Junction 5 and Junction 8 of the A1139 Frank Perkins Parkway. At peak times these junctions are particularly busy. Alternative routes to access Fengate include Bishops Road, Eastfield Road, Oxney Road and Storey's Bar Road. Although these routes are less congested than Junctions 5 and 8, they still become very busy and experience peak hour delay.

1.3.6 Improvements for Junction 5 of the A1139 and Fengate (road) are being developed and delivered through the CPCA funded University Access Study, for which an Outline Business Case is due in Autumn 2023.

1.3.7 There are also crucial junctions within Fengate that experience peak hour congestion and are forecast to go over capacity with future year growth, including the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road junction and the Oxney Road / Edgerley Drain Road junction.

1.3.8 Beyond existing and forecast highway capacity issues, pedestrian and cyclist connectivity throughout Fengate requires improvement to ensure that the planned growth can be sustainable.

Growth and Development

1.3.9 The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities, and objectives for Peterborough up to 2036. The updated strategy identifies the required delivery of 21,315 new homes and 17,600 new jobs between 2016 and 2036[3].

1.3.10 Within the Local Plan Fengate is identified as an area of employment growth for the City, with proposed growth ranging between 18ha and 48ha of employment land. This is expected to generate over 3,000 jobs in the area. Investment (beyond developer contributions) is needed into the transport network to support these development aspirations.

1.3.11 The Fengate area is an important employment area for Peterborough, with many small and medium sized businesses located there, alongside large employers like Perkins Engines. The Local Plan seeks to build upon the existing industry in the area and has several allocations within the area for employment development.

1.3.12 Figure 1.3 shows a plan of the allocated sites within Fengate, the largest employment allocation being the Red Brick Farm site which covers 126,600 square metres.

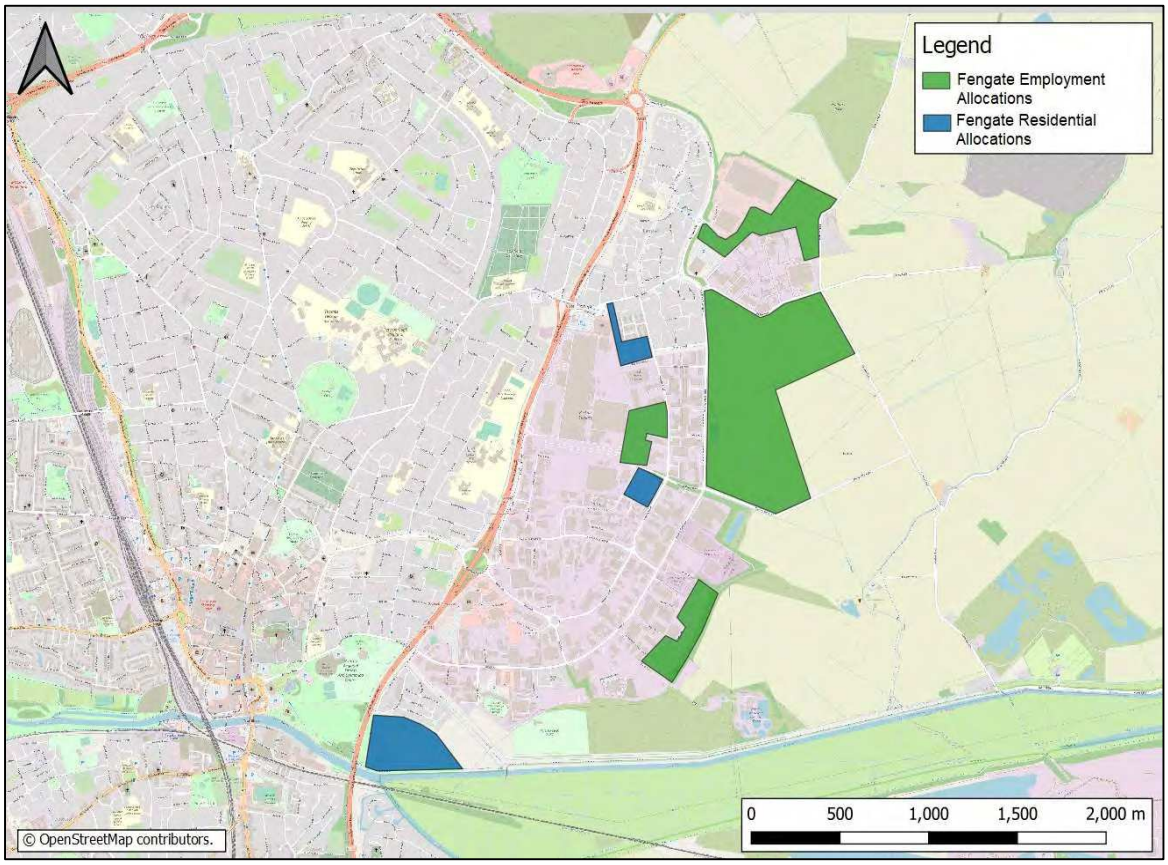

Figure 1.3: Allocated Sites for Fengate within Peterborough's Local Plan

[3] Peterborough Local Plan, 24th July 2019

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Figure 1.4: Red Brick Farm Site (looking north from the Edgerley Drain Road / Storeys Bar Road / Vicarage Farm Road Junction)[4]

1.3.13 The current proposed land use, under reference 18/00080/OUT, consists of 72,678m^2 of B8 (Storage and Distribution), 47,088m^2 of B2 (General Industry), and 6,835m^2 of B1c/B2 (Office Space).

1.3.14 Another notable nearby development within the study area is the Peterborough Renewable Energy Limited (PREL) which received planning permission in October 2018.

1.3.15 PREL will convert biomass slurry waste into solid fuel. The site will also include a research and development visitor centre to host schools, universities, and other interested parties to educate on the process of turning waste in to fuel, rather than landfill.

1.3.16 As part of the planning permission, the following highway improvements are proposed:

[4] Google Earth, 2022

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- Reconstruction and widening of Storey's Bar Road (east) to 7.3m with a 3m cycleway on the south side, eastwards from the junction with Edgerley Drain Road to a point just west of Adderley Drain
- Provision of a roundabout and Right Turn Lane facility to serve the PREL site
- A new Toucan Crossing on Storey's Bar Road (south) to the south of the existing Edgerley Drain Road junction including upgraded pedestrian / cycle facilities.
- Upgrading of the Puffin Crossing on Vicarage Farm Road at the Edgerley Drain Road junction to a Toucan Crossing including upgraded pedestrian / cycle facilities.
- Reduction in speed limit on Storey's Bar Road (east) to 50mph.

1.3.17 This development has not been included within the economic assessment at this stage, as there is still uncertainty as to when this development will come forward, and the number of trips generated by the site is not considered significant, however this development has been considered in design terms to ensure that provision for future active travel connections to the site are built into nearby scheme designs.

1.3.18 The Business Case promotes a package of schemes that will provide the necessary capacity within Fengate to unlock congestion and reduce delay within the study area, enabling the proposed Local Plan growth to be realised.

1.3.19 Additionally, the package of schemes will address the existing poor active travel provision and provide a 20% biodiversity improvement.

1.4 Document Structure

1.4.1 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.

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2. The Strategic Dimension

2.1 Introduction

2.1.1 This chapter sets out the Strategic Dimension for the Fengate Access Study 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.

2.1.2 Fengate has been a key part of Peterborough's economy for many years, and thousands of residents are employed here across multiple sectors, such as engineering, manufacturing and retail. There is now further signicant growth planned within Fengate, which will add further employment opportunities, and investment in the transport infrastrucutre is required to support this growth. Indivudal developments will identify and deliver schemes, or make financial contributions, to mitigate their own impact on the transport network, however a broader investment is required to address existing issues such as poor active travel connectivity and localised congestion, which are barriers to sustainable growth.

Growth and Development

2.1.3 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 identified the required delivery of 19,440 new homes and 17,600 jobs.

2.1.4 Peterborough has a requirement for 76 hectares of employment land to be developed between 2015 and 2036. Three strategic employment allocation sites are identified within the Local Plan that cover a total of 136.53 hectares, of which Red Brick Farm (LP44.3 & LP45) in Fengate accounts for 30 hectares or 39% of the local requirement for new employment land.

2.1.5 Local Plan Policy LP45: Red Brick Farm states that planning permission will only be granted once appropriate and deliverable solutions are demonstrated for issues such as transport. Specifically, the impact of proposed development on the local and wider road network needs to be considered.

2.1.6 Local Plan Policy LP46: Employment Allocations also outlines a further three allocation sites for B1, B2, and B8 development within Fengate. Oxney Road Site C (LP46.1), Perkins South (LP46.2), and Land off Third Drove and Front Fengate (LP46.3) equate to a total area of 17.38 hectares. The delivery of these three employment sites, along with Red Brick Farm would account for about 62% of the local requirement for new employment land between 2015 and 2036.

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2.2 Business Strategy

2.2.1 The Government's strategy for facilitating further economic growth requires the 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 the Fengate Improvement Scheme 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.

2.2.3 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.

2.2.4 An improvement scheme at Fengate will add network capacity and reduce congestion and improve journey time reliability within the study area. The delivery of these benefits will support economic growth which are aligned to the main objectives of the DfT's 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, 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).

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

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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 Policy Framework (Figure 2.1 shown overleaf) has been developed to provide a clear pathway to delivering on the ambitious and transformational agenda for Cambridgeshire and Peterborough. The alignment of the Fengate Access Study Improvement Schemes to each of these components is discussed beyond the figure.

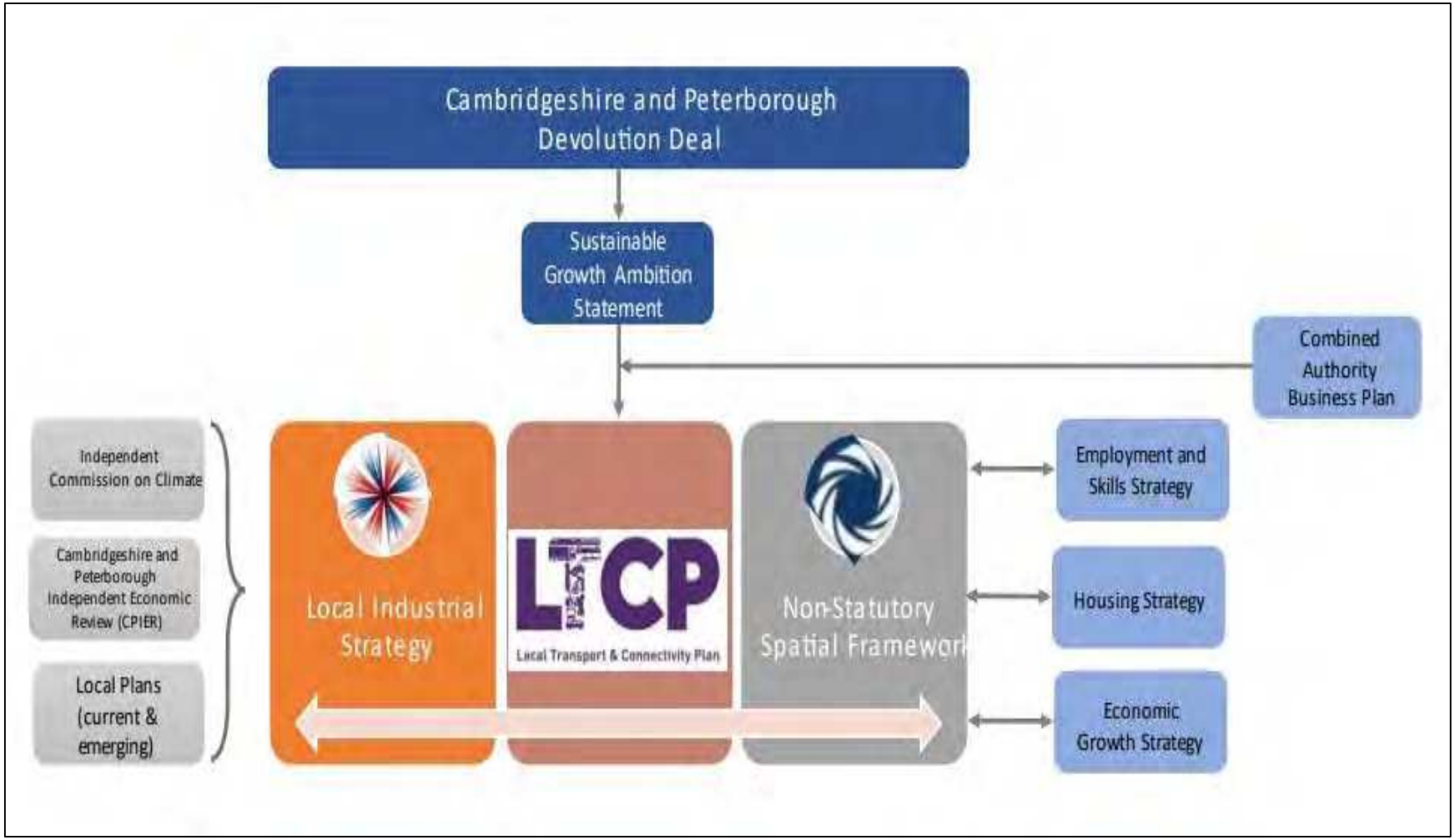

Figure 2.1: CPCA Policy Framework

Cambridgeshire and Peterborough Sustainable Growth Ambition Statement

2.2.8 The CPCA Mayor's Growth Ambition Statement sets out the regions priorities for achieving ambitious levels of inclusive growth and meeting the commitments of the Devolution Deal. The Statement's six themes[6] 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 Fengate Access Study Improvements Schemes will help to achieve the ambition set out within the CPIER for 'Peterborough to become a leading place to live, learn and work' by 2030. The package of schemes will remove congestions hotspots which currently impact on Fengate's ability to accommodate further growth and provide improved active travel connections that will help to reduce inequalities associated with travel to work whilst supporting the climate and nature by encouraging travel by sustainable modes, and through the delivery of biodiversity net Enhancement designed into the package of schemes.

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

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2.2.13 The schemes will help support local growth, as well as provide wider network benefits. By addressing future highway issues, increasing accessibility, and enhancing the local area, the attractiveness of the City will increase helping to increase the population and support existing and future businesses.

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 Fengate Access Study will help support the growth aspirations of Peterborough City Council, by providing high quality active travel improvements in the Fengate area, alongside localised junction improvements to overcome existing issues of congestion. A key focus of the active travel improvements is to reduce severance (particularly over Oxney Road) and ensure that LTN 1/20 compliant provision is built into junction improvements, ensuring a safe and high-quality cycling provision as an alternative to car travel.

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

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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, all 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 Fengate Access Study, with a need to ensure it supports the CPCA growth ambitions and aligns 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 Fengate Access Study will provide improvements that will directly benefit growth in the Fengate area by improving active travel accessibility and unlocking localised congestion, providing a platform for future growth including that identified at Red Brick Farm.

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.

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.

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

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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 Plan. 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 accessible transport system so 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 within the Fengate Access Study area, and form the basis against which scheme, initiatives and policies will be assessed. The initial scheme objectives for The Fengate Access Study were devised at the beginning of the study and pre-date the objectives of the Local Transport Plan.

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 Fengate Access Study are set out later in this chapter, however the package of schemes strongly align to the Local Transport Plan's Economy, Society and Environment goals.

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 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.

2.2.31 The Fengate area is identified within the Local Transport Plan as a corridor in need of improvement to relieve congestion and support growth[13].

[13] Peterborough Long Term Transport Strategy v1.0, April 2021.

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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 the Cambridgeshire and Peterborough region will be guided by the LTCP.

2.2.35 Consultation was undertaken on the draft LTCP between May and August multiple platforms. Feedback from the consultation has been received and will be incorporated into the final version of the LTCP, which will be subject to approval by the CPCA Board in 2023.

Mayoral Ambition

2.2.36 The CPCA Mayoral Election on the 6th of 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. The LTCP will be finalised in Spring 2023.

2.2.39 Despite the Fengate Access Study being developed before the new Mayors visions and publication of the LTCP, the scheme does provide strong connections to the 3'Cs:

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

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- **Compassion:** The schemes will improve active travel accessibility throughout Fengate, making it easier for residents and employees alike to travel safely in a sustainable way.
- **Co-operation:** Strong engagement with key stakeholders including developers has been maintained throughout scheme development and the Business Case process, helping to create a scheme which recognises the interests of all partners.
- **Community:** The Fengate Access Study schemes will significantly improve provision for active travel users, and specifically reduce severance over Oxney Road, and will help to connect communities within the Fengate area to key services and employment opportunities.

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

2.2.40 The Council adopted the Local Transport Note 1/20: Cycle Infrastructure Design (LTN 1/20) guidance in October 2020. 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)

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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 can 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 Fengate Access Study Improvement Schemes have been developed within the Gear Change and LTN 1/20 policy framework, and includes new cycle infrastructure through the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction, Junction 7 and a new signal controlled crossing over Oxney Road. These improvements will be LTN 1/20 compliant where constraints permit, and will enable improved connectivity between new developments in Fengate and the rest of the city, as well as limit severance and improve safety for active travel users.

2.3 Fit within the Wider Policy Context

2.3.1 The wider policy context is set out in Table 2.1 below. 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 Schemes

Policy Framework	Policy Function	Objectives	Fengate Access Study Policy Fit
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 within the Fengate Area will: • Support the housing and economic growth ambitions of the city • Improve reliability for drivers on this section of the city's road network.
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 within the Fengate Area 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 • Improve the sustainable transport provisions within this section of the network • Protect and enhance the enviorment
Peterborough City Council Strategic Priorities	The Council's priorities to help meet its vision to 'create and 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 Environmental 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 within the Fengate Area 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.
Peterborough City Council Local Plan	Updates the 2011 Core Strategy and looks to deliver 20,112 homes and 17,600 jobs by 2036		

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Fit Within Wider Environmental Policy

2.3.2 Alongside the overarching policies outlined in Table 2.1, local policy has strong emphasis on 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: Policy Context in Relation to Environment

Policy Framework	Policy Description / Function	Objectives	Fengate Access Study Policy Fit
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 scheme 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	Improvements within the Fengate Area will: • Support Green infrastructure by creating more cycle ways. • Protect the environment reducing vehicle usage and travel time.
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).	Improvements within the Fengate Area will: • Mitigate the loss of bio-diversity value of the area. • Replace any loss of tree and woodland to other sites in the city
Peterborough City Council – Trees and Woodland Strategy (2018)	The strategy sets out the benfits 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.	Improvements within the Fengate Area will: • Mitigate the loss of bio-diversity value of the area. • Replace any loss of tree and woodland to other sites in the city
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 enhancement requirement on new development / schemes • A strengthened biodiversity duty on public authorities • Local Nature Recovery Strategies (LNRSs) • Species Conservation Strategies and Protected Sites Strategies Targeted measures to protect existing trees	Improvements within the Fengate Area will: • Mitigate the loss of bio-diversity value of the area. • Replace any loss of tree and woodland to other sites in the city
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.	Improvements within the Fengate Area will: • Improve Air Quality index, public health and quality of life by improving sustainable modes of travel. • Create long term financial gains with accident benefits and infrastructure growth. • Replace any loss of tree and woodland to other sites in the city.

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2.4 The Need for Change

2.4.1 This section discusses the need for change which sets the requirement for the Fengate Access Study Improvement Schemes.

2.4.2 There is a very clear and compelling case for change within Fengate. The Local Plan allocates a significant proportion of employment growth within the Fengate area. The Red Brick Farm site is the largest of these growth allocations and is currently progressing through the planning process with the intention of developing the site in 2023. The timing of this development, and the employment that it will create, will provide Peterborough with crucial economic resilience in the wake of the COVID-19 Pandemic, and the subsequent impact that is being felt on the economy.

2.4.3 Evidence of existing and future conditions demonstrates that there are significant issues that need to be overcome to enable broader growth to be realised within the area, particularly the poor active travel connections and localised congestion.

2.4.4 It should be noted that the impact of specific developments on the network, such as Red Brick Farm, will be assessed and mitigation provided by the developer. The problems identified beneath, and which underpin the need for transport investment in Fengate, relate to existing conditions and general area wide growth. It is expected the package of schemes identified within the Fengate Access Study will be complimented by developer delivered schemes as future growth occurs throughout the area.

Problems Identified

2.4.5 The following problems have been identified within the Study area. The Fengate Access Study Improvement Schemes will address these challenges:

- Congestion and Delay
- Accident Rates
- Poor Active Travel Infrastructure
- Asset Condition (Junction 7)

2.4.6 If not resolved, these issues will compromise the City's growth aspirations, as well as The Council's objectives to remain a pleasant place to live and work.

Existing Congestion and Delay

Area Wide

2.4.7 High levels of congestion and delay are experienced across the study area in both the AM and PM peak hours. Note that these issues were identified before the COVID-19 pandemic but have been reverified in 2022, following the lifting of all restrictions. Further information on the impact of COVID-19 on Peterborough's traffic levels can be found in section 2.12 'Key Risks'.

2.4.8 Figures 2.2 and 2.3 overleaf show the typical traffic conditions across the study area on an average weekday according to Google traffic, for the AM and PM peaks respectively.

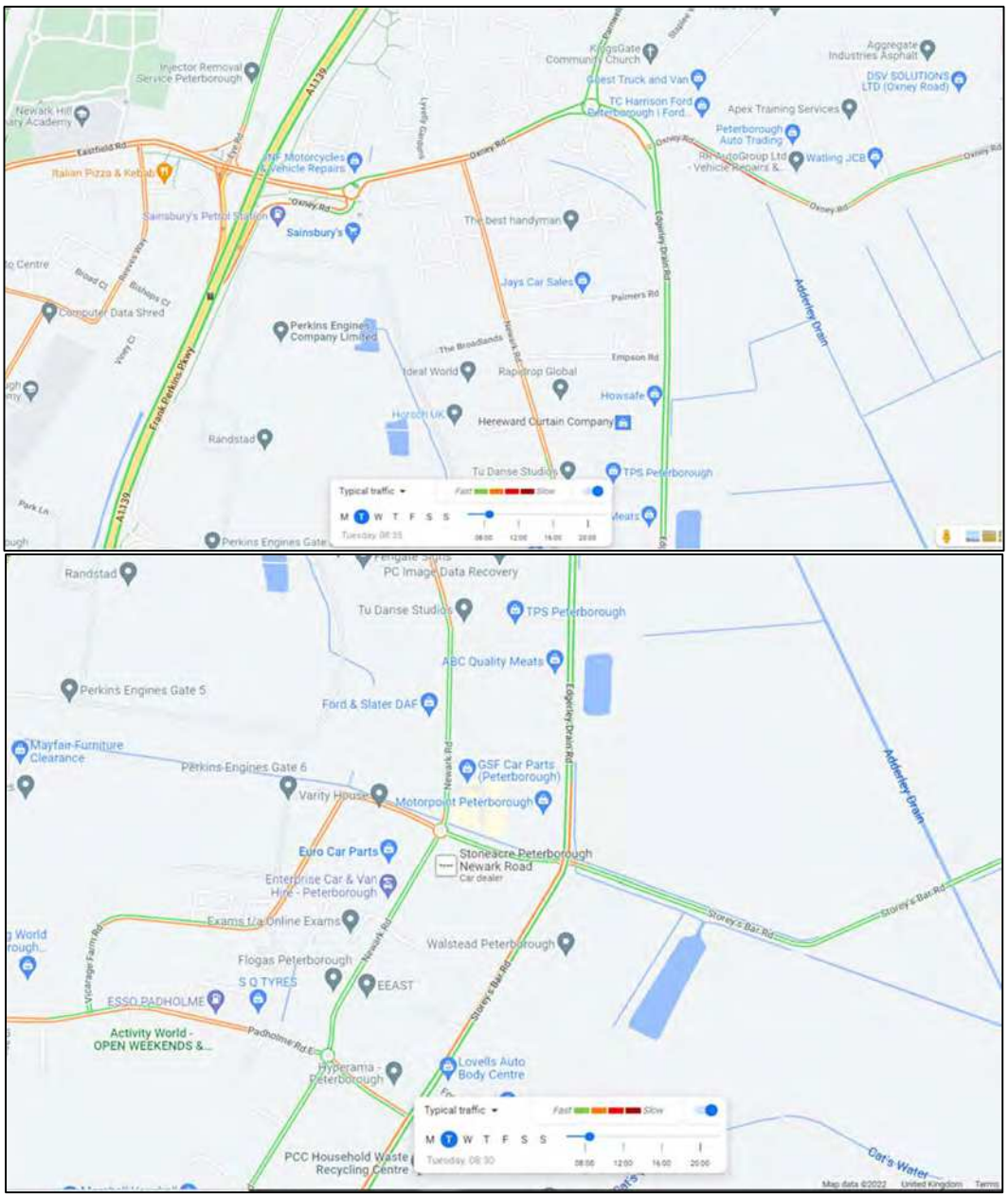

Figure 2.2: AM Peak Hour Congestion within Fengate (Google Average Tuesday Traffic)

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2.4.9 Delay within Fengate is particularly common along Storey's Bar Road during the AM peak hour, particularly when travelling northbound towards Edgerley Drain Road, which is a consequence of the signalised junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road. The delay on Storey's Bar Road from the signalised junction can extend back 0.7 miles impacting the operation of the Fengate / Boongate Junction.

2.4.10 The Newark Road northbound approach to Oxney road also shows a large amount of delay, indicating queues of around 600 metres. The Eastfield Road approach to Junction 7 also suffers from delays, which often extend back 800m to the Peterborough Regional College (University Centre) site. Junction 7 generally experiences delay on all arms.

2.4.11 Figure 2.3 below shows the typical traffic conditions across the area on an average weekday halfway through the PM peak hour.

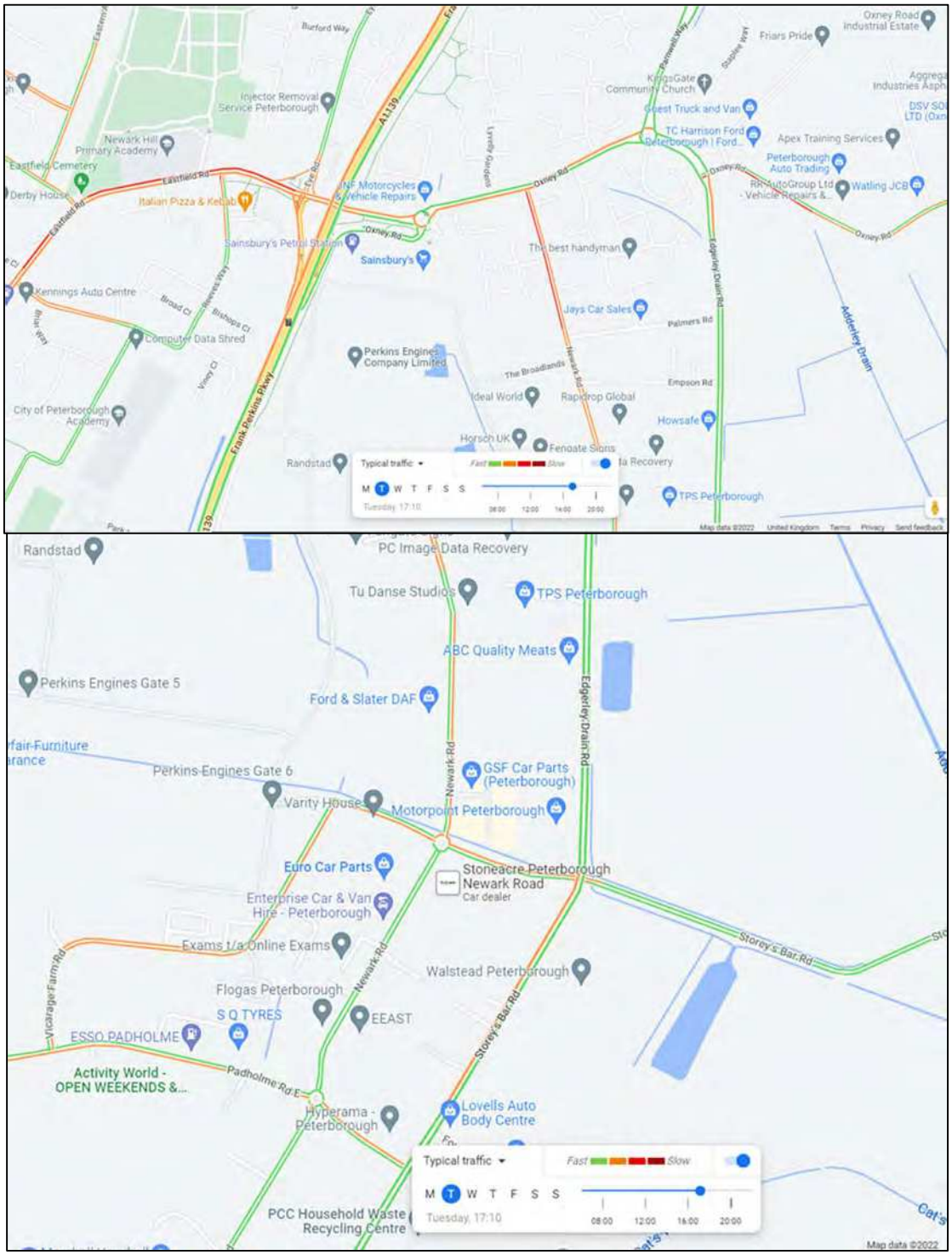

Figure 2.3: PM Peak Hour Congestion within Fengate, January 2022 (Google Live Traffic)

2.4.12 The location of delay and congestion in the PM peak is similar to that shown in the AM peak hour, however congestion appears to be more significant in some locations. Most notably, the Eastfield Road eastbound approach to Junction 7 and Newark Road Northbound approach to Oxney Road both fall into the red category, indicating significantly reduced speeds.

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Junction Specific – Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road

2.4.13 Satellite Navigation data has been used to assess journey times and delay at the key junctions within the study area. The data provided is for the period from the 15th of November 2017 to 13th December 2017. The dataset was selected to avoid major roadworks scheduled for 2018 / 2019 that would have influenced the journey times, and the impact of the COVID-19 Pandemic from Spring 2020 to Spring 2022.

2.4.14 Figure 2.4 displays the journey times for vehicles on the approaches to Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junctions, for the following time periods:

- Free Flow (FF) (00:00 – 05:00)
- AM peak hour (08:00-09:00)
- PM peak hour (17:00 – 18:00).

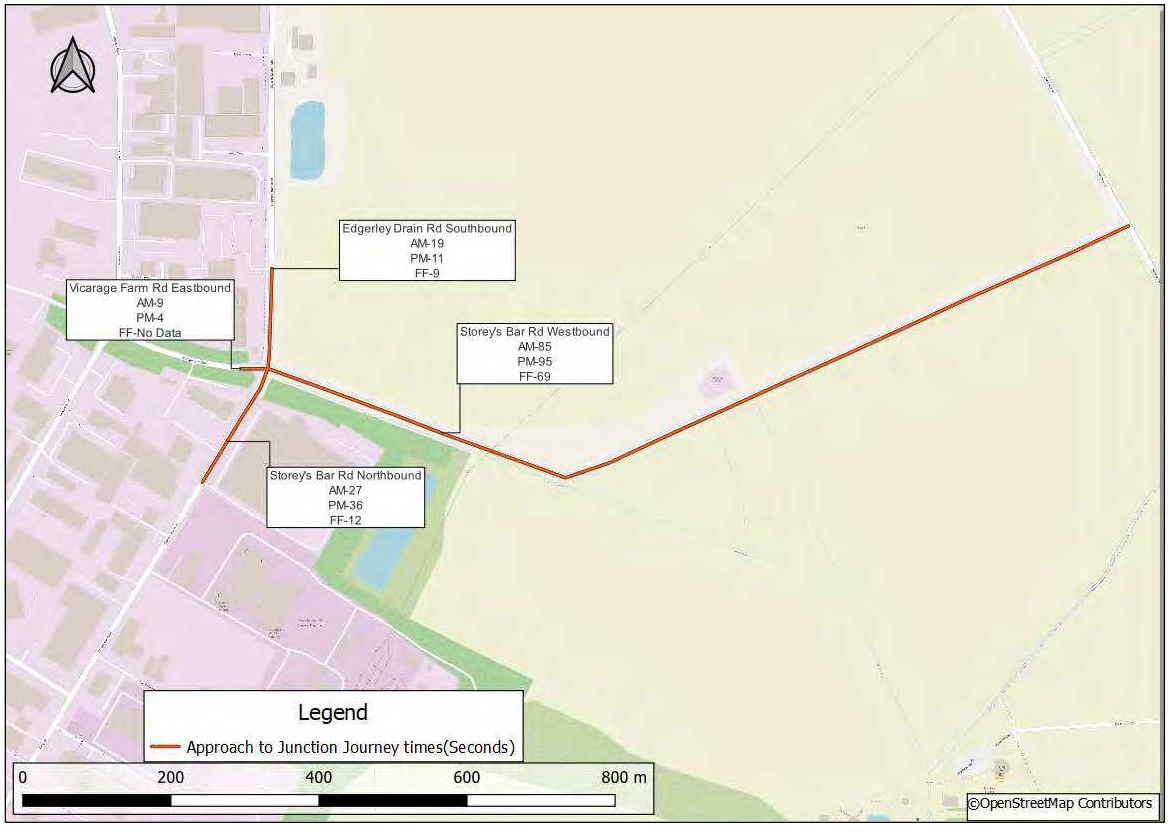

Figure 2.4: Journey Times for Edgerley Drain Road / Storey's Bar Road / Vicarage Road Junction

2.4.15 Journey time data at the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road junction shows that delays of between 10 – 16 seconds per vehicle occur on three of the approaches during both the AM peak hour, and delays of approximately 25 seconds occur on both Storey's Bar approaches in the PM peak hour.

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Junction Specific – Junction 7

2.4.16 The same Satellite Navigation data has been used to assess journey times and delay at Junction 7, as shown in Figure 2.5 overleaf.

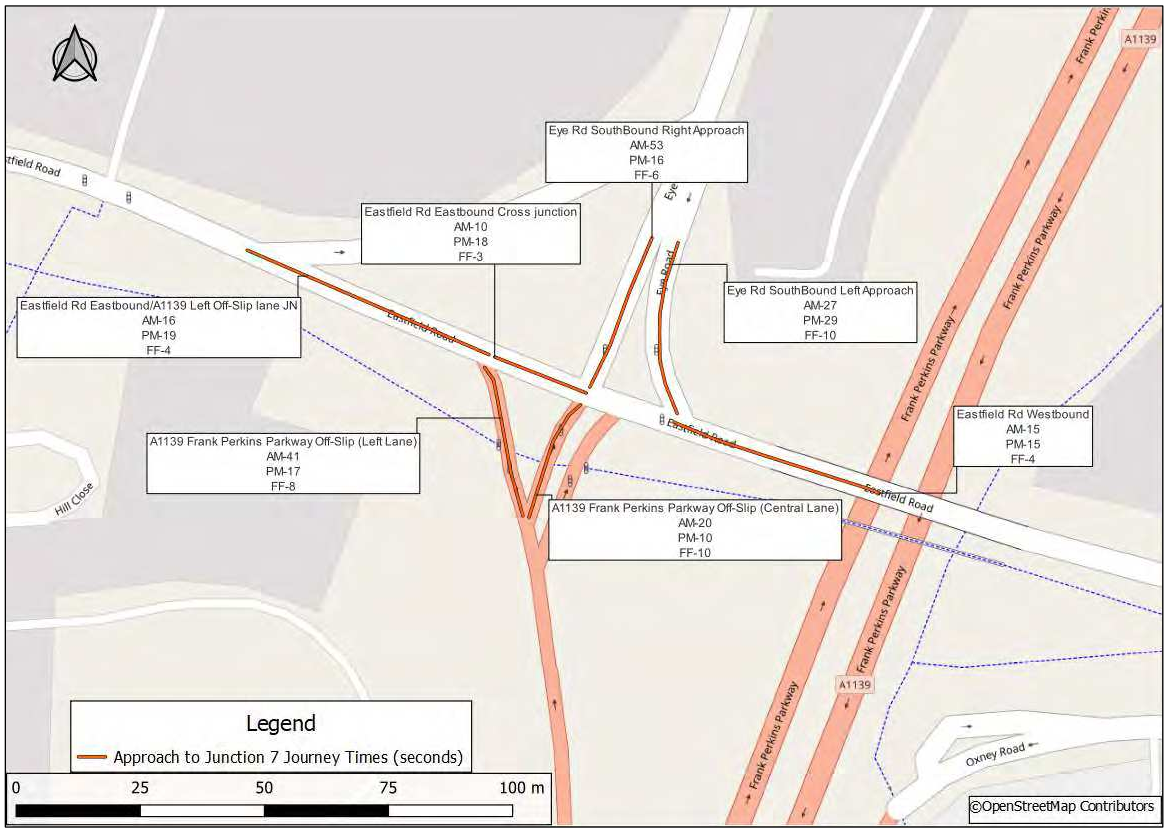

Figure 2.5: Journey Time Data for Junction 7

2.4.17 All approaches to Junction 7 experience delay in the AM peak hour, most noticeably on the A1139 Frank Perkins Parkway off-slip and the Eye Road southbound approach.

2.4.18 The Eye Road South approach right lane is shown to have the greatest increase in delay in the AM peak hour, with journey times of 53 seconds compared to 6 seconds in the free-flow period. During the PM peak hour, the greatest delay switches to left lane of Eye Road South approach whereby 29 seconds of delay is added to journey times, compared to the 10 second free-flow conditions. This pattern may reflect the tidal movements of motorists using Eastfield Road to join or leave the A1139 Frank Perkins Parkway during peak times.

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Accident Rates

2.4.19 Personal Injury Accident (PIA) data was also collected for the purposes of COBALT assessment, for a 5-year period covering 2015 to 2019.

2.4.20 Figure 2.6 below shows a map of accidents in the Fengate study area, coloured by severity.

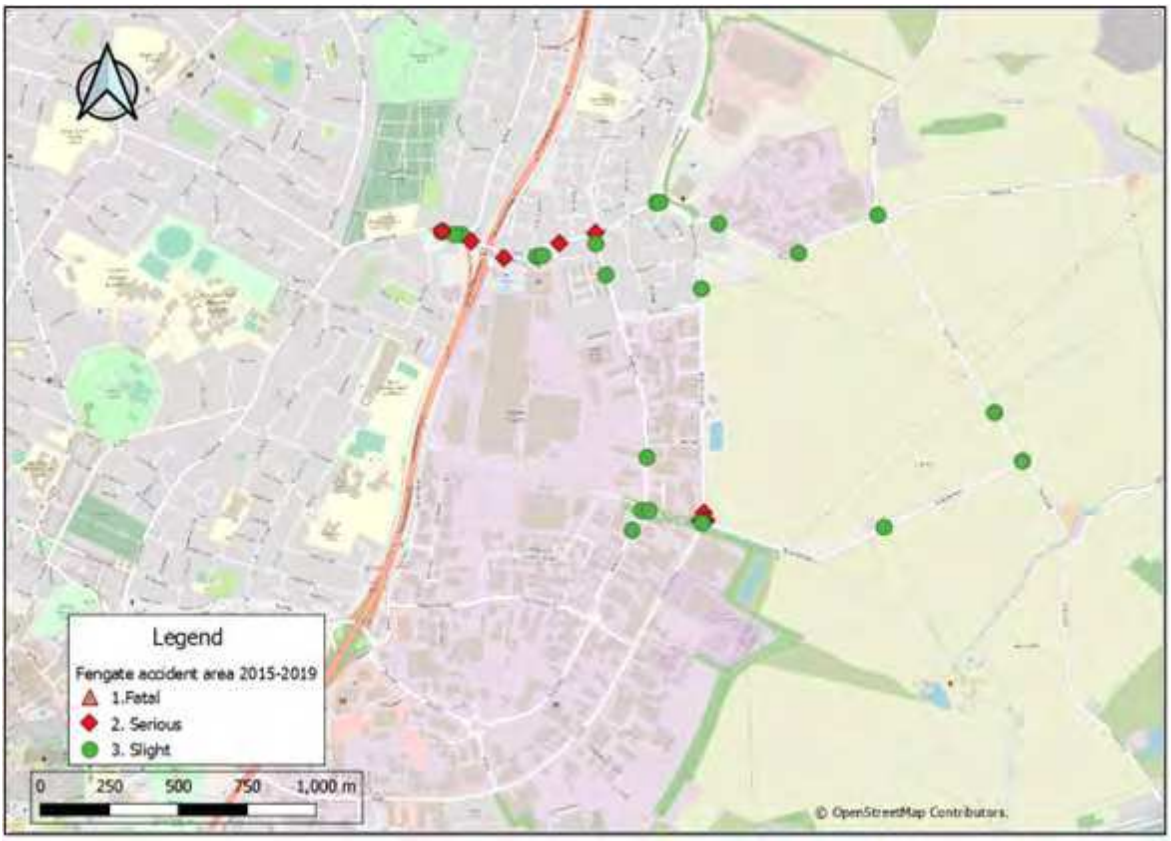

Figure 2.6: Personal Injury Accidents by Severity

2.4.21 Figure 2.6 shows 33 total accidents, comprised of 0 “Fatal”, 9 “Serious”, and 24 “Slight”. Seven of these occurred at the Edgerley Drain Road / Storey’s Bar Road / Vicarage Farm Road Junction, and 6 on Newark Road. Of the 33 accidents, there were 40 casualties, including 2 pedestrians, 11 cyclists, 3 powered two wheelers, 5 OAPs and 1 child.

2.4.22 In all, 73% of the total accidents were classified as slight while the remaining 27% were serious. It is also worth noting that 44.4% of the serious accidents occurred at night the junction was lit by streetlights, suggesting opportunities to improve street lighting as part of scheme designs at these locations.

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Poor Active Travel Infrastructure

2.4.23 The existing Active Travel infrastructure in Fengate area is either poor in both quality and quantity, or completely non-existent. This harms the area's connectivity and discourages the uptake of active travel journeys, compromising the potential for sustainable development in this area.

2.4.24 Figure 2.7 below shows the relative density of existing cycleway provision in the Fengate area. Higher levels of provision are represented by the darker coloured cells.

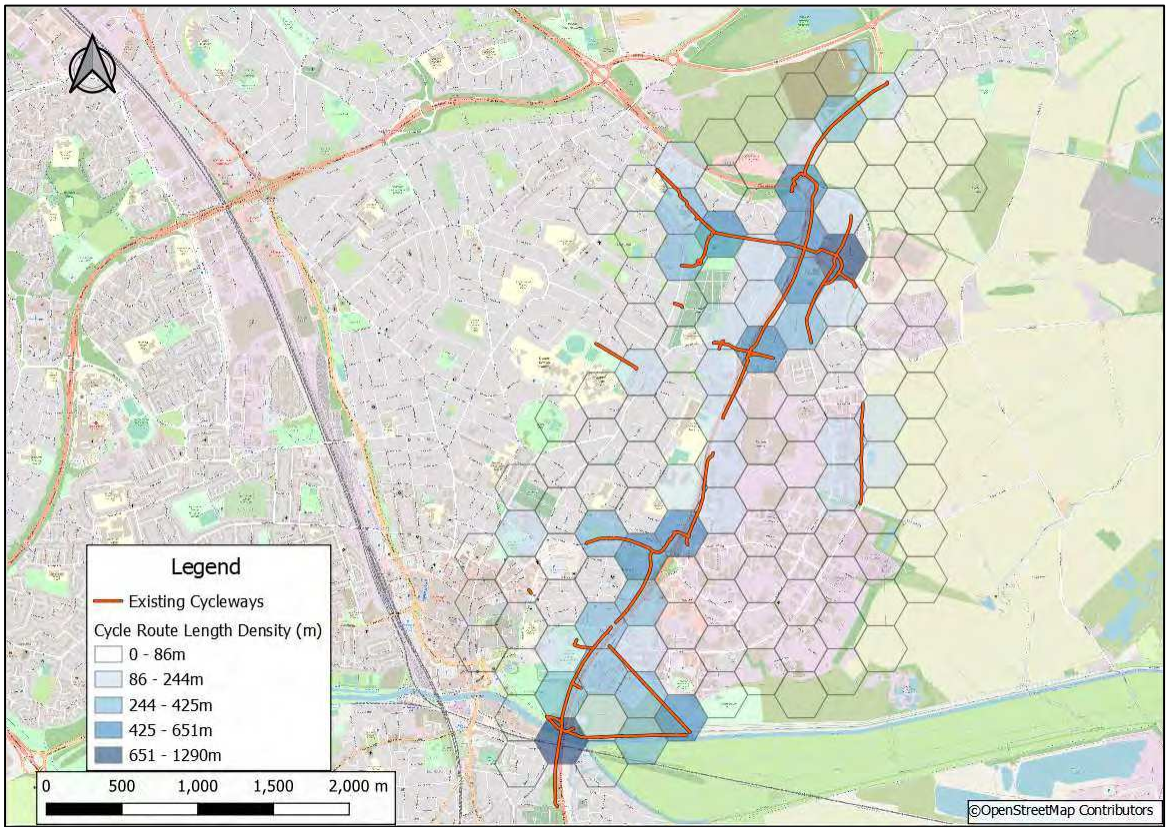

Figure 2.7: Existing Cycle Infrastructure In Fengate Study Area

2.4.25 Figure 2.7 shows that there is a clear lack of cycling infrastructure in the Fengate area, with a few scattered areas of connectivity that do not provide an acceptable level of sustainable access into the Fengate area.

2.4.26 In addition to the lack of cycling infrastructure in many parts of Fengate there are also areas with very poor existing provision. The current layout at Junction 7 includes segmented, cluttered, and confusing cycling provision which is not inviting to users. Figure 2.8 below shows the pedestrian and cycle areas crossing the A1139 Frank Perkins Parkway northbound approach to Junction 7, and Figure 2.9 shows the same crossing from Eastfield Road.

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Figure 2.8: View of Northbound Approach to Junction 7, Showing Poor Cycle Provision Crossing Traffic Lanes (Google, 2022).

Figure 2.9: Alternate View of Northbound Approach to Junction 7, Showing Poor Cycle Provision Crossing Traffic Lanes (Google, 2022).

2.4.27 Figures 2.8 and 2.9 show alternate views of the existing active provision through Junction 7, which requires cyclists and pedestrians to cross three separate lanes of traffic, with the possibility of being caught between them. Of the six accidents recorded at this location between 2015 and 2019, five of the accidents involved a cyclist.

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2.4.28 It is worth noting that this route is heavily used by pupils travelling between residential areas to the east of the A1139 Frank Perkins Parkway to primary and secondary education facilities located to the west along Eastfield Road.

Asset Condition (Junction 7)

2.4.29 Junction 7 of the A1139 Frank Perkins Parkway provides access to the north of Fengate from the Peterborough Parkway Network and is a key gateway into Fengate. As described above, the junction experiences peak hour congestion and the active travel provision is currently poor. In addition to these problems the current asset is outdated and in poor condition, and improvements at this junction offer the opportunity to address this.

2.4.30 The traffic signal equipment at Junction 7 is beyond its serviceable life and is the second oldest signal asset in Peterborough. The site infrastructure was originally installed in 1984 making it 38 years old which is 23 years beyond its intended design life. The site controller was installed in 2003 which has also exceeded its recommended design life of 15 years.

2.4.31 The site has been identified as a significant maintenance risk due to lack of ducting and is a safety concern having failed recent inspections. The asset condition, along with issues associated with congestion and poor active travel provision, have all been identified as problems at Junction 7 and have been addressed through the Fengate Access Study.

2.5 Impact of Not Changing

2.5.1 As highlighted above, Fengate is identified as an area of growth in the Peterborough Local Plan, with residential and employment allocations expected to come forward before 2036.

2.5.2 Without intervention the existing issues will continue to worsen and compromise the viability of local growth aspirations:

- Congestion and Delay
- Accident Rates
- Active Travel Provision
- Asset Condition.

Worsening Congestion, Delay and Poor Journey Times

2.5.3 The Peterborough Transportation Model (PTM3) has been used to assess conditions within Fengate should the growth occur without any broader highway improvements (Do Minimum Scenario).

2.5.4 PTM3 was developed using SATURN (v11.4.07H), which is a suite of network analysis programs. SATURN allows the user to model baseline and future year traffic conditions, such as traffic volumes, capacities, and delays, at a strategic level and analyse the impact of potential road-investment schemes.

2.5.5 The model has been constructed to represent the morning (08:00 - 09:00), Inter (14:00 - 15:00) and evening (17:00 - 18:00) peak hours, to reflect the most congested time periods across Peterborough's network, and it models cars, LGVs, HGVs and buses. The base model was validated using traffic count and travel time data from 2019.

2.5.6 The PTM3 forecast models use the base model and applies traffic growth sourced from the Department for Transport's Trip End Model Presentation Program (TEMPro v7.2), National Road Traffic Forecasts (NRTF) and trip rates for local developments. Forecast growth has been calculated for 2026, 2031 and 2036 to align with the Local Plan.

Do Minimum Model Results

2.5.7 Figure 2.10 and Figure 2.11 provide peak hour delay across the study area network in the 2036 Do Minimum scenario. The green bars represent delay in 2036 resulting from growth within the area. These bars indicate where future congestion and delay is expected to occur.

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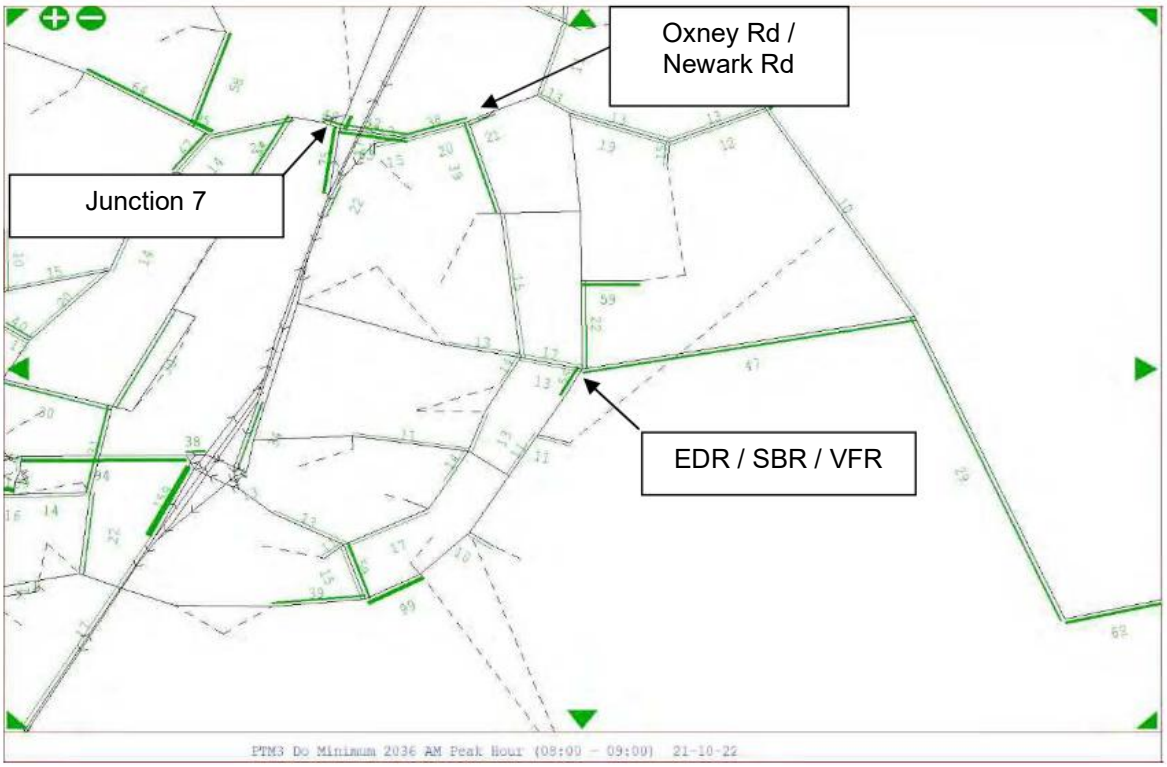

Figure 2.10: AM Peak Hour Delay, 2036 Do-Minimum Scenario (PTM3)

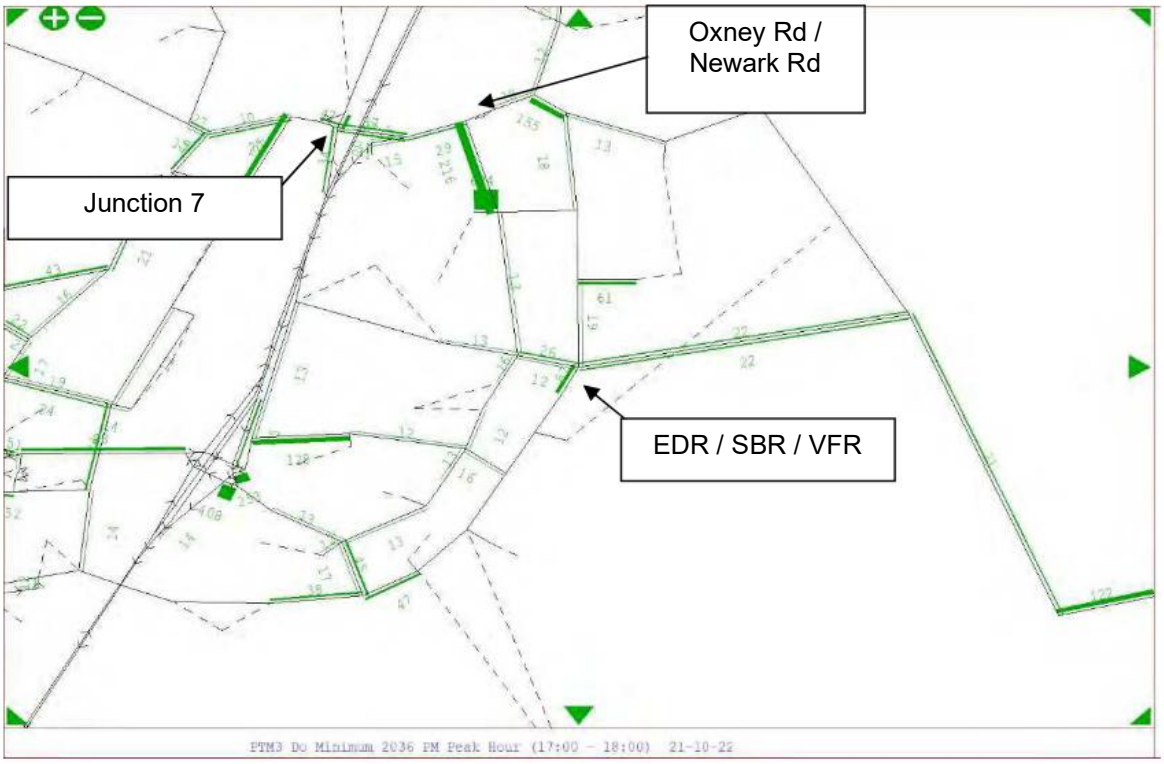

Figure 2.11: PM Peak Hour Delay, 2036 Do-Minimum Scenario (PTM3)

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2.5.8 Figures 2.10 and 2.11 show that the biggest increases in delay during peak hours are forecast at:

- Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction – Storey's Bar Road westbound approach will experience an increase in delay of 47 seconds per vehicle in the AM peak hour. The Storey's Bar Road northbound approach will experience delays of 55 seconds per vehicle in the AM peak hour and 87 seconds per vehicles in the PM peak hour.
- Junction 7 – The A1139 Eye Road approach will have an increase in delay of around 91 seconds per vehicle in both the AM and PM peak hour. The A1139 northbound off-slip will experience 75 seconds delay per vehicle in the AM peak hour and 34 seconds per vehicle in the PM peak hour.
- Oxney Road / Newark Road – the average delay per vehicle will be 219 seconds in the PM peak hour without intervention.

2.5.9 There are several other junctions to the south and west of the study area that are also expected to experience significant increases in delay with future levels of growth. These are addressed within the University Access Study, which is currently developing Preliminary Designs and an Outline Business Case for a range of interventions for these locations.

Accident Rates

2.5.10 Without intervention, accident rates will not change significantly. However, an increase in traffic in the future without intervention would increase the exposure to current highway conditions that result in accidents. A consequence of this would be an increase in local accidents as future growth is realised.

Active Travel Provision

2.5.11 Without intervention for active travel users, there will be a missed opportunity to increase active mode uptake in the area. As stated in the government's Cycling and Walking Investment Strategy (2017), "Realising our ambition will take sustained investment in cycling and walking infrastructure".

Asset Condition (Junction 7)

2.5.12 If an improvement scheme is not delivered at Junction 7 then emergency repairs will be needed at this site, either due to further asset deterioration or damage following an RTA. Any repairs would be limited to the minimum required to 'make safe' due to pressures on the council's existing maintenance budgets and would not significantly alter the form or operation of the junction, and therefore miss opportunities to reduce congestion and improve the active travel provision at this location.

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2.6 Internal Drivers for Change

2.6.1 Internal drivers for change are factors that 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 to access Fengate come from local growth aspirations in an area that has some of Peterborough's highest deprivation levels, and from the structured framework of support provided by the CPCA to enable this growth to be realised.

Local Growth Aspirations

2.6.3 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[17]. 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.

2.6.4 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 improving access to the key employment area of Fengate.

2.6.5 Table 2.3 and Table 2.4 below show the breakdown of the allocated sites by location and the timescale in which they are expected to come forward. There are 488 dwellings proposed within Fengate, however 350 of these are proposed at Fengate South, which lays beyond the Fengate Access Study area.

2.6.6 The largest employment allocation is Red Brick Farm at 126,600 sqm, which is likely to be a mixture of B8 (Storage and Distribution) units and B2 (General Industry) unit with ancillary B1 office space. The remaining allocated land takes the form of smaller sites across Fengate which are likely to be B1 or B2 uses.

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

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Table 2.3: Residential Development Proposed for Fengate

Residential Developments (Units)					
Local Plan Development	Up to 2019	2019-2026	2026-2031	2031-2036	Total Units
Potters Way Fengate		18			18
Fengate South		0	150	200	350
Former Perkins Engines Site Newark Road		104			104
Tanholt Farm, Eyebury Road		3			3
Rear of 83 Oxney Road		5			5
105 Oxney Road		8			8

Table 2.4: Employment Development Proposed for Fengate

Mixed Commercial Developments (sq.m)						
Local Plan Development	Land Use Class	Up to 2019	2019 -2026	2026 -2031	2031 -2036	Total Size (sq.m)
Red Brick Farm	Employment			126,600		126,600
Oxney Road Site C	Employment			34,825		34,825
Perkins South	Employment			14,700		14,700
Land of Third Drove and fronting Fengate	Employment			5,950		5,950

2.6.7 It is acknowledged that if no changes are made to existing congestion and journey times then growth aspirations will be compromised. The Local Transport Plan identified that infrastructure requirements are needed to address existing capacity constraints on the local network and cater for the increased travel demand arising from growth in Fengate, as well as across the rest of the city.

Index of Deprivation

2.6.8 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.

2.6.9 Despite high population growth, the socio-economic growth of the city has not grown at an equal rate, 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].

2.6.10 Figure 2.12 overleaf 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))

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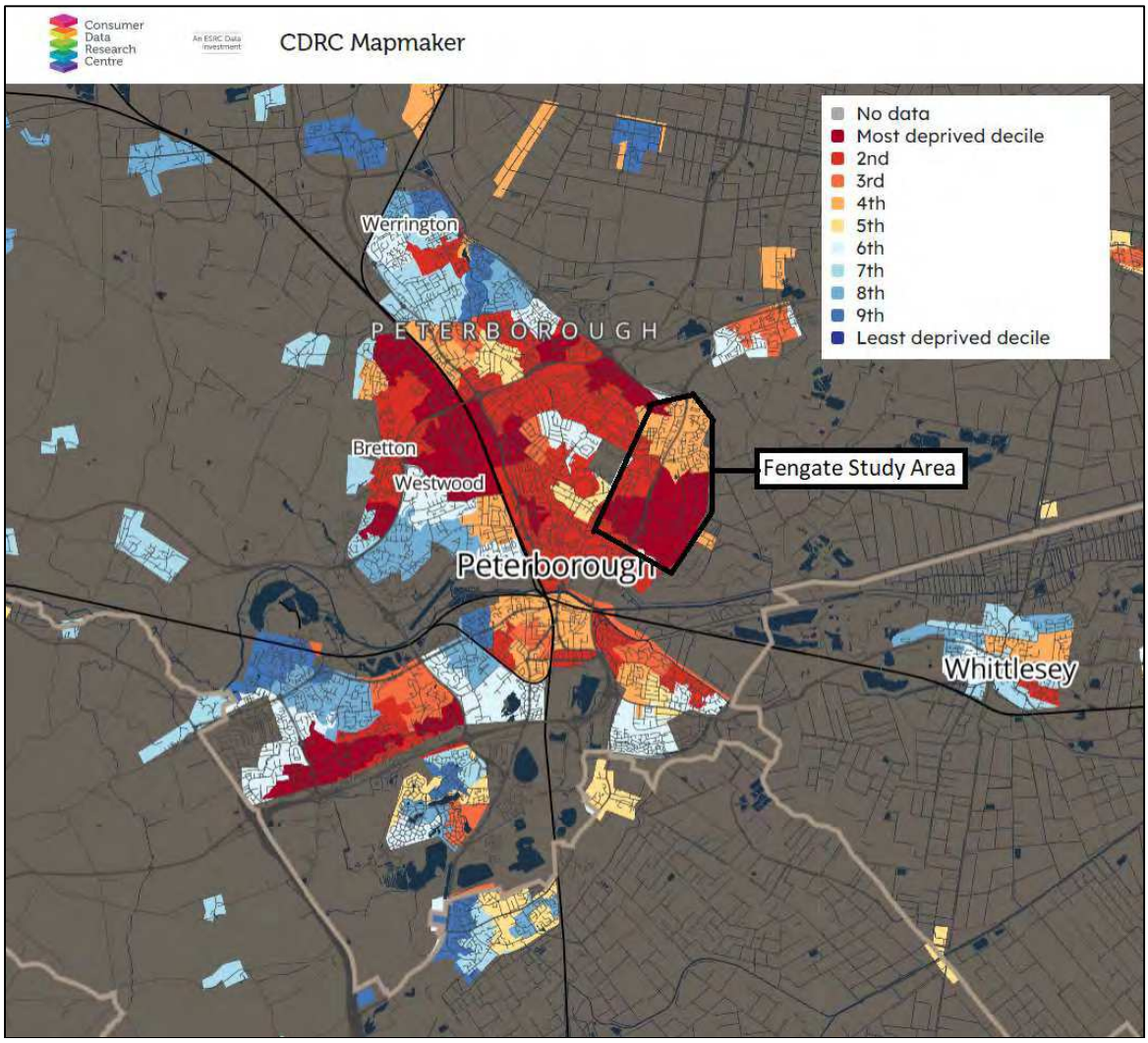

Figure 2.12: 2019 Index of Multiple Deprivation (Consumer Data Research Centre)

2.6.11 As highlighted in Figure 2.12, 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 10% - 30% most deprived within Peterborough.

2.6.12 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.

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Combined Authority Support

2.6.13 The CPCA has identified strategic projects which it believes will provide transformational benefits for the area. The Fengate Access Study is one of the studies shortlisted as a priority, and the consequent designation of funding and the CPCA's investment strategy are considered internal drivers.

2.7 External Drivers for Change

2.7.1 Peterborough's Local Plan has identified significant amounts of employment growth within the Fengate area. The Red Brick Farm site constitutes a large portion of this and is actively seeking outline planning approval, and this is an external driver for the Fengate Access Study.

2.8 Scheme 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. Secondary objectives tend to be delivered because of the primary objectives, as a causal chain effect.

2.8.2 The objectives for the Fengate Access Study were originally 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 were based on the goals and outcomes from local policy documents at the time, such as the Peterborough Local Plan.

2.8.3 Although the original objectives pre-date those of the CPCA, work has been undertaken to ensure they align with the problems identified in Section 2.4 and the most recent CPCA, PCC and transport objectives. The primary and secondary objectives for the Fengate Access Study are listed beneath.

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2.8.4 The primary objectives include:

1. **Tackle congestion and reduce delay:** Traffic signal improvements at key pinch points in Junction 7 of the A1139 Frank Perkins Parkway will tackle congestion and reduce delay.

2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** Help to bring about the planned employment growth at Red Brick Farm.

3. **Protect the local environment and improve biodiversity:** Environmental improvements will achieve 20% biodiversity net enhancement within one year in the study area.

4. **Improve Road Safety:** Reduce personal injury accidents and improve personal security amongst all users by making traffic signal improvements in Junction 7 and creation of mini roundabout at the junction of Oxney Road / Newark Road.

5. **Improve Active Travel Provision with Fengate:** Improve active travel provision by creating a new pedestrian crossing over Oxney Road and making improvements to Newark Road footpath.

2.8.5 Secondary objectives include:

6. **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes affected by the traffic and congestion by making traffic signal improvements at junction 7 and junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Road as well as creating a mini roundabout at the junction of Oxney Road/Newark Road.

7. **Reduce Severance for Active Travel Users:** Reduce severance caused to active travel users by the road network by creating a new pedestrian crossing between Junction 7 and Oxney road/Sainsburys roundabout and improvements to Newark Road Footpath

8. **Upgrade Junction 7:** Upgrade the junction by making traffic signal improvements to overcome maintenance and safety concerns.

2.8.6 The Fengate Access Study package of schemes will satisfy all the primary objectives, and as many of the secondary objectives as possible.

2.8.7 Table 2.5 below demonstrates the link between scheme objectives and the goals and outcomes of the Peterborough Local Plan.

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Table 2.5: Alignment of Scheme of Objectives to Local Policy Documents

Scheme Objective	CPCA Local Transport Plan Objectives
Tackle congestion and reduce delay	• **Resilience** – Build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability
Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site	• **Housing** – Support new housing and development to accommodate a growing population and workforce, and address housing affordability issues • **Employment** – Connect all new and existing communities sustainably so all residents can easily access a good job within 30 minutes by public transport, spreading the region's prosperity
Protect the local environment and improve biodiversity	• **Environment** – Deliver a transport network that protects and enhances our natural, historic and built environments
Improve Road Safety	• **Safety** – Embed a safe systems approach into all planning and transport operations to achieve a Vision Zero – zero fatalities or serious injuries
Improve Active Travel Provision within Fengate	• **Health and Wellbeing** – Provide 'Healthy Streets' and high-quality public realm that puts people first and promotes active lifestyles
Positively impact traffic conditions on the wider network	• **Resilience** – Build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability
Reduce Severance for Active Travel Users	• **Health and Wellbeing** – Provide 'Healthy Streets' and high-quality public realm that puts people first and promotes active lifestyles • **Accessibility** – Promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all
Upgrade Junction 7	• **Resilience** – Build a transport network that is resilient and adaptive to human and environmental disruption, improving journey time reliability

SMART Objectives

2.8.8 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 Fengate Access Study project:

2.8.9 The Primary SMART objectives are:

1. **Tackle congestion and reduce delay:** To provide sufficient highway capacity at the following junctions (determined by a Degree of Saturation (DoS) of less than 90%) to support the development of the Red Brick Farm Site within the current Local Plan period (to 2036).
    - Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road
    - Junction 7.
2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** to provide sufficient highway capacity at the following junctions (determined by a Degree of Saturation (DoS) of less than 90%) to support the development of the Red Brick Farm site within the current Local Plan period (to 2036).
    - Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road
    - Junction 7.
3. **Protect the local environment and improve biodiversity:**
    - To provide a 20% Biodiversity enhancement within one year of scheme completion.
4. **Improve Road Safety:** to achieve the following per year reductions in personal injury accidents following scheme completion:
    - Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road – 50% per year reduction in all personal injury accidents
    - Junction 7 – 50% per year reduction in all personal injury accidents, and 75% per year reduction in personal injury accidents involving cyclists.
    - Oxney Road / Newark Road - 75% per year reduction in personal injury accidents involving pedestrians and cyclists.
5. **Improve Active Travel Provision with Fengate:** to directly link the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction to the western Red Brick Farm access with new cycle infrastructure and provide an upgraded pedestrian route along Newark Road between Oxney Road and Palmer's Road.

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2.8.10 Secondary SMART objectives include:

6. **Positively impact traffic conditions on the wider network:** to ensure that highway junctions within the study area to do not exceed an RFC of 0.85 / DoS of 90% because of growth from the Red Brick Farm site within the current Local Plan period (to 2036).

7. **Reduce Severance for Active Travel Users:** to provide an additional signalised crossing over Oxney Road between Junction 7 and the Oxney Road / Newark Road junction.

8. **Upgrade Junction 7:** to renew the assets twenty-year life expectancy and avoid all reactive maintenance costs for the traffic signal infrastructure at Junction 7 for five years following scheme completion (except for in the event of RTAs).

2.9 Measures of Success

2.9.1 Table 2.5 beneath 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 2.6: Measures of Success

Objective	Scheme Outcome	Measure of Assessment
Tackle congestion and reduce delay	• Reduce delay and journey times at key pinch points within Fengate and access into the area	• Traffic surveys to be conducted at major junctions within the study area • Comparison of existing and future journey times for key routes within the study area
Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site	• Ensure successful delivery of committed and statutory development across Peterborough, through increasing capacity on the road network, in order to cater for existing and future traffic demand	• Preferred scheme to be assessed against future traffic growth • Monitor quantum of development at Red Brick Farm against agreed development profile.
Protect the local environment and improve biodiversity	• Ensure a 20% biodiversity net enhancement within the study area	• Post scheme review of biodiversity gain compared to pre-scheme situation
Improve Road Safety	• Improve personal security and reduce personal injury accidents amongst all travellers.	• Review the existing accident statistics for the study area, then compare this against future data post construction
Improve Active Travel Provision within Fengate	• Improve active travel provision with the Fengate Access Study area.	• Post scheme audit of active travel provision.
Positively impact traffic conditions on the wider network	• Reduce delay and journey times on the surrounding network, positively impacting traffic flows through the Fengate area.	• Traffic surveys at major junctions within the study area • Comparison of existing and future journey times for routes within the study area
Reduce Severance for Active Travel Users	• Reduce severance caused to active travel users by the road network.	• Review the existing accident statistics for the study area, then compare this against future data post construction
Upgrade Junction 7	• Overcome Maintenance and safety concerns with the current study area. • Increase biodiversity through planting and landscaping within the scheme elements.	• Traffic modelling and satellite navigation data at major junctions before and after completion of the preferred scheme • Post scheme review of biodiversity gain compared to pre-scheme situation.

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2.10 Constraints, Powers and Approvals

2.10.1 The scheme constraints and mitigations are set out beneath in Table 2.6.

Table 2.7: Constraints and Mitigations

Constraint	Detail of Constraint	Mitigation
Funding / Budget	The cost of the scheme will need to compete with other transport infrastructure funding priorities which may exceed the CPCA's core transport investment budget allocation. A sufficient budget must be available to fund the scheme.	Dialogue with the CPCA has ensured that the scheme is identified within CPCAs Medium Term Financial Plan with an allocated budget, and that the scheme is included within all necessary funding decisions.
Historic Environment	There is a potential for significant archaeological constraints in the area. Flag Fen is close by and there have been other historical finds in the local area recently.	Thorough searches have been undertaken as part of the ensuing design phases to identify where archaeological remains may be found. An archaeological watching brief will be provided during the construction phase at the relevant locations agreed with the relevant PCC Officer.
Ecology	There is a potential for ecological constraints in the area.	Ecological surveys have informed the highway designs and identified any measures necessary to protect vulnerable species during construction. Ecologists will maintain a watching brief during the construction phase where appropriate.
Topographical	Fengate is at the edge of the Fens, is generally low level and flat, and the water table is typically quite high.	Topographical surveys have been undertaken at an early stage to identify any issues that could affect scheme designs. Any schemes developed in this area will need to include mitigations for flood risk.
Land Ownership	Where possible, improvements will need to be achievable within the land available. Any additional land acquisition required may act as a constraint.	The schemes have been designed to fit within the existing highway boundary / wider Peterborough City Council land (such as CRA land) where possible. Scheme designs were updated as part of the Detailed Design to ensure that no third-party land was required.
Non acceptance from the public or stakeholders	The scheme should not be considered controversial and should be capable of gaining support during stakeholder and public consultation.	Early stakeholder engagement has taken place with statutory stakeholders and local developers, as well as public consultation. Any relevant comments have been fed back into the scheme designs where appropriate.
Traffic Management	Traffic management will need to be carefully considered to ensure that there is minimal disruption to the Fengate area.	Agreements with PCC Streetworks team will be secured prior to construction to confirm TM arrangements and agree a construction programme.
Statutory Undertakers Plant	The presence of Statutory Undertakers Plant within the scheme extents is likely to result in the diversion of assets.	NRSWA C3 / C4 process have been undertaken with utility companies during Detailed Design and confirmed prior to construction commencing onsite. Sufficient lead in time for statutory diversions has been incorporated into the construction programme before work onsite commences.

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

Table 2.8: 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 construction. Temporary roadspace booking to be confirmed once construction programme finalised.
Environment	Protected Species Licence(s)	Natural England	Licence to undertake work activities which will disturb or remove protected species and/or damage their habitat.	Surveys undertaken in May & July 2021 did not definitively confirm presence of any protected species, however, on-going periodic monitoring recommended. Further ecological surveys have been programmed to ensure this is still the case. The requirement for any Protected Species Licences will be determined upon completion of these surveys and actioned accordingly. Nesting birds and potential for presence of water voles and roosting bats are currently the key species of concern. J7 Eastfield, Newark Road Footpath, Storeys Bar Road & A15: Pre-work nesting bird checks (within 24 hours) of all vegetation requiring removal will be needed if clearance works are undertaken during breeding bird season (typically March – September). J7 Eastfield & A15: Pre-work emergence or re-entry surveys to be undertaken between May and September prior to the commencement of the works. Storeys Bar Road: Update water vole survey required at least 12 weeks prior to the commencement of works within the period mid-April-September.
	Consultation	Peterborough City Council Tree Officer	All tree works must be undertaken in accordance with the '4572.Fengate.Vicarage.RHDHV.TPP' Arboricultural Method Statement & Tree Protection Plan, and the scope of tree removal must be approved by the Local Authority Tree Officer prior to commencement of works taking into account potential issues such as loss of trees providing a visual screening function and Tree Preservation Order (TPO) constraints. TPOs present within or in close proximity to the following schemes - Oxney Road (Newark Road Junction), Oxney Road (Eastfield Signals, Junction 7) and Oxney Road (Sainsburys Crossing).	Arboricultural Method Statement & Tree Protection Plan in place. Engagement with the Local Authority Tree Officer to be undertaken once construction programme confirmed. Stakeholder engagement recommended in advance of any tree clearance works to mitigate adverse public reaction.
	Section 61 Consent	Peterborough City Council Environmental Health Officer	Required for construction works which are likely to have a significant impact on receptors in relation to noise and vibration, particularly night-time works.	Section 61 Consent Application to be produced once construction programme confirmed.
	Air Quality	Peterborough City Council Environmental Health Officer	Consultation regarding modelled negative operational impacts on air quality.	Operational Air Quality Assessment completed. Engagement with Environmental Health Officer to be undertaken in Q4 2022.
	Heritage Feature	Peterborough City Council Cultural Heritage Officer	Oxney Road (Eastfield Signals, Junction 7) scheme has a war memorial located adjacent to the works. Engagement with Peterborough City Council Cultural Heritage Officer recommended considering the potential to disturb or damage the feature. Pre-works photographic survey also recommended.	Engagement with Cultural Heritage Officer to be undertaken in Q4 2022. Pre-works photographic survey to be added to the construction programme as a pre-construction activity.
	Flood Risk Activity Permit / Exemption	Environment Agency	Required for temporary and permanent works within 8m of a Main River and/or the Floodplain.	Meeting with Environment Agency on 05/08/2022. Additional information on temporary and permanent works within 8m of the Main River and/or Floodplain to be submitted for review and advice on exemption/permit requirements.
	Wayleave	Environment Agency Estates Team	Required to allow access to land/assets owned by the Environment Agency.	Environment Agency providing contact details and advised that Peterborough City Council will need to apply for this wayleave as the Client/Highways Authority.
	Ordinary Watercourse Consent	Peterborough City Council Flood & Water Management Team	Land Drainage Consent required for works which will impact on the channels and/or flows within ordinary watercourses, including existing drainage ditches.	Engagement with Peterborough City Council Flood & Water Team as the Lead Local Flood Authority (LLFA) required in Q4 2022 to determine Land Drainage Consent requirements for both temporary and permanent works. A Flood Risk Assessment is also likely to be required to demonstrate any potential impacts on flows associated with increases in hardstanding areas and associated discharge rates.
	Discharge Consent	Environment Agency, Peterborough City Council Flood & Water Management Team, and Anglian Water	Consent required to cover any temporary discharges of surface water to ground and/or existing watercourses during construction works. This includes dewatering and over-pumping activities and will require approval from either the Environment Agency and/or Peterborough City Council depending on the discharge locations. Engagement also required with Anglian Water as they have an existing permitted discharge/outfall into Padholme Drain and confirmation is needed that our temporary and permanent works will not impact on compliance with their discharge consent thresholds.	Information on temporary discharge arrangements to be submitted to the Environment Agency and/or Peterborough City Council Flood & Water Management Team as part of the pre-application engagement in Q4 2022. Engagement with Anglian Water on-going.
	Landscaping	Peterborough City Council	Storeys Bar Road - it has been agreed with Michael Britton and Darren Sharpe of Peterborough City Council that grass verges will be re-seeded with Emorsgate EL1 Flowering Lawn Mix or EL1 general purpose meadow mix. There is also an aspiration to plant some smaller trees along the north eastern section of Storeys Bar Road.	Design drawings and BoQ to be updated with agreed seeding specification. Landscaping activities to be included in the construction programme. Further engagement on tree planting required in Q4 2022.
	Archaeology	Peterborough City Council	Storeys Bar Road - a programme of archaeological evaluation by trial trenching is to be implemented in advance of the main construction works. This is for the whole of the road corridor, including the footprint of the scheme and any land outside that footprint (e.g., for drainage ditches, compounds, water reservoirs, access routes, cycle ways, etc.).	Quote obtained from Headland Archaeology to produce a Written Scheme of Investigation (WSI). This will need to be approved by Peterborough City Council Archaeology Services. The fieldwork and associated reporting will then be completed. Works to be programmed as a pre-construction activity.
	Scheduled Monument	Historic England	Storeys Bar Road - there is a Scheduled Monument (Flag Fen - NHLE 1406460) in close proximity to the scheme. The Bronze Age post alignment and timber platform features have been preserved within wet conditions and so any changes to the local groundwater levels could result in damage to these delicate and vulnerable remains. Historic England have asked for an assessment to be undertaken to determine if the development would alter the local hydrology and potential impacts on the Scheduled Monument.	Capita are currently undertaking a Tier 1 Hydrogeological Risk Assessment and this will be issued to Historic England in October 2022 for approval.
	Asphalt Waste Classification Testing	Environment Agency	Asphalt waste will be generated from a number of schemes but this has not yet been tested or classified in accordance with the Environment Agency's Technical Guidance WM3. This needs to be addressed to ensure legal compliance with Waste Duty of Care requirements.	Sampling Plan to be developed for this waste stream in Q4 2022 which is likely to entail advance and/or on-site testing, with the latter option presenting the greatest risks.
	Waste Exemptions	Environment Agency	Suitable waste exemptions need to be registered to allow low risk waste operations to be undertaken on site. This is likely to include temporary storage and on-site re-use of certain waste streams in accordance with specific conditions.	Waste exemptions to be registered in advance of the construction works. These are free of charge and take approximately 1 hour to register and are 'active' with immediate effect.
Design	RSA2	Peterborough City Council	Road Safety Audit Stage 2	Road Safety Audit Stage 1 and 2 Undertaken and comments have been agreed with the Client
	Drainage Consents	Environment Agency	Permitting	Awaiting consents
	Drainage Consents	Environmental Agency	Freehold transfers, CPO, wayleaves and easements etc.	Case is being reviewed awaiting comment
	Drainage Consents	North Level Drainage	Permitting	To be contacted with regards to working in close proximity of Adderley Drain.
	Drainage Consents	Anglian Water	Potential Drainage Consents	Anglia Water response required
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 the January 2023 CPCA Board meeting.

2.11 Scope

2.11.1 The project scope is to construct a package of schemes within the Fengate study area, which achieves the primary objectives of:

1. **Tackle congestion and reduce delay:** Tackle congestion at key pinch points across the Study Area and reduce delay in to the Fengate area.
2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** Help to bring about the planned employment growth at Red Brick Farm.
3. **Protect the local environment and improve biodiversity:** Ensure a 20% biodiversity net enhancement within the study area.
4. **Improve Road Safety:** Reduce personal injury accidents and improve personal security amongst all travellers.
5. **Improve Active Travel Provision with Fengate:** Improve active travel provision with the Fengate Access Study area.

2.12 Interdependencies

2.12.1 The key interdependency for the Fengate Access Study Improvements Schemes is the development of the Red Brick Farm. Without this development, the scale of growth to be accomodated within Fengate would be reduced, and may require a different form of intervention to overcome the identified challenges.

2.12.2 Outline Planning Permission has been secured for the Red Brick Farm site and the developers proactively engaging with PCC and have indicated that they intend to begin building in 2023, so there is considered to be a high degree of certainty that the development will materialise in the form currently proposed.

2.13 Key Risks

2.13.1 The Risk Registers provided in Appendix A identify the project and construction risks and provide appropriate mitigation measures for these, along with potential risk costs which have been included in the scheme costings used within the Financial and Economic Dimensions accordingly.

2.13.2 The main risks associated with the Fengate Access Study Improvement Schemes are:

- Land acquisition
- COVID-19 (legacy).

Land Acquisition

2.13.3 The initial scheme design for the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction required the acquisition of four individually owned parcels of land, totalling 6,243m^2, adjacent to the existing highway.

2.13.4 Discussions with these landowners began during the Preliminary Design phase of the project and continued throughout the Detaield Design stage, however progress has been limited.

2.13.5 This posed the single largest risk to delivery of the scheme as delays in agreeing land acquisition could compromise the TCF funding availability which is time limited. The TCF funding must be spent by March 31st 2024, and the risk of land acquistion delaying construction beyond this point was consdiered to be increasingly significant, and as a result of this the scope of the sceheme design was amended to remove the components requiring third party land (Edgerley Drain Road southbound and Storey's Bar Road westbound approaches).

2.13.6 The scheme now only includes improvements to the Vicarage Farm Road and Storey's Bar Road northbound approaches, along with active travel improvements along Edgerley Drain Road, all of which is within PCC land. The remaining components will be delivered at a future date via a different project / Business Case. The economic assessment included in this FBC has been updated to reflect the alteration to scope at this junction.

COVID-19 (Legacy)

2.13.7 There is a risk that the legacy of COVID-19 on travel patterns could undermine the need for schemes should traffic levels remain significanly below those observed when the schemes were 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 levels from a permanent monitoring site from the begining of the pandemic in March 2020 until November 2022. The figure shows that traffic levels have remained consistent and stable for much of 2022, and there is now little fluctutation due to the pandemic.

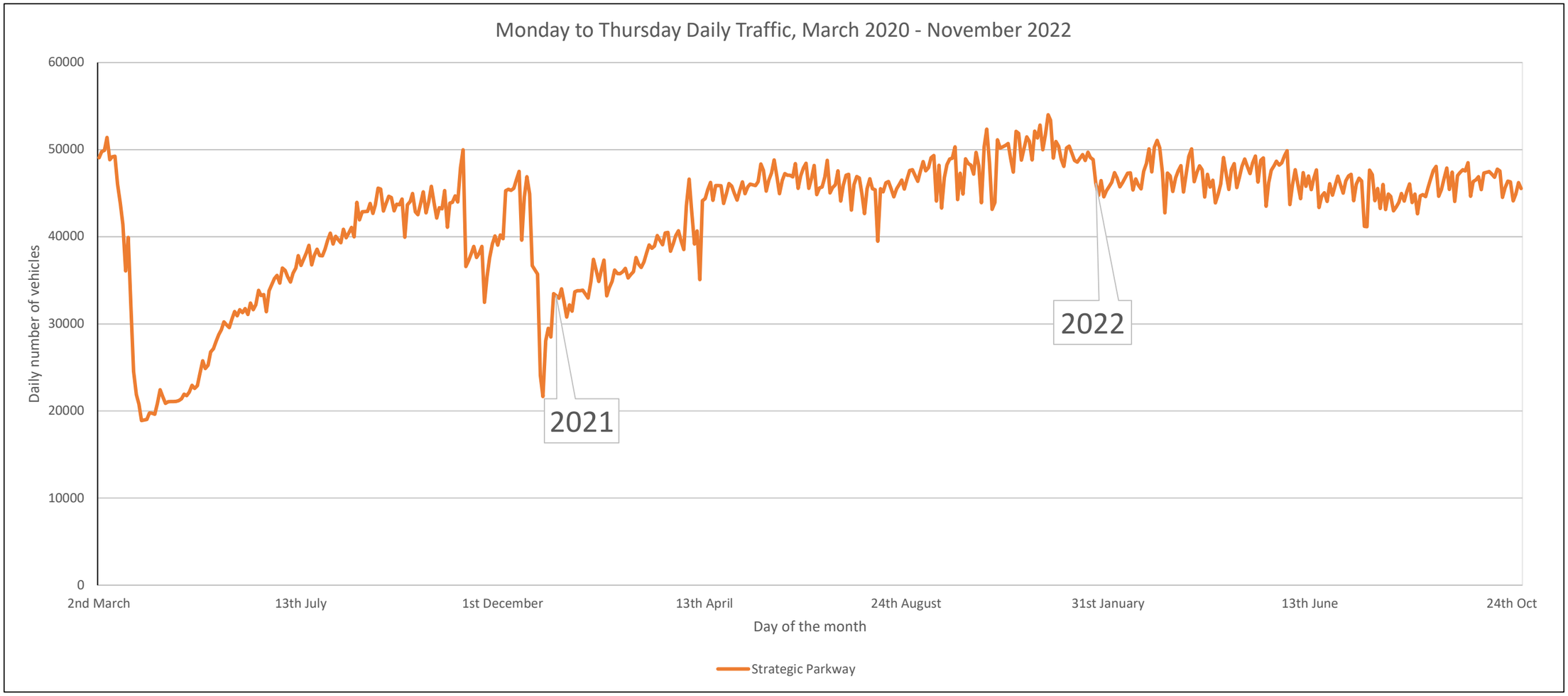

Figure 2.13: Peterborough COVID-19 Traffic Level Monitoring

2.13.10 Appendix A contains the Project Risk Register which identifies all other project 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 have been identified as:

- CPCA as the Local Transport Authority and funding body for the scheme.
- The Council as the Local Highway Authority.
- Natural England, as the organisation responsible for conserving, enhancing, and managing the natural environment.
- Environment Agency as the public body responsible for protecting and improving the environment.
- Statutory Undertakers, including Anglia Water, Utilities and Telecommunications Companies, who have infrastructure within the vicinity of the proposed schemes.
- The North Level District Internal Drainage Board (IDB) as the organisation responsible for managing water levels.
- Businesses and residents situated in Fengate that are within the vicinity of the scheme / s including the developers for the Red Brick Farm site.

2.14.2 Engagement and communication with key stakeholders is an essential part of planning Transport Schemes, and there has been appropriate levels of dialogue with all relevant stakeholders throughout the scheme design and development process. Stakeholder's needs and requirements have been considered for the final scheme design for Fengate, following the completion of stakeholder consultation.

Stakeholder Consultation

2.14.3 Stakeholder consultation was undertaken following approval of the SOBC and in line with the timings of the public consultation (2nd February – 18th March 2021). All key stakeholders were consulted via email or letter for comment on the scheme options prior to the commencement of Detailed Design, and their feedback has been used to shape the final scheme designs.

2.14.4 Feedback from the consultation has shown that all stakeholders support the package of schemes for Fengate and there are no conflicts with stakeholders interests. The environment, drainage, and active travel connections to the Red Brick Farm developer proposals have been the main discussion points during the stakeholder engagement.

Public Consultation

2.14.5 Public consultation on the concept of a scheme at Fengate was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan[21] that was adopted in January 2020. This consultation made residents aware that Fengate 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 were received.

2.14.6 A further round of public consultation took place between February and March 2021 using the concept designs. No comments were received relating the scheme designs themselves, however some feedback was received regarding the poor level of pedestrain infrastrcuture currently within Fengate. Two additional schemes were included in the package of works to address this (further infomation is provided in Section 2.16 beneath.

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 within the Fengate Access Study Option Assessment Report (OAR), which was submitted along with the SOBC in November 2020. Subsequent changes to the package of options made since submission of the SOBC are discussed at the end of this section.

2.15.2 An option development workshop was held on the 15th of May 2018 and attended by representatives from various disciplines within PHS. The workshop reviewed the existing conditions and future issues surrounding access to Fengate, explored its relationship with the surrounding road network and discussed the various constraints at the site. The purpose of the workshop was to develop a long list of potential improvement options to be considered by this study.

2.15.3 A total of twenty-four options were considered in the workshop, with potential schemes ranging widely in estimated cost and level of impact on the network. The twenty-four initial options formed the Long List which is shown in Table 2.8 beneath.

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

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Table 2.9: Long List of Options

Eye Road
Restrictions along Eye Road, including possible closure
Dual Eye Road southbound towards Junction 8
Junction 8
Grade-Separated Road (above Junction 8) connecting A15 Paston Parkway to A1139 Frank Perkins Parkway southbound
At-Grade Road connecting A15 Paston Parkway to A1139 Frank Perkins Parkway southbound through Junction 8 (Hamburger style roundabout)
Provide an additional Lane on the A15 eastbound from Junction 20 to Junction 8
New Link Road Options from Eye
New link road from Eye Road to Parnwell Way at the Keys Park Junction
New link road from Eyebury Road to the A47 on the west of Eye
Southern Eye bypass linking Eyebury Road to the A47 to the east of Eye
Oxney Road
Build a roundabout at Oxney Road / Edgerley Drain Road Junction
Build an elongated roundabout incorporating the Oxney Road / Edgerley Drain Road roundabout and the current roundabout at the Parnwell Way / Oxney Road junction
Signalise Oxney Road / Edgerley Drain Road Junction
Signalise the Oxney Road / Edgerley Drain Road and the Parnwell Way / Oxney Road Junctions
Restrict access to Oxney Road west from the Parnwell Way / Oxney Road junction
Junction 7
Build a grade separated junction at Junction 7
Build a grade separated junction at Junction 7 and dual Oxney Road towards Parnwell Way
Open Junction 6 to allow entrance and exit
Build a new link road from Newark Road to Sainsbury's Roundabout
Improvements to existing signals
Other Options
Add additional lane to Storey's Bar Road westbound from North Bank
Build a southern access road from Stanground Bypass to Storey's Bar Road
Replace Storeys Bar Road \ Edgerley Drain Road / Vicarage Farm Road signals with roundabout
Signal improvements to signals at Storeys Bar Road \ Edgerley Drain Road \ Vicarage Farm Road
Raise North Bank so it is not susceptible to flooding which requires route to close
Create a Park and Ride site

EAST Assessment

2.15.4 The EAST assessment was used to assess the Long List of options against the scheme objectives 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 2.9 beneath.

Table 2.10: Scheme Objectives

Strategic Objectives
Ability to reduce congestion
Ability to reduce journey times
Ability to improve air quality and reduce emissions
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
Project risk
Stakeholder support and public acceptability

2.15.6 The EAST Scoring Assessment is reported within the OAR. Scores were given in relation to the proportion of the expected impact on the entire junction and not just the section of road it occurs on. A neutral score was given when the score against an objective is uncertain, or there is a comparable negative and a positive element associated with the scheme.

2.15.7 Shortly after the EAST assessment had been undertaken, the scale of development planned for Red Brick Farm was significantly reduced from the original expectations. Initial proposals for the development meant that it was expected to generate around 6,000 vehicle trips per day, however the proposed land use mix was changed, and based on the current proposals, there are now expected to be approximately 600 additional vehicle trips per day.

Shortlisting Summary

2.15.8 Due to the reduced impact of the development on the highway network, the large strategic schemes being considered, such as bypasses and grade separated junctions, were removed from the list of potential options, and the smaller, more localised improvement schemes which scored well in the EAST assessment were taken forward for further assessment.

2.15.9 Table 2.10 details the options taken forward for further assessment, including traffic modelling.

Table 2.11: Modelled Package of Schemes

Junction 8
Provide an additional Lane on the A15 eastbound from Junction 20 to Junction 8
Oxney Road
Build a roundabout at Oxney Road / Edgerley Drain Road Junction
Signalise Oxney Road / Edgerley Drain Road Junction
Junction 7
Improvements to existing signals
Other Options
Replace signals at Storeys Bar Road \ Edgerley Drain Road / Vicarage Farm Road with a roundabout
Signal improvements to existing signals at Storeys Bar Road \ Edgerley Drain Road \ Vicarage Farm Road

Technical Assessment

2.15.10 The technical assessment of shortlisted options was undertaken using the PTM3 model. PTM3 has been developed using SATURN (Version 11.4.07H), a traffic and assignment model which can be used to evaluate potential traffic schemes. Saturn focuses on whether a defined network can cope with a defined vehicle demand in a defined time period.

2.15.11 The Saturn traffic model has been 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, to represent the most congested time periods. In addition, an Inter-Peak (14:00 to 15:00) model has also been constructed to understand the impact of any improvements outside of the congested periods of the day.

2.15.12 PTM3 has a 2019 baseline, and the model is validated and calibrated to ensure it represents the traffic conditions experienced on the network during the survey period.

2.15.13 To understand traffic conditions in future years, growth factors have been derived from the DfT's Trip End Model Presentation Program (TEMPro). Future year models were built using these growth factors for 2026, 2031 and 2036 scenarios. Local growth of LGV and HGV traffic has been estimated using 2015 Road Traffic Forecast data produced from the National Transport Model (NTM).

2.15.14 The technical assessment undertaken for the Fengate Access Study have concentrated on the 2036 future year to capture the full impact of the Local Plan growth. Further information on this assessment is contained within the Fengate Access Study OAR.

Option Packaging

2.15.15 The options described above were arranged into potential packages of improvements, designed to address the identified and forecast issues across the study area. Analysis of the packages focused on the change in delay and traffic flows, at sites across the network in both the AM and PM peak hours compared to the DM scenario.

2.15.16 The three packages tested were:

- Package 1 – New Roundabout at the Oxney Road / Edgerley Drain Road Junction, signal improvements to Edgerley Drain Road / Storey's Bar Road / Vicarage Farm road and an additional lane on A15 Paston Parkway between Junction 20 and Junction 8.
- Package 2 – New Roundabout at the Oxney Road / Edgerley Drain Road Junction, New Roundabout at Edgerley Drain Road / Storey's Bar Road / Vicarage Farm road and an additional lane on A15 Paston Parkway between Junction 20 and Junction 8.
- Package 3 – New traffic signals at the Oxney Road / Edgerley Drain Road Junction, signal improvements to Edgerley Drain Road / Storey's Bar Road / Vicarage Farm road and an additional lane on A15 Paston Parkway between Junction 20 and Junction 8.

2.15.17 The package locations are shown in Figure 2.14 overleaf.

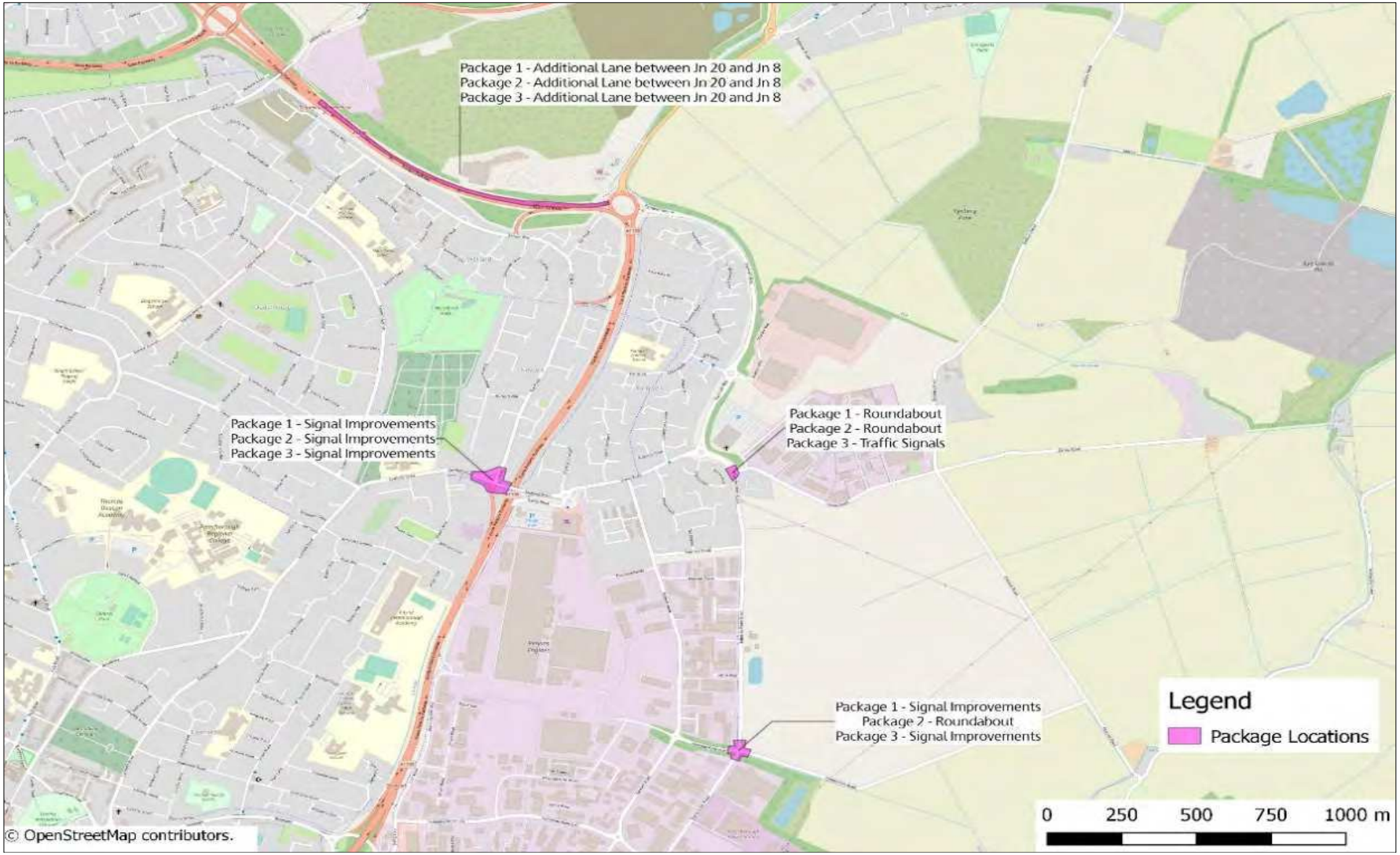

Figure 2.14: Fengate Access Study Package Locations

Preferred Package

2.15.18 Package 1 was identified as the Preferred Option and formed the basis of the SOBC submitted in November 2020, at which point it consisted of the following schemes:

- Creation of a roundabout at the junction of Oxney Road / Edgerley Drain Road
- Traffic Signal Improvements (including an initial Smart Junctions Trial) at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road.
- Traffic Signal Improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road)
- Creation of a third lane southbound on the A15 Paston Parkway approach to Junction 8 (A1139 Frank Perkins Parkway / A15 Paston Parkway / A1139 Eye Road / Parnwell Way).

2.15.19 Further information on the assessment of the three packages can be found within the Fengate Access Study OAR.

2.16 Preferred Option Development

2.16.1 The preffered package of schemes been updated since SOBC following changes to transport policy, stakeholder feedback and ongoing techncial and economic assessment.

2.16.2 The changes are summarised in Table 2.11 overleaf and are discussed beneath. These predominantly result from the increasing importance of active travel schemes in recent years and value engineering as designs and cost estimates have matured. The updated package now better reflects a combination of low cost and medium cost options that adress both highway and active travel concerns within the Fenagte study area.

Table 2.12: Amendments to Preferred Package Since SOBC

Scheme No.	Scheme Description	Status	Reason for Change
n/a	Creation of a roundabout at the junction of Oxney Road / Edgerley Drain Road.	Removed	This scheme will now be delivered by the Red Brick Farm development through a S106 agreement. This has now been removed from the package of schemes to be delivered by PCC on behalf of the CPCA, however still forms part of the council's transport strategy for the Fengate area.
1	Traffic Signal Improvements (including an initial Smart Junctions Trial) at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road.	Retained / Amended	This scheme has been retained; however, the scope of the improvements has been amended since SOBC to include high quality active travel provision at the junction and remove improvements to the Edgerley Drain Road and Storeys Bar Road westbound approaches which require land acquisition.
2	Traffic Signal Improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road).	Retained / Amended	This scheme has been retained; however, the scope of the improvements has been significantly enhanced since SOBC to include high quality active travel provision at the junction.
n/a	Creation of a third lane southbound on the A15 Paston Parkway approach to Junction 8 (A1139 Frank Perkins Parkway / A15 Paston Parkway / A1139 Eye Road / Parnwell Way).	Removed	This scheme was removed following a value engineering exercise. The cost estimate for this scheme increased during the preliminary design phase due to changes in design standards. Site investigations also confirmed a high level of tree loss would result from construction of the scheme which had not been anticipated prior to design. Furthermore, changes to transport policy since the SOBC was submitted have placed much greater emphasis on active travel improvements and localised highway improvements instead of large-scale highway only schemes. In light of these circumstances, sensitivity testing was undertaken to understand the impact of removing this scheme from the package, and this testing demonstrated that the package of schemes would still offer high value for money whilst reducing environmental and cost risks.
3	Creation of a mini roundabout at the junction of Oxney Road / Newark Road.	Added	This scheme was added following ongoing technical assessment which identified that improvements to Junction 7 as well as developer led improvements to the Oxney Road / Edgerley Drain Road Junction would improve traffic flow along Oxney Road, resulting in an increase in delay on Newark Road as joining from the side road becomes more difficult. To alleviate this issue, a mini roundabout has been designed for this location, and transport modelling has demonstrated that it provides clear benefits by reducing queues and delay on Newark Road without causing a significant increase in delay to the dominant flow along Oxney Road (as would be caused by a traffic signal-controlled junction).
4	Improvements to Newark Road footpath.	Added	Feedback from residents identified a poor level of provision for pedestrians along Newark Road, which forms part of a broader route between Oxney Road (and residentials areas to the north of the study area) and the employment sites in the southern half of the study area.
5	Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.	Added	Again, this scheme was added following public and stakeholder consultation which identified the need to provide a safe crossing point over Oxney Road (in the vicinity of Sainsburys) to overcome the severance caused by the road and serve pedestrian desire lines to key services.

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Oxney Road / Edgerley Drain Road Roundabout

2.16.3 This scheme consisted of converting the existing priority junction at Oxney Road / Edgerley Drain Road into a roundabout to reduce delay on the Oxney Road westbound approach. High levels of delay already occur here during peak hours, and these are expected to increase as growth occurs across Fengate and the Red Brick Farm site is developed.

2.16.4 The planning application for the Red Brick Farm site has progressed since the submission of the SOBC, and a commitment to deliver this scheme has been secured through a S106 agreement with the developer. This scheme has therefore been removed from the scope of the Fengate Access Study, but very much remains a part of the transport vision for the Fengate area.

Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction

2.16.5 This scheme remains as part of the preferred package; however, it has been significantly enhanced to incorporate pedestrian and cycle infrastructure, specifically:

- Creation of a shared used cycleway along the western side of Edgerley Drain Road, providing a direct cycle route from the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road junction to the western access into the Red Brick Farm development.
- Creation of a pedestrian footpath along the northern side of Storey's Bar Road, connecting the junction with the future PREL site and a potential access into the southern end of the Red Brick Farm site.

2.16.6 Figure 2.15 overleaf shows the General Arrangement drawing, and the addition of active travel infrastructure to the highway scheme.

2.16.7 The SOBC also referenced a SMART Junctions trial at this location. Funding for this was secured as part of the SOBC approval in December 2020; however, a more suitable location was found for the trial. The trial has instead been conducted at the junction of London Road / Fletton Avenue / Glebe Road junction and has assessed the ability to use Artificial Intelligence (AI) to operate the traffic signal controls rather than the existing MOVA controller. The trial has been largely successful to date, confirming that the junction can operate under AI, and is now comparing the performance of AI operation over MOVA.

2.16.8 Note that only improvements to the Vicarage Farm Road and Storey's Bar Road northbound approaches, along with the active travel improvements along Edgerley Drain Road, will be delivered as part of this FBC. This is to remove the risk associated with land acquisition timescales on the other two approaches compromising the availability of TCF funding.

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Figure 2.15: General Arrangement of the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Scheme

Junction 7 Improvements

2.16.9 This scheme also remains as part of the preferred package; however, it has again been significantly enhanced to incorporate pedestrian and cycle infrastructure. A segregated east-west cycle route has been incorporated into the junction, providing cyclists with a safe route along Oxney Road and onto Eastfield Road.

2.16.10 The General Arrangement drawing for this scheme is shown in Figure 2.16 beneath.

Figure 2.16: General Arrangement of the Junction 7 Scheme

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A15 Paston Parkway Lane Gain (Junction 20 to Junction 8)

2.16.11 This scheme has been removed from the original package due to several factors.

2.16.12 Updated cost estimates were prepared following completion of Preliminary Design earlier in 2022, and the cost of this scheme had increased significantly since the SOBC. The increase was largely due to changes in design standards since the scheme was originally designed in 2013/14, especially in relation to drainage and vehicle restraint systems.

2.16.13 The preliminary design work also identified that significant tree loss would be required along the eastern side of the carriage to accommodate the signage and roadside furniture which would be relocated as part of the widening.

2.16.14 Both factors would have a bearing on the fiscal and environmental cost of the scheme, and an impact on the economic assessment. In light of this, and a shift in transport policy away from conventional large scale road improvement schemes, sensitivity testing was under undertaken to understand the impact of removing this scheme from the package of Fengate Access Study schemes.

2.16.15 The sensitivity test demonstrated the benefit to cost ratio (BCR) of the original package (as reported at SOBC) was significantly reduced due to the increased cost estimate following Preliminary Design. The revised costs reduced the package BCR to 1.09. Removing the A15 Lane Gain Scheme, with its associated cost from the economic assessment significantly improved the package BCR to 2.46 because of the costs nearly halving. The results from the sensitivity test are shown in Table 2.12 beneath.

Table 2.13: With / Without A15 Lane Gain Sensitivity Test Results

AMCB	Value (£,0000s) 2010 prices, discounted to 2010	
	With A15 Lane Gain Included	With A15 Lane Gain Removed
Present Value of Benefits (PVB)	15,993	18,547
Present Value of Costs (PVC)	14,674	7,540
Net Present value (NPV)	1,319	11,007
Benefits / Cost Ratio (BCR)	1.09	2.46

2.16.16 Note that due to the nature of the A15 Lane Gain scheme, the sensitivity only considered the impact on transport user benefits.

Oxney Road / Newark Road Mini Roundabout

2.16.17 This scheme was added following ongoing technical assessment which identified that improvements to Junction 7 as well as developer led improvements to the Oxney Road / Edgerley Drain Road Junction would improve traffic flow along Oxney Road, resulting in an increase in delay on Newark Road as joining from the side road becomes more difficult.

2.16.18 To alleviate this issue, a mini roundabout has been designed for this location, and transport modelling has demonstrated that it provides clear benefits by reducing queues and delay on Newark Road without causing a significant increase in delay to the dominant flow along Oxney Road (as would be caused by a traffic signal-controlled junction).

Newark Road Footpath

2.16.19 This scheme was added due to feedback received about existing active travel provision within Fengate, and specifically the poor-quality pedestrian route along Newark Road which is key route linking Oxney Road and employment in the southern half of the study area.

New Pedestrian Crossing over Oxney Road

2.16.20 This scheme was added due to feedback received about existing active travel provision within Fengate, and specifically about the issue of severance caused by Oxney Road, which currently serves as a barrier separating residentials areas north of Oxney Road with large employment areas (including Red Brick Farm) to the south of Oxney Road.

Revised Package of Improvements

2.16.21 As a result of these changes, the package of schemes identified for delivery now consists of the:

1. Traffic signal improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road, on the Vicarage Farm Road and Storey's Bar Road northbound approaches, and active travel improvements to Edgerley Drain Road.
2. Traffic signal improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road)
3. Creation of a mini roundabout at Oxney Road / Newark Road
4. Improvements to Newark Road footpath.
5. Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.

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2.16.22 The location of these schemes is shown in Figure 2.17 beneath

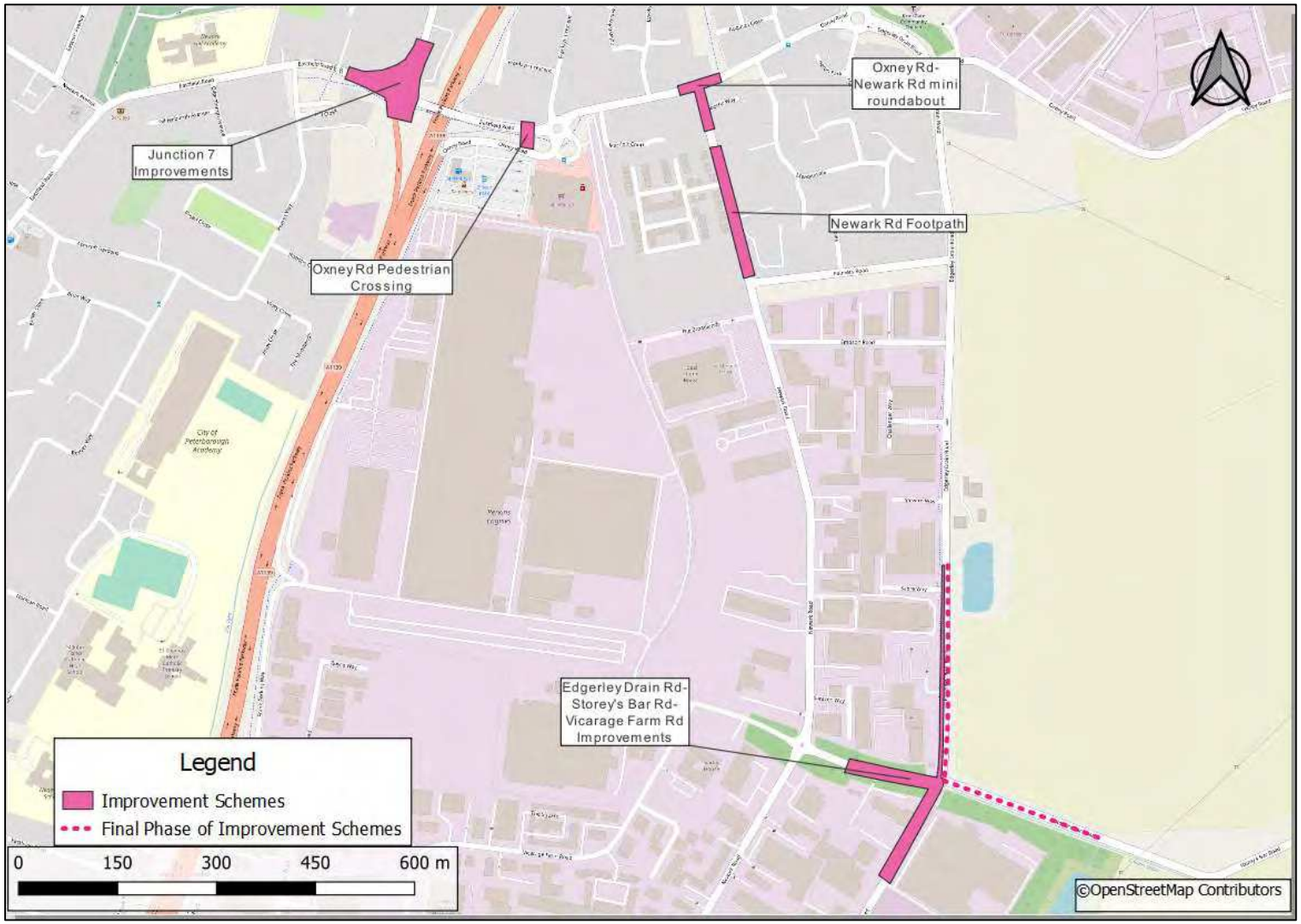

Figure 2.17: Fengate Access Study Improvement Schemes – Final Package

2.16.23 The final scheme includes improvements dedicated to both highway and active travel infrastructure in the study area. Beyond the benefits identified within this FBC, no additional opportunities have been identified as occurring as a result of the implementation of the Fengate Access Study Improvement Schemes.

Confirmation of Strategic Fit

2.16.24 A review has been undertaken to confirm the strategic fit of the package of options due to the changes since the SOBC submission. The review is shown in Table 2.13 overleaf and confirms that the package of schemes has a very strong fit with the Strategic objectives, and that there is a clear strategic case for investment.

Table 2.14: Review of Strategic Fit

Review of Strategic Fit	Strategic Objectives							
	Tackle congestion and reduce delay	Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site	Protect the local environment and improve biodiversity	Improve Road Safety	Improve Active Travel Provision with Fengate	Positively impact traffic conditions on the wider network	Reduce Severance for Active Travel Users	Upgrade Junction 7
Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction Improvements	This scheme will directly address congestion and delay by increasing junction capacity and providing more efficient traffic signal control.	This scheme will add capacity to a key junction within the study area, and along the main approach to the RBF site from the south.	The environmental impact of all schemes has been assessed, and a 20% biodiversity net gain will be delivered as part of the Fengate Access Study Improvement Scheme.	The scheme will improve safety through better junction design, including removal of opposed right turns, and enhanced active travel provision.	The scheme directly improves active travel routes along Edgerley Drain Road, Storey's Bar Road and through the junction itself.	The scheme will remove a congestion hotspot, and help ease the flow of traffic throughout the wider network.	The scheme will provide safe and coherent active travel routes within Fengate, and to the Red Brick Farm site.	This objective is specific to Junction 7
Junction 7 Improvements	This scheme will directly address congestion and delay by increasing junction capacity and providing more efficient traffic signal control.	This scheme will add capacity to a key junction within the study area, and along the main approach to the RBF site from the west.	The environmental impact of all schemes has been assessed, and a 20% biodiversity net gain will be delivered as part of the Fengate Access Study Improvement Scheme.	The scheme will improve road safety through better junction design and specifically providing safer cycling routes through the junction.	The scheme directly improves active travel through the junction, especially along the east-west axis, and will especially benefit students accessing educational facilities to the west of Junction 7.	The scheme will remove a congestion hotspot, and help ease the flow of traffic throughout the wider network.	The scheme will provide safe and coherent active travel routes within Fengate, and to the Red Brick Farm site.	The scheme will overhaul and upgrade the junction, removed significant existing maintenance liabilities whilst enabling the junction to be improved for all users.
Oxney Road / Newark Road Mini Roundabout	This scheme will directly address congestion and delay by increasing junction capacity and better regulating the flow of traffic at this location.	This scheme will add capacity to a key junction within the study area, and along a route that links residential areas to the north of the study area with employment areas to the south.	The environmental impact of all schemes has been assessed, and a 20% biodiversity net gain will be delivered as part of the Fengate Access Study Improvement Scheme.	The scheme will reduce delay (and driver frustration) along Newark Road, and better regulate the flow of traffic through this junction, making it safer for users.	The scheme will remove congestion at the junction, making active travel movements through and around the junction easier.	The scheme will remove a congestion hotspot, and help ease the flow of traffic throughout the wider network.	The scheme will remove congestion at the junction, making active travel movements through and around the junction safer.	This objective is specific to Junction 7
Newark Road Footpath	The scheme will not directly impact on congestion or delay, but will encourage active travel, lessening demand on the road network.	The scheme will provide a safe and enhanced active travel connection from Oxney Road to employment areas in the south of the study area.	The environmental impact of all schemes has been assessed, and a 20% biodiversity net gain will be delivered as part of the Fengate Access Study Improvement Scheme.	The scheme will provide users with a safe route, segregated from road users.	The scheme will directly improve active travel provision within Fengate by upgrading pedestrian facilities along Newark Road.	This is an active travel scheme and will not materially impact on traffic conditions on the wider network, but will encourage an increase in active travel which will lessen demand on the road network.	The scheme will reduce active travel severance by providing a high quality route on a key north-south route within the study area.	This objective is specific to Junction 7
Oxney Road Pedestrian Crossing	The scheme will not directly impact on congestion or delay, but will encourage active travel, lessening demand on the road network.	The scheme will provide a safe crossing location over Oxney Road, reducing severance and better linking communities to the north of Oxney road with employment opportunities within Fengate.	The environmental impact of all schemes has been assessed, and a 20% biodiversity net gain will be delivered as part of the Fengate Access Study Improvement Scheme.	The scheme will provide users with a signal-controlled crossing point and reduce the need for pedestrians to cross informally in gaps between traffic.	The scheme will directly improve active travel provision within Fengate by providing a signal-controlled crossing over Oxney Road, and reducing severance.	This is an active travel scheme and will not materially impact on traffic conditions on the wider network, but will encourage an increase in active travel which will lessen demand on the road network.	The scheme will directly reduce severance caused by Oxney Road through the provision of a signal-controlled crossing.	This objective is specific to Junction 7

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 Fengate Access Schemes 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."

2.17.2 The purpose of the preliminary design carbon assessment 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.

2.17.3 The preliminary design baseline carbon cost of the Fengate Access Schemes was **1,186 tCO2e**, which is equivalent to 379 return flights from London to Sydney. This was reduced to **1,182 tCO2e** after completion of detailed design. Although this represents a relatively small carbon reduction of 4 tCO2e (-0.2%), more significant carbon reductions were achieved on individual schemes (see section 2.17.6 below). It is also worth noting that some increases in carbon output for the detailed design phase assessments can be attributed to having more information available for carbon accounting. Although this can 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 2.18).

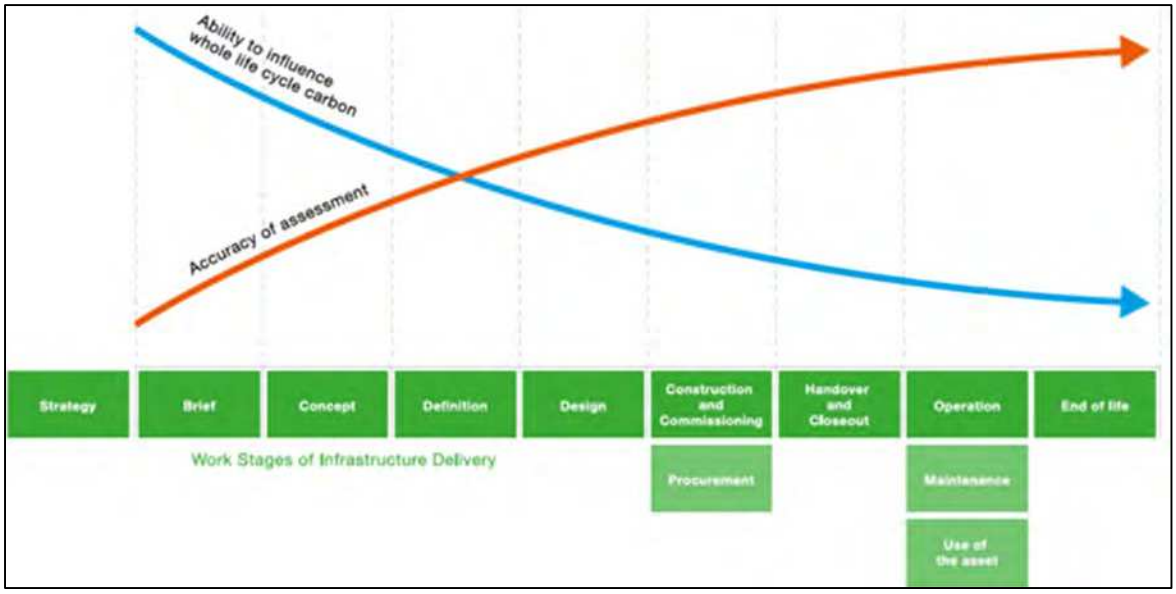

Figure 2.18: Relationship between Work Stages, Assessment Accuracy, and Ability to Influence Whole Life Cycle Carbon. *Source: Green Construction Board*

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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. Figure 2.19 below shows the breakdown of the detailed design carbon footprint for the Fengate Access schemes based on work activity 'series'.

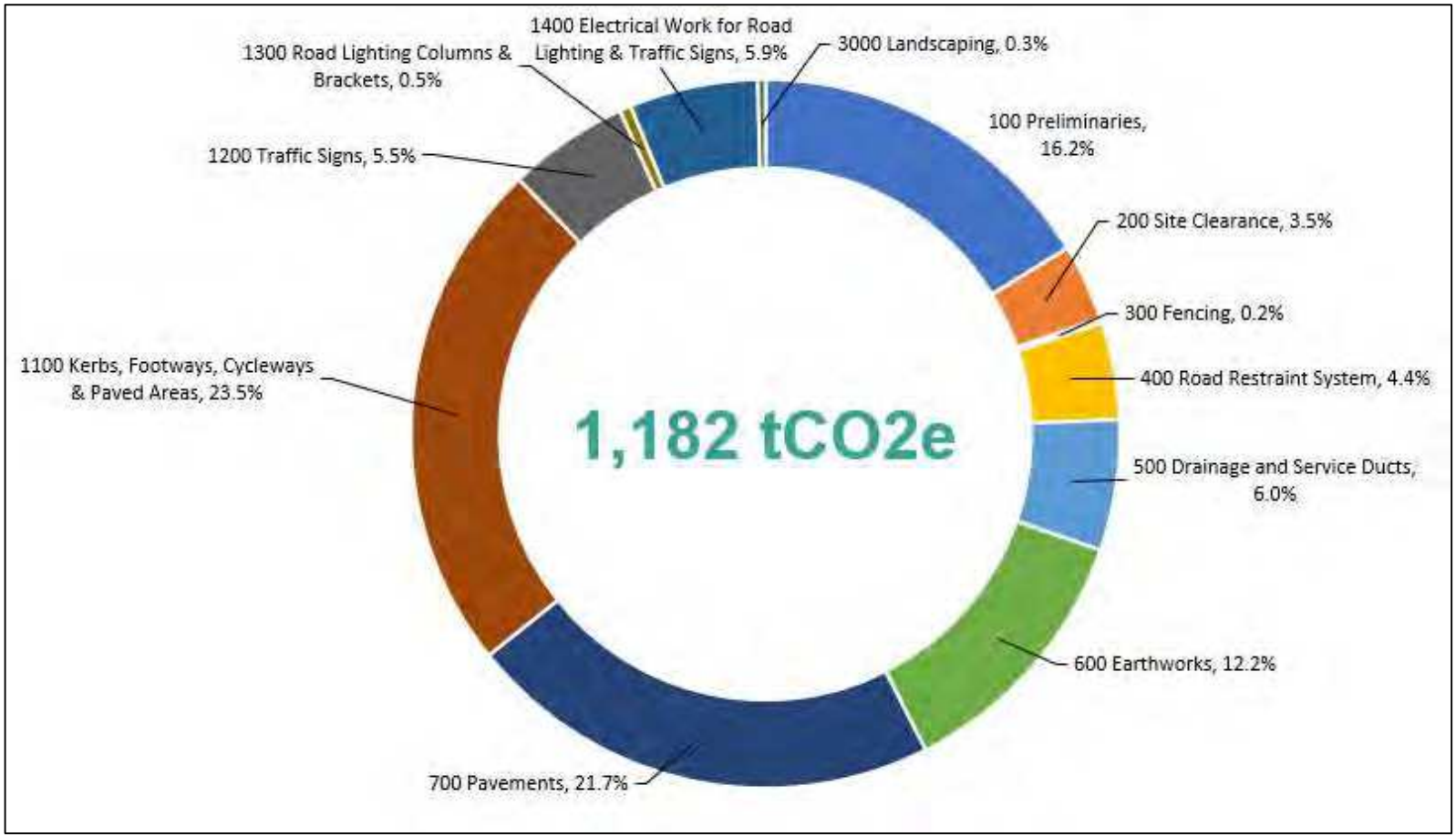

Figure 2.19: Fengate Access Scheme - Detailed Design Carbon Footprint by Work Activity 'Series'

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2.17.5 Figure 2.19 demonstrates that the highest carbon contributors based on the detailed design are:

- Series 1100: Kerbs Footways – 278 tCO2e (24%)
- Series 700: Road Pavements – 257 tCO2e (22%)
- Series 100: Site Preliminaries – 192 tCO2e (16%)

2.17.6 Individual carbon assessments have been undertaken for each of the 5 Fengate Access schemes to allow further scrutiny of variations in carbon outputs between preliminary and detailed design stages. These are presented in Table 2.15 below along with a summary of any carbon reduction measures implemented to date.

Table 2.15: Carbon Footprints at Preliminary and Detailed Design Stages

Scheme	Preliminary (tCO2e)	Detailed (tCO2e)	% change	Carbon Reduction Measures
Junction 7 Eastfield	141	143	0.5%	Grasscrete maintenance layby to reduce asphalt use and retain drainage
Newark Road Footpath	88	87	-0.3%	Value engineering to reduce scope, tegula blocks for vehicle overrun
Newark-Oxney Road Roundabout	94	90	-2.4%	Value engineering to reduce scope
Oxney Road Sainsburys Crossing	93	80	-7.5%	Retention of existing safety barrier
Storeys Bar Road	771	783	0.8%	Retention of existing drainage and footpath, re-use of excavated material
Total	**1186**	**1182**	**-0.2%**	Use of warm mix asphalt across all schemes

2.17.7 The carbon data has been collated in a manner which also allows us to undertake further analysis of the carbon hotspots shown in Figure 2.18 to identify specific work 'categories' and 'activities' which are contributing the most significant proportions of carbon and facilitate a more focused carbon reduction effort.

2.17.8 Table 2.16 and Figure 2.20 below highlight these and provide some suggested carbon reduction measures for consideration.

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Table 2.16: Fengate Access Schemes - Detailed Design Carbon Footprint by Work 'Activity'

Activity	Carbon Output (tCO2e)	Potential Carbon Reduction Measures
Contractors General Prelim Construction	154	· Mains power connection for welfare · On-site renewable energy solutions
Full depth carriageway construction (Assumed 990mm depth) Carriageway Widening	143	· Use of Cold Recycled Bound Materials · Use of asphalt with higher RAP content
TM	117	· Electric vehicle alternatives · Use of HVO fuel
AC14 CLOSE SURF Binder course 100/150 90mm	111	· Use of 'SuperLow' asphalt · Use of asphalt with higher RAP content
Disposal of unacceptable material Class U1A	110	· Re-use for landscaping on site · Export for re-processing to allow re-use
Full depth carriageway construction (Assumed 990mm depth) Carriageway Reconstruction	66	· Use of Cold Recycled Bound Materials · Use of recycled aggregates for sub-base
Sub-base 350 mm thick	66	· Use of recycled aggregate · Use of geotextiles to reduce thickness
Marshalls Beany Drain (Combined kerb Drain)	65	· Use of Durakerb products · Use of concrete with higher GGBS content
Full depth carriageway construction (Assumed 1105mm depth) Carriageway Reconstruction	64	· Use of Cold Recycled Bound Materials · Use of recycled aggregates for sub-base
50mm S/c 65 PSV	56	· Use of 'SuperLow' asphalt · Use of asphalt with higher RAP content
AC14 CLOSE SURF Binder course 100/150 90mm	45	· Use of Cold Recycled Bound Materials · Use of asphalt with higher RAP content
Sub-Contractors General Prelim Construction	45	· Sustainable travel plan · Explore opportunities to reduce programme
Full depth carriageway construction (Assumed 1105mm depth) Carriageway Widening	45	· Use of Cold Recycled Bound Materials · Use of recycled aggregates for sub-base
Imported topsoil Class 5B	44	· Retain/re-use excavated material on site · Identify closest approved supplier(s)
VRS	43	· Retain/re-use existing barrier · Use of steel with higher recycled content

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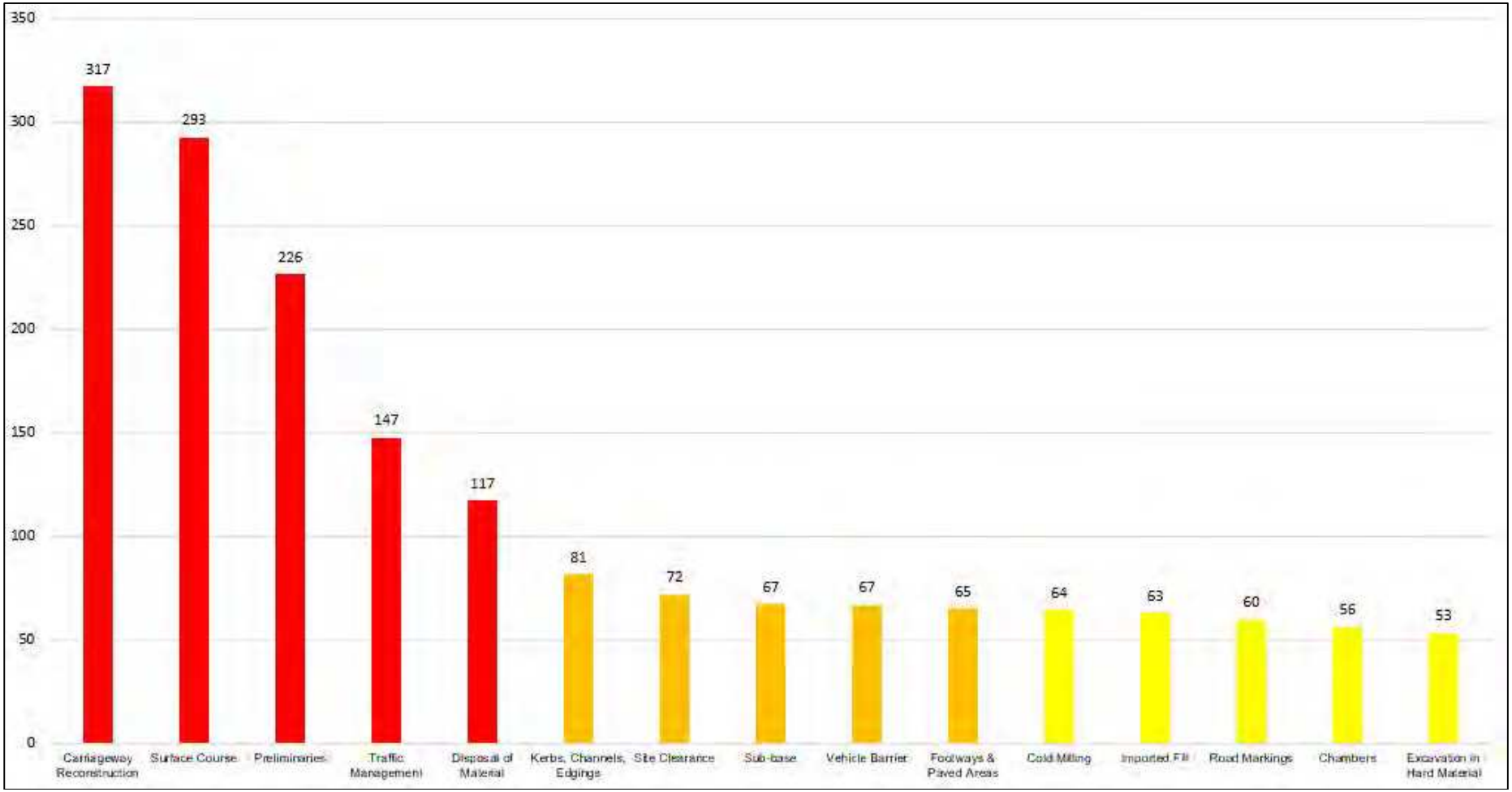

Figure 2.20: Fengate Access Schemes - Detailed Design Carbon Footprint by Work 'Category'

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2.17.9 To date, no carbon reduction workshops have been undertaken to help collaboratively identify initiatives which could be considered for implementation. It is recommended that this is coordinated at the earliest opportunity with representation from client, design, principal contractor, and supply chain organisations. The workshop should focus on construction phase carbon reduction initiatives related to the carbon 'hotspots' identified above. This will provide an opportunity to develop a carbon reduction plan for the scheme incorporating clear actions, responsibilities, and deadlines to ensure effective implementation of carbon reduction measures which also deliver cost savings. 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 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, as shown in Figure 2.21 below. 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 Fengate Access Schemes which have not yet been quantified related to:

- Reducing congestion and idling traffic.
- Promoting active travel instead of driving.
- Using sockets for signs and traffic signals to improve the efficiency of future repairs.
- Dismantling traffic signal equipment for future maintenance re-use.

2.17.11 The intention is to quantify these aspects more effectively in the future as suitable carbon accounting methods are developed and agreed.

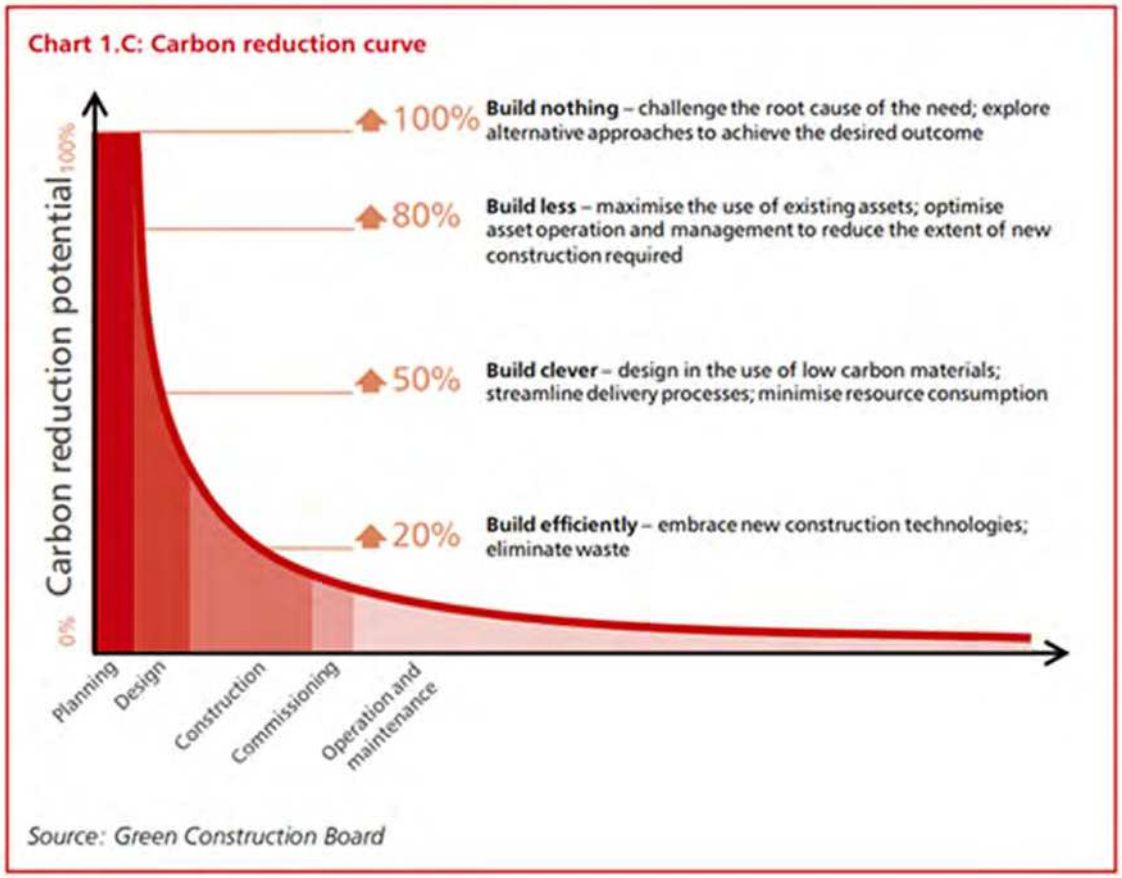

Figure 2.21: Relationship between Work Stages and Carbon Reduction Potential

2.17.12 This carbon assessment should also be updated when the as-built BoQ are available to confirm the final carbon output associated with the Fengate Access Schemes and highlight carbon reductions achieved throughout the whole project lifecyle. This will require effective data collection during the construction phase. A final 'as-built' carbon footprint will be calculated for the scheme to highlight any further carbon reductions through 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 2.22 below.

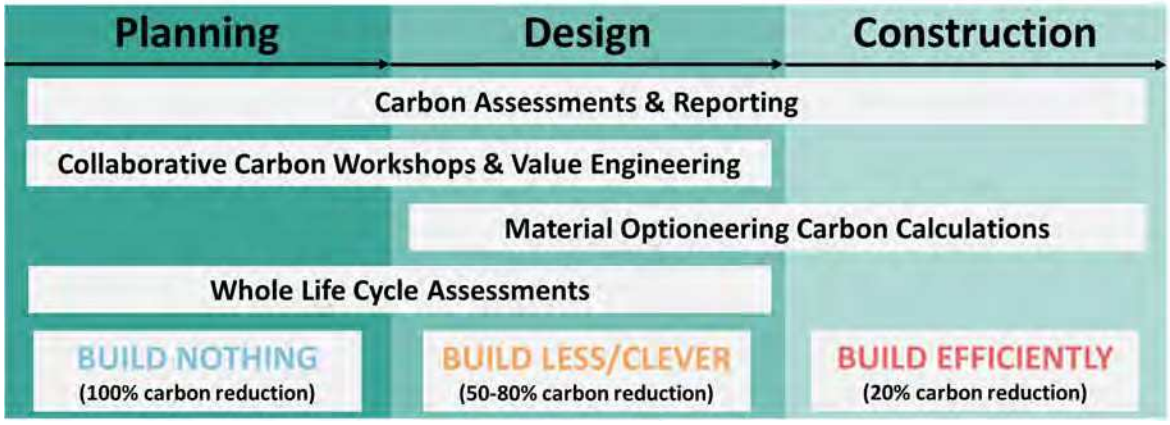

Figure 2.22: Relationship between Work Stages and Carbon Reduction Potential

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3. The Economic Dimension

3.1 Introduction

3.1.1 This chapter sets out the approach taken to assess the Economic Dimension for the Fengate Access Improvement Scheme and demonstrates that the scheme 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, May 2022.

3.2 Options Appraised

3.2.1 The technical assessment documented in the Option Appraisal Report (September 2020) identified Option 1 as the Preferred Option.

3.2.2 Three packages of schemes were identified in the report. Package 2 closely resembled package 1, with the difference being the conversion of the Edgerley Drain / Storey's Bar / Vicarage Farm Road signalised junction into a roundabout. This package was not taken forward following an initial design review due to engineering and safety concerns over providing a roundabout at this location. These are documented in the OAR.

3.2.3 Package 3 included the signalisaion of the Oxney Road / Edgerley Drain road junction. This was not taken forward as it still presented capacity issues at the improved junction.

3.2.4 The components included in Package 1 are listed beneath:

1. Traffic signal improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road, on the Vicarage Farm Road and Storey's Bar Road northbound approaches, and active travel improvements to Edgerley Drain Road.
2. Traffic signal improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road)
3. Creation of a mini roundabout at Oxney Road / Newark Road
4. Improvements to Newark Road footpath.
5. Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.

3.2.5 The General Arrangements for each of the schemes are provided in Appendix B.

3.3 Economic Assessment

Approach to Appraisal

3.3.1 The Economic Dimension for the scheme is focused on:

- Assessing the monetised direct, localised, and economic efficiency benefits of the scheme
- Qualitative appraisal of wider scheme benefits, such an environmental, social, and enablement of planned development
- Distributional Impacts
- 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 benefits and costs are detailed in the rest of this chapter.

3.4 Present Value of Costs

3.4.1 A robust scheme cost estimate has been produced based on Detailed Designs produced between 2021 and 2022. The Base Investment Costs are detailed in Table 3.3 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	390,689		61,400	19,385	471,474
2023	3,606,198		700,415	138,477	4,445,090
2024	683,336		135,919	11,330	830,584
2025				25,000	25,000
Total	**4,680,223**		**897,733**	**194,192**	**5,772,149**

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%[22] 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 derived from construction output price indices as well as

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

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knowledge of costs associated with recent schemes in Peterborough. Peterborough Highways Services work is measured using BCIS indices.

- 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 £1,233,043.
- 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	5,772,149	100,000
Base Cost with Real Cost Increases	6,165,217	845,846
Base Cost with Real Cost Increases and Optimism Bias	7,398,260	845,846
Rebased to 2010 Price Year	5,799,510	663,061
Discounted to 2010 Prices	3,697,567	122,455
Adjusted to Market Prices	4,400,105	145,722

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

3.5 Present Value Benefits

3.5.1 The economic assessment of the Fengate Access Study 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 2036 year 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 It should be noted that the Do-Minimum and Do-something networks include developer funded / delivered highway schemes, including converting the Oxney Road / Edgerley Drain Road priority T-Junction into a roundabout. Accesses to the Red-Brick Farm site are also included in both model scenarios, including a signalised junction in the south-west on Edgerley Drain Road, and a priority junction on Oxney Road to the north of the site.

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

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

3.5.8 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.

3.5.9 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. It was found that the 16:00 – 17:00 hour flows closely resembled the total flows observed within the modelled PM peak hour. PM annualisation factors have therefore been calculated that convert the single peak hour demand to annual peak period demand.

Table 3.3: TUBA Annualisation Factors

Time Slice	Time Period	Estimated Annualisation Factor	Description
1	AM Peak Hour	245	08:00 – 09:00
2	Inter-Peak Hour	1,518	14:00 – 15:00
3	PM Peak Hour	525	17:00 – 18:00

3.5.10 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.

3.5.11 This identifies the Present Value Benefits (PVB) to be £18,527,000. 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	326
Consumer Users (Commuting)	9,687
Consumer Users (Other)	3,924
Business Users / Providers	4,930
Indirect Taxes	-340
Present Value of Benefits (PVB)	**18,527**

3.5.12 The breakdown of benefits demonstrates that the scheme is anticipated to have a positive impact on greenhouse gas emissions (£326,000). There is a disbenefit of - £340,000 to indirect taxation as a result of improved journey times reducing fuel consumption which is directly taxed by central government.

3.5.13 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.

3.5.14 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					
< -5 mins	-5 to -2 mins	-2 to 0 mins	0 to 2 mins	2 to 5 mins	> 5 mins
0	-5	-6,280	6,911	124	4,475

3.5.15 Table 3.5 also shows that the majority of journey time savings are between 0 to 2 minutes, followed by 5 minutes or greater. The 2 to 5 minute bracket experiences much lower benefits than the other brackets, which is potentially due to the location of the schemes and the nature of the trips that use them.

3.5.16 The Fengate area does not accomodate many through trips, and functions more as a destination and origin area in the highway network, with the majority of the through trips being experienced by the adjacent parkway. As such, the benefits of the schemes are localised, and do not have wide reaching impacts in terms of re-routing. Re-routing as a result of schemes would ordinarily be a source of medium range trip benefits (which would most likely to fall into the 2-5 minute saving).

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

Table 3.6: Transport User Benefits by Time Period

Fengate Improvement Scheme Benefits (£,000)	
Time Period	User Time
AM Peak	2,383
Inter Peak	3,300
PM Peak	11,851

3.5.18 Table 3.6 shows that the greatest benefits are realised in the PM peak period, which are more than triple those of the Inter-peak period. The AM Peak period experiences the least benefits.

3.5.19 The increased annualisation factor associated with the PM peak will be partly responsible for the large proportion of benefits in this time period, but the existing delay in the peak periods (shown in Figure 2.2 and Figure 2.3 in the strategic case) show clear evidence that the schemes will provide more benefit in the PM peak simply because the observed congestion is worse than the AM peak.

3.5.20 The SATURN forecast model represents these differences, and indicates the Newark Road northbound approach to the proposed mini-roundabout to be a particular location where the PM peak congestion far outweighs that of other peaks.

3.5.21 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	6	103	174	129	37	-9	5	-8
Car	Commuting	18	355	897	782	266	-17	16	1
Car	Other	28	975	848	296	-25	-185	17	-4
LGV	Business	3	74	126	181	65	-3	2	0
HGV	Business	0	10	20	23	23	5	5	-16

3.5.22 The table shows that those making trips between 5 – 10 kilometres benefit the most from the proposed scheme, followed by journeys between 1 – 5 kilometres and 10 - 25 kilometres. As with the benefits by time savings, car users experience the greatest benefits, mostly those who travel for commuting or 'other' purposes.

Accident Benefits

3.5.23 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.

3.5.24 The total accident savings in 2010 values and prices is £1,606,600. COBALT estimates the scheme would result in a reduction of 41.7 accidents over a 60-year appraisal period. There would be a reduction of 0.3 fatal, 4.3 serious and 52.4 slight casualties.

3.5.25 A sensitivity test has been undertaken to estimate the total accident savings in 2010 values and prices based on local accident values as opposed to the COBALT defaults. The test demonstrates how accident savings based on local statistics differ from the average and is reported as a sensitivity test in section 3.7 beneath. Note that local accident rates are typically only required where there exceptional evidence that they should be used.

Environment Benefits

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

3.5.27 The TUBA assessment estimated £326,000 benefits relating to a reduction of 4,150 tonnes of untraded CO_2 emissions and 18 tonnes of traded CO_2 emissions across all three modelled time periods over a 60-year appraisal period.

3.5.28 The combined AMATs estimated £4,310 benefits relating to Greenhouse Gas Reductions over the 20-year appraisal period of the active travel improvements, and £610 of Noise benefits.

3.5.29 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.

3.5.30 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.

3.5.31 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.

3.5.32 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:

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

- 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).
- 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).

3.5.33 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.

3.5.34 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.

3.5.35 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.

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

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

3.5.38 The total air quality benefits in 2010 values and prices are £266,119 over a 60-year appraisal period. It was estimated that the scheme would result in an increase of NO2 emissions and decrease of PM2.5 emissions of 3 tonnes and -2 tonnes, respectively.

3.5.39 The total noise benefits in 2010 values and prices are £36,492 over a 60-year appraisal period, and combines the following benefits:

- Sleep disturbance: - £2,387
- Amenity: £28,235
- Acute Myocardial Infarction (AMI): - £7,076
- Stroke: £7,045
- Dementia: £10,675.

3.5.40 It was estimated that the scheme would result in a net reduction of 29 households experiencing daytime noise.

Active Travel

3.5.41 The benefits associated with active travel improvements in the Fengate Access Study area were assessed using the Active Mode Appraisal Toolkit (AMAT) and the University College London (UCL) Tool to Value Reductions in Community Severance Caused by Roads (Anciaes and Jones, 2020).

3.5.42 Severance is not currently considered as an Established Monetised Impact within TAG or the Value for Money Framework. However, it could be considered an Indicative Monetised Impact that when combined with the core benefits reported within the AMCB Table would demonstrate an indicative PVB.

3.5.43 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.

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3.5.44 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).

3.5.45 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.

3.5.46 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.

3.5.47 A comparison between Shrewsbury Avenue in Orton Longueville, which is a comparable land use, and Fengate 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 Fengate had mode shares of 4.45% for walking and 6.27% for cycling. The uplift factors would therefore be 1.198 for walking and 1.303 for cycling.

3.5.48 Table 3.8 below shows the number of walking and cycling trips by scenario for each scheme. Note that no cycling trips have been assumed for the Newark Road footway scheme as the scheme is intended for pedestrian use only.

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
Eastfield Road Ped Crossing / Junction 7 improvements	1,862	2,231	107	139
Newark Road Footway	773	926	-	-
Edgerley Drain / Storey's Bar Improvements	153	183	100	130

3.5.49 The UCL Tool to Value Reductions in Community Severance Caused by Roads (Anciaes and Jones, 2020) is a spreadsheet used to estimate the value of interventions that reduce the barrier effect caused by roads, including changes to road design, traffic, and crossing facilities. This tool is referred to as the "Severance Tool" within this report.

3.5.50 Severance is calculated at each point along a road. The Severance Tool assumes that severance originates from the road conditions at a particular point and the possibility of walking along the road to cross in a place with better road conditions or crossing facilities.

3.5.51 The Severance Tool has only been used for the Oxney Road / Eastfield Road Pedestrian Crossing scheme and it requires the following intervention-specific details for calculating active travel benefits:

- Length of road segment (100 – 5,000m)
- Total potential demand for walking trips crossing the road (minimum of 1,000 trips per day)
- Percentage of each age group in the demand
- Average walking speed by age group
- Journey purpose of each age group
- Percentage of demand at each crossing location along the road segment
- Lifetime of the project (maximum of 10 years)
- Road conditions including the number of lanes in each direction, central reservation (wide, narrow, or none), traffic density (low, medium, or high), and traffic speed (10, 20, 30, or 40mph).
- Crossing facilities available at the extreme and middle points of the road segment. Options include pedestrian refuge, straight pelican, staggered pelican, footbridge, or underpass.
- Waiting time (0 to 5 minutes).

3.5.52 It has been assumed that the scheme will generate an increase in walking trips and therefore the rule of half has been applied to the benefits associated with the increase.

3.5.53 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)			
	Eastfield Rd & Junction 7	Newark Road	Edgerley Drain / Storey's Bar	**Total**
Congestion Benefit	33.03	9.91	10.38	53.33
Infrastructure Maintenance	0.19	0.06	0.06	0.30
Accident	5.68	1.70	1.77	9.16
Local Air Quality	0.80	0.24	0.24	1.29
Noise	0.38	0.11	0.12	0.61
Greenhouse Gases	2.70	0.81	0.81	4.31
Physical Activity (Health)	1,053.55	360.19	240.32	1,654.06
Journey Ambience	203.72	74.94	35.54	314.20
Absenteeism	4.79	33.77	33.62	72.17
Indirect Taxes	-3.39	-1.02	-0.99	-5.40
Total	1,301.25	480.66	321.82	2,103.73

3.5.54 The benefits over a 20-year appraisal period for the Oxney Road & Junction 7, Newark Road, and Edgerley Drain / Storey's Bar junction schemes are £2,103,730 in total, with the majority (62%) of the benefits arising from the Oxney Rd / Junction 7 scheme. Health benefits associated with physical activity form the most benefits in each scheme.

3.5.55 The Indicative PVB associated with the severance benefits of the Oxney Road and Junction 7 scheme is £1,073,428.

Benefits Summary

3.5.56 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	326
	Consumer Users (Commuting)	9,687
	Consumer Users (Other)	3,924
	Business Users / Providers	4,930
	Indirect Taxes	-340
	Total TUBA PVB	18,527
Active Mode Appraisal	Congestion Benefit	53.3
	Infrastructure Maintenance	0.3
	Accident	9.2
	Local Air Quality	1.3
	Noise	0.6
	Greenhouse Gases	4.3
	Physical Activity (Health)	1,654
	Journey Ambience	314
	Absenteeism	72
	Indirect Taxes	-5
	Total AMAT PVB	2,104
Environment	Noise	36.5
	Air Quality	266.1
COBALT	Accident Benefit	1,607
Benefits Summary	*Active Mode Appraisal PVB*	*2,104*
	TUBA PVB	*18,527*
	Environment PVB	*303*
	COBALT PVB	*1,607*
	Total PVB	22,540

3.5.57 Most benefits come from Transport User benefits (£18,527,000), followed by the Active Mode appraisal (£2,104,000).

3.5.58 The additional £1,073,428 benefits from severance would increase the total PVB from £22,540,000 to approximately £23,613,360.

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: Fengate Access Study Improvements AMCB Table

Type	Schemes / Description	Core
TUBA (£,000s)	Greenhouse Gases	326
	Consumer Users (Commuting)	9,687
	Consumer Users (Other)	3,924
	Business Users / Providers	4,930
	Indirect Taxes	-340
	Present Value of Benefits (PVB)	18,527
	Broad Transport Budget	4,551
	Present Value of Costs (PVC)	4,551
Active Mode Appraisal (£,000s)	Congestion Benefit	53.33
	Infrastructure Maintenance	0.30
	Accident	9.16
	Local Air Quality	1.29
	Noise	0.61
	Greenhouse Gases	4.31
	Physical Activity (Health)	1,654.06
	Journey Ambience	314.20
	Absenteeism	72.17
	Indirect Taxes	-5.40
	PVB	2,104
Environment (£,000s)	Noise	36.49
	Air Quality	266.12
COBALT (£,000s)	Accident Benefits	1,606.60
Economic Dimension Summary	*Active Mode Appraisal PVB*	2,103.73
	TUBA PVB	18,527.00
	Environment PVB	302.61
	COBALT PVB	1,606.60
	Total PVB (£'000s)	**22,539.94**
	Total PVC (£'000s)	**4,551.00**
	Net Present Value (NPV) (£'000s)	**17,988.94**
	BCR	**4.953**
	Value for Money	**Very High**

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Value for Money Statement

3.6.3 The Fengate Access Study Improvement Schemes will provide Very High Value for Money with a Benefit Cost Ratio of 4.95.

3.7 Key Risks, Sensitivities and Uncertainties

Risks

3.7.1 Sensitivity tests have been undertaken to understand the robustness of the Fengate Access Study 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 failure of the nearby development to deliver infrastructure associated with that development, programme delays which affect the availability of funding (TCF funding is time limited) and lower levels of growth than expected materialising within Fengate (thereby reducing the benefits associated with the schemes).

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 Fengate Access Study 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 £4,551,000 falls into the "Very High" category, and could increase by £1,084,000 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	£ 22,540	>=£22,540
Low	BCR between 1 and 1.5	£ 22,540	£22,540 to £15,027
Medium	BCR between 1.5 and 2	£ 22,540	£15,027 to £11,270
High	BCR between 2 and 4	£ 22,540	£11,270 to £5,635
Very High	BCR greater than or equal to 4	£ 22,540	<=£5,635

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 Fengate Access Study Improvement Schemes would still offer High Value for Money in a Low Growth scenario with a BCR of 3.244.

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 Fengate Access Study Improvement Schemes would offer Very High Value for Money in a High Growth scenario with a BCR of 5.047.

3.7.11 Usually a more significant increase in benefits would be expected from the High growth scenario, due to the increased forecast traffic and associated increase in delay. The small increase in benefits estimated here most likely arises from the additional traffic being restricted from entering the study area (and thus experiencing the improvements) due to issues in the wider network.

3.7.12 Interrogation of the High growth model reveals such delays at Junction 5, along Eastfield Road, and at the junction of Fengate / Boongate. Improvements to these areas are within the scope of the University Access Study, and the level of certainty around these is not great enough for them to be included within this project. However, these issues offer an explanation as to why the High growth scenario is not achieving it's full potential.

Local COBALT Accident Rates

3.7.13 The Local COBALT Accident Rates sensitivity test assesses the impact on the PVB of using local accident rates rather than the default values provided in COBALT.

3.7.14 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 4.464 when local acccident values are used in the economic 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 Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 4.729 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 Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 5.177 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 Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 4.710 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 Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 5.169 should the AMAT appraisal period be increased.

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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 Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 4.907 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 Fengate Access Study Improvement Schemes would offer Very High Value for Money with a BCR of 5.072 should the values associated with air quality increase.

Reduced PM Peak Annualisation

3.7.27 The Reduced PM Peak Annualisation sensitivity test assesses the impact of reducing the annualisation factor applied to the PM Peak transport user benefits.

3.7.28 The sensitivity test demonstrates that the Fengate Access Study Improvement Schemes would offer High Value for Money with a BCR of 3.611 should the PM Peak delay not occur over the expected time period.

Absent Developer Scheme Scenario

3.7.29 Another Sensitivity test was undertaken on the core scenario transport user benefits to determine how the transport user benefits are affected should the developer-led scheme at Oxney Road / Edgerley Drain Road be undelivered. The scheme currently involves converting the Oxney Road / Edgerley Drain Road T-Junction into a roundabout.

3.7.30 The location of the developer-led scheme, as well as the proposed development accesses, are shown in Figure 3.1 below.

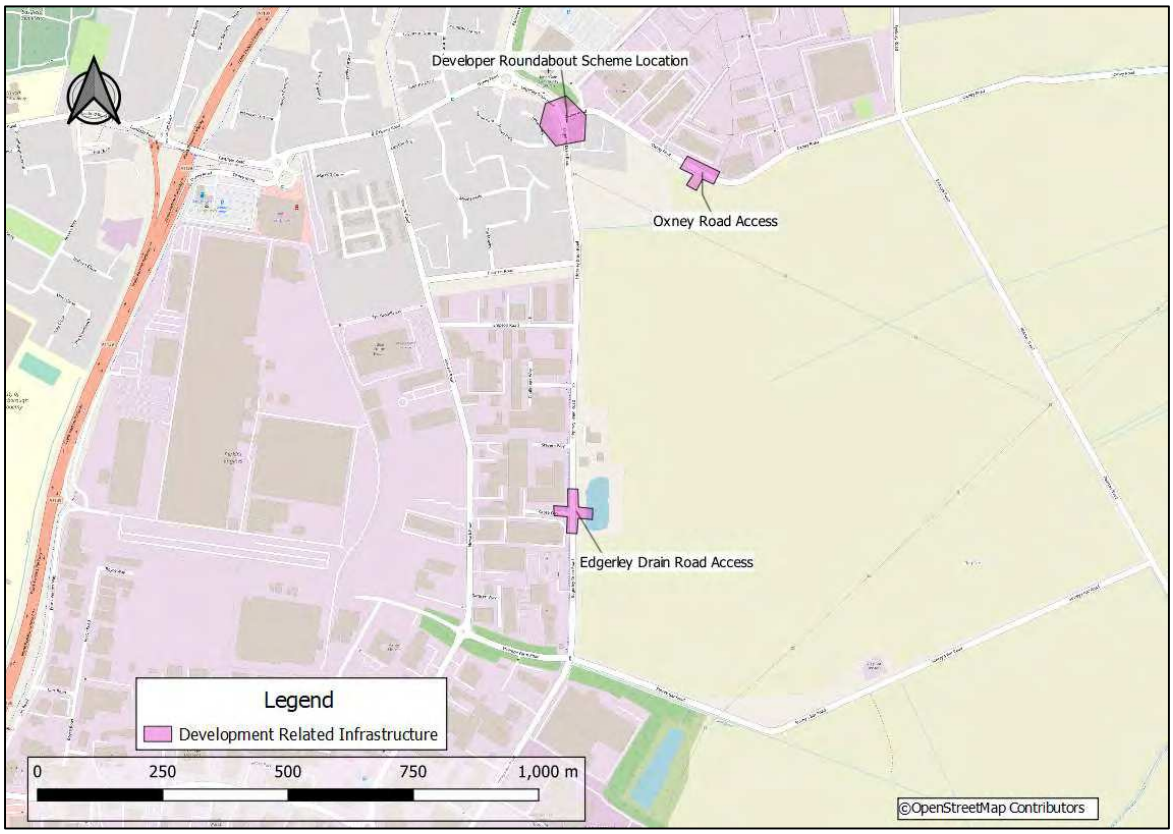

Figure 3.1: Development Related Infrastructure Changes

3.7.31 The Do-Minimum and Do-Something scheme were re-run with the Oxney Road / Edgerley Drain Road improvements missing. These results where then fed into TUBA and COBALT programmes as per the core assessment.

3.7.32 The resultant Transport User PVB is £39,203,940 and the resultant accident savings PVB is £1,827,600. The PVB indicated by this test is greater than that of the core scenario, so there is no risk to the benefits of the scheme if the developer led scheme does not come forward. This would result in a BCR of 8.614, which falls into the Very High Value for Money category.

Sensitivity Test Summary

3.7.33 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	**22,540**	**4,551**	**17,989**	**4.95**	**Very High**
Low Growth	14,763	4,551	10,212	3.24	High
High Growth	22,969	4,551	18,418	5.05	Very High
Local Accident Values (COBALT)	20,316	4,551	15,765	4.46	Very High
Low Active Travel Uptake	21,523	4,551	16,972	4.73	Very High
High Active Travel Uptake	23,563	4,551	19,012	5.18	Very High
Reduced AMAT Appraisal Period	21,435	4,551	16,884	4.71	Very High
Increased AMAT Appraisal Period	23,525	4,551	18,974	5.17	Very High
Low Environment Values	22,332	4,551	17,781	4.91	Very High
High Environment Values	23,081	4,551	18,530	5.07	Very High
Reduced PM Peak Appraisal Period	16,432	4,551	15,765	3.61	High
Absent Developer Scheme	39,204	4,551	34,653	8.61	Very High

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3.7.34 Figure 3.2 shows the range of sensitivity test BCRs. The Figure demonstrates that the Fengate Access Study Improvement Package offers at least High Value for Money in all scenarios assessed, and that there is a strong cluster of BCR values in the 4.0 – 5.5 range, confirming that the value for money for the schemes is robust.

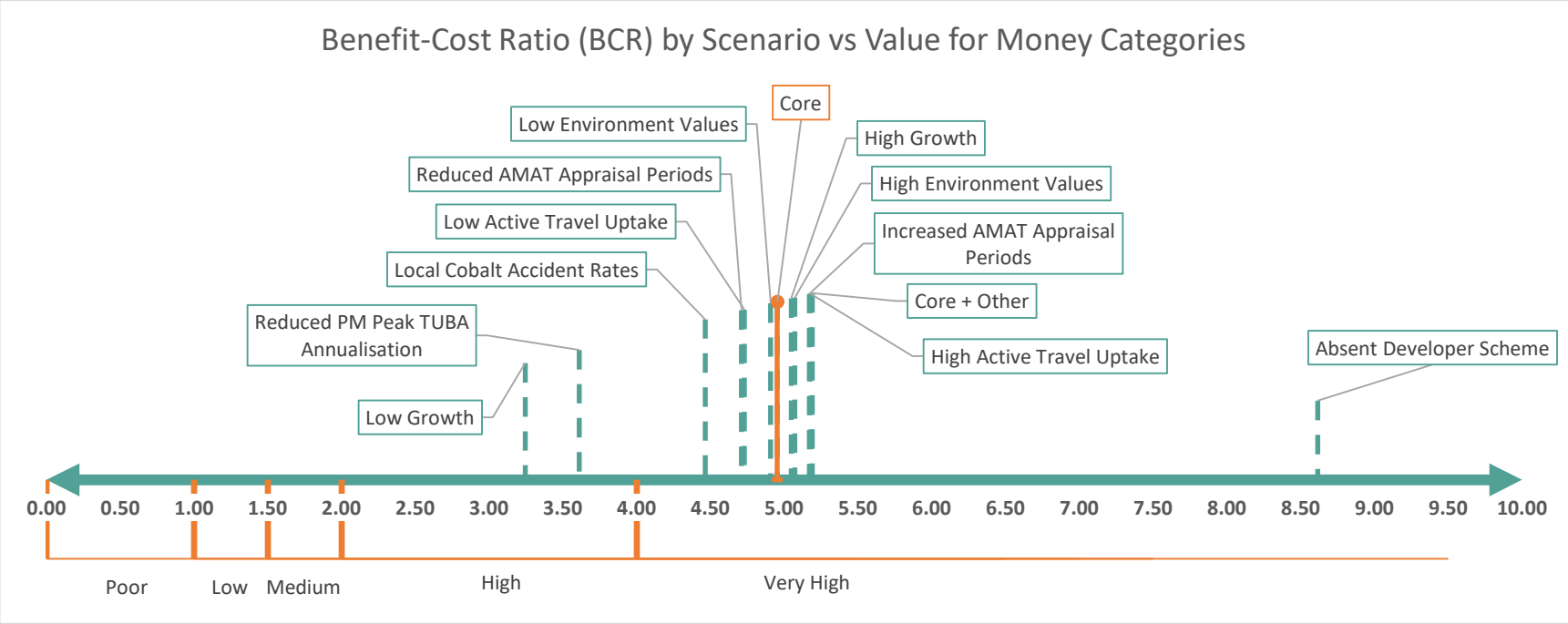

Figure 3.2: Sensitivity Test BCR Ranges

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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

Distributional Assessment	Most deprived areas ←			→ Least deprived areas	
	0%-20%	20%-40%	40%-60%	60%-80%	80%-100%
Total Benefits (£,000s)	5,403	2,984	2,036	2,501	679
Share of User Benefits	40%	22%	15%	18%	5%
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 all IMD 2019 quintiles benefit from the intervention and there are no net disbenefits. The 0% to 20% IMD quintiles would receive the greatest proportion (40%) of the transport user benefits for the greatest proportion of the Peterborough population (32%) and are therefore better off in relative terms.

3.8.4 This assessment demonstrates that the scheme supports the Levelling up agenda by generating the greatest proportion of benefits to the most deprived areas of Peterborough.

3.9 Additional Qualitative Assessments

3.9.1 In addition to the quantitative assessment of benefit, qualitative analysis has been undertaken for the environmental, social and distributional impacts of the Fengate Access Improvement where appropriate. This analysis is summarised beneath, and included within the Appraisal Summary Table (AST) contained within Appendix D. Completed TAG worksheets for each of the schemes are included in Appendix E.

3.9.2 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 purely on the quantified transport user, active travel, accident and noise and air quality benefits.

Landscape Impacts

3.9.3 The Fengate Access Study Improvement schemes have been assessed as having a neutral impact on the Landscape following completion of an appraisal for each of the five schemes.

3.9.4 The Storey's Bar Road scheme presents the greatest risks of adverse effects considering the loss of 16 semi-mature and mature trees. However, the receptors directly impacted are commercial and light industrial facilities which are less sensitive to such changes and replacement planting is being carefully planned to provide further mitigation.

3.9.5 The Newark / Oxney Road roundabout scheme also presents elevated risk due to the close proximity of valuable mature trees subject to Tree Preservation Orders (TPOs). However, these trees and all other retained vegetation across the schemes, will be managed and protected in accordance with the Arboricultural Method Statements.

Townscape Impacts

3.9.6 The Fengate Access Improvement Study Schemes have been assessed as having a neutral impact on the Townscape following completion of an appraisal for each of the five schemes.

3.9.7 The Townscape characters of all the schemes are busy, active and typically urban in nature, with presence of significant development within the surrounding area consisting of residential, commercial and / or light industrial buildings.

3.9.8 The proposed schemes will retain the essential townscape character of these areas and involve replacement of existing highways assets on a like-for-like basis with associated improvements. The proposed schemes will also promote active travel by improving safety and connectivity between pedestrian and cyclway routes throughout the highways network

3.9.9 The war memorial present within the scheme footbprint of the Junction 7 Eastfield scheme is expected to be of significant local importance to residents and stakeholders and will not be directly impacted by the works. Standard mitigation measures will be implemented to protect this feature.

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Historic Environment Impacts

3.9.10 The Fengate Access Improvement schemes have been assessed as having a Neutral impact on the Historic Environment following completion of an appraisal for each of the five schemes.

3.9.11 The Storey's Bar Road scheme presents the greatest risk of adverse effects considering the proximity to the Flag Fen Bronze Centre Scheduled Monument site. However, a hydrogeological assessment has been undertaken in consultation with Historic England which concluded the proposed scheme would have insignificant impacts on this receptor.

3.9.12 Previous archaelogical investigations in the area have revealed significant remains of local and regional importance, but the PCC Archaeologist has already been consulted and adequate mitigation has been specified.

3.9.13 The risk of encountering and damaging archaeological remains is further reduced by considering te scale of modern development within the vicinity and scope of the proposed works in terms of land take and depth of excavation.

Biodiversity Impacts

3.9.14 The Fengate Access Study Improvement Schemes have been assessed as having a neutral impact on Biodiversity following completion of an appraisal for each of the five schemes.

3.9.15 Each site is located more than 1km away from designated sites with no connectivity identified and the scope of works limiting any potential for indirect impacts linked to discharges, emissions, noise and lighting.

3.9.16 Potential protected species which may be encountered include nesting birds, water voles and bats. A majority of the proposed works are confined to areas of existing hardstanding and initial surveys have been undertaken with further pre-works check planned to enable suitable mitigation measures to be implemented.

3.9.17 One of the primary objectives of the Fengate Access Study Improvement Schemes is to achieve a 20% enhancement in Biodiversity. This is not possible to achieve within the footprint of the scheme due to land constraints, however engagement is underway with the relevant stakeholders at PCC to determine how best to achieve the 20% enhancement, and this will be agreed ahead of construction and reported on in the one-year post scheme monitoring report.

3.9.18 Where it is not possible to provide biodiversity enhancements within the footprint of a scheme, PCC's preferred course of action is to identify a nearby site/s (within several kilometres) where the improvements can instead be made. The current engagement with PCC's environmental stakeholders is to identify suitable sites close to Fengate.

Water Environment Impacts

3.9.19 The Fengate Access Study Improvement Schemes have been assessed as having a neutral impact on the Water Environment following completion of an appraisal for each of the five schemes.

3.9.20 The Water Environment includes environmental resources such as rivers / canals, floodplains, groundwater, sea and estuaries, and stillwater (lakes and ponds).

3.9.21 Most of the scheme footprints are located above an aquifer which has high vulnerability to pollutants. However, the proposed works are relatively confined to shallower strata meaning there are very limited pathways for significant impacts to occur, especially when further mitigation measures which will be implemented throughout the Construction Environment Management Plan (CEMP) are considered.

3.9.22 Although there is potential for existing watercourses to be impacted, these are generally artificial drains with low geomorphological value. Existing water quality within nearby surface water features is generally poor based on current 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.

3.9.23 Storey's Bar road presents the highest risk from a flooding perspective, but the design has incorporated flood mitigation measures. The additional areas of hardstanding have been assessed as having an insignificant impact on flooding at this location and there is an existing attenuation feature locally.

3.9.24 All other schemes are outside Flood Zones 2 and 3.

3.10 Summary of Benefits and Costs

3.10.1 The Fengate Access Improvement Scheme has a Present Value of Cost of £4,587,000 and a Present Value of Benefit of £22,539,000 resulting in a Net Present Value of £17,952,940 and a BCR of **4.91**, offering **Very High Value for Money**.

3.10.2 Sensitivity testing has demonstrated that the Fengate Access Improvement Schemes would still offer at least High Value for Money in multiple sensitivity test scenarios, which demonstrates that the scheme's value for money is robust.

4. The 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 Costing

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 estimates include a risk allowance based on a Quantified Risk Assessment (QRA) and inflation, as well as non construciton related costs associated with scheme delivery, such as project management, land and legal costs. The scheme cost estiamtes were preapred between May and October 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 withih this FBC is based upon the milestone activities set out in the Management Dimension (Chapter 6), and the dates used to calculate the scheme costs, including the application of inflation, are shown in Table 4.1 overleaf.

Table 4.1: Key Activity Timeline

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Newark Road Footpath and Oxney Road Pedestrian Crossing)
November 2022	Construction commences on the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes. Advance works begin for construction of the remaining three schemes, including vegetation clearance and STATS diversions.
May 2023	Construction starts on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road and Junction 7 schemes.
July 2023	Construction finishes on the Junction 7 scheme. Construction starts on the Oxney Road / Newark Road scheme.
September 2023	Construction finishes on the Oxney Road / Newark Road scheme.
March 2024	Construction finishes on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme.
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 Newark Road Footpath and Oxney Road Pedestrian Crossing schemes, along with the costs required to undertake preparatory works relating to statutory undertakers diversions for all schemes. The purpose of this was to bring the 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

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demonstrate that the two accelerated schemes (Newark Road Footpath and Oxney Road Pedestrian Crossing, would still offer value for money should the rest of the package fail to be delivered. This assessment is included in Appendix F for reference.

4.2.7 Although delivery of these two schemes has been accelerated, they still form part of the Fengate Access Study package of schemes, 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 Estimates

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 Estimates

Description of Cost Type	Cost (£) Total
Base Investment Cost	5,772,149
Risk Adjusted Base Cost	6,790,497
Risk Adjusted Base Cost with Construction Industry Inflation (**Outturn Cost**)	**7,531,120**
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	8,376,966

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 G.

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. The Base Investment Cost has been informed by a target costing exercise based on the Detailed Designs, 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	390,689		61,400	19,385	471,474
2023	3,606,198		700,415	138,477	4,445,090
2024	683,336		135,919	11,330	830,584
2025				25,000	25,000
2026					
2027					
Total	**4,680,223**		**897,733**	**194,192**	**5,772,149**

4.3.6 The scheme Base Investment Cost is £5,772,149 which includes £4,680,223 of Construction related costs, £897,733 of Preparation and Supervision costs and £194,192 of 'Other' costs.

4.3.7 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 refer to procurement and Project Management fees and include a value of £25,000 in 2025 for post scheme monitoring which is due to be undertaken at one, and five year intervals following completion of the schemes 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 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	Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction	£ 2,505,564.87	£ 377,673.88	£ -	£ 58,500.00	£ 96,541.69	**£ 3,038,280.45**
2	Junction 7	£ 1,024,972.42	£ 143,635.14	£ -	£ 43,500.00	£ 40,968.54	**£ 1,253,076.10**
3	Oxney Road / Newark Road Junction	£ 368,306.98	£ 56,124.62	£ -	£ 33,500.00	£ 17,911.60	**£ 475,843.19**
4	Newark Road Footpath	£ 293,366.97	£ 49,152.39	£ -	£ 30,500.00	£ 15,963.97	**£ 388,983.33**
5	Oxney Road Pedestrian Crossing	£ 488,011.85	£ 73,647.36	£ -	£ 31,500.00	£ 22,806.40	**£ 615,965.61**
Total		**£ 4,680,223.10**	**£ 700,233.39**	**£ -**	**£ 197,500.00**	**£ 194,192.19**	**£ 5,772,148.68**

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Risk Adjusted Base Cost

4.3.10 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. *(Note: this is 5% for the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Scheme).*
- Budget Detail Contingency (3%) of construction cost: for incidental costs not covered by the core bill of quantities.
- Design Development Contingency (7.5%) of construction cost: for alterations to the design or scope at later phases of the project. *(Note: this is 10% for the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Scheme).*
- Employer's Risk: based on experience of similar recent schemes. This equates to 3% of the construction cost.

4.3.11 Table 4.5 below shows the 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	390,689		61,400	19,385	79,292	**550,766**
2023	3,606,198		700,415	138,477	761,686	**5,206,776**
2024	683,336		135,919	11,330	177,370	**1,007,954**
2025				25,000		**25,000**
2026						
2027						
Total	**4,680,223**		**897,733**	**194,192**	**1,018,348**	**6,790,497**

4.3.12 The addition of the risk allowance takes the Risk Adjusted Base £6,790,497. The total risk allocation for each scheme is shown in Table 4.6 beneath.

Table 4.6: Risk Allocation by Scheme (2022 Prices)

	Scheme		Risk Allocation
1	Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction	£	650,356.28
2	Junction 7	£	154,154.05
3	Oxney Road / Newark Road Junction	£	55,253.93
4	Newark Road Footpath	£	82,355.77
5	Oxney Road Pedestrian Crossing	£	76,228.10
Total		**£**	**1,018,348.14**

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Inflated Risk Adjusted Cost (Outturn Cost)

4.3.13 The Inflated Risk Adjusted Cost, or Outturn Cost, is the Risk Adjusted Base Cost with construction inflation applied.

4.3.14 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%[23] has been applied to all costs incurred from 2025 onwards (applying to maintenance costs in the Economic Assessment).

4.3.15 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: Inflation Increases on Construction Costs (2023 – 25)

Calendar Year	Risk Adjusted Base Cost (£)	Cost of Inflation (£)	Total with Inflation (£)
2022	550,766		550,766
2023	5,206,776	520,677.65	5,727,454
2024	1,007,954	211,670.33	1,219,624
2025	25,000	8,275.00	33,275
2026			
2027			
Total	**6,790,497**	**740,623**	**7,531,120**

4.3.16 The cost of inflation is £740,497 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 £7,531,120. The Outturn Cost represents the amount required by PCC to deliver the scheme.

4.3.17 Note that £865,424 of the Outturn Cost was approved for release at the CPCA Board Meeting on October 19th 2022[24], and therefore Peterborough City Council request the balance of £6,665,696 subject to the approval of this FBC.

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

Inflated Risk Adjusted Cost Including Whole Life Costs

4.3.18 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.

4.3.19 Maintenance costs have been included for the introduction of a traffic signals at the Oxney Road Pedestrian Crossing as this is additional infrastructure which represents an increased maintenance burden.

4.3.20 A maintenance cost of £25,000 each fifteen years has been assumed based on recent traffic signal maintenance costs. These costs have been applied from 2034 onwards.

4.3.21 Note that no other maintenance allowance has been included. The rationale for this is set out in Table 4.8 overleaf.

Table 4.8: Application of Maintenance Costs by Scheme

Scheme		Maintenance Costs (per 15 years)	Justification
1	Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction	£ -	Both the existing and new junction are signalised, and there is no change in junction form. The increase in the junction footprint will result in a small increase in maintenance costs, however this will be delivered through the existing maintenance regime and the minor increase is considered to be offset by the reduction in short term maintenance need after the asset is updated.
2	Junction 7	£ -	Both the existing and new junction are signalised, and there is no change in junction form. There is no notable increase in the size of the asset, only the arrangement, and the scheme will replace aged infrastructure, which is currently a significant maintenance concern to PCC, with updated infrastructure which will require little / no maintenance in the short-term.
3	Oxney Road / Newark Road Junction	£ -	The existing priority junction is to be replaced with a mini-roundabout. There is not considered to be any significant increase in maintenance liability associated with this change.
4	Newark Road Footpath	£ -	This scheme will upgrade the existing asset, but not increase the footprint or maintenance liability. There will be a short-term maintenance benefit following completion of the scheme.
5	Oxney Road Pedestrian Crossing	£ 25,000	An allowance has been included for the addition of traffic signals at the pedestrian crossing. There is not considered to be any further increase in maintenance liability.
Total		£ 25,000	

4.3.22 The maintenance costs applied are shown in Table 4.9 below.

Table 4.9: Calculation of Whole Life Maintenance Costs

Whole Life Maintenance Costs	Cost (£)
Maintenance Cost per year	25,000
Maintenance Cost for 60 Assessment Period (without inflation)	100,000
Maintenance Cost for 60 Assessment Period (with inflation)	845,846

4.3.23 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	7,531,120
Inflated Whole Life Costs	2026 - 2085	845,846
Inflated Risk Adjusted Cost Including Whole Life Costs	2022 - 2085	8,376,966

4.3.24 The Inflated Risk Adjusted Cost Including Whole Life Costs over the 60-year assessment period is £8,376,966. Note that only the Outturn Cost is required to deliver the scheme, which is £7,531,120, of which £865,424 has already been approved.

4.3.25 Note that PCC, as the Highway Authority, are liable for all future maintenance costs, and that these costs are not requested from the CPCA as part of the scheme funding. They are calculated to demonstrate the whole life cost of the scheme, and for use within the Economic Assessment.

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

4.4 Budgets and Funding Cover

Funding Cover

4.4.1 The CPCA have an infrastructure delivery budget of £20 million per year, allocated for the next 30 years. 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.

4.4.2 The full scheme Outturn Cost of £7,531,129 will be funded through the CPCA Single Investment Fund using the authority's Transforming Cities Fund (TCF). A budget of £11,000,000 has already been allocated in the CPCA's Medium Term Financial Strategy (MTFS) subject to approval of this FBC. The funding matches the budget allocation funding profile, and is shown beneath:

- FY 2022 / 2023: £ 865,424
- FY 2023 / 2024: £ 6,665,696
- Total: £ 7,531,120

4.4.3 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 construction programme for the Fengate Access Study Improvement Schemes has been developed to fit within this timeframe.

4.4.4 There are not known to be any other financial constraints associated with the funding.

5. The 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 Delivery of the scheme will produce the following outputs:

- Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road – creation of an upgraded signalised junction, including capacity enhancements to the Vicarage Farm Road and Storey's Bar Road (northbound) approaches, and off-road cycle facilities along Edgerley Drain Road.
- Junction 7 (Eastfield Road / Eye Road / A1139 Frank Perkins Parkway) – creation of an upgraded signalised junction, including pedestrian crossing facilities over Oxney Road and the A1139 Frank Perkins Parkway (off-slip).
- Oxney Road / Newark Road - creation of a mini-roundabout at the junction of Oxney Road / Newark Road, replacement of the existing single signalised pedestrian crossing to the west with two zebra crossings, one to the west and one to the east of the junction.
- Oxney Road – creation of a new signal-controlled pedestrian crossing on Oxney Road, between Junction 7 and the Oxney Road / Sainsbury's Roundabout.
- Newark Road – upgrade to the existing footpath, including the provision of additional crossings (uncontrolled).

5.2.2 General arrangement drawings for each of these schemes are included in Appendix B.

5.2.3 Delivering the scheme outputs should generate the following outcomes, which in turn will ensure that the primary scheme objectives outlined in the Strategic Dimension are realised, including:

1. Outcome 1: Reduced delay at key junctions within the Study Area.

   Objective 1: Tackle congestion and reduce delay.

2. Outcome 2: Planned employment growth at Red Brick Farm can be accommodated.

   Objective 2: Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site.

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

   Objective 3: Protect the local environment and improve biodiversity.

4. Outcome 4: A reduction in personal injury accidents.

   Objective 4: Improve Road Safety.

5. Outcome 5: Improve active travel provision within the Fengate Access Study area.

   Objective 5: Improved Active Travel Provision with Fengate.

5.2.4 In addition to the primary scheme objectives, the procurement strategy should deliver ensure that outcomes are delivered which also serve the secondary objectives.

5.2.5 Details of how the schemes will be measured against these objectives are provided in the Scheme Monitoring and Evaluation Plan (Appendix I) as discussed within the Management Dimension.

5.2.6 To deliver the above scheme outcomes, the procurement strategy will be required to deliver the following outputs:

- **Cost certainty:** Achieve cost certainty, ensuring the Fengate Access 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 Fengate Access 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 Fengate Access 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 Fengate Access 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, who will use local sub-contractors to assist with delivery of the scheme various improvements.

5.5.2 A pool of pre-qualified sub-contractors will be selected for delivery of the schemes, based on the following selection criteria:

- 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 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 this, 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 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 phsae and fully understand the scheme objectives and required outputs.

5.5.7 PHS recently used this procurement model in Spring 2022 to procure a range of contractors to deliver the CPCA funded Junction 15 Improvement Scheme in Peterborough. The procurement exercise successfully secured the services of twelve different contrators including civils, traffic management, street lighting and piling specicalists. A full list of these is provided in Appendix K.

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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 design and planning activities (such as designer support during construction)
- Option C (Target Cost) will be used for construction of the scheme. This incentivises both parties (PCC and Milestone Infrastructure) 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.

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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 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[25].

5.8.4 In summary, risk is allocated to the CPCA by default, but the CPCA reserve the right to reallocate this risk to PCC if 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.

5.9 Contract Length

5.9.1 The PHS contract runs until 2028 and has the relevant skills and competencies to deliver the Fengate Access 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 four of the five schemes in the package is expected to be complete by September 2023. Construction Programmes for the three schemes due to be built in the 2023 / 2024 financial year are included in Appendix J.

[25] 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

5.9.3 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 Delivery Timescales

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Newark Road Footpath and Oxney Road Pedestrian Crossing)
November 2022	Construction commences on the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes. Advance works begin for construction of the remaining three schemes, including vegetation clearance and STATS diversions.
May 2023	Construction starts on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road and Junction 7 schemes.
July 2023	Construction finishes on the Junction 7 scheme. Construction starts on the Oxney Road / Newark Road scheme.
September 2023	Construction finishes on the Oxney Road / Newark Road scheme.
March 2024	Construction finishes on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

5.10 Contract Management

5.10.1 Development and delivery of the scheme has been monitored and managed to date through fortnightly project progress meetings consisting of the Project Team, and at Project Board meetings. 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 for the delivery of the scheme. This individual hsa had consistent involvelemt in the project since the early phases of design, and will work closely with the delivery team during the construction of the scheme.

5.10.3 Governance between PCC and the CPCA is 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. The Management Dimension

6.1 Introduction

6.1.1 The Management Dimension explains how the scheme promoter will successfully manage 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. These schemes are located 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)

A605 / B1095 Junction Improvement Scheme - £2.2m

6.2.7 This scheme was constructed between September 2020 and July 2021 with the objective of alleviating traffic delays on the A605 for traffic exiting the south-east of Peterborough, towards Pondersbridge. The total cost of the scheme was £2.2m.

6.2.8 The scheme successfully delivered improvements to the existing T-junction. The improvements involved widening an existing bridge with a 4 metre wide, 12.4 meter span extension to the south, and installation of a 66 metre retaining wall. Care was taken to keep traffic management delays to a minimum, with the A605 bridge and junction only closed during the carriageway surfacing at the end of the project. The construction also had to work around and with major utility diversions concerning the “shelling” of a high pressure gas main plus 600m of BT apparatus diversions, and all operations were carried out at the height of the COVID-19 pandemic with appropriate working practices.

6.2.9 Innovations in this project included the use of SmartRaft VRS foundations, removing the requirement for deep excavation around the gas main, a one-way traffic management system, which allowed the junction to remain open during construction, and an agreed joint construction programme and shared welfare facilities developed with Cadent Gas to prevent compromising the critical path of the project.

Figure 6.2: A605 / B1095 Junction improvement scheme

Staniland Way Junction Improvement - £0.5m

6.2.10 The Stanliand Way scheme was a major roundabout construction and road realignment project close to Werrington Centre. The site was a known accident cluster site, and the purpose of the scheme was to improve safety. Peterborough Highways Services designed and built the roundabout through its term maintenance contract. The scheme was completed ahead of schedule in May 2015. This scheme bears many similarities to the proposed roundabout at Oxney Road / Edgerley Drain Road.

Figure 6.3: Staniland Way Junction Improvement

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Active Travel Schemes – Various

6.2.11 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 6.4: Haddon Cycleway Improvement

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6.3 Programme / Project Dependencies

6.3.1 The scheme programme will need to consider the following key dependencies:

- **Red Brick Farm Development Programme**: Design and delivery of the package of schemes should be coordinated with the development proposals for the Red Brick Farm site to ensure that any highway improvement works do not hold back the planned growth, and creation of employment opportunities, in Fengate or cause unacceptable disruption to the network.
- **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 because of the Fengate schemes, although this will be limited through the careful planning of traffic management arrangements.
- **Construction Disruption**: The Council have significant recent experience of undertaking maintenance and delivering improvements on its highway 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 Fengate Access Study, 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 6.5.

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 Fengate Schemes to date. All skills and competencies to deliver this scheme are available within the local PHS contract.

CPCA Board	**Responsible Officers** CA Board Members	**Responsibilities Include** To support CCC in the development of the scheme To undertake technical review of the buissness case To make recommendations on future project stages
Programme Board	**Responsible Officers** CPCA Transport Programme Representatives, CCC,DfT and National Highways	**Responsibilities Include** To approve change requests and RAG changes
Funding Partner(CPCA)	**Responsible Officers** Programme CO-Ordinator	**Responsibilities Include** To secure funding and support CCC in scheme development Undertake technical review to ensure scheme value for money
Delivery Partner	**Responsible Officers** Transport Planning Officers,Project Engineers	**Responsibilities include** Manage/review day to day project issues Monitor progress/key milestones Report issues to the Project Board Engage with Stakeholders
Contractor(PHS)	**Responsible Officers** Transport Planning,Highway Design, Environment,Network Manager and Street Works Co-Ordinator	**Responsibilities Include** Technical Delivery of the scheme Day to day running of the project Highlighting project/scheme risks Identifying options and assessing scheme value for money

Figure 6.5: Key Project Roles and Responsibility

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 scheme delivery are outlined in Table 6.1 beneath:

Table 6.1:Key Project Milestones

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Newark Road Footpath and Oxney Road Pedestrian Crossing)
November 2022	Construction commences on the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Newark Road Footpath and Oxney Road Pedestrian Crossing schemes. Advance works begin for construction of the remaining three schemes, including vegetation clearance and STATS diversions.
May 2023	Construction starts on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road and Junction 7 schemes.
July 2023	Construction finishes on the Junction 7 scheme. Construction starts on the Oxney Road / Newark Road scheme.
September 2023	Construction finishes on the Oxney Road / Newark Road scheme.
March 2024	Construction finishes on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme.
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.

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Project Liaison Officer

6.8.2 A designated Project Liaison Officer (PLO) was assigned to the scheme throughout the public consultation period and will continue to be available 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. The PLO will contact residents and stakeholders via letter several months ahead of construction to provide final details on the scheme and the construction delivery programme, creating a two way communication channel between the scheme delivery team and residents and stakeholders.

6.8.3 The PLO will also be responsible for providing regular updates via email and social media and will be the first point of contact for queries, suggestions and complaints, and will coordinate responses to members of the public and key stakeholders when these queries are received.

Stakeholders

6.8.4 The stakeholders include:

- CPCA as the Local Transport Authority and funding body for the scheme.
- The Council as the Local Highway Authority.
- Natural England, as the organisation responsible for conserving, enhancing, and managing the natural environment.
- Environment Agency as the public body responsible for protecting and improving the environment.
- Statutory Undertakers, including Anglia Water, Utilities and Telecommunications Companies, who have infrastructure within the vicinity of the proposed schemes.
- The North Level District Internal Drainage Board (IDB) as the organisation responsible for managing water levels.
- Businesses and residents situated in Fengate that are within the vicinity of the scheme / s including the developers for the Red Brick Farm site.

6.8.5 Stakeholder consultations were undertaken by the Project Team following approval of the SOBC and at the time of the Public Consultation (February 2021 – March 2021). All stakeholders were consulted via email or letter for comments on the Preferred scheme prior to the completion of Detailed Design.

6.8.6 Communication with key stakeholders has been maintained throughout the project and there has been no adverse response to the scheme presented. Stakeholder discussions have predominantly focused on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme, and specifically it's interaction with the Red Brick Farm site and nearby drainage infrastructure.

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Public Consultation

6.8.7 Public consultation on the concept of a scheme at Fengate was initially undertaken in the summer of 2019, as part of the CPCA Local Transport Plan[26] that was adopted in January 2020. This consultation made residents aware that Fengate 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 were received.

6.8.8 A further round of public consultation took place between February and March 2021 using the concept designs. No comments were received relating the scheme designs themselves, however some feedback was received regarding the poor level of pedestrain infrastrcuture currently within Fengate. Two additional schemes were included in the package of works to address this (further infomation is provided in Section 2.16 of the Strategic Case).

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.

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

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6.10 Scheme Evaluation

6.10.1 The Scheme Evaluation Plan for the Fengate Access Study is detailed in Appendix I. This has been prepared in line with the CPCA Assurance Framework and DfT guidance, and will follow 'standard monitoring'[27] principles.

6.10.2 The Scheme Evaluation Plan was 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 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.

[27] Major Scheme Business Cases: Evaluation Guidance for Local Authority Major Schemes (publishing.service.gov.uk).

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Table 6.2: Benefits Realisation Strategy

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Data Collection Method	Benefit Owners	Benefit Enablers
Tackle congestion and improve journey time reliability: Tackle congestion at key pinch points across the Study Area and reduce delay in to the Fengate area.	• Traffic Signal Improvements at Junction 7 • Creation of a mini roundabout at the junction of Oxney/Newark Road • Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road	• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased operational efficiency of the road network • Reduction in stationary / rolling traffic resulting in air quality improvement • Increased attractiveness of the Fengate area	• Commuters / Business trips • Local residents • Visitors to the City	• Desk study / site visits • Survey footage review • Journey time dataset for a month period	CPCA / PCC	• Completion of the schemes • Monitoring of network performance
Support Peterborough's Growth Agenda and facilitate the development of Red Brick Farm site: Ensure that the planned employment growth at Red Brick Farm can be accommodated.	• Traffic Signal Improvements at Junction 7 • Creation of a mini roundabout at the junction of Oxney/Newark Road • Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road	• Reduced peak hour congestion for journeys leading to more reliable journey times • Increased network capacity and operational efficiency • Increased attractiveness of the Fengate area	• PCC in regard to fulfilment of the Local Plan • Businesses in Fengate • Residents / Local Community	• Desk Study of economic data provided by PCC • Review of Local Plan goals for economic growth	CPCA / PCC	• Completion of the schemes • Promotion of Fengate businesses and wider City Area
Protect the local environment and improve biodiversity: Ensure a 20% biodiversity net enhancement within the study area.	• Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout	• Reduced peak hour congestion for journeys leading to more reliable journey times • Increased attractiveness of the Fengate area • Achievement of 20% biodiversity net enhancement	• PCC / CPCA in regard to environment and biodiversity • Businesses in Fengate area • Residents / Local Community	• Desk Study analysis FBC calculation for carbon • Analysis of key project documents by the schemes Project Board	CPCA / PCC	• Completion of the schemes • Promotion of Fengate businesses and wider City Area • Biodiversity Net Enhancement Calculation • Air quality monitoring
Improve Road Safety: Reduce personal injury accidents and improve personal security amongst all travellers.	• Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout • Improvements to Newark Road footpath • Traffic Signal Improvements at Junction 7 • Creation of a mini roundabout at the junction of Oxney/Newark Road	• Reduced peak hour congestion for journeys leading to more reliable journey times • Increased operational efficiency of the Fengate network • Fewer causalities • Fewer accidents involving rear end shunts on main approaches	• Commuters / Business trips • Local residents • Bus Operators	• Desk study / site visits • Collated data from 12-hour manual classified counts • Survey footage review • Journey time dataset for a month period	CPCA / PCC	• Monitoring of network performance • Completion of the schemes including walking and cycling elements • Road safety audit • Monitoring / investigation of accidents
Improve Active Travel Provision with Fengate: Improve active travel provision with the Fengate Access Study area.	• Improvements to Newark Road footpath • Creation of a mini roundabout at the junction of Oxney/Newark Road • Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout	• Fewer accidents involving rear end shunts on main approaches • Reduced peak hour congestion for journeys leading to more reliable journey times • Increased attractiveness of the Fengate area	• Commuters / Business trips • Local residents • Visitors to the City • Active Mode users • Fengate business users	• Desk study / site visits • Survey footage review	CPCA / PCC	• Completion of the schemes including walking and cycling elements • Road safety audit • Monitoring / investigation of accidents
Positively impact traffic conditions on the wider network: Positively impact the performance of local routes impacted by the traffic and congestion in and around Fengate	• Traffic Signal Improvements at Junction 7 • Creation of a mini roundabout at the junction of Oxney/Newark Road • Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road	• Reduced peak hour congestion for journeys 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	• Desk study / site visits • Collated data from 12-hour manual classified counts • Journey time dataset for a month period	CPCA / PCC	• Completion of the schemes • Monitoring of network performance
Reduce Severance for Active Travel Users: Reduce severance caused to active travel users by the road network	• Improvements to Newark Road footpath • Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout	• Reduced peak hour congestion for journeys leading to more reliable journey times • Fewer accidents involving rear end shunts on main approaches	• Commuters • Local residents • Visitors to the City	• Desk study / site visits • Survey footage review • Journey time dataset for a month period	CPCA / PCC	• Completion of the schemes • Monitoring of network performance
Upgrade Junction 7: Upgrade the junction to overcome maintenance and safety concerns with the current asset.	• Traffic Signal Improvements at Junction 7 • Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout	• Reduced peak hour congestion for journeys leading to more reliable journey times • Increased attractiveness of the Fengate area	• Commuters • Local residents • Visitors to the City • Bus Operators	• Desk study / site visits • Analysis of key project documents by the schemes Project Board • Survey footage review	CPCA / PCC	• Completion of the schemes • Monitoring of network performance

Monitoring and Evaluation Delivery

6.10.5 The monitoring and evaluation of the Fengate Access Study 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 Fengate Access Study Improvement Schemes are as follows:

Table 6.3: Monitoring and Evaluation Timescales

Monitoring Activity	Timescale
Prior to scheme build (Baseline)	2019
During Construction	2023
Scheme Opening	2024
One year post scheme opening	2025
Five years post scheme opening	2029

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6.10.7 Table 6.4 overleaf summaries the monitoring and evaluation approach for the Fengate Access Study Improvement Schemes, detailing how the objectives will be measured, the data sources to be collected and the timescales for when monitoring and evaluation of the scheme will be reported.

6.10.8 Full details of the Monitoring and Evaluation Plan are provided in Appendix I.

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Table 6.4: Monitoring 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	October 2022 – January 2023	-	CPCA / PCC	-
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Inspection On-Site	December 2022	November 2022 – March 2024	2025	CPCA / PCC	£1,500
Objectives	**Outcomes**							
1 / 4 / 5 /8	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage	October 2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
		Enhanced Network Performance for Public Transport, namely for the Citi 4 and 37 Service	Local Bus Company Punctuality Data	2019 / 2022	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
		New Infrastructure for Sustainable Modes	Site Inspection / Usage Data	2021 / 2022	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
		Reduce the number of accidents at Junction 7and Edgerley Drain Road / Storey's Bar Road Junction	Peterborough Database of Road Traffic Records	Dataset 2015 - 2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
4 / 5 / 6 / 7	Travel Demand	Enhanced Network Performance, Junction 7 and Edgerley Drain Road/Storey's Bar road/Vicarage Farm Road junction	Classified Turning Counts / Site Visits / Video Survey Footage	October 2019	-	April 2025 / April 2029	CPCA / PCC	£3,750 for count surveys and £500 for data analysis at both 1 year and 5-year reporting Total = £7,500
2 / 3	Impact on Economy	Employment Growth Ambitions in Fengate	PCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5-year reporting Total = £1,000
3	Impact on the Local Environment	Ensure a Net Gain of Biodiversity across the Study Area	Biodiversity Calculation / Site Survey and Desk Based Assessment	October 2022	-	April 2025 / April 2029	CPCA / PCC	£1000 for site inspections and data analysis at both 1 year and 5-year reporting Total = £2,000
1 / 6	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / PCC Air Quality Monitoring Sites / Future traffic demand data	October 2022	-	April 2025 / April 2029	CPCA / PCC	£1000 data analysis at both 1 year and 5-year reporting Total = £2,000
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							**£25,000**

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6.11 Scheme Logic Map

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

- Changes in traffic flow and journey time reliability, in the Fengate Access study area
- 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 road network has supported Council growth aspirations
- Changes to the level of active travel provision within the Fengate Access study area.

6.11.2 The Logic Map in Figure 6.6 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.

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Context

- The Fengate Access study will help support local growth, as well as provide wider network benefits. By addressing future congestion issues, increasing accessibility, and enhancing the local area and attractiveness of the city will support existing and future businesses
- The Scheme will provide the necessary improvements to unlock the identified growth throughout the area, as well as tackle any associated congestion issues from the proposed growth

Inputs

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

Network Improvement Scheme

Outputs

- Traffic Signal Improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road).
- Creation of a mini roundabout at the junction of Oxney Road / Newark Road.
- Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.
- Traffic Signal Improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road.
- Improvements to Newark Road footpath.

Transport Outcomes

- Improved journey times for users within the study area, particularly Edgerley Drain Road / Storeys Bar Road.
- Reduction in queue lengths, congestion, and accidents during peak times at key junctions
- Increased attractiveness of active travel modes through reduced severance and improved infrastructure provision

People, Business, and Place Outcomes

- Improved network efficiency will help facilitate development in the Fengate Study area, and will increase the attractiveness of the city as a place to live and invest in.
- Early environmental considerations, Improving 20% Biodiversity Net Enhancement within one year

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 6.6: Fengate Access Study Logic Model

Appendices

Appendix A – Project and Construction 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	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	Resident/ business letter drop & advanced warning sign displayed 2 weeks prior to starting.	High	Milestone
2	Weather delays affecting operations	50%	£3,000	£6,000	£12,000	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.	£3,000	Check forecasts, manage sites accordingly From weather. Possible stand-down allowed 10 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	Sub-contractors to manage risk. Alternative procurement options to be available.	Low	Milestone
4	Underground utilities and condition	80%	£1,200	£14,000	£21,000	Operational	Extensive underground utilities pr	£11,200	Provision of vacuum excavat	High	Milestone
5	Take off errors	15%	£1,500	£3,000	£5,000	Operational		£450		Low	Milestone
6	Damages	80%	£200	£1,500	£5,000	Operational	Works location in close proximity to known high crime area.	£1,200	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%	£5,000	£10,000	£20,000	Operational		£9,500		High	Milestone
8	No availability of materials- steel and other construction materials	70%	£100	£300	£1,000	Operational		£210		High	Milestone
9	Traffic signal works are sourced by client - traffic signal works under Milestone TM and programme provision	30%	£750	£3,750	£5,000	Operational	Delay 5 supervision shifts	£1,125	Allow for supervision element and loss of revenue	Medium	PCC
10	Welfare location, cost and its reinstatement	100%	£500	£1,500	£3,000	Operational		£1,500	Aragon to reinstate compound area	Low	Milestone
11	Overhead utilities	100%	£100	£200	£300	Operational	BT overhead cables within works a	£200	Provision of signage/ blue cones	Low	Milestone
12	Hazardous substance during excavation - asphalt/ soil	60%	£700	£7,000	£15,000	Operational	Contaminated soil/ planings identified. Segregation & specialist disposal required	£4,200	Testing to be carried out prior to works starting.	Low	Milestone
13	DNO pot ends - TS equipment removal	60%	£900	£1,500	£2,400	Operational	Electrical disconnections not speci	£900	TBC before works start on site.	High	Milestone
14	Works adjacent to mature trees. Multiple mature trees and other vegetation require removal	100%	£10,000	£15,000	£20,000	Operational		£15,000	Aragon to carry out works before construction start date.	High	Milestone
15	Private land acquisition	50%	£0	£25,000	£100,000	Planning/ operational	Start date delay.	£12,500	May be possible to start without CPO being issued by PCC planning. TBC.	High	PCC
16	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
								£ -			Milestone
								£ -			Milestone
								£ -			Milestone
								£ -			Milestone
								£ -			Milestone
	Total							£87,385			
								0			

Date Updated: 11/10/2022

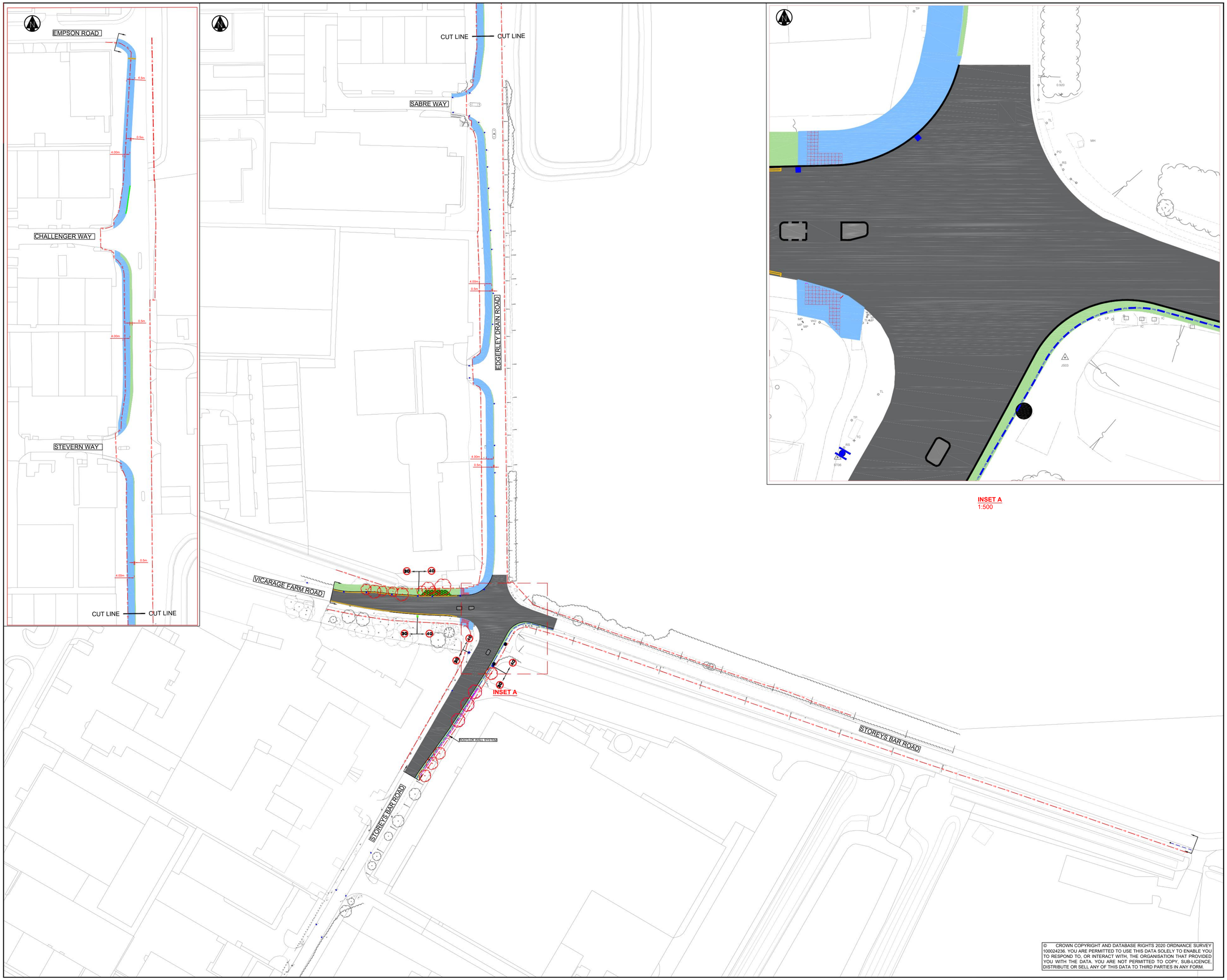
No:	Risk Description	Likelihood	Minimum Cost (£)	Most Likely Cost (£)	Maximum Cost (£)	Project Impact	Comments	Likelihood (%) x Most Likely Cost (£)	Mitigation	Risk Category	Owner
1	Public issues/Access issues	90%	£500	£1,000	£2,500	Operational	Risk with PCC, a Provision is made in Target against so 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
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	80%	£1,200	£7,000	£14,000	Operational	Extensive underground utilities present.	£ 5,600.00	Provision of vacuum excavator.	High	Milestone
5	Take off errors	15%	£1,500	£3,000	£5,000	Operational		£ 450.00		Low	Milestone
6	Damages	75%	£500	£1,000	£5,000	Operational	Works location in close proximity to known high crime area.	£ 750.00	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%	£1,000	£1,500	£2,500	Operational		£ 1,425.00		High	Milestone
8	No availability of materials- steel and other construction materials	70%	£100	£300	£1,000	Operational		£ 210.00		High	Milestone
9	Traffic signal works are sourced by client - traffic signal works under Milestone TM and programme provision	30%	£750	£3,750	£5,000	Operational	Delay 5 supervision shifts	£ 1,125.00	Allow for supervision element and loss of revenue	Medium	PCC
10	Welfare location, cost and its reinstatement	100%	£500	£1,500	£2,500	Operational		£ 1,500.00	Aragon to reinstate compound area	Low	Milestone
11	Overhead utilities	100%	£100	£200	£300	Operational	BT overhead cables within works area.	£ 200.00	Provision of signage/ blue cones	Low	Milestone
12	Hazardous substance during excavation - asphalt/ soil	60%	£700	£5,000	£7,000	Operational	Contaminated soil/ planings identified. Segregation & specialist disposal required	£ 3,000.00	Testing to be carried out prior to works starting.	Low	Milestone
13	DNO pot ends - TS equipment removal	60%	£900	£1,500	£2,400	Operational	Electrical disconnections not specified on the drav	£ 900.00	TBC before works start on site.	High	Milestone
14	Works adjacent to mature trees. Tree roots in excavation area.	50%	£1,200	£1,400	£7,000	Operational		£ 700.00	Provision of vacuum excavator.	High	Milestone
15	5G network mast within vicinity of works.	75%	£1,200	£7,000	£14,000	Operational	High risk service.	£ 5,250.00	Provision of vacuum excavator.	High	Milestone
16	Works on bus route	100%	£5,000	£10,000	£15,000	Operational		£ 10,000.00	Restricted hours working	High	Milestone
								£ -			Milestone
								£ -			Milestone
								£ -			Milestone
								£ -			Milestone
								£ -			Milestone
	Total							£ 34,010.00			
								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	Traffic signal works are sourced by client - traffic signal works under Milestone TM and programme provision	30%	£750	£1,500	£3,750	Operational		£ 450.00	TM/ supervision costs for delays.	Medium	PCC
10	Welfare location, cost and its reinstatement	75%	£500	£750	£1,500	Operational		£ 562.50	Aragon to reinstate compound area	Low	Milestone
11	Overhead utilities	100%	£100	£200	£300	Operational	BT overhead cables within works area.	£ 200.00	Provision of signage/ blue cones	Low	Milestone
12	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
13	DNO pot ends - TS equipment removal	60%	£900	£1,500	£2,400	Operational	Electrical disconnections not specified on the drawing.	£ 900.00	TBC before works start on site.	High	Milestone
14	Works adjacent to mature trees. Tree roots in excavation area.	50%	£1,200	£1,400	£7,000	Operational		£ 700.00	Provision of vacuum excavator.	High	Milestone
15	Works on bus route	100%	£2,500	£5,000	£10,000	Operational		£ 5,000.00	Restricted hours working	High	Milestone
								£ -			Milestone
	Total							£ 19,305.00			
								0			

	Risk Information										Cause & Effect		Inherent Score			Risk Control		Residual Score	Action required			Risk cost		Target Score	
Risk Ref	Risk Title	Date Identified	Risk type	Proximity	Risk Status	Risk Owner	Risk Lead	Latest Review Date	Last Reviewed By	Last Review Comments	Cause	Effect	Inherent Risk Score	Likihood Score	Impact Score	Control (mitigation action)	Control Owner	Residual Risk Score	Action	Person responsible	Date to be implemented by	Cost of risk/ control (£k)	Escalation Required?	Target Risk Score	Date Closed
19	Projects funded by TCF funding are required to commence their construction by 31 March 2023. There is a risk that the Fengate project will likely be impacted by this.	Apr-22	Financial	Imminent	**Open**	Lewis Banks		Oct-22	Lewis Banks		Start construction of all TCF funded projects by March 2023	Risk of losing funding	5	1	5	A review will take place of all projects that are to be impacted by their spending requirement. Furthermore, clarification will be sought from the DfT whether funding deadline can be extended into 2023/24.	Lewis Banks	5	Not at the moment.				No	7	
21	Potential for redesign work to be undertaken on the Storey's Bar scheme of the Package.	Apr-22	External	Imminent	**Open**	Lewis Banks		Oct-22	Lewis Banks		Developers for Red Brick Farm have recently resubmitted their proposals for the site, which may alter future trips expected within the area.	Potential redesign work, delay to programme, increased cost etc.	10	5	2	Undertake sensitivity tests within AIMSUN with the new future trip proposals, to understand the impact on scheme design and package BCR should amendments to the scheme be needed.	Lewis Banks	6	Not at the moment.				No	6	
13	**Land ownership issues** Small amount of land is required for the Edgerly Drain / Storey Bar scheme. Redline plans have been drawn up with proposed area required and sent to developers to aid this process. "	Apr-21	Legal or Procurement	Close	**Open**	Lewis Banks		Oct-22	Lewis Banks	Very high risk if land is not required in time of construction that TCF funding will not be claimed as planned.	Land ownership	"Delay to completion of detailed design. Risk of unknown stats that could impact scheme"	10	5	2	Mitigation is for designers, PCC planning to maintain strong communication with developers.	Lewis Banks	10	Not at the moment.				No	7	
24	Board Sept 2022 - advance TCF for walking and cycling	Aug-22	**Financial**	**Close**	**Open**	**PCC/CPCA**		Oct-22	Emma White		Due to TCF deadlines of March 2024 request has been made to advance funding before completion of FBC to progress construction of active travel	De-risk programme and TCF spend	5	1	5	T and I Committee and CA board Sept 2022	Emma White	5						5	
20	Scheme construction cost may increase significantly following rise in inflation of raw materials.	Apr-22	Financial	Imminent	**Open**	Lewis Banks		Oct-22	Lewis Banks		Rise in inflation	More funding than previously identified would be required	2	1	2	This will be regularly monitored. One of the options considered could be to procure raw materials early.	Lewis Banks	2	Not at the moment.				No	2	
22	Challenges on biodiversity net gain being achieved within the study footprint due to limited opportunity for replanting etc. Consequence of this is that it replanting may have to be offset across the City area.	Apr-22	Planning or Environmental	Imminent	**Open**	Lewis Banks		Oct-22	Lewis Banks		Biodiversity Net Enhancement and limited land availability within the study footprint	Replanting may have to be outside the study footprint, in order to meet PCC/ CA policy objectives for Major schemes.	6	3	2	Talks to be held with PCC / CA on this matter, for both parties to understand constraints within the study area, and what opportunities can be taken to best achieve net gain.	Lewis Banks	5	Not at the moment.				No	5	
14	**Loss of trees during construction of scheme** There is a risk that there may be some trees that wil need removing for highway improvement works."	Jul-21	Planning or Environmental	Close	**Open**	Lewis Banks		Oct-22	Lewis Banks		Tree loss	Bad publicity	10	5	2	To mitigate with the loss of trees, additional trees will be planted as part of the scheme. This will be covered as part of the environmental assessment.	Lewis Banks	4	Not at the moment.				No	4	
18	Difficulty is achieving Biodiversity Net Gain objectives currently set for project.	Mar-22	Planning or Environmental	Approaching	**Open**	Lewis Banks		Oct-22	Lewis Banks		Biodiversity Net Gain	Risk of not meeting standards ste by DEFRA.	3	1	3	PCC and Milestone will hold a meeting with CPCA to discuss this further. If Biodiversity Net Gain cannot be achieved there will still be a number of environmental enhancements delivered as part of this scheme.	Lewis Banks	3	Not at the moment.				No	3	
4	**No signed grant agreement** There is risk due to the uncertainty with the project may result in the grant agreement also being put on hold until agreement is reached with the developer. "	Jul-19	External	Imminent	**Open**	Lewis Banks		Oct-22	Lewis Banks		Delay in sign off of grant agreement	No signed grant agreement	5	1	5	The CPCA will be informed with regular updates so when an agreement is reached a grant agreement can issued.	Lewis Banks	3	Not at the moment.				No	3	
6	**Delay to obtaining planning approval** The developer is to submit a planning application which is scheduled to be reviewed at the Planning Committee meeting on June 2020. This decision will determine what changes will be required to the scope of the business case."	Feb-20	Strategic	Approaching	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Delay to decision on scope of scheme	Unable to obtain sign off of SOBC and OAR Unable to request for approval to commence start of next stage - OBC"	20			The CPCA will be kept updated and will be informed of outcome. The SOBC will be completed with all options being considered and when the next stage will commence it is hoped a decison will have been made concerning the planning application. Therefore the OBC will be prepared looking at the aspects that would be delivered by PCC.	Lewis Banks	5					Yes (Programme)	5	Apr-21
9	**Consultation** There is a risk that schemes identified may receive objections from local residents and stakeholders."	Feb-21	Political	Imminent	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Public and stakeholder objections	Likely effect is that a delay would be caused to FBC and detailed design.	12			Early consultation/notification as deemed necessary by PCC. Develop publicity strategy and liaise with businesses/residents affected by the works and scheme mobilisation.	Lewis Banks	5					No	5	Apr-21
2	**Scheme on hold due to change** There is a risk the scheme could be on hold for longer than expected due to not being able to come to an agreement with the developer on what highway schemes identified in the study could be funded/delivered by the developer."	Jul-19	External	Imminent	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Not coming to an agreement with developer	Unable to make changes to current SOBC and OAR as	10			The council will look to hold regular meetings with the developer in order to come to an agreement of which schemes they will deliver.	Lewis Banks	5					No	5	Aug-20
7	**Delay to start of the next stage** Due to SOBC and OAR not being approved, the next stage cannot be started."	Jul-19	External	Imminent	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Delay in obtaining approval to commence the next stage	"Unable to obtain sign off of SOBC and OAR Unable to request for approval to commence start of next stage."	10			Arrange for necessary processes to be in place so when approval is granted there is no further delay and the next stage can commence	Lewis Banks	5					Yes (Programme)	5	Dec-20
16	Project to go on hold if additional funding not approved	Sep-21	External	Imminent	**Closed**	EW		Oct-22	Lewis Banks		Extra £150,000 needed to complete FBC	delay to tasks planned	7			PCC funding is close to being fully spent, additional funding from the CPCA is required to complete the FBC. Decision to be confirmed at the January CPCA Board meeting. Without this funding the project would have to go on hold.	Emma White	4					No	4	Feb-22
1	**Budget unlikely to be fully spent** Due to the project being on hold longer than expected, it is unlikely the budget will be fully spent this year."	Jul-19	External	Imminent	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Project progress on hold	"Unable to obtain sign off of SOBC and OAR Unable to request for approval to commence start of next stage - OBC"	7			When it is clear that the budget will not be fully spent then inform the relevant parties (Internal and CPCA) so that the necessary procedures are followed.	Lewis Banks	4					Yes (Programme)	4	Feb-21
8	**Delay to start of OBC** Current supplier, Skanska is in the process of selling part of its business to M Group Services. This includes highway services. There is a possible risk that transfer of resource may result in delay of project delivery. The consequences of which could impact progress."	Jan-21	External	Imminent	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Change of supplier	Likely effect is that a delay would be caused	7			Regular communication will be maintained and programme will be revised should there be a need.	Lewis Banks	3					No	3	May-21
3	**Changes to SOBC and OAR** There is a risk that the study undertaken will need to be updated to reflect the changes proposed by the developer. The programme planned will need to adjusted.	Jul-19	Internal	Close	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Not coming to an agreement with developer	"Unable to obtain sign off of SOBC and OAR Unable to request for approval to commence start of next stage - OBC"	7			The Council Transport Planning team will hold regular progress meetings with the Skanska Project Team, so they are able to identify what the changes will be and include these in the project programme.	Lewis Banks	3					No	3	Sep-20
12	**Delay to completion of FBC** Due to delay of developer led scheme, the FBC will be not completed as planned."	Mar-21	External	Close	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Delay to developer planned works	"Delay to completion of FBC Delay to start of construction works"	8			The Project Team has been advised of a 9-month delay to the Developer programme, which will have a knock-on impact on the programme. The reprofiling of the programme is currently underway and will be submitted to CPCA for agreement. At present its likely that the FBC submission will be spring 2022 with construction anticipated to be Jun 2022 onwards.	Lewis Banks	4	Not at the moment.				No	4	Oct-22
10	**Delay to programme** Delay to project programme resulting from slower developer programme. If the developers are further delayed on their side, there will be a knock-on impact for PHS in terms of construction. "	Feb-21	External	Approaching	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Delay to developer planned works	Delay to tasks planned	8			Mitigation is to have ongoing discussions with developers to understand their programme and any further delay.	Lewis Banks	4	Not at the moment.				No	4	Oct-22
5	**Coronavirus outbreak** There is risk that with the rise of coronavirus cases that some of the staff working on the project may become infected and would have to.self isolate."	Mar-20	Internal	Imminent	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Delay to project	Likely effect is that a delay would be caused	10			Government guidance would be followed. Any member of staff or their family do become unwell, they would be recommended to work from home for a 10 day period/self isiolate.	Lewis Banks	5	Not at the moment.				Yes	5	Mar-22
11	**Delay to detailed design** Delay to programme resulting from slow return from STAT information which are provided by third parties."	Feb-21	External	Imminent	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Delay to stat companies providing plans	"Delay to completion of detailed design. Risk of unknown stats that could impact scheme"	10			Mitigation is to continue to chase for information required.	Lewis Banks	6	Not at the moment.				No	6	Oct-22
17	Review is needed to ensure all of the designs are to LTN1/20 standards.	Feb-22	Legal or Procurement	Imminent	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Compliance of scheme design with LTN 1/20	"Additional design costs Further changes maybe required to scheme in order to ensure compliance "	11			On-going discussions with the design team.	Lewis Banks	6	Not at the moment.					6	Dec-22
15	**Advance stat payments** The number of stat diversions required for the individual schemes will result in significant C4 budget costs. "	Aug-21	Financial	Approaching	**Closed**	Lewis Banks		Oct-22	Lewis Banks		Stat costs	Delay to start of construction works	15			The construction budget will be used to cover the C4 stat payments. A request could be made to use part of the construcion budget early in order to make advance payment to stat companies.	Lewis Banks	6	Not at the moment.				No	6	Oct-22
23	**J20-J8 Lane/Gain scheme to expensive** Risk that due to the cost of the scheme it may be decided to not proceed with it as part of the package of schemes proposed for Fengate.	24-Jun	Financial	Approaching	**Closed**	Lewis Banks		Oct-22	Lewis Banks	Sensitivity testing has confirmed this to be removed. This removes the funding risk associated with the project, as the outturn cost is now expected to be within the funding secured (subject to TCF constraints)	Improvement works required are estimated to cost significantly more than the other schemes	Additional budget required	15			Once all of the schemes planned for Fengate have been costed a decision will be made whether to include J20-J8 scheme or deliver it as a separate scheme if it cannot be covered within the budget available.	Lewis Banks	7	Not at the moment.					7	Jul-22

Appendix B – General Arrangement Drawings



KEY

- PROPOSED VERGE (WIDTH VARIES)
- PROPOSED CARRIAGEWAY (SEE NOTE 4 a)
- PROPOSED TRAFFIC ISLANDS
- PROPOSED SHARED USE PATH
- VEHICLE HARD STANDING
- HB — EXISTING INDICATIVE HIGHWAY BOUNDARY
- 40 / 30 — PROPOSED SPEED LIMIT CHANGE (SEE NOTE 4e)
- SCHEME EXTENTS
- PROPOSED ROAD MARKINGS (SEE NOTE 4g)
- PROPOSED TACTILE PAVING (SEE NOTE 4b)
- ROOTLOK WALL SYSTEM WITH CLASS 61 STONE BACKFILL (SEE NOTE 4l)
- VRS — VRS — PROPOSED VRS FENCING (SEE NOTE 4d)
- TF — WOODEN THREE POST FENCE
- EXISTING TREE TO BE REMOVED (SEE NOTE 4h)
- PROPOSED CORDUROY PAVING (SEE NOTE 4b)

Notes:
1. Do not scale from this drawing.
2. Site verify all dimensions prior to construction
3. Report all discrepancies to the Drawing Originator immediately
4. This drawing is to be read in conjunction with all relevant documents and drawings.
   a) Pavement design; 5080845-MIL-HPV-SBR-DR-CH-0701
   b) Proposed Kerbing; 5080845-MIL-HKF-SBR-DR-CH-1101
   c) Proposed Drainage; 5080845-PCC-HDG-ZZ-DR-CH-0500
   d) Proposed VRS; 5080845-MIL-HRR-SBR-DR-CH-400 & 402
   e) Proposed Signs; 5080845-MIL-HSN-SBR-DR-CH-1251
   f) Proposed Earthworks; 5080845-MIL-HEW-SBR-DR-CH-601
   g) Proposed Road markings; 5080845-MIL-HMK-SBR-DR-CH-1201 5080845-MIL-HMK-SBR-DR-CH-1201
   h) Proposed Site Clearance; 5080845-PCC-HSC-DR-CH-0201
   i) Estimate GE2734 Rev A

Rev	Date	Description	Drn	Chkd	App
P03	21/10/22	REDUCED SCOPE DUE TO CPO	MU	CH	CH
P02	05/09/22	GW5 DETAILED DESIGN	CAT	CH	CH
P01	01/07/22	GW5 SAFETY AUDIT	CAT	MU	CH

Revisions

Drawing Originator

Peterborough Highway Services
Delivered by Milestone
Peterborough City Council

Drawing Status
GW5 DETAILED DESIGN

Project Name
FENGATE ACCESS
STOREYS BAR ROAD

Title
GENERAL ARRANGEMENT

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:1000	CAT	MU	CH
		Drawn Date 01/07/22	Checked Date 01/07/22	Approved Date 01/07/22

Drawing Number	Status	Rev
5080845-MIL-HGN-SBR-DR-CH-0101	S2	P03

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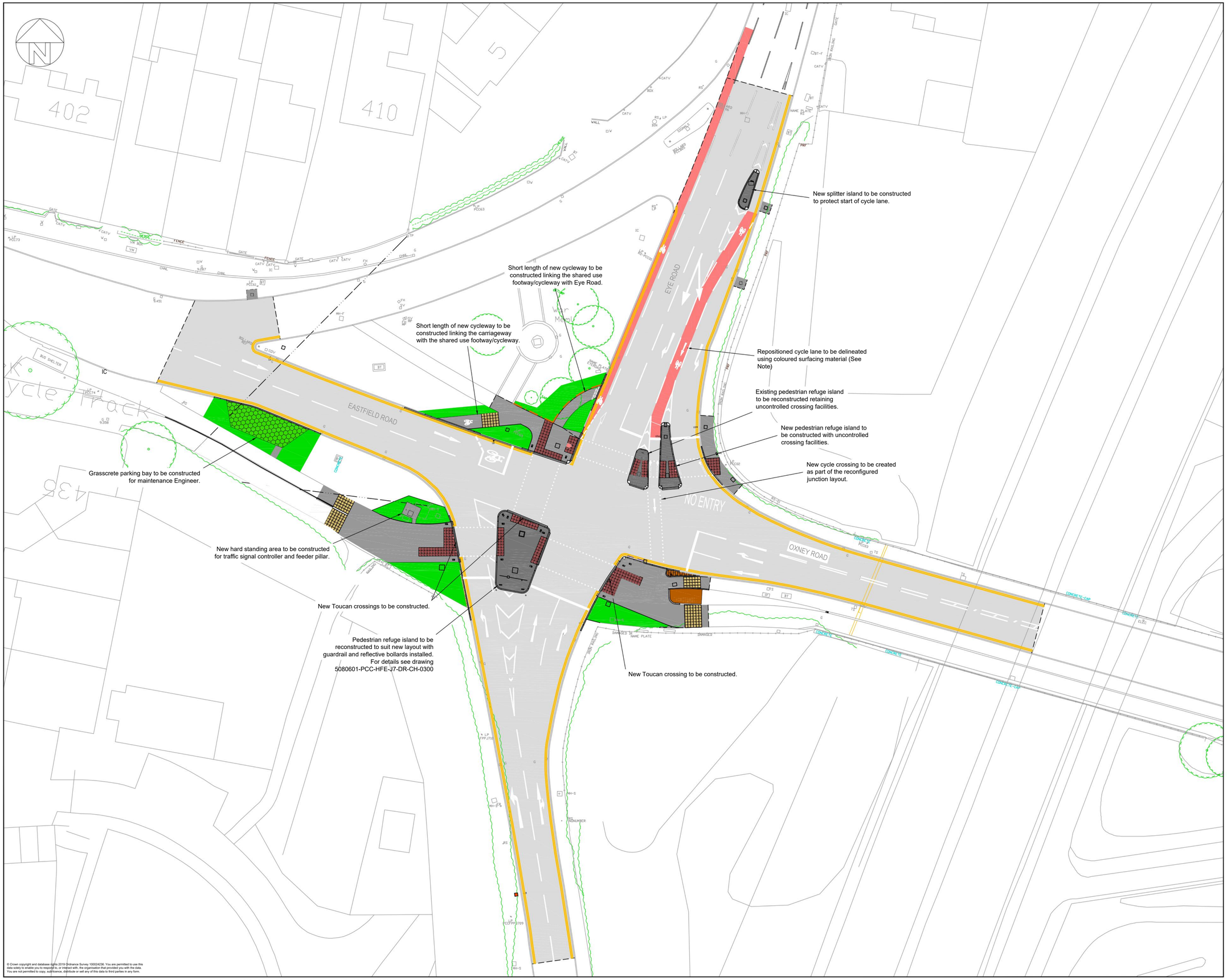

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KEY:

- CYCLE LANE (SEE NOTE 7)
- CARRIAGEWAY RESURFACING (SEE NOTE 5)
- ROAD MARKINGS (SEE NOTE 8)
- FOOTWAY OR CYCLE TRACK (SEE NOTE 7)
- REFUGE ISLAND (SEE NOTE 12)
- BLOCK PAVING (SEE NOTE 7)
- MAINTENANCE LAYBY (SEE NOTE 7)
- TOP SOILING & GRASS SEEDING (SEE NOTE 7)
- CORDUROY PAVING (SEE NOTE 7)
- TACTILE PAVING (SEE NOTE 7)

NOTES:

1. DO NOT SCALE FROM THIS DRAWING.
2. SITE VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION
3. REPORT ALL DISCREPANCIES TO THE DRAWING ORIGINATOR IMMEDIATELY
4. FOR SITE CLEARANCE DETAIL REFER TO DRAWINGS: 5080601/PCC/HSC/DR/CH/0200 & 201.
5. FOR PAVEMENT DETAIL REFER TO DRAWING: 5080601/PCC/HPV/DR/CH/0700.
6. FOR KERBING DETAIL REFER TO DRAWINGS: 5080601/PCC/HKF/DR/CH/1100 & 1101.
7. FOR FOOTWAYS, PAVED AREAS, LANDSCAPING, MAINTENANCE LAYBY AND DUCTING DETAIL REFER TO DRAWINGS: 5080601/PCC/HKF/DR/CH/1102-1105 & 1108.
8. FOR ROAD MARKINGS DETAIL REFER TO DRAWING: 5080601/PCC/HMK/DR/CH/1200.
9. TRAFFIC SIGNS NOT SHOWN FOR CLARITY, FOR DETAIL REFER TO DRAWING: 5080601/PCC/HSN/DR/CH/1201-1203.
10. TRAFFIC SIGNALS NOT SHOWN FOR CLARITY, FOR DETAIL REFER TO DRAWING: 17099-103B
11. STREET LIGHTING NOT SHOWN FOR CLARITY, FOR DETAIL REFER TO TO DRAWINGS 5080601-SKA-HLG-DR-EO-1301
12. FOR REFUGE ISLAND DETAIL REFER TO DRAWING: 5080601-PCC-HFE-J7-DR-CH-0300

Rev	Date	Description	Drn	Chk'd
P02	10.11.22	General amendments	CAT	CH
P01	26.02.21	First issue	PS	SM

Revisions

Client

Peterborough Highway Services
Delivered by Milestone Infrastructure
Peterborough City Council

Drawing Status

Preliminary

Project Name

Eastfield Road-Oxney Road Junction 7 Traffic Signal Refurbishment

Title

Original drawing sheet is A1

General Arrangement

Scale	Drawn by	Checked by	Approved by
1 : 250	PS	SM	SM
	Drawn Date 25/02/21	Checked Date 26/02/21	Approved Date 26/02/21

Drawing Number: 5080601-PCC-HGN-J7-CH-0100-D1

Revision: P02

File location: P:\Highways\Peterborough\Design\Highways\Schemes 2018-19\5080685 Oxney Road-Eastfield Signals\900 CAD & BIM\910 Design Drawings\5080601_PCC_HGN_DR_CH_0105_D1 P02 General Arrangement.dwg Printed by: Tasker, Christopher

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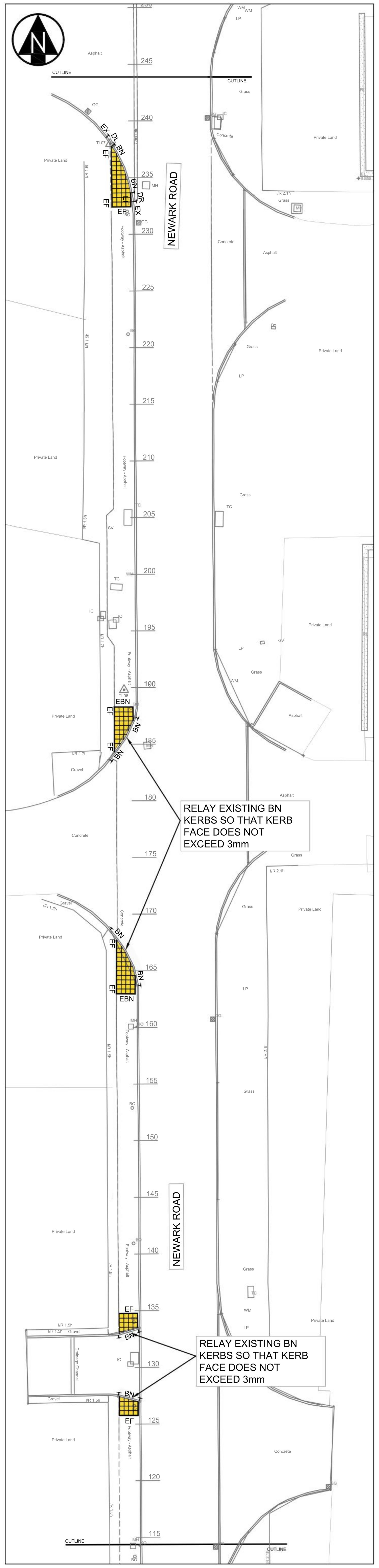
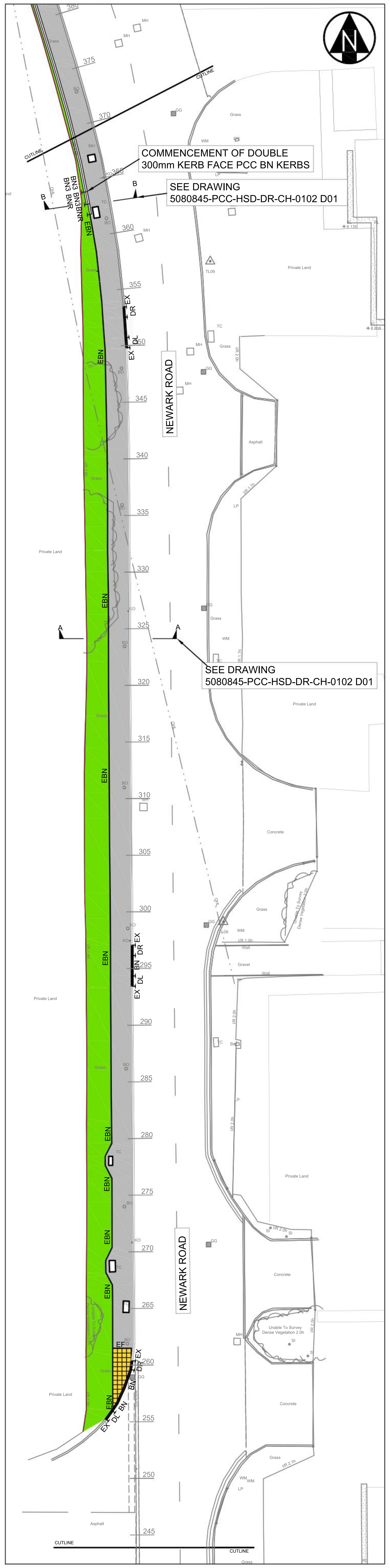
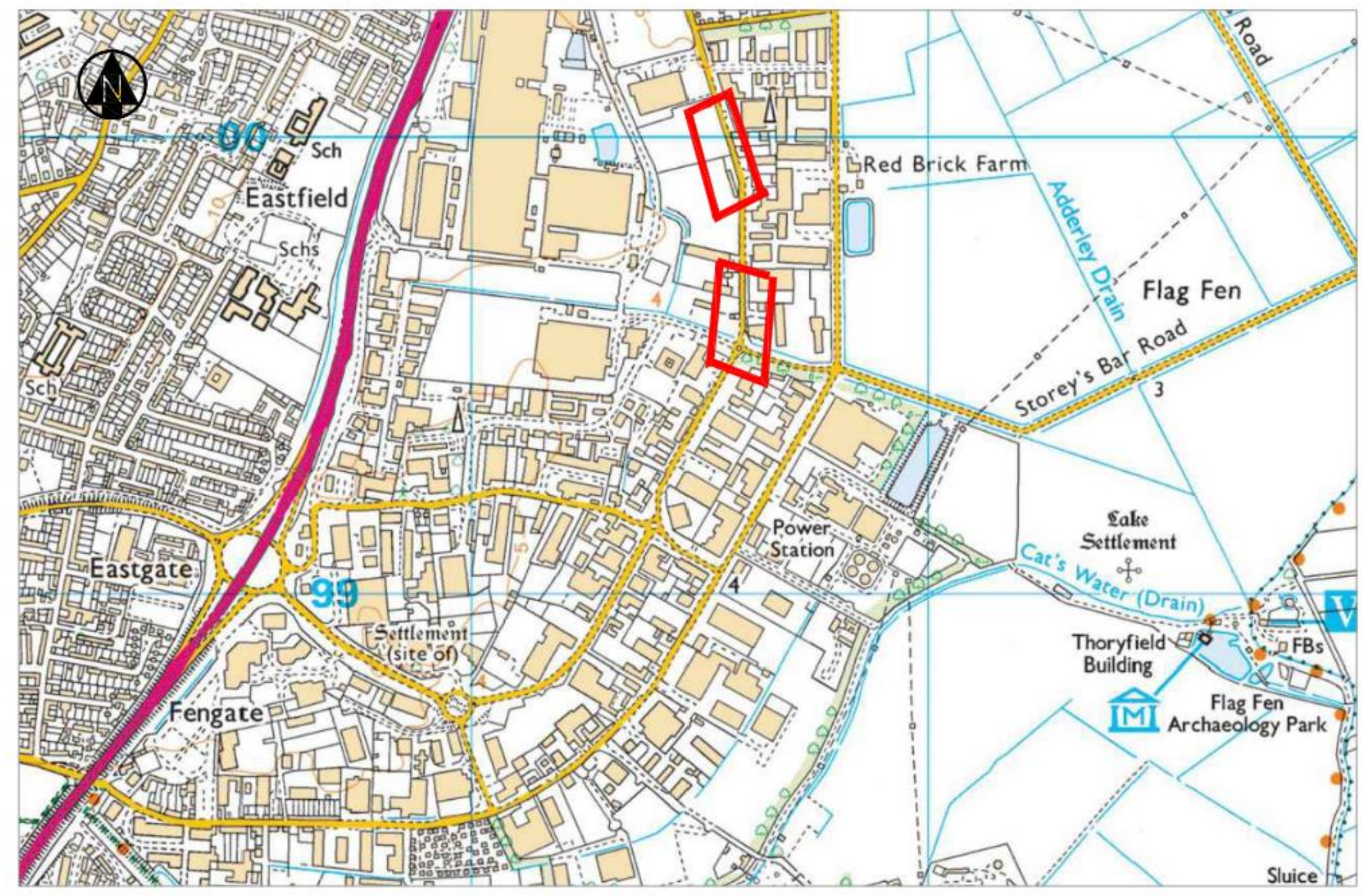
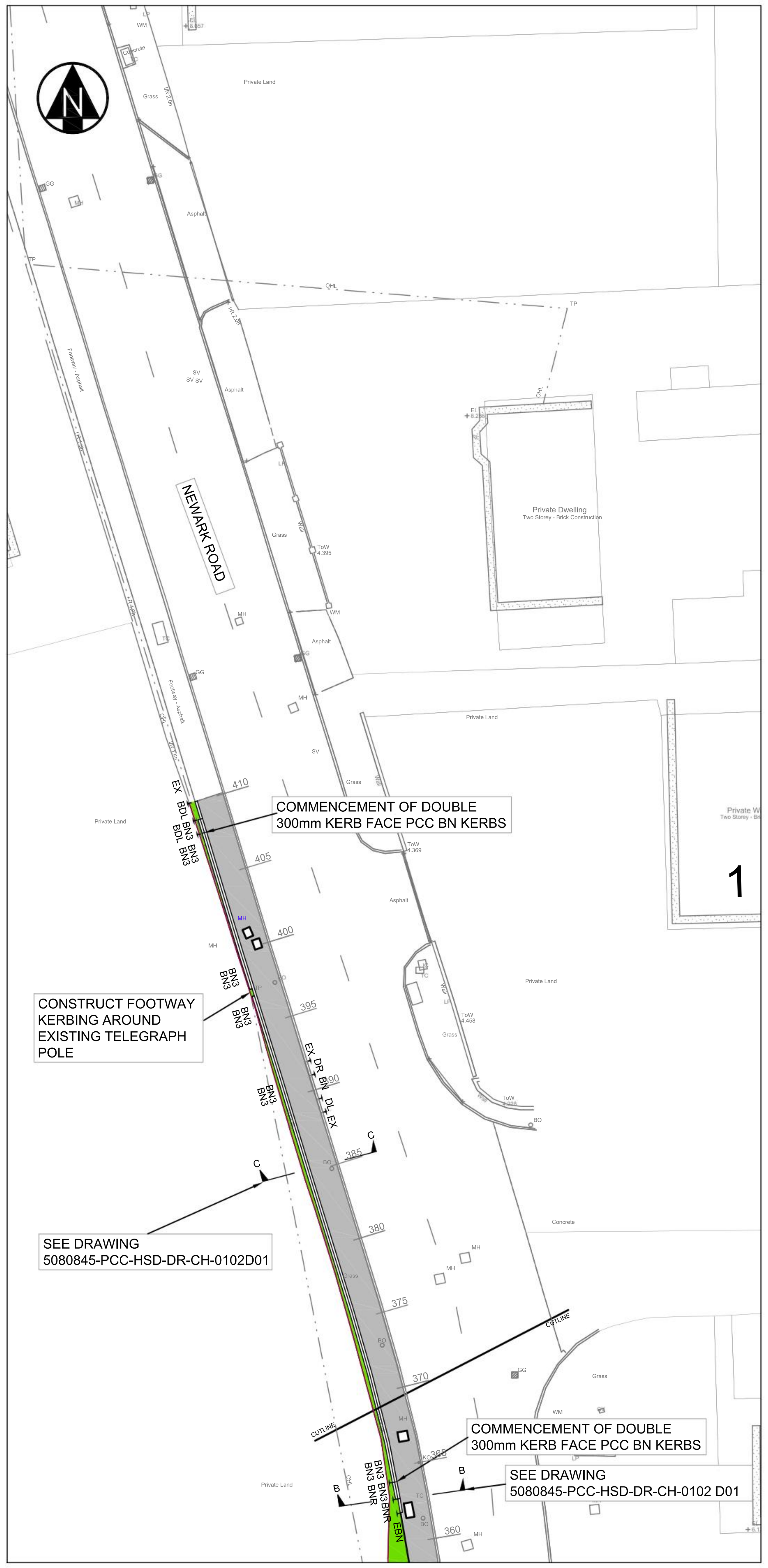






LOCATION PLAN
N.T.S.



NOTES:
1. DO NOT SCALE FROM THIS DRAWING.
2. REPORT ALL DISCREPANCIES TO THE DRAWING ORIGINATOR IMMEDIATELY
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTS AND DRAWINGS.
4. ALL APPROACH LANES ARE 3.2m WIDE.

KEY

HB2	Half battered kerb with 125mm upstand.
BN	Bullnose dropped kerb with 0 to 3mm upstand.
BN3	PCC 300mm Kerbface BN kerb
BN L/R	PCC 300mm Kerbface BN dropped kerb
DL	Half battered left hand drop kerb.
DR	Half battered right hand drop kerb.
EF	Flat topped PCC edging.
EBN	Bull nosed topped PCC edging

EXISTING LIGHTING COLUMN INCLUDING BRACKET ARM AND LUMINAIRE TO REMAIN

PROPOSED 8m GALVANISED STEEL LIGHTING COLUMN WITH PLANTED ROOT 0.5M OUTREACH BRACKET FITTED WITH LUMINAIRE AND TELENSA TELECELL FROM ADJACENT EXISTING COLUMN BEING REMOVED **- 1No.**

PROPOSED 10m GALVANISED STEEL LIGHTING COLUMN WITH PLANTED ROOT 0.5M OUTREACH BRACKET FITTED WITH LUMINAIRE AND TELENSA TELECELL FROM ADJACENT EXISTING COLUMN BEING REMOVED **- 2No.**

473.5m² FOOTWAY - FULL DEPTH CONSTRUCTION (CLAUSE 18.10)

SEE DRAWING 5080845-PCC-HSD-02-CH-01001-DO1 FOR CONSTRUCTION DETAIL AND DEPTHS.

25m² CARRIAGEWAY RESURFACING
PLANE OUT TO A DEPTH OF 30mm EXISTING SURFACING AND REPLACE WITH 30mm THK SMA 6 SURF 100/150 (PROPRIETARY DRIVEWAY/INDUSTRIAL MIX TO CLAUSE 18.5.1 OF THE PERCS

ROOT PROTECTION ZONE - BELOW TREE CANOPY HAND DIG ONLY

REPROFILE VERGE 150mm OF TOPSOIL AND GRASS SEED

BUFF COLURED TEGULA BLOCKS 80mm (h) x 200mm (l) x 100mm , ON A 30mm COMPACTED SAND LAYING BED.

25m² FOOTWAY - TACTILE PAVING

i.) SURFACE COURSE 65mm THICK 400x400 BUFF COLOURED FIBRE REINFORCED BLISTER TACTILE PAVING SLABS TO BS EN 1339: 2003
ii) BEDDING COURSE 35mm THICK MORTAR OR EQUIVALENT TO BE USED TO BED TACTILE PAVING
iii) BINDER COURSE - LOWER LAYERS TO MATCH ADJOINING FOOTWAY CONSTRUCTION
iv) SUB-BASE - LOWER LAYERS TO MATCH ADJOINING FOOTWAY CONSTRUCTION

Rev	Date	Description	Drn	Chk'd	App
C02	07/11/22	FOR INFORMATION	CAT		
C01	26/08/21	FOR CONSTRUCTION	CAT	RB	RB

Revisions

Drawing Originator
Peterborough Highway Services
Delivered by MILESTONE
PETERBOROUGH CITY COUNCIL

Drawing Status
FOR CONSTRUCTION

Project Name
NEWARK ROAD
FOOTWAY

Title

PAVEMENT AND KERB DESIGN

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:2500	CAT	RB	RB
		Drawn Date 11.02.2021	Checked Date 25.05.2021	Approved Date 25.05.2021

Drawing Number	Status	Rev
5080845-PCC-02-HGEN-DR-CH-0101	FI	C02

File printed: 07 November 2022 14:48:00 File location: P:\Highways\Peterborough\Design\Highways\Schemes 2020-21\5080845 Newark Rd Footpath\900 CAD & BIM\910 Design Drawings\construction\5080845-PCC-HGA-02-DR-CH-0101 C02.dwg Printed by: Tasker, Christopher

Proposed belisha beacon to be installed on outreach bracket, with pole sited at the back of footway.

Proposed 2.4m wide zebra crossing, 30m East of the Sainsbury's roundabout. Existing bus stop to be removed.

Existing carriageway to be re-surfaced using high PSV surfacing between Sainsbury's roundabout and new zebra crossing.

Existing carriageway to be resurfaced using high PSV surfacing, 40m in advance of crossing.

Oxney Road

CUTLINE A

Existing footway to be re-constructed to new tactile paving

Proposed kerb build out to provide horizontal deflection for eastbound vehicles. Entry width reduced to 3.0m. Build-out to remain partially over-runnable outside No.103a to maintain access.

Existing tree with TPO

Existing tree with TPO

New illuminated sign. (TSRGD Diag 611.1)

Existing tree with TPO

2 No. Existing private access.

101

101a

103

103a

105a

Hatching to tie-in to existing.

Proposed 2.4m wide zebra crossing, adjacent to the Parnwell footpath.

CUTLINE B

Existing signalised crossing to be replaced with 2no. zebra crossings as shown to the East and West of this location.

Oxney Road

Oxney Road

CUTLINE A

Proposed painted mini-roundabout, 2m diameter.

New illuminated sign. (TSRGD Diag 611.1)

Proposed 1.3m wide traffic island to provide horizontal deflection for westbound vehicles. 2 No. traffic bollards to be installed on island with min. 450mm clearance to edge of carriageway.

Proposed blockwork over-runnable strip. Existing kerbline to remain.

New sign to existing illuminated post. (TSRGD Diag 611.1)

Marking on Newark Road to be domed to improve conspicuity

New uncontrolled crossing point.

Newark Road

Newark Road entry width reduced to 3.5m.

144

142

138

138a

Hatching to tie-in to existing

Existing hatching to be re-marked from ends of zig-zags.

CUTLINE B

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Notes:
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2. Site verify all dimensions prior to construction
3. Report all discrepancies to the Drawing Originator immediately
4. This drawing is to be read in conjunction with all relevant documents and drawings

Key:

- Footway to remain as existing
- Footway to be re-surfaced
- Carriageway to remain as existing
- Carriageway to be re-surfaced
- Existing Verge
- Blockwork over-runnable strip
- Proposed traffic sign
- Glasdon Hazardmaster reflective marker post (or other similar approved).
- Belisha Beacon

Residual Risk Assessment
Wherever possible, risk is designed-out of this proposal during the design process. Where this is not possible the risk is indicated by this symbol.

SIGNIFICANT CDM HEALTH & SAFETY RISKS

1. Significant underground services

Rev	Date	Description	Drn	Chk'd	App
C01	08/2021	First Issue	STE	RLB	AE

Revisions

Drawing Originator

Peterborough Highway Services
Delivered by Milestone and Peterborough City Council

Drawing Status

DETAILED DESIGN

Project Name

FENGATE ACCESS
NEWARK ROAD & OXNEY ROAD JUNCTION

Title

GENERAL ARRANGEMENT (SHEET 1 OF 1)

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	1:200	STE	RLB	AE
		Drawn Date	Checked Date	Approved Date
		00-00-00	08/2021	08/2021

Drawing Number	Status	Rev
5080845-MIN-HGN-OR-DR-CH-0102	S2	C01

File printed: 18 August 2021 15:16:17 File location: Q:\HandT\GBPEB\Design\Highways\Schemes 2020-21\5080845 Fengate Access\900 CAD & BIM\910 Design Drawings\Newark & Oxney Rd Junction\0100 - HGN\5080845-SKA-HGN-OR-DR-CH-0101.dwg Printed by: Eastwood, Stephen (IS TUPE)

PS06
PROPOSED 'NEW TRAFFIC SIGNAL AHEAD' SIGN TO DIAG. 7014.

SCALE 1:200

CUTLINE 1
SEE BELOW FOR CONTINUATION

CUTLINE 1
SEE ABOVE FOR CONTINUATION

El Sub Sta

79

TCB

2

Shelter

PROPOSED PUFFIN CROSSING

CONNECT TO EXISTING LOW VOLTAGE POWER SUPPLY.

NEW LOCATION OF REMOVED ADVERT SIGN.

CONNECT TO EXISTING LOW VOLTAGE POWER SUPPLY.

TIE INTO EXISTING FOOTWAY TO PCC STANDARD DETAILS DRAWING No. APPENDIX C2

AREA OF EXISTING SOIL TO BE EXCAVATED OR FILLED WITH SUITABLE EXCAVATED MATERIAL TOP SOILED WITH 150mm MATERIAL TO SPECIFICATION FOR HIGHWAY WORKS (SHW) CLAUSE 618 AND GRASS SEEDED.

Northing	Level
300466.758	8.605
300483.764	10.465
300441.257	6.480
300467.810	5.637

Residual Risk Assessment
Wherever possible, risk is designed-out of this proposal during the design process. Where this is not possible the risk is indicated by this symbol.

SIGNIFICANT CDM HEALTH & SAFETY RISKS

1. UNDERGROUND ELECTRICAL CABLES
2. UNDERGROUND BT, GAS AND COMBINED SEWER WITHIN 10M WIDTH
3. UNDERGROUND BT UNDERGROUND CABLES

Notes:
1. Do not scale from this drawing.
2. Site verify all dimensions prior to construction
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4. This drawing is to be read in conjunction Utility Drawing 5080845-PH-VUT-ZZ-DR-CH-0101.dwg

KEY:

- BUFF-COLOURED TACTILE PAVING
- RED-COLOURED TACTILE PAVING
- BUFF COLORED THICK LADDER PATTERN TACTILE PAVING
- BUFF COLOURED TRAMLINE PATTERN TACTILE PAVING
- BN1 BULLNOSE KERBS INSTALLED AS DROPPED KERB
- BN2 BULLNOSE KERBS INSTALLED AS FULL HEIGHT KERB. KERB FACE TO MATCH EXISTING.
- DL DROPPED KERB LEFT HAND
- DR DROPPER KERB RIGHT HAND
- EF KERB EDGING
- HB2 HALF-BATTERED KERBS
- SP1 SPLAY KERBS
- TR1 SPLAY TO HALF-BATTERED PROFILE TRANSITION KERBS
- PROPOSED GRASSCRETE CELLULAR GRASS PAVING OR SIMILAR
- PROPOSED GRASS SEED TO REPLACE EXISTING PAVEMENT
- PLANE 40MM AND INLAY WITH WITH NEW ASPHALT.
- BREAK UP EXISTING FOOTWAY AND REPPLACE WITH PROPOSED GRASS SEED
- FOOTWAY RESURFACING.
- NEW FOOTWAY
- EXISTING SAFETY BARRIER TO BE RETAINED.
- EXISTING GIVE WAY LINES TO BE RENEWED
- EXISTING UNLIT SIGN TO BE REMOVED
- EXISTING ILLUMINATED SIGN TO BE REMOVED
- PROPOSED SIGN
- PROPOSED 1 X 100mm Ø ORANGE DUCT 6M² 3-CORE PVC CABLE.
- PROPOSED 2 X 100mm Ø ORANGE DUCT 6M² 3-CORE PVC CABLE.
- PROPOSED 4 X 100mm Ø ORANGE DUCT 6M² 3-CORE PVC CABLE.
- PROPOSED 1 X 50mm Ø BLACK ELECTRICITY DUCT.
- CTL NEW TRAFFIC SIGNAL CONTROLLER TO BE INSTALLED BY OTHERSON A PROVIDED RS115DF NAL RETENTION SOCKET, 600mm DEEP.
- FP NEW HALDO E2 210 HINGED FEEDER PILLAR WITH CAMLOCKS TO BE INSTALLED AND CONNECTED TO UKPN SUPPLY. FEEDER PILLAR TO BE CONNECTED TO THE NEW CONTROLLER USING 50mm DIAMETER SMOOTH SIDED BLACK ELECTRICAL DUCT.
- PROPOSED 600 x 600mm HIGHWAYS APPROVED TRAFFIC SIGNAL INSPECTION CHAMBER TO MANUFACTURER'S STANDARD DETAILS AND SPECIFICATIONS. PROPOSED COVER AND FRAME TO BE D250 STANDARD.
- RS115DF NAL RETENTION SOCKET, 600mm DEEP, TO BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.

Rev	Date	Description	Drn	Chk'd	App
P03	07.11.22	FOR INFORMATION	MD	AE	AE
P02	14.9.22	SIGN RELOCATED	CAT	AE	AE
P01	27.7.22	FOR TARGET COSTING	CAT	AE	AE

Revisions

Drawing Originator

Peterborough Highway Services
Delivered by MILLSTONE, PETERBOROUGH CITY COUNCIL

Drawing Status
FOR TARGET COSTING

Project Name
OXNEY ROAD CROSSING -SAINSBURY

Title
GENERAL ARRANGEMENT

Sheet Size	Scale	Drawn by	Checked by	Approved by
A1	AS SHOWN	MD	AE	AE
		Drawn Date 07/11/22	Checked Date 07/11/22	Approved Date 07/11/22

Drawing Number	Status	Rev
5080845-PCC-HGN-OXN-DR-CH-0100	S2	P03

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Appendix C – Sensitivity Testing Technical Note

Technical Note

Description:	Fengate FBC Economic Sensitivity Testing	To:	
Reference:		From:	Steven Percy
Date:	07/11/2022	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:

- Absent Developer Scheme Scenario
- Cost Sensitivity
- Low Growth Scenario
- High Growth Scenario
- Local Accident Rates in COBALT
- Low Active Travel Uptake
- High Active Travel Uptake
- Reduced AMAT Appraisal Periods
- Increased AMAT Appraisal Periods
- Low Environment Values
- High Environment Values
- Reduced PM Peak Appraisal Period

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

Absent Developer Scheme Scenario

A sensitivity test was undertaken on the transport user benefits to determine how the transport user benefits are affected should the developer-led scheme at Oxney Road / Edgerley Drain Road be undelivered. The scheme currently involves converting the Oxney Road / Edgerley Drain Road T-Junction into a roundabout.

The location of the developer-led scheme, as well as the proposed development accesses, are shown in Figure 1 below.

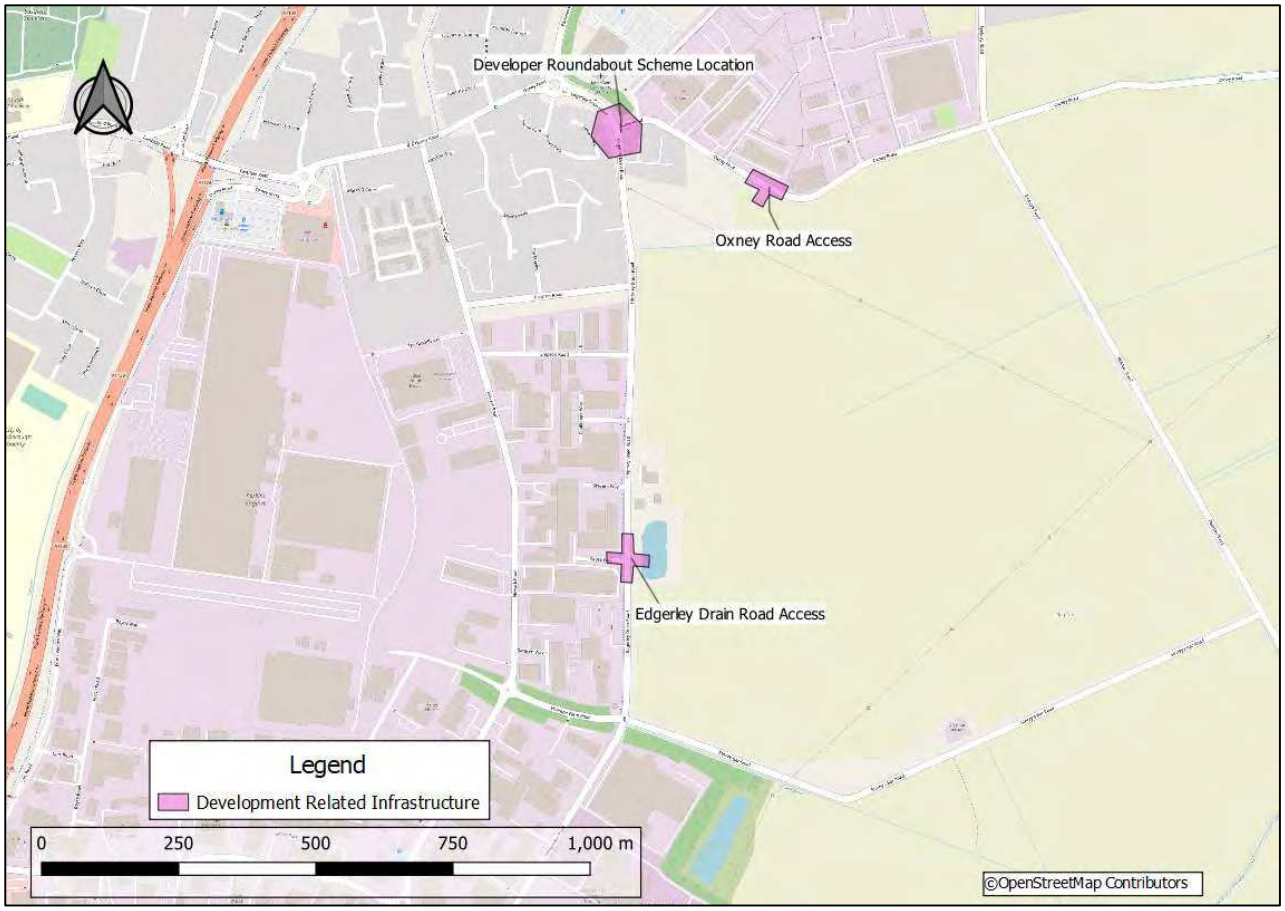

Figure 1: Development Related Infrastructure Changes

The Do-Minimum and Do-Something scenarios were re-run in SATURN with the Oxney Road / Edgerley Drain Road improvements missing. The results were then fed into TUBA as per the core assessment.

The resultant Transport User PVB is £39,203,940 and the resultant accident savings PVB is £1,827,600. The PVB indicated by this test is greater than that of the core scenario, so there is no risk to the benefits of the scheme if the developer led scheme does not come forward. This would result in a BCR of 8.614, which would fall into the Very High Value for Money category.

Cost Sensitivity

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

The current core scenario PVC of £4,551,000 falls into the "Very High" category and could increase by £1,084,000 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	£ 22,540	>=£22,540
Low	BCR between 1 and 1.5	£ 22,540	£22,540 to £15,027
Medium	BCR between 1.5 and 2	£ 22,540	£15,027 to £11,270
High	BCR between 2 and 4	£ 22,540	£11,270 to £5,635
Very High	BCR greater than or equal to 4	£ 22,540	<=£5,635

This test demonstrates that the Fengate Access 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.
- No additional adjustments have been made to account for the effects of the COVID-19 pandemic on traffic volumes, as local evidence from permanent Automatic Traffic Counts show that traffic has returned to the levels seen prior to the pandemic. TAG guidance currently suggests that the low growth scenario can be used as a reasonable proxy test for the long-term effects of COVID.
- 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 2 to Figure 4 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

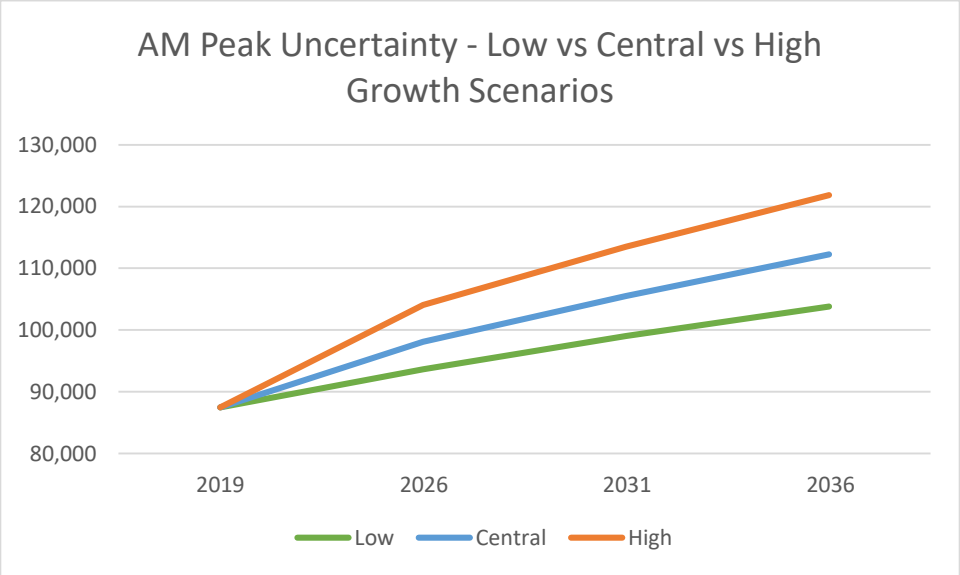

Figure 2: AM Peak Hour: Total Number of Trips in Model

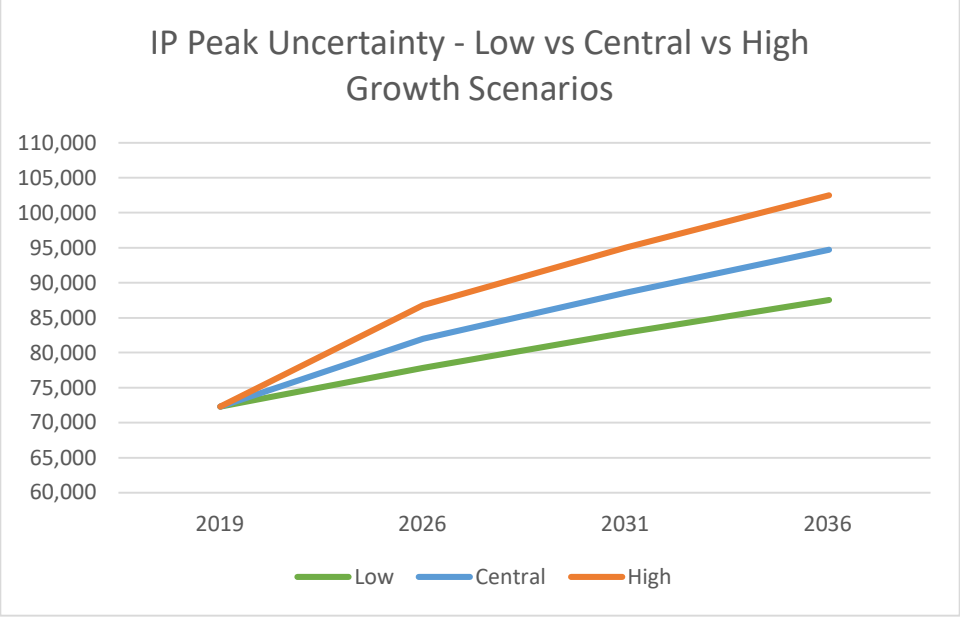

Figure 3: Inter-Peak Hour: Total Number of Trips in Model

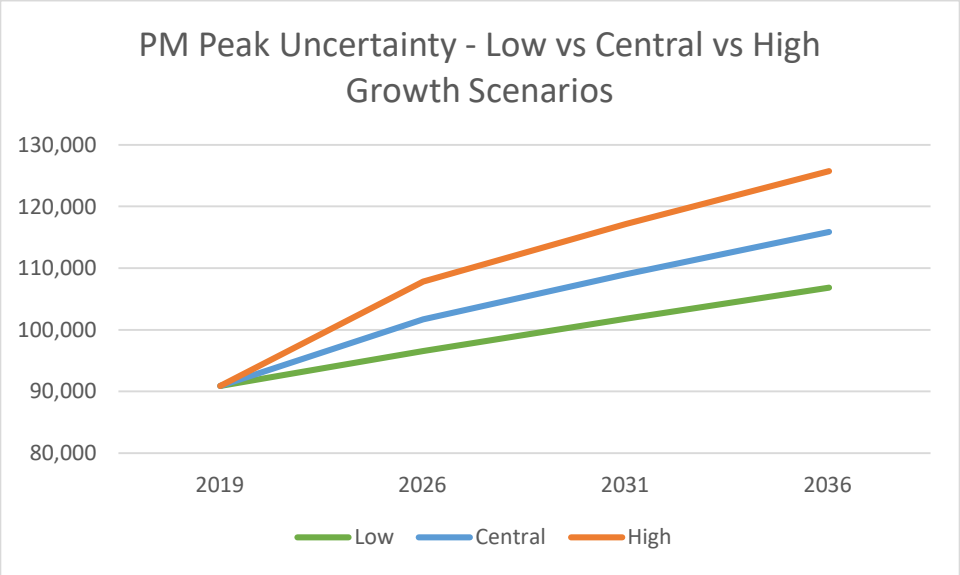

Figure 4: PM Peak Hour: Total Number of Trips in Model

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	220	326	374
	Consumer Users (Commuting)	3,701	9,687	7,831
	Consumer Users (Other)	4,258	3,924	6,505
	Business Users / Providers	2,871	4,930	5,360
	Indirect Taxes	-222	-340	-397
	Present Value of Benefits (PVB)	10,828	18,527	19,673
COBALT (£,000s)	Accident Benefits	1,529.00	1,606.60	889.30
Summary	Total (£,000s)	12,357	20,134	20,562
	BCR	3.24	4.95	5.05

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

This demonstrates the robustness of the scheme against varying traffic growth assumptions.

Local Accident Rates in COBALT

A sensitivity test was undertaken to demonstrate how robust the BCR is when using local accident data instead of default accident values in COBALT.

Personal Injury Accident (PIA) data covering a 5-year period from 2015 – 2019 for the scheme area was entered into COBALT.

Figure 5 below shows a map of the PIA data, symbolised by severity.

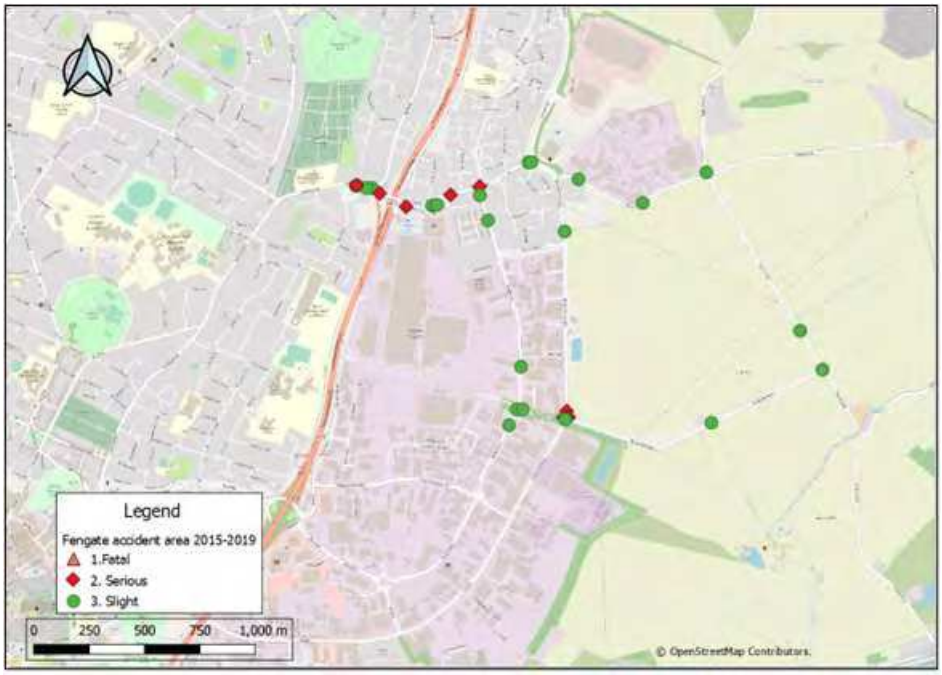

Figure 5: Personal Injury Accident data in the Fengate Study Area

Figure 5 shows 33 total accidents, comprised of 0 “Fatal”, 9 “Serious”, and 24 “Slight”. Seven of these occurred at the Edgerley Drain Road / Storey’s Bar Road / Vicarage Farm Road Junction, and 6 on Newark Road.

Using local accident numbers indicates that the COBALT PVB decreases from £1,606,600 to £-617,300. This results in a BCR of 4.464, which represents Very High Value for Money.

The negative benefits figure indicates that the current accident rate in the study area is low compared to the defaults used within COBALT.

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 4 below.

Table 4: Active Travel trips used in Sensitivity Tests

Walking			
	Trips		
Scheme Location	Low	Core	High
Newark Road	850	926	1,003
Junction 7 / Oxney Road	2,047	2,231	2,416
Edgerley Drain Road	168	183	198
Total	3,065	3,340	3,617
Cycling			
	Trips		
Scheme Location	Low	Core	High
Newark Road	-	-	-
Junction 7 / Oxney Road	123	139	155
Edgerley Drain Road	115	130	145
Total	238	269	300

Table 5 below shows the benefits and resultant BCRs that come about as a result of the changes in trips.

Table 5: Changes in Benefits under Active Travel Uptake Scenarios

Active Mode Appraisal Benefits	PVB (£,000s)		
	Low	Core	High
Newark Road	257	481	707
Junction 7 / Oxney Road	654	1,301	1,951
Edgerley Drain Road	176	322	468
Total	1,087	2,104	3,126
BCR	4.73	4.95	5.18

Table 5 demonstrates that the scheme BCR varies from 4.73 to 5.18 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 6 below demonstrates how the active mode benefits and costs change over reduced appraisal periods of 10 and 30 years.

Table 6: Active Mode Appraisal Period Sensitivity test outputs

Active Mode Appraisal Benefits	PVB (£,000s)		
	10 Years	20 Years (Core)	30 Years
Newark Road	229	481	704
Junction 7 / Oxney Road	616	1,301	1,913
Edgerley Drain Road	154	322	471
Total	999	2,104	3,088
BCR	4.71	4.95	5.17

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 4.71. The increased appraisal period test demonstrates that the scheme would provide very high value for money in the longer term with a BCR of 5.17.

Both of these 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 £806,761, and a Lower net present value of change in air quality of £57,887.

These result in a BCR of 5.072 for the higher air quality change values scenario and a BCR of 4.907 for the lower air quality change values scenario. Both of these BCRs fall into the Very High Value for Money category.

Reduced PM Peak Annualisation Period

A sensitivity test has been undertaken to demonstrate how robust the BCR is against a reduced annualisation factor for the PM peak period. The annualisation factor is intended to represent how often the modelled delay

occurs over each year, and the core scenario currently assumes that the PM peak period covers the 16:00 – 18:00 period.

A reduced annualisation factor of 267 was used, which represents the 17:00 – 18:00 peak period as opposed to the core scenario representation of 16:00 – 18:00.

This results in Transport User Benefits of £16,431,940, and a BCR of 3.611, which represents Very High Value for Money.

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Summary of Sensitivity Tests

Figure 6 below demonstrates the range of BCRs indicated by the sensitivity tests.

The figure demonstrates that the Fengate Access Study 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 4.0 - 5.5 range, confirming that the Value for Money of the schemes is robust.

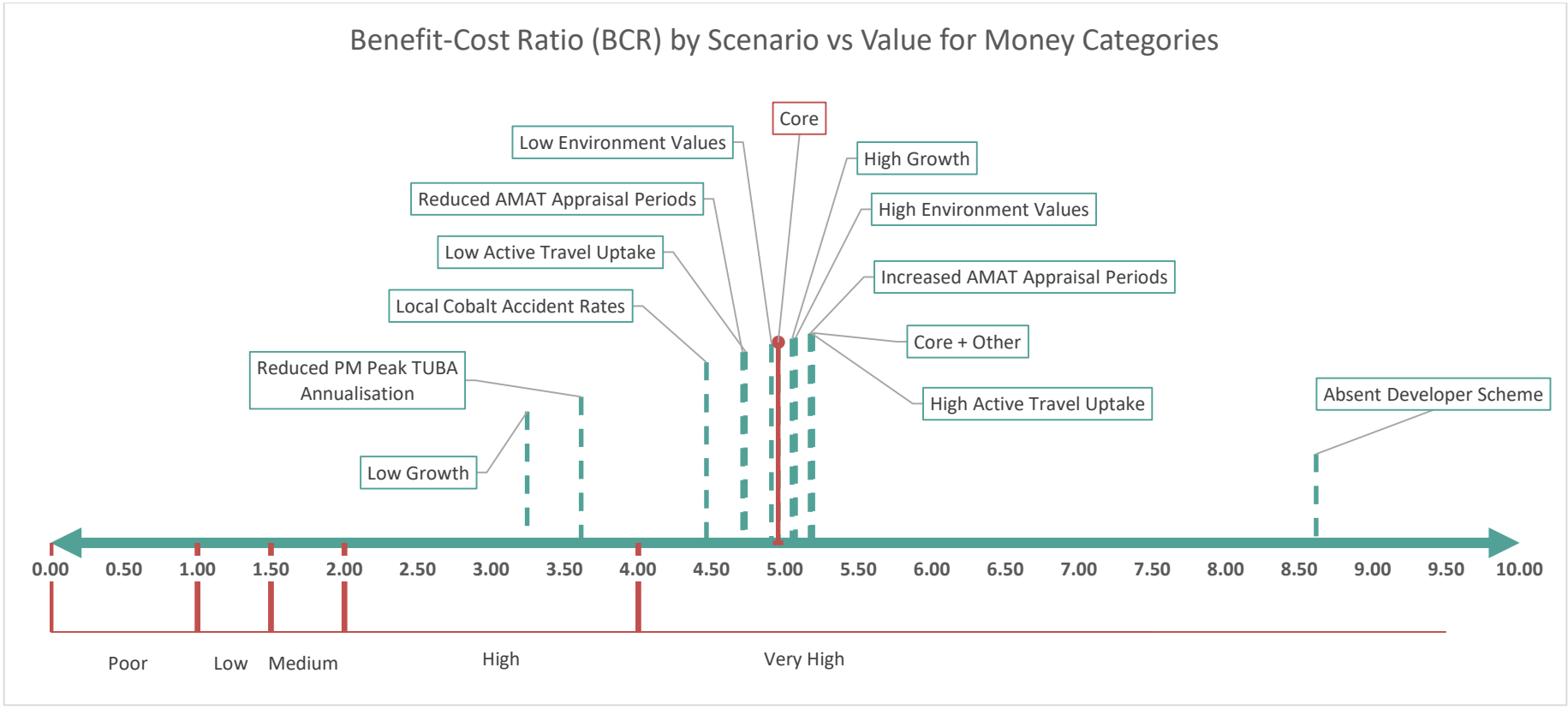

Figure 6: Sensitivity Testing BCR Range

Appendix D – Appraisal Summary Table (AST)

Appraisal Summary Table

Date produced:	15/12/2022

Contact:	
Name	Lewis Banks
Organisation	Peterborough City Council
Role	Promoter/Official

Name of scheme:	Fengate Access Improvement Scheme
Description of scheme:	Improvements to Junction 7, Oxney Road / Newark Road and Edgerley Drain Road / Storeys Bar Road / Vicarage Farm Road Junction. Active travel schemes on Newark Road, Junction 7 and Edgerley Drain Road.

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. The most significant benefits are experienced for journey changes greater than 5 minutes, followed by those between 0 and 2 minutes.	Net Journey time benefits (£,000s): 0 to 2min: 211; 2 to 5min: 27; > 5min: 722	Not Assessed	£960,000	Not Assessed
	Reliability impact on Business users	Not Assessed	Not Assessed	Not Assessed	Not Assessed	
	Regeneration	Not Assessed	Not Assessed	Not Assessed	Not Assessed	
	Wider Impacts	Not Assessed	Not Assessed	Not Assessed	Not Assessed	
Environmental	Noise	Scheme results in Net reduction of 29 households experiencing daytime Noise	Sleep Disturbance: -£2,387, Amenity £28,235, Acute Myocardial Infarction: -£7,076, Stroke £7,045, Dementia £10,675	Neutral	£364,892	Not Assessed
	Air Quality	The scheme produces overall benefit, likely as a result of reductrion in congestion despite the schemes collectively drawing more traffic onto the network.	Change in NOX emissions over 60 year appraisal period: 3 tonnes Change in PM2.5 emissions over a 60-year appraisal period: -2 tonnes	Positive	£266,199	Not Assessed
	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 £4,310 is identified by the AMATs.	Change in non-traded carbon over 60y (CO2e): -4,150 Change in traded carbon over 60y (CO2e): -18	Not Assessed	£330,000	
	Landscape	The Fengate Access Road Improvements have been assessed as having a Neutral impact on the Landscape following completion of an appraisal for each of the 5 schemes. The Storey's Bar Road scheme presents the greatest risks of adverse effects considering the loss of 16 semi-mature and mature trees. However, the receptors directly impacted are commercial and light industrial facilities which are less sensitive to such changes and replacement planting is being carefully planned to provide further mitigation. There is also an elevated risk associated with the Newark - Oxney Road Roundabout scheme considering the close proximity of valuable mature trees subject to Tree Preservation Orders. However, these trees, and all other retained vegetation across the schemes, will be managed and protected in accordance with the Arboricultural Method Statements.	Not Assessed	Neutral	-	
	Townscape	The Fengate Access Road Improvements have been assessed as having a Neutral impact on the Townscape following completion of an appraisal for each of the 5 schemes. The Townscape characters of all the schemes are busy, active and typically urban in nature, with presence of significant development within the surrounding area consisting of residential, commercial, and/or light industrial buildings. The proposed schemes will retain the essential townscape character of these areas and involve replacement of existing highways assets on a like-for-like basis with associated improvements. The proposed schemes will also promote active travel by improving safety and connectivity between pedestrian and cycleway routes through the highways network. The war memorial present within the scheme footprint of the Junction 7 Eastfield Scheme is expected to be of significant local importance to residents and stakeholders and will not be directly impacted by the works. Standard mitigation measures will be implemented to protect this feature.	Not Assessed	Neutral	-	
	Historic Environment	The Fengate Access Road Improvements have been assessed as having a Neutral impact on the Historic Environment following completion of an appraisal for each of the 5 schemes. The Storey's Bar Road scheme presents the greatest risks of adverse effects considering the proximity to the Flag Fen Bronze Centre Scheduled Monument site. However, a Hydrogeological assessment has been undertaken in consultation with Historic England which concluded that the proposed scheme would have insignificant impacts on this receptor. Previous archaeological investigations in the area have revealed significant remains of local and regional importance, but the PCC Archaeologist has already been consulted and adequate mitigation has been specified. The risk of encountering and damaging archaeological remains is further reduced considering the scale of modern development within the vicinity and scope of the proposed works in terms of land take and depth of excavation.	Not Assessed	Neutral	-	
	Biodiversity	The Fengate Access Road Improvements have been assessed as having a neutral impact on Biodiversity following completion of an appraisal for each of the 5 schemes. Each site is located more than 1km away from designated sites with no connectivity identified and the scope of works limiting any potential for indirect impacts linked to discharges, emissions, noise and lighting. Potential protected species which may be encountered include nesting birds, water voles and bats. A majority of the proposed works are confined to areas of existing hardstanding and initial surveys have been undertaken with further pre-works checks planned to enable suitable mitigation measures to be implemented. Suitable stakeholder engagement and planning will be undertaken to achieve 20% net gain in Biodiversity through on-site and off-site landscaping initiatives, but this will be subject to agreement and suitable provision of land from	Not Assessed	Neutral	-	
	Water Environment	The Fengate Access Road Improvements have been assessed as having a neutral impact on the Water Environment following completion of an appraisal for each of the 5 schemes. A majority of the scheme footprints are located above an aquifer which has high vulnerability to pollutants. However, the proposed works are relatively confined to shallower strata meaning there are very limited pathways for significant impacts to occur, especially when further mitigation measures which will be implemented through the Construction Environmental Management Plan (CEMP) are considered. Although there is potential for existing watercourses to be impacted, these are generally artificial drains with low geomorphological value. Existing water quality within nearby surface water features is generally poor based on current 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. Storey's Bar Road presents the highest risks from a flooding perspective, but the design has incorporated flood mitigation measures. The additional areas of hardstanding have been assessed as having an insignificant impact on flooding at this location and there is an existing attenuation feature locally. All other schemes are outside Flood Zones 2 and 3.	Not Assessed	Neutral	-	
Social	Commuting and Other users	The Scheme will result in a net reduction in journey times for commuting users and other users across all time periods for the 60 year appraisal period. The most significant journey time benefits are experienced by journey changes greater than 5 minutes, followed by those between 0 and 2 minutes.	Net Journey time benefits (£,000s): 0 to 2min: 420; 2 to 5min: 102; > 5min: 3,753	Not Assessed	£4,275,000	Not Assessed
	Reliability impact on Commuting and Other users	Not Assessed	Not Assessed	Not Assessed	Not Assessed	
	Physical activity	Positive Impact identified in AMAT	Not Assessed	Not Assessed	£1,654,060	
	Journey quality	Positive Impact identified in AMAT	Not Assessed	Not Assessed	£314,200	
	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 Injru Accidents	COBALT estimated the scheme will result in a reduction of 41.7 accidents over the 60 year appraisal period, equating to 0.3 fatal, 4.3 serious, and 52.4 slight casualties.	Not Assessed	£1,606,600	Not Assessed
	Security	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
	Access to services	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
	Affordability	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
	Severance	The Active Travel Schemes around Junction 7 / Eastfield Road introduce new crossing facilities that reduce severance	Not Assessed	Not Assessed	£1,073,428	Not Assessed
	Option and non-use values	Not Assessed	Not Assessed	Not Assessed	Not Assessed	
Public Accounts	Cost to Broad Transport Budget	The Scheme PVC has been identified as £4,551,000. The BCR is 4.95.			£4,551,000	
	Indirect Tax Revenues	Indirect taxes values from TUBA			-£345,400	

Appendix E – TAG Worksheets

Air Quality Valuation Workbook - Worksheet 3

Scheme Name:	Fengate Access Scheme
Present Value Base Year	2010
Current Year	2021
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 (£):	-£16,739
Present value of change in PM2.5 emissions (£):	£282,859
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 (£):	£266,119

*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)	3
Change in PM2.5 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	-2
OR	
Change in PM10 emissions over 60 year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	0

Qualitative Comments:

The total NPV is predicted to be £266,119 as a result of the scheme presenting a benefit. This is likely due to a overall reduction in congestion despite the schemes collectively drawing more traffic onto the network.

Sensitivity Analysis:

Upper estimate net present value of change in air quality (£):	£806,761
Lower estimate net present value of change in air quality (£):	£57,887

Data Sources:

DEFRA Emission Factor Toolkit version 11.0
Traffic data was provided from Milestone Infra, Nov 2022

TAG Biodiversity Impacts Worksheet **Scheme:** **Storeys Bar Rd**

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**
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 - internationally designated site with wildfowl, waders and associated botanical species. Ramar Site, SPA & SSSI.	Neutral - This site is not within the area where works are proposed and is located approx. 1.4km south. 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 - nationally protected species.	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
Water voles	Protected species	National	High - national protection for water voles and their habitats from direct harm and disturbance under The Wildlife and Countryside Act 1981 (as amended).	Water voles are also listed as rare and most threatened species under Section 41 of the Natural Environment and Rural Communities Act (2006).	High - nationally protected species.	Neutral - The Edgerley Drain ditch (containing water) is assessed as suitable to support water voles. However, no evidence of water vole activity was observed during 2021 or 2022 surveys. A further pre-works check will also be undertaken to mitigate any potential impacts.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
MAGIC website
OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

The Nene Washes SPA/SSSI/Ramsar site is located 1.4km south of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered.
The proposed works will require the removal of habitat that is suitable for both breeding birds and water voles. However, surveys undertaken to date have not identified any activity associated with these protected species and further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

TAG Biodiversity Impacts Worksheet **Scheme:** **Newark Rd Footpath**

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**
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 - internationally designated site with wildfowl, waders and associated botanical species. Ramar Site, SPA & SSSI.	Neutral - This site is not within the area where works are proposed and is located approx. 1.1km south. 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 - nationally protected species.	Neutral - 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

The Nene Washes SPA/SSSI/Ramsar site is located 1.4km south of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered.
The proposed works will require the removal of habitat that is suitable for breeding birds. However, further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

TAG Biodiversity Impacts Worksheet **Scheme:** **Newark-Oxney Rd Roundabout**

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**
Dogsthorpe Star Pit SSSI and LNR	This site is afforded protection for its variety of habitats and invertebrate/botanical species.	National (SSSI) Regional / Local (LNR)	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Dogsthorpe Star Pit SSSI and Local Nature Reserve (LNR) contains a variety of habitats supporting nationally and regionally scarce plant and animal species.	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Neutral - This site is not within the area where works are proposed and is located approx. 1.9km north. 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 - nationally protected species.	Neutral - 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

Dogsthorpe Star Pit SSSI and LNR is located 1.9km north of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered.
The proposed works will require the removal of habitat that is suitable for breeding birds. However, further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

TAG Biodiversity Impacts Worksheet **Scheme:** **Oxney Rd Crossing**

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**
Dogsthorpe Star Pit SSSI and LNR	This site is afforded protection for its variety of habitats and invertebrate/botanical species.	National (SSSI) Regional / Local (LNR)	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Dogsthorpe Star Pit SSSI and Local Nature Reserve (LNR) contains a variety of habitats supporting nationally and regionally scarce plant and animal species.	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Neutral - This site is not within the area where works are proposed and is located approx. 1.9km north. 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 - nationally protected species.	Neutral - 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

Dogsthorpe Star Pit SSSI and LNR is located 1.9km north of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered.
The proposed works will require the removal of habitat that is suitable for breeding birds. However, further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

TAG Biodiversity Impacts Worksheet **Scheme:** **J7-Eastfield Rd Traffic Signals**

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**
Dogsthorpe Star Pit SSSI and LNR	This site is afforded protection for its variety of habitats and invertebrate/botanical species.	National (SSSI) Regional / Local (LNR)	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Dogsthorpe Star Pit SSSI and Local Nature Reserve (LNR) contains a variety of habitats supporting nationally and regionally scarce plant and animal species.	High - Nationally designated site containing nationally and regionally scarce plant and animal species.	Neutral - This site is not within the area where works are proposed and is located approx. 1.8km north. 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 - nationally protected species.	Neutral - 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
Bats	Protected species	International & National	Very High - bats and their habitats are afforded protection at an international level.	All bat species are protected by the Wildlife and Countryside Act (1981) (as amended) and the Conservation of Habitats and Species Regulations (2017) (as amended).	Very High - bats and their habitats are afforded protection at an international level.	Neutral - Some trees requiring removal have been assessed as having low to moderate potential for roosting bats. However, pre-works surveys have been programmed to ensure appropriate mitigation measures are implemented.	Neutral

Reference Sources

Extended Phase 1 Habitat Survey
MAGIC website
OS Maps / Google Earth

Summary Assessment Score

Neutral

Qualitative Comments

Dogsthorpe Star Pit SSSI and LNR is located 1.8km north of the proposed scheme and there is no identified connectivity between the two. The works are therefore very unlikely to have any impact on this designated site, especially when the scope and duration of works are considered.
The proposed works will require the removal of habitat that is suitable for breeding birds and bats. However, further pre-works checks are planned to ensure appropriate mitigation measures are implemented.

TAG Historic Environment Impacts Worksheet **Scheme:** **Storeys Bar Rd**

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Flag Fen Bronze Centre Scheduled Monument - Bronze Age post alignment and timber platform at Flag Fen and associated Bronze Age and later field systems and settlement to either side of the Northey Road. Other archaeological remains - previous archaeological investigations in the immediate areas surrounding the scheme have produced significant evidence for Neolithic, Bronze Age, Iron Age and Roman activity characterised by agricultural, domestic, funerary, and ritual use of the landscape.	Flag Fen Bronze Centre 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.	Flag Fen Bronze Centre Scheduled Monument - the Scheduled Monument designation is evidence for highly significant Bronze Age settlement within the area surrounding the River Nene. Other archaeological remains - Likely to be non-designated buried remains of potential medium significance due to their archaeological interest.	Flag Fen Bronze Centre Scheduled Monument - The post alignment and timber platform at Flag Fen represent a class of monument where relatively few examples survive and are well documented. Amongst these it is unique for its scale, completeness, longevity and complexity. Other archaeological remains - It is anticipated that most finds are likely to be relatively 'common' for the region (i.e. ditches and pits of prehistoric to medieval date), but peat deposits could preserve rarer remains under waterlogged conditions.	Slight adverse effect - Hydrogeological assessment undertaken to confirm that the proposed scheme would have insignificant impacts on groundwater levels at the Scheduled Monument site located circa 350m south-east of the development. This is important to ensure nationally significant remains are suitably preserved. The current setting of this Scheduled Monument is a mixture of modern road infrastructure and residential areas to the west, and rural agricultural lands to the north, east and south. Programme of pre-construction trenching / field evaluation agreed with PCC Archaeologist to assess on-site remains which have been assessed as most likley having local or regional importance.
Survival	Flag Fen Bronze Centre Scheduled Monument - the survival of timbers and artefacts within the wet conditions of the Flag Fen basin is outstanding, while the survival of features on the dry gravels to the east is good, and their condition apparently stable. Other archaeological remains - unknown, but likely to have been impacted previously by the original construction of road network and other development in the area.				
Condition	Flag Fen Bronze Centre Scheduled Monument - estimate general condition as 'Good' = >70% remains intact due to conditions. Other archaeological remains - estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Flag Fen Bronze Centre Scheduled Monument - Bronze Age post alignment and timber platform at Flag Fen and associated Bronze Age and later field systems and settlement to either side of the Northey Road. Other archaeological remains - previous archaeological investigations in the immediate areas surrounding the scheme have produced significant evidence for Neolithic, Bronze Age, Iron Age and Roman activity characterised by agricultural, domestic, funerary, and ritual use of the landscape.				
Context	As the proposed schemes are improvements to already established highway infrastructure, it is anticipated the impact to the setting of the Scheduled Monument and/or other archaeological remains will be negligible.				
Period	Flag Fen Bronze Centre Scheduled Monument - Bronze Age. Other archaeological remains - previous archaeological investigations in the immediate areas surrounding the scheme have produced significant evidence for Neolithic, Bronze Age, Iron Age and Roman activity characterised by agricultural, domestic, funerary, and ritual use of the landscape.				

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 2021 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Slight adverse (negative) effect

Qualitative Comments

There is potential for damage to locally or regionally significant buried archaeological remains for which adequate mitigation has been specified in consultation with the PCC Archaeologist. The archaeological potential of the surrounding area is high but this is in part reduced due to 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 (relatively) minor scale in terms of land take and depth of excavation, it is considered that the potential to impact any potential buried archaeological remains (if they are indeed present) is low, with the previous construction works for the highway itself having likely removed any archaeological remains.
Historic England have been consulted in relation to the Flag Fen Bronze Scheduled Monument located circa 350m south-east of the development. Hydrogeological assessment undertaken to confirm that the proposed scheme would have insignificant impacts on groundwater levels at the site to ensure preservation of nationally significant remains. No significant impacts on the setting of the Scheduled Monument anticipated.

TAG Historic Environment Impacts Worksheet **Scheme:** **Newark Rd Footpath**

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Previous archaeological investigations to the north of the proposed scheme have produced archaeological remains dating from Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation undertaken as part of previous investigations also discovered archaeological remains dating to the Bronze Age. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches.	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, but likely to have been impacted previously by the original construction of road network and other development in the area.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations to the north of the proposed scheme have produced archaeological remains dating from Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation undertaken as part of previous investigations also discovered archaeological remains dating to the Bronze Age. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches.				
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	Previous archaeological investigations to the north of the proposed scheme have produced archaeological remains dating from Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation undertaken as part of previous investigations also discovered archaeological remains dating to the Bronze Age. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches.				

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 2021 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 infrastructure footprint, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Historic Environment Impacts Worksheet **Scheme:** **Newark-Oxney Rd Roundabout**

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	Previous archaeological investigations to the south of the proposed scheme have produced archaeological remains dating from the Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation discovered archaeological remains dating to the Bronze Age in the form of a rectilinear field system, alongside a pit with the cremated remains of one individual, and another field system complete with ditches, postholes and a number of tree throws. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches. Two pits, one containing animal bone, alongside shallow linear features thought to represent the truncated remains of plough furrows rather than ditches were also revealed. Although undated, the features are thought to be medieval in date.				
Survival	Unknown, but likely to have been impacted previously by the original construction of road network and other development in the area.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	Previous archaeological investigations to the south of the proposed scheme have produced archaeological remains dating from the Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation discovered archaeological remains dating to the Bronze Age in the form of a rectilinear field system, alongside a pit with the cremated remains of one individual, and another field system complete with ditches, postholes and a number of tree throws. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches. Two pits, one containing animal bone, alongside shallow linear features thought to represent the truncated remains of plough furrows rather than ditches were also revealed. Although undated, the features are thought to be medieval in date.	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.
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	Previous archaeological investigations to the south of the proposed scheme have produced archaeological remains dating from the Late Neolithic to the Early Iron Age. Geophysical survey and archaeological evaluation discovered archaeological remains dating to the Bronze Age in the form of a rectilinear field system, alongside a pit with the cremated remains of one individual, and another field system complete with ditches, postholes and a number of tree throws. Other investigations at the site also revealed a single Early Iron Age Pit, Late Neolithic/Early Bronze Age pits, overlain by a network of field boundary ditches. Two pits, one containing animal bone, alongside shallow linear features thought to represent the truncated remains of plough furrows rather than ditches were also revealed. Although undated, the features are thought to be medieval in date.				

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 2021 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 infrastructure footprint, it is considered that the potential to impact any buried archaeological remains is very low.

TAG Historic Environment Impacts Worksheet **Scheme:** **J7-Eastfield Rd Traffic Signals**

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations to the west of the proposed scheme near Newark Hill Primary Academy produced extensive Iron Age to Roman features. There is also a War Memorial located within the centre of the triangular island within the centre of the site footprint.	Any potential archaeological remains are considered likely to be of local or regional importance. The War Memorial is a feature of local importance.	Likely to be non-designated buried remains of potential medium significance due to their archaeological interest. Although not designated, the War Memorial is expected to be of significant interest to local stakeholders.	It is anticipated that most finds are likely to be relatively 'common' for the region. War Memorials are relatively common across the UK, but it is suspected this feature has remained in-situ for a relatively long time.	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. Simple and standard mitigation measures can be implemented to protect these features.
Survival	Unknown, but likely to have been impacted previously by the original construction of road network and other development in the area. It is expected that the war memorial was installed or relocated as part of the original road construction.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development. The War Memorial appears to be in 'Good' condition.				
Complexity	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations to the west of the proposed scheme near Newark Hill Primary Academy produced extensive Iron Age to Roman features.				
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	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations to the west of the proposed scheme near Newark Hill Primary Academy produced extensive Iron Age to Roman features.				

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 2021 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 infrastructure footprint, it is considered that the potential to impact any buried archaeological remains is very low. Simple and standard miligation measures can be implemented to protect the war memorial and the scheme will not cause any significant changes in setting.

TAG Historic Environment Impacts Worksheet **Scheme:** **Newark_OxneyRd Sainsburys**

Step 2		Step 3			Step 4
Feature	**Description**	**Scale it matters**	**Significance**	**Rarity**	**Impact**
Form	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations in relatively close proximity to the scheme produced Roman and Medieval pottery.	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, but likely to have been impacted previously by the original construction of road network and other development in the area.				
Condition	Estimate general condition as 'Poor' = <40% remains intact due to previous road works and other development.				
Complexity	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations in relatively close proximity to the scheme produced Roman and Medieval pottery.				
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	The current archaeological baseline suggests that the area has been densely settled since late prehistory, with numerous finds and features being recorded. Previous archaeological investigations in relatively close proximity to the scheme produced Roman and Medieval pottery.				

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 2021 Heritage Impact Appraisal Report

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The archaeological potential of the surrounding area is high but this is in part reduced due to 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 (relatively) minor scale in terms of land take and depth of excavation, it is considered that the potential to impact any potential buried archaeological remains (if they are indeed present) is low, with the previous construction works for the highway itself having likely removed any archaeological remains.

TAG Landscape Impacts Worksheet **Scheme:** **Storeys Bar Rd**

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	This area is defined by its position on the very eastern edge of the town, with a lack of residential properties and a predominance of commercial and industrial land uses to the northwest, west and south. Conversely, land to the northeast and east features agricultural fields, introducing a far more open, rural character in those directions. Woodland belt vegetation along both sides of Vicarage Farm Road and surrounding Peterborough Power Station.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - 9 trees will be removed on the north-western side of the junction. 7 trees will have to be removed from the south-eastern side of the junction. These trees are a mix of semi-mature and mature trees which have both landscape and biodiversity value. 4 very minor tree saplings will also have to be removed from the north-eastern side of the junction. The receptors directly impacted from a landscape perspective are commercial facilities. This will reduce screening of the existing road and other commercial facilities but there are already some relatively large gaps in the existing tree belts. 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 road junction surrounding 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	Flag Fen Bronze Centre Scheduled Monument is located circa 350m south-east of the proposed scheme at the closest point.	National	Rare	High	Not substitable	Neutral - the current setting of this Scheduled Monument is a mixture of modern road infrastructure and residential areas to the west, and rural agricultural lands to the north, east and south. The proposed scheme will not impact this setting.
Landcover	Woodland belts flank both sides of Vicarage Farm Road in the west. There is another woodland belt to the south side of Storey's Bar Road in the east, which thins out and extends south along the boundary of the Walstead commercial printing facility.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Slight adverse (negative) effect - 9 trees will be removed on the north-western side of the junction. 7 trees will have to be removed from the south-eastern side of the junction. These trees are a mix of semi-mature and mature trees which have both landscape and biodiversity value. 4 very minor tree saplings will also have to be removed from the north-eastern side of the junction. The receptors directly impacted from a landscape perspective are commercial facilities. This will reduce screening of the existing road and other commercial facilities but there are already some relatively large gaps in the existing tree belts. 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	The location is where the more open, rural character of agricultural land to the northeast and east meets the more urban, developed character of the commercial and industrial facilities to the north-west, west and south. Vegetation is prominent within the roadside verges along the boundaries of the commercial and industrial facilities which helps to integrate the area into the landscape.	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 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.

TAG Landscape Impacts Worksheet **Scheme:** **Newark Rd Footpath**

	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 area. Looser pattern of built development associated with commercial and industrial facilities that require more space, including car parking and loading / circulation areas.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the character of this area considering the scope of works.
Tranquillity	Low - Newark Road is an existing road with high levels of 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	Woodland belts flank both sides of Vicarage Farm Road. Sporadic grass verges along Neward Road with some shrubs, hedgerows and trees linked to commercial and industrial premises.	Local and Regional	Moderate	High	Trees - not substitutable over short timeframes.	Neutral - no trees will be removed as part of the proposed works and measures will be implemented to ensure their protection, 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 and limited green urban areas.	Local	Common	Low	Substitutable	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing highways footprint.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the landscape character of this area. Vegetation works will be limited to pruning / trimming to achieve the necessary clearances for road users. The mature trees located on the nort-west side of the junction between Newark Road and East Vicarage Farm Road, which are the most valuable landscape features in the vicinity, will be retained. Tree protection measures will be implemented in accordance with current industry standards and agreed Arboricultural Method Statement. There are also opportunities to reseed the reprofiled verges with a more diverse mix.

TAG Landscape Impacts Worksheet **Scheme:** **Newark-Oxney Rd Roundabout**

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	This proposed scheme area is set within an established residential area with minor roads leading off the main Oxney Road heading in a broad southwest to northeast direction. The residential pattern is relatively tightly arranged, with a mix of detached and semi-detached properties along with apartment blocks on both sides of the carriageway. Mature trees are present in places, along with roadside hedgerows and vegetation belts, softening the urban grain of built development. 4 of these trees on the north side of the existing carriageway are subject to Tree Preservation Orders.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the character of this area considering the scope of works.
Tranquillity	Low - Oxney Road is a busy road corridor with high levels of activity.	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	Mature trees along the northern side of Oxney Road in close proximity to the junction, 4 of which are subject to Tree Preservation Orders. Roadside hedgerow vegetation further to the northeast, including a triangle of grassland on corner with Meadenvale. Some hedgerow vegetation associated with front gardens along the southern side of Oxney Road.	Local and Regional	Rare	High	Trees - not substitutable over short timeframes.	Neutral - no trees will be removed as part of the proposed works and measures will be implemented to ensure their protection, particularly where there are potential interfaces with root protection areas.
Summary of character	Active and urban character associated with a busy road and extensive built development along both sides of Oxney Road and extending southwards down Newark Road.	Local	Common	Low	Substitutable	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing highways footprint.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the landscape of this area considering the scope of works. Vegetation works will be limited to pruning / trimming to achieve the necessary clearances for road users. The mature trees, including those subject to Tree Preservation Orders, will be retained which are the most valuable landscape features in the vicinity. Tree protection measures will be implemented in accordance with current industry standards and agreed Arboricultural Method Statement.

TAG Landscape Impacts Worksheet **Scheme:** **Oxney Rd Crossing**

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	Scheme footprint is bounded to the north by residential dwellings although somewhat screened from them by intervening roadside vegetation. To the south is a very large Sainsbury's car park beyond which is a large commercial facility, with associated car parking. To the east is more residential development while land to the west is defined by the A1139 Frank Perkins Parkway. The pattern therefore is mixed use urban.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the character of this area considering the scope of works.
Tranquillity	Low - Eastfield Road and Oxney Road are busy road corridors with high levels of activity.	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 northern side of Eastfield Road features a tree belt which provides a screen between the road and residential properties. The 'island' area between Eastfield Road and the car park access road to the south is grassed with individual trees in linear patterns. The larger of the two roundabouts immediately east features trees while the smaller one is vegetated with scrubby shrubs.	Local and Regional	Moderate	Medium	Trees - not substitutable over short timeframes.	Neutral - no trees will be removed as part of the proposed works and measures will be implemented to ensure their protection. There are opportunities to re-seed new soft landscaping areas with more diverse mixes and plant the 'island' area between Eastfield Road and Oxney Road.
Summary of character	Active, urban landscape dominated character associated with a busy road and roundabout junction. Trees within urban grain help to soften the built development.	Local	Common	Low	Substitutable	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing highways footprint.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

The scheme will not affect the landscape of this area considering the scope of works. Vegetation works will be limited to pruning / trimming to achieve the necessary clearances for road users. The mature trees within the 'island' between the two roads will be retained which are the most valuable landscape features in the vicinity. Tree protection measures will be implemented in accordance with current industry standards. There may be opportunities to seed new soft landscaping areas with more diverse mixes and plant the 'island' area between Eastfield Road and Oxney Road.

TAG Landscape Impacts Worksheet

Scheme: J7-Eastfield Rd Traffic Signals

	Step 2	Step 3				Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Impact**
Pattern	Scheme footprint is set within a wider residential part of Peterborough. There is a grassland area between Eastfield Road and Hill Close, a triangular shaped junction and pedestrian island, and larger areas of woodland surrounding the junction. However, the character is still evidently urban in nature.	Local	Common	Low	Substitutable	Neutral – the scheme will have virtually no effect on the character of this area considering the scope of works.
Tranquillity	Low - Eastfield Road and Eye Road are busy carriageways with high levels of vehicle and pedestrian activity.	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 designated cultural or historic features in close proximity to this location, but there is a war memorial in the triangular island.	Local	Common	High for local residents and stakeholders.	Limited substitutability considering the likely time it has been located in its current location.	Neutral - the war memorial will be retained as part of the proposed work and standard mitigation measures will be implemented to protect this feature.
Landcover	Mature tree belts along the southern side of Eastfield Road and especially flanking both sides of the slip road from the A1139. Tree belts within land between Eye Road and the A1139. Grassland areas within the 'triangle' shaped pedestrian island at the junction of Eastfield Road and Eye Road, along with individual mature trees. Large open grassland area with some trees to the south of Eastfield Road, west of the junction.	Trees - Local & Regional Grassland - Local	Trees - Reasonably common Grassland - Very common	Trees - High Grassland - Low	Trees - not substitutable over short timeframes. Grassland - Substitutable	Trees - slight adverse (negative) effect - one of the trees within the triangular island area will be removed and other trees/vegetation within the development area will be cut back. However, this is unlikely to have a significant impact on the landscape and mitigation measures will be implemented to prevent damage to other retained trees/vegetation. Grassland - Neutral - areas of grassland will be disturbed as part of the proposed works but will be reseeded with an appropriate mix.
Summary of character	Active and urban dominated character associated with a busy road junction surrounded by extensive built development.	Local	Common	Low	Substitutable	Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing road network footprint.

Reference Sources

Site visit & baseline study
Google and OS mapping
MAGIC GIS

Step 5 - Summary Assessment Score

Neutral

Qualitative Comments

Neutral - the scheme will not have any significant impact on the scale, landform or pattern of the surrounding landscape and will be confined to the existing road network footprint. Existing trees/vegetation will be trimmed back as required, and the scheme will only require removal of a single semi-mature tree which will not have any significant impact on the surrounding landscape. Disturbed grassland areas will be reseeded with an appropriate mix.

Noise Workbook - Worksheet 1

Proposal Name: Fengate Access Study

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 (£):	£36,492

positive value reflects a **net benefit** (i.e. a reduction in noise)

Net present value of impact on sleep disturbance (£):	-£2,387
Net present value of impact on amenity (£):	£28,235
Net present value of impact on AMI (£):	-£7,076
Net present value of impact on stroke (£):	£7,045
Net present value of impact on dementia (£):	£10,675

Quantitative results

Households experiencing increased daytime noise in forecast year:	59
Households experiencing reduced daytime noise in forecast year:	98
Households experiencing increased night time noise in forecast year:	n/a
Households experiencing reduced night time noise in forecast year:	n/a

Qualitative Comments:

Night-time results estimated from daytime traffic data based on national averages of the differences between daytime and night-time flows.

The overall effects of the scheme can be classified as neutral in terms of noise effects.

Data Sources:

Road traffic model provided by MilestoneInfra on 26/10/2022.
Dwellings within 300 metres of the road traffic model links (PTM3_FengateDM&DS_Links) identified through Ordnance Survey (OS) AddressBase Premium as provided by Peterborough City Council on 01/11/2022.

TAG Townscape Impacts Worksheet **Scheme:** **Storeys Bar Rd**

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	This area is defined by its position on the very eastern edge of the town, with a lack of residential properties and a predominance of commercial and industrial land uses to the northwest, west and south. Conversely, land to the northeast and east features agricultural fields, introducing a far more open, rural character in those directions.	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, with more rural, open agricultural land to the north-east and east.	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	Buildings and trees surrounding the proposed scheme are at a relatively consistent height and protrude much higher than any assets associated with the proposed improvements, which will primarily entail groundworks. The dominant feature in the landscape here is Peterborough Power Station.	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.
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 is an existing footpath along the western side of Storey's Bar Road in the south which extends up Edgerley Drain Road to the north. The proposed scheme will improve this provision by upgrading this to a combined cycleway / footway route as well as an additional cyclway and safer signalised crossing points.	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	Flag Fen Bronze Centre Scheduled Monument is located circa 350m south-east of the proposed scheme at the closest point.	National	Rare	High	Not substitutable	No impact	Neutral - the current setting of this Scheduled Monument is a mixture of modern road infrastructure and residential areas to the west, and rural agricultural lands to the north, east and south. The proposed scheme will not impact this setting.
Land use	Existing crossroads junction surrounded by commercial and light industrial facilities in addition to agricultural land. There is an existing footpath along the western side of Storey's Bar Road in the south which extends up Edgerley Drain Road to the north. Existing active travel routes will be upgraded as part of the proposed scheme. Land use within the scheme footprint and surrounding areas will not change.	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 location is where the more open, rural character of agricultural land to the northeast and east meets the more urban, developed character of the commercial and industrial facilities to the north-west, west and south.	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

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is primarily commercial and light industrial in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes.

TAG Townscape Impacts Worksheet **Scheme:** **Newark Rd Footpath**

	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 area. Looser pattern of built development associated with commercial and industrial facilities that require more space, including car parking and loading / circulation areas.	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	Buildings surrounding the proposed scheme are at a relatively consistent height and protrude much higher 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. No trees will be removed as part of the proposed works and measures will be implemented to ensure their protection, 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 is an existing footpath along the western side of Newark Road but this is unfavourable for cyclists and overgrown in places. The proposed scheme will improve this provision by improving connectivity and safety.	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 footpath surrounding by commercial and light industrial facilities. Existing pedestrian routes in the area will be improved as part of the proposed works in terms of safety and connectivity. 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 and limited green urban areas.	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

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is commercial and light industrial in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes.

TAG Townscape Impacts Worksheet **Scheme:** **Newark-Oxney Rd Roundabout**

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	This proposed scheme area is set within an established residential area with minor roads leading off the main Oxney Road heading in a broad southwest to northeast direction. The residential pattern is relatively tightly arranged, with a mix of detached and semi-detached properties along with apartment blocks on both sides of the carriageway. At the existing junction, the Parnwell cycleway route connects Oxney Road in the south with Henshaw Road in 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 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	Buildings surrounding the proposed junction improvements are at a relatively consistent height. There are no features associated with the proposed works which will impact on this. The 4 large trees immediately north-east of the existing junction are subject to Tree Preservation Orders and represent an important townscape features along Oxney Road.	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. No trees will be removed as part of the proposed works and measures will be implemented to ensure their protection, 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 active travel routes linking Eastfield Road and Oxney Road but the proposed scheme will improve this provision by improving connectivity and safety. At the existing junction, the Parnwell cycleway route connects Oxney Road in the south with Henshaw Road in 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.	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	There are already busy road and active travel routes in the area which will be improved as part of the works routes in terms of safety and connectivity. 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	Active and urban character associated with a busy road and extensive built development along both sides of Oxney Road and extending southwards down Newark Road.	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

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is busy, active and typically urban in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes and establishing additional safe crossing points.

TAG Townscape Impacts Worksheet **Scheme:** **Oxney Rd Crossing**

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	Scheme footprint is a busy road network with connecting pedestrian and cycleway routes. It is set within a wider residential part of Peterborough interspersed with small urban green spaces including trees and grassland areas. There are large commercial buildings located immediately south of the site. The A1139 Frank Perkins Parkway is located immediately west.	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 and commercial buildings. A1139 Frank Perkins Parkway located immediately adjacent to the junction improvements (west).	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	Buildings and tree cover surrounding the proposed junction improvements are at a relatively consistent height. There are no features associated with the proposed works which will impact on this.	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 scale of the townscape considering the scope of works.
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 active travel routes linking Eastfield Road and Oxney Road but the proposed scheme will improve this provision by improving connectivity and safety.	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	There are already busy road and active travel routes in the area which will be improved as part of the proposed works in terms of safety and connectivity. 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	Active, urban landscape dominated character associated with a busy road and roundabout junction.	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

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is busy, active and typically urban in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes and establishing safer signalised crossing point.

TAG Townscape Impacts Worksheet **Scheme:** **J7-Eastfield Traffic Signals**

	Step 2	Step 3					Step 4
Features	**Description**	**Scale it matters**	**Rarity**	**Importance**	**Substitutability**	**Changes in Without-scheme case**	**Impact**
Layout	Scheme footprint is a busy road junction set within a wider residential part of Peterborough interspersed with small urban green spaces including trees and grassland areas.	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 with some commercial buildings. A1139 Frank Perkins Parkway located immediately adjacent to the junction improvements (east).	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	Buildings and tree cover surrounding the proposed junction improvements are at a relatively consistent height. There are no features associated with the proposed works which will impact on this.	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 scale of the townscape considering the scope of works.
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 active travel routes which pass through the junction but the proposed scheme will improve this provision by improving connectivity and safety.	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 designated cultural or historic features in close proximity to this location, but there is a war memorial in the triangular island.	Local	Common	High for local residents and stakeholders.	Limited substitutability considering the likely time it has been located in its current location.	No impact	Neutral - the war memorial will be retained as part of the proposed work and standard mitigation measures will be implemented to protect this feature.
Land use	There is already an existing busy junction and the proposed works will improve active travel routes through the area and overall safety. 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	Active and urban dominated character associated with a busy road junction surrounded by extensive built development.	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

Neutral

Qualitative Comments

The scheme will not affect the townscape character of this area, which is busy, active and typically urban in nature. It will, however, promote active travel by improving connectivity between pedestrian and cycleway routes through the junction and establishing safer signalised crossing points.

TAG Water Environment Impacts Worksheet **Scheme:** **J7-Eastfield Traffic Signals**

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Junction 7 Eastfield Road / Oxney Road Junction The scheme is located off Junction 7 of the A1139 on Eastfield Road / Oxney Road. There is one small reach of open watercourse south of the site which has connection to a small pond and flows to the south. Part of the site lies within a Secondary A aquifer and an area of 'High' groundwater vulnerability. No designated sites are within the study area.									
Potential impacts									
Surface water									
Construction - Increased sediment supply to watercourse (e.g. clays, fine silts, sands) from construction works.	Rivers: Unnamed drain within 500m.	Conveyance of flow and material	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Alteration to flow characteristics during construction works could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the watercourse.		Conveyance of flow and material	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to watercourses by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Groundwater									
Construction - Pollution to Secondary A aquifer (Bedrock) underlying the study area.	Groundwater Secondary A aquifer (Bedrock) underlying the study area. The study area is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater vulnerability	High groundwater vulnerability.	Local	Common	Not substitutable	Medium	Negligible	Insignificant

Reference Sources

Environment Agency Catchment Data Explorer
Defra MAGIC Map
Environment Agency Flood Map for Planning
Royal Haskoning Water Report

Summary Assessment Score

Neutral

Qualitative Comments

Risk to the small watercourse identified in the study area is very low due to the disconnection from the site. While the aquifer at depth is at high vulnerability, the proposed activities are confined to surface strata and as such there is limited connectivity and no pathway for significant impact to occur. Furthermore, a Construction Environmental Management Plan (CEMP) will be implemented during the construction phase to manage the potential impacts on surface and groundwater. This will include best practice measures to control the release of sediment and contaminants from construction activities. The scheme does not lie within Flood Zone 2 or 3 and is not likely to increase flood risk.

TAG Water Environment Impacts Worksheet **Scheme:** **Newark Rd Footpath**

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Newark Road Footpath The scheme is located on Newark Road within Fengate Industrial Park. The site is within 500m of a minor unnamed watercourse which is not designated as a main river. To the west of the site, part of this drain within the study area flows within a culvert. It emerges from the culverted section and flows in an easterly direction adjacent to Vicarage Farm Road. An unnamed pond to the east of the site surface water feature within the study area. There are no designated sites within the study area.									
Potential impacts									
Construction - Increased sediment supply to watercourses (e.g. clays, fine silts, sands) from footpath construction.	Rivers: Unnamed drains within 500m.	Conveyance of flow and material	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Alteration to flow characteristics during construction of the footpath on Newark Road could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the watercourses.		Conveyance of flow and material	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to watercourses by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Increased sediment supply and/or release of pollutants impacting upon water quality of the unnamed pond off Edgerley Drain road.	Stillwaters (lakes and Ponds) Unnamed pond off Edgerley Drain Road	Biodiversity	Low - pond has limited conservation value and is not designated.	Local	Common	High	Low	Negligible	Insignificant
Groundwater									
Construction - Pollution to Secondary A aquifer (Bedrock) underlying the study area.	Groundwater Secondary A aquifer (Bedrock) underlying the study area. The study area is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater vulnerability	Medium The groundwater has high vulnerability to pollutants. WFD GW status - Good	Local	Common	Not feasible	Low	Negligible	Insignificant

Reference Sources

Environment Agency Catchment Data Explorer
Defra MAGIC Map
Environment Agency Flood Map for Planning
Royal Haskoning Water Report

Summary Assessment Score

Neutral

Qualitative Comments

Risk to the identified small watercourse is very low due to the disconnection from the site. The site does not lie within Flood Zone 2 or 3 and there is no expected increase in flood risk from the construction or operation of this scheme. While the aquifer at depth is at high vulnerability, the proposed activities are confined to surface strata and as such there is limited connectivity and no pathway for significant impact to occur. The Construction Environmental Management Plan will be implemented throughout the construction phase to further reduce risk of impacts to groundwater and surface water.

TAG Water Environment Impacts Worksheet **Scheme:** **Newark-Oxney Rd Roundabout**

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Newark Road / Oxney Road Roundabout The scheme is located on the junction of Newark Road and Oxney Road. There is one minor watercourse within 500m of the works. No other key water environment receptors are located within the study area.									
Potential impacts									
Surface water									
Construction - Increased sediment supply to watercourse (e.g. clays, fine silts, sands) from construction works.	Rivers: Unnamed drains within 500m.	Conveyance of flow and material	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Alteration to flow characteristics during construction works could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the watercourse.		Conveyance of flow and material	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to watercourses by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low - due to the artificial nature of the watercourses, absence of natural geomorphology and in-channel habitats.	Local	Common	High	Low	Negligible	Insignificant

Reference Sources

Environment Agency Catchment Data Explorer
Defra MAGIC Map
Environment Agency Flood Map for Planning
Royal Haskoning Water Report

Summary Assessment Score

Neutral

Qualitative Comments

Construction Environmental Management Plan (CEMP) will be implemented to manage the potential impacts during the construction phase. This will include best practice measures to control the release of sediment and contaminants from construction activities. The site does not lie within Flood Zone 2 or 3 and there is no expected increase in flood risk from the construction or operation of this scheme. Operational drainage designed to ensure there will be no additional flood or pollution risk from surface water runoff.

TAG Water Environment Impacts Worksheet **Scheme:** **Oxney Rd Crossing**

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Oxney Road Sainsburys Crossing The scheme is located outside Sainsburys on Oxney Road. There is one small reach of open watercourse south of the site which has connection to a small pond and flows to the south. Part of the site lies within a Secondary A aquifer and an area of 'High' groundwater vulnerability. No designated sites are within the study area.									
Potential impacts									
Surface water									
Construction - Increased sediment supply to watercourse (e.g. clays, fine silts, sands) from construction works.	Rivers: Unnamed drain within 500m.	Conveyance of flow and material	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats	Local	Common	High	Low	Negligible	Insignificant
Construction - Alteration to flow characteristics during construction works could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the watercourse.		Conveyance of flow and material	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to watercourses by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low - due to the artificial nature of the watercourse, absence of natural geomorphology and in-channel habitats	Local	Common	High	Low	Negligible	Insignificant
Groundwater									
Construction - Pollution to Secondary A aquifer (Bedrock) underlying the study area.	Groundwater Secondary A aquifer (Bedrock) underlying the study area. The scheme is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater vulnerability	High groundwater vulnerability.	Local	Common	Not feasible	Medium	Negligible	Insignificant

Reference Sources

Environment Agency Catchment Data Explorer
Defra MAGIC Map
Environment Agency Flood Map for Planning
Royal Haskoning Water Report

Summary Assessment Score

Neutral

Qualitative Comments

Risk to the identified small watercourse is very low due to the disconnection from the site. The site does not lie within Flood Zone 2 or 3 and there is no expected increase in flood risk from the construction or operation of this scheme. While the aquifer at depth is at high vulnerability, the proposed activities are confined to surface strata and as such there is limited connectivity and no pathway for significant impact to occur. The Construction Environmental Management Plan will be implemented throughout the construction phase to further reduce the risk to the highly vulnerable aquifer.

TAG Water Environment Impacts Worksheet **Scheme:** **Storey's Bar Road**

Description of study area/ summary of potential impacts	Key environmental resource	Features	Quality	Scale	Rarity	Substitutability	Importance	Magnitude	Significance
Study Area: Storey's Bar Road / Edgerley Drain Road The scheme is located at the crossroad junction of Storey's Bar Road and Edgerley Drain Road. The study area is on the eastern edge of an urban area, with low-lying agricultural land to the east. Key surface water features within 0.5km are two unamed drains which flow alongside Storey's Bar Road and Edgerley Drain Road. The drain on the south side of Storey's Bar Road is designated as a main river. Both drains on this road join Adderley Drain to the east. A flood storage area is connected to the southern unnamed drain on Storey's Bar Road and a pond is located to the north of the scheme off Edgerley Drain Road. The proposed scheme lies within the Artificial WFD river water body North Level Pumped Areas 2 and 3 (GB205032050385). There are no designated sites within the study area.									
Potential impacts									
Surface water quality									
Construction - Proposed realignment of existing drain on Edgerley Drain Road and Storey's Bar Road will cause permanent alteration of the bed and banks. Construction works will change flow characteristics of the drain which will alter erosion, deposition and sediment transport processes. These works could also impact upon the receiving Adderley Drain less than 500m downstream of the works.	Rivers: Surrounding unnamed drains and Adderley Drain. The proposed scheme lies within the Artificial WFD river water body North Level Pumped Areas 2 and 3 Water Body Waterbody ID: GB205032050385 Moderate Ecological Status	Conveyance of flow and material/	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition. There are also no designated sites in the study area.	Local	Common	High	Low	Negligible	Insignificant
Construction - Site preparation, cycle way/footpath construction, road improvement works and vegetation removal could lead to increased surface runoff as a result of changes to surface runoff patterns and flows. Alteration to flow characteristics could impact upon the geomorphology of the surrounding drains on Edgerley Road and Storey's Bar Road, and the connecting Adderley Drain (within 500m of the constuction site) that may affect channel erosion and deposition processes.		Conveyance of flow and material/	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition. There are also no designated sites in the study area.	Local	Common	High	Low	Negligible	Insignificant
Construction - Increased sediment supply (e.g. clays, fine silts, sands) from earthworks associated with drain realignment, footpath construction, vegetation removal and road improvement works. Increased sediment input would increase turbidity levels and increase fine sediment deposition on the bed. This could also impact on the receiving Adderley Drain (within 500m of construction site).		Biodiversity	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition.	Local	Common	High	Low	Negligible	Insignificant
Construction - Pollution to drains on Edgerley Road and Storey's Bar Road and the connecting Adderley Drain by accidental spillage of contaminants or from accidental release of oils, lubricants and fuels from construction machinery.		Biodiversity	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition. There are also no designated sites in the study area.	Local	Common	High	Low	Negligible	Insignificant
Operation - Increased sediment supply (e.g. clay, fine silts, sands) Changes to the current infrastructure through operation of a footpath/cycleway adjacent to the drain. This increase in hard-standing area could increase runoff of fine sediments and pollutant input into the drain.		Conveyance of flood flows	Low quality due to the artificial nature and absence of natural geomorphology and in-channel habitats of the surrounding watercourses. Moderate overall WFD status but at Poor status for Ammonia and Phosphate and in failing chemical condition. There are also no designated sites in the study area.	Local	Common	High	Low	Negligible	Insignificant
Construction - Increased sediment supply and/or release of pollutants impacting upon water quality of pond.	Stillwaters (lakes and Ponds)	Biodiversity	Low - pond has limited conservation value and is not designated.	Local	Common	High	Low	Negligible	Insignificant
Flood Risk									
Construction - Flood risk Site preparation, construction of the realigned channel, road improvement works, cycle way/footpath construction and vegetation removal may increase surface water runoff due to alterations in surface drainage patterns and surface water flows. Infiltration rates could be reduced during construction of cycle way/footpath.	Floodplain	Conveyance of flood flows	Medium - Part of the study area is within Flood Zones 2 and 3. The drains on either side of Storey's Bar Road currently present a medium flood risk to a small number of commercial properties surrounding the study area.	Local	Common	High	Low	Negligible	Insignificant
Operation - Flood risk New realigned channel on the northern side of Storey's Bar Road could potentially impact on flood risk.	Floodplain	Conveyance of flood flows	Medium - Part of the study area is within Flood Zone 3 and 2. The drains on either side of Storey's Bar Road currently present a medium flood risk to a small number of commercial properties surrounding the study area. The capacity of the realigned channel will remain the same to avoid impacts on flood risk.	Local	Common	Not substitutable	Low	Negligible	Insignificant
Operation - Flood risk Changes to the current infrastructure with an increase in hard standing area on Storey's Bar Road and Edgerley Drain Road through operation of a footpath/cycleway which could increase flood risk.	Floodplain	Conveyance of flood flows	Medium - Part of the study area is within Flood Zone 3 and 2. The drains on either side of Storey's Bar Road currently present a medium flood risk to a small number of commercial properties surrounding the study area.	Local	Common	Not substitutable	Low	Negligible	Insignificant
Groundwater									
Construction - Pollution to Secondary A aquifer (Bedrock) underlying the study area.	Groundwater Secondary A aquifer (Bedrock) underlying the study area. The study area is within 500m of the WFD groundwater body Nene Mid Lower Jurassic Unit.	Groundwater vulnerability	Medium - The groundwater is at medium to high vulnerability to pollutants. Nene Mid Lower Jurassic Unit WFD GW status - Good	Local	Common	Not substitutable	Medium	Negligible	Insignificant
Construction & Operation - Impact on groundwater levels in the surrounding area which is of particular concern for the Flag Fen Bronze Centre Scheduled Monument located circa 350m south-east of the proposed scheme.	Groundwater	Groundwater vulnerability	The survival of timbers and artefacts within the wet conditions of the Flag Fen basin is outstanding. The post alignment and timber platform at Flag Fen represent a class of monument where relatively few examples survive and are well documented. Waterlogged deposits and artefacts are vulnerable to changes in water levels and to the effects of encroaching industrial development. Hydrogeological Assessment has been undertaken to confirm that the proposed scheme will have no significant impact upon groundwater levels within the vicinity of the Scheduled Monument.	National	Rare	Not substitutable	High	Negligible	Insignificant

Reference Sources

Environment Agency Catchment Data Explorer
Defra MAGIC Map
Environment Agency Flood Map for Planning
Royal Haskoning Water Report

Summary Assessment Score

Neutral

Qualitative Comments

The risk to water quality and biodiversity of the surrounding surface water features is low. All watercourses are artificial drains and have low geomorphological and ecological value. The construction activities and the new scheme in operation are considered to have an insignificant impact on these features. Despite a medium fluvial flood risk in the study area, there is no increased flood risk anticipated from these construction activities or operation of the new cycleway/footpath due to their small scale and the presence of a flood storage area on the southern side of Storey's Bar Road. Although the aquifer at depth is in an area of medium-high groundwater vulnerability, proposed activities are confined to surface strata and as such there is limited connectivity and no pathway for significant risk to occur. Mitigation measures outlined within the Construction Environmental Management Plan will further prevent any adverse impact on key features. This will include best practice measures to control the release of sediment and contaminants from construction activities. Operational drainage will be designed to ensure there will be no additional flood or pollution risk from surface water runoff.

Appendix F – Early Release of Funding Technical Note

Technical Note

Description:	Fengate Active Travel Early Funding Release	To:	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 Fengate Access Study from the Cambridgeshire and Peterborough Combined Authority (CPCA).

This is to accelerate the construction of two active travel schemes, which form part of the Fengate Access Study 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:

- Newark Road Footpath
- Oxney Road Pedestrian Crossing.

Peterborough City Council and the CPCA have been considering opportunities to accelerate scheme delivery as the project is funded by the Transforming Cities Fund (TCF). The TCF is time limited and must be spent by 31st March 2024.

Including the Fengate Access Study project, there is approximately £17m of TCF funded transport infrastructure to deliver in Peterborough in the 2023 / 2024 financial year. 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 Fengate Access Study 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 that there is a strong strategic case for investment as well as the necessary measures in place to successfully deliver the schemes.

Schemes

The Fengate active travel schemes are designed and ready to be delivered.

The Newark Road Footway scheme consists of the following:

- 473.5 sqm of footway from the south of Newark Road
- 25.0 sqm of tactile paving positioned either side of:
    - The East Vicarage Farm Road arm of the Newark Road / East Vicarage Farm Road Roundabout
    - The Newark Road north arm of the Newark Road / East Vicarage Farm Road Roundabout
    - Access junctions along the entire footway length on the western side of Newark Road.
- 25.0 sqm of carriageway resurfacing.

The Oxney Road Pedestrian Crossing scheme consists of the following:

- A new puffin crossing over Eastfield Road, west of Oxney Road.
- Red tactile paving on each side of the crossing.
- A total green time of 5.0 seconds for pedestrians, with up to 18.0 seconds of red time for motorised vehicles.
- A 2.4m wide footpath between Oxney Road (north of Sainsbury's) and Eastfield Road
- Break up of existing footway between Oxney Road (north of Sainsbury's) and Eastfield Road
- Buff-coloured tactile paving on each side of Oxney Road, where the proposed footpath meets.
- Buff-coloured tactile paving on each side of the Franklyn Crescent arm of the Oxney Road / Eastfield Road / Franklyn Crescent Roundabout.
- Footway resurfacing on the south side of the puffin crossing.

The scheme drawings for each scheme can be provided upon request.

Figure 1 overleaf shows the location of the schemes in Fengate.

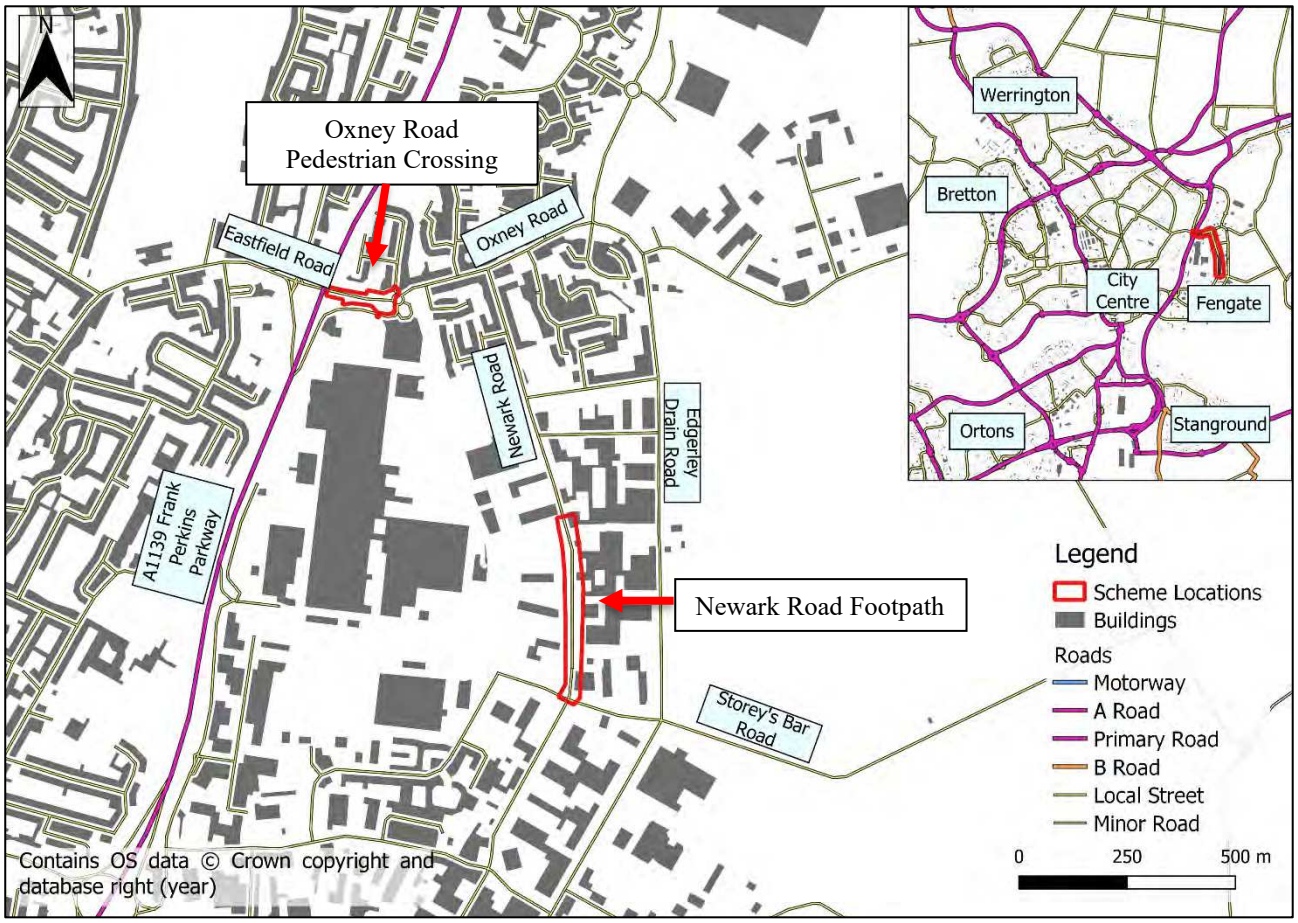

Figure 1: Fengate Active Travel Scheme Locations

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 Fengate 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

Trafficmaster Satellite Navigation data (November 2017) has been used to assess baseline vehicular journey times and delay within the study area for the free flow (00:00 – 05:00), AM peak hour (08:00 – 09:00), and PM peak hour (17:00 – 18:00) periods. The approaches of the following junctions have been considered within the Fengate FBC:

- Oxney Road / Edgerley Drain Road priority junction
- Edgerley Drain / Storey's Bar Road / Vicarage Road signalised junction
- Junction 8 signalised junction.

Significant delay was observed at all of these junctions in the AM and PM peak hours when compared to the free flow period.

An assessment of future year highway conditions was undertaken using the Peterborough Transportation Model (PTM3) and large increases in delay per vehicle are forecast to take place at all three junctions.

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.

Fengate is a particularly car-dependent employment destination, as shown in Figure 2 below, and the quality of the active travel infrastructure is of a lower quality compared to other areas of Peterborough. The density of cycleways per one square kilometre is also lower than other areas of the city as shown in Figure 3 overleaf.

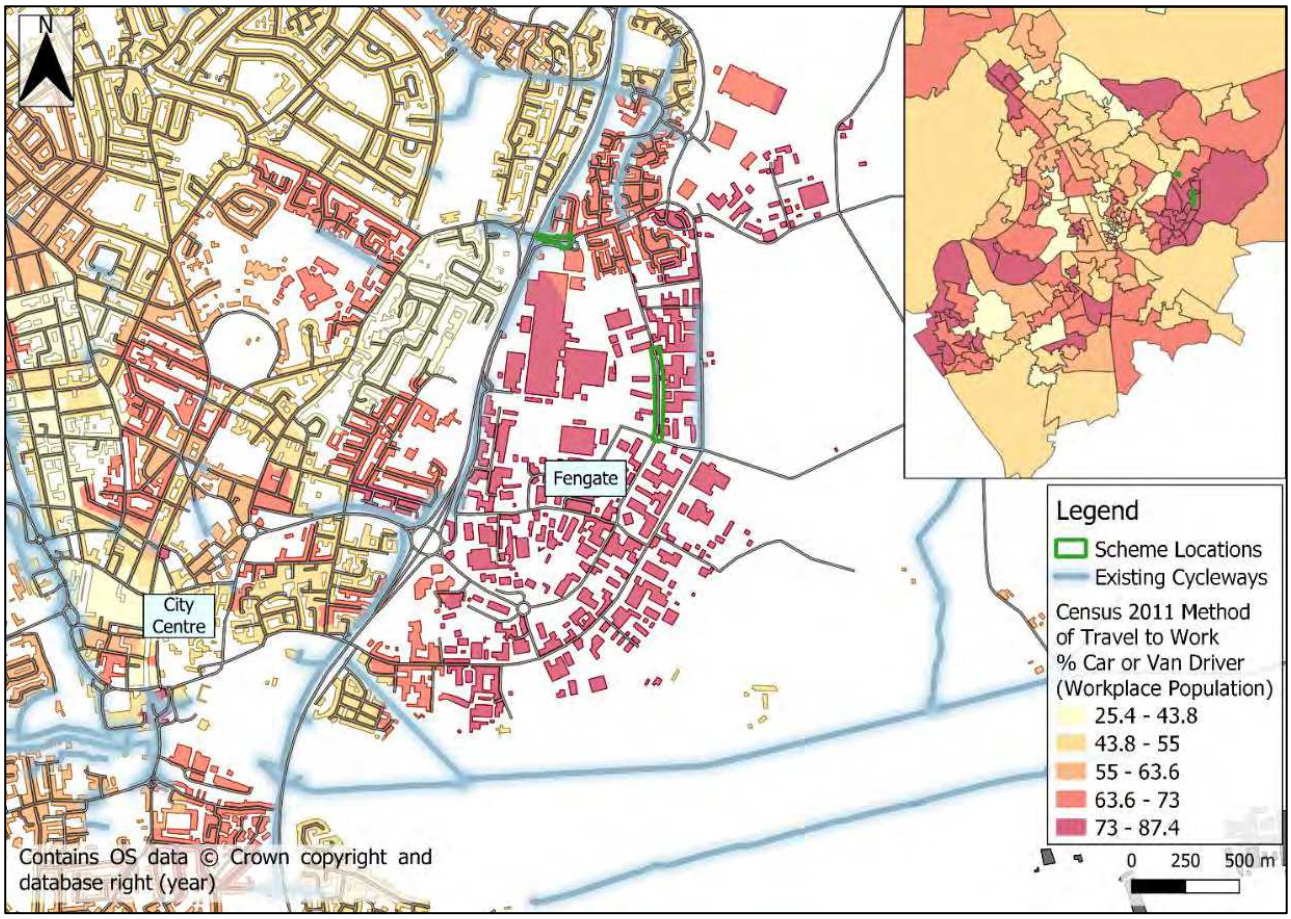

Figure 2: Census 2011 Method of Travel to Work – Percentage Car or Van Driver within Workplace Population

Figure 3: Total Length of Existing Cycleway per One Square Kilometre

The average car travel to work mode share for Fengate is 79%, whereas the whole of Peterborough is 61%. In contrast, Fengate has a low walking travel to work mode share of 3%, as shown in Figure 4 overleaf. The whole of Peterborough has a walking mode share of 8%, which is almost triple of the mode share in Fengate. Without an improvement in active travel infrastructure, Fengate will remain a car-dependent destination that is less accessible for those able to travel by foot or cycle.

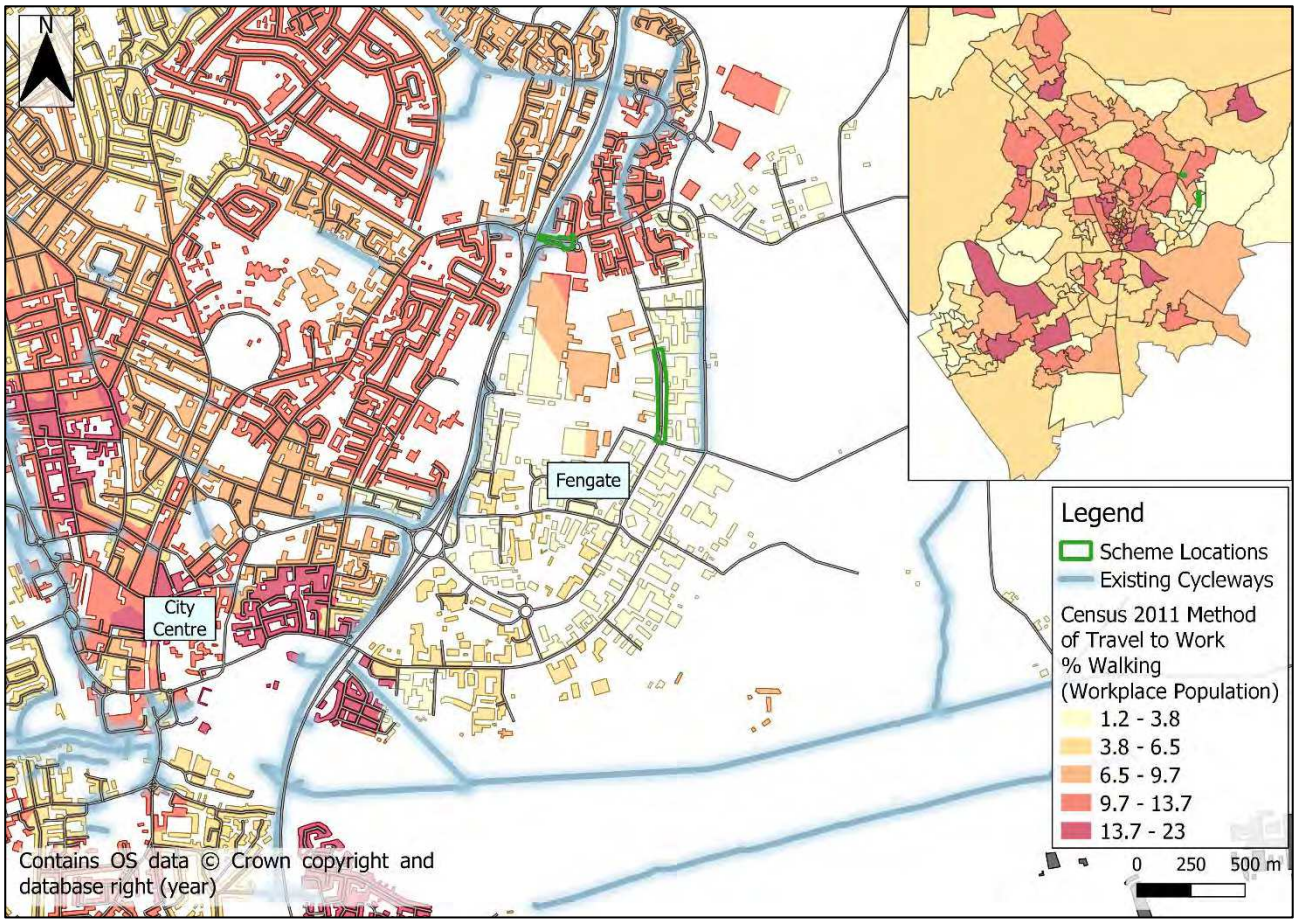

Figure 4: Census 2011 Method of Travel to Work – Percentage Walking within Workplace Population

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 improving access to the key employment area of Fengate.

Tables 1 and 2 show the breakdown of the residential and employment developments that are proposed for Fengate, respectively.

Table 1: Residential Development Proposed for Fengate

	Residential Developments (Units)				
Local Plan Development	**Up to 2019**	**2019-2026**	**2026-2031**	**2031-2036**	**Total Units**
Potters Way Fengate	0	18	0	0	18
Fengate South	0	0	150	200	350
Former Perkins Engines Site Newark Road	0	104	0	0	104
Tanholt Farm, Eyesbury Road	0	3	0	0	3
Rear of 83 Oxney Road	0	5	0	0	5
105 Oxney Road	0	8	0	0	8

Table 2: Employment Development Proposed for Fengate

Mixed Commercial Developments (sq.m)						
Local Plan Development	**Land Use Class**	**Up to 2019**	**2019 -2026**	**2026 -2031**	**2031 -2036**	**Total Size (sq.m)**
Red Brick Farm	Employment	0	0	126,600	0	126,600
Oxney Road Site C	Employment	0	0	34,825	0	34,825
Perkins South	Employment	0	0	14,700	0	14,700
Land of Third Drove and fronting Fengate	Employment	0	0	5,950	0	5,950

Local residential and employment growth in Fengate will be compromised if no changes are made to existing congestion and delay. An increase in active travel within Fengate 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 walking infrastructure that would encourage walking to work within Fengate as a more sustainable alternative to car travel.

Scheme Objectives

The project scope is to construct schemes within Fengate that achieve each of the primary objectives of the Fengate FBC.

The primary scheme objectives, as outlined in the Fengate FBC, are as follows:

- Tackle congestion and reduce delay
- Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site
- Protect the local environment and improve biodiversity.
- Reduce dependence on car travel and increase travel by healthier, more sustainable modes.

The secondary scheme objectives, as outlined in the Fengate FBC, are as follows:

- Positively impact traffic conditions on the wider network
- Improve road safety.

The Fengate 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 15th May 2018 and attended by representatives from various disciplines within Peterborough Highway Services (PHS). The workshop used EAST to review existing and future issues relating to access to Fengate and site constraints.

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 Fengate FBC will measure the success of the schemes against the scheme objectives.

Key Risks

A project Risk Register is available as part of the Fengate 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 can be provided 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 Fengate 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
- Severance.

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 and severance Present Value of Benefits (PVB) of each scheme has been assessed using the Active Mode Appraisal Toolkit (AMAT) and the University College London (UCL) Tool to Value Reductions in Community Severance Caused by Roads, respectively.

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).

The number of walking trips with the proposed interventions 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 based on the ratio of Shrewsbury Avenue to Fengate walk trips.
- Applying the resultant uplift factor to the number of walking trips without the proposed interventions.

A comparison between Shrewsbury Avenue in Orton Longueville, which is a comparable land use, and Fengate was undertaken to understand the potential for travel to work by walking. The assessment identified that Shrewsbury Avenue had 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.

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.

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, site visits to each scheme location have shown that each scheme is integral to delivering a better-connected network that reduces severance and improves safety and journey quality for cycling. Without any infrastructure improvements, the study area would not be appropriate for increased cycling.

Table 3 below shows the number of walking trips by scenario for each scheme.

Table 3: Do Nothing and Do Something Daily Walking Trips by Scheme

Scheme	Daily Walking Trips	
	Do Nothing	Do Something
Oxney Road Pedestrian Crossing	1,701	2,038
Newark Road Footway	773	926

The UCL Tool to Value Reductions in Community Severance Caused by Roads (Anciaes and Jones, 2020) is a spreadsheet used to estimate the value of interventions that reduce the barrier effect caused by roads, including changes to road design, traffic, and crossing facilities. This tool is referred to as the "Severance Tool" within this report.

Severance is calculated at each point along a road. The Severance Tool assumes that severance originates from the road conditions at a particular point and the possibility of walking along the road to cross in a place with better road conditions or crossing facilities.

The Severance Tool has only been used for the Oxney Road Pedestrian Crossing scheme and it requires the following intervention-specific details for calculating active travel benefits:

- Length of road segment (100 – 5,000m)
- Total potential demand for walking trips crossing the road (minimum of 1,000 trips per day)
- Percentage of each age group in the demand
- Average walking speed by age group
- Journey purpose of each age group
- Percentage of demand at each crossing location along the road segment
- Lifetime of the project (maximum of 10 years)
- Road conditions including the number of lanes in each direction, central reservation (wide, narrow, or none), traffic density (low, medium, or high), and traffic speed (10, 20, 30, or 40mph).
- Crossing facilities available at the extreme and middle points of the road segment. Options include pedestrian refuge, straight pelican, staggered pelican, footbridge, or underpass.
- Waiting time (0 to 5 minutes).

It has been assumed that the scheme will generate an increase in walking trips and therefore the rule of half must be applied to the benefits associated with the increase.

Table 4 overleaf summarises the benefits for each scheme.

Table 4: Summary of Benefits by Scheme

Benefit Type	Benefit Item	Benefits ('000s)		
		Oxney Road	Newark Road	**Total**
Mode Shift	Congestion Benefit	21.84	9.91	31.75
	Infrastructure Maintenance	0.12	0.06	0.18
	Accident	3.75	1.70	5.46
	Local Air Quality	0.53	0.24	0.77
	Noise	0.25	0.11	0.36
	Greenhouse Gases	1.78	0.81	2.59
Health	Reduced Risk of Premature Death	793.36	360.19	1,153.55
	Absenteeism	165.06	74.94	240.00
Journey Quality	Journey Ambience	17.40	33.77	35.51
Severance (Indicative Monetised Impact)	Reduced Community Severance Caused by Roads	948.70	Not assessed	948.70
Indirect Taxation	Indirect Taxation	-2.24	-1.02	-3.26
Total		**1,950.43**	**480.66**	**2,431.09**

The benefits over a 20-year appraisal period for the Oxney Road and Newark Road schemes are £1,950,430 and £480,660, respectively. Health (49%) and Severance (49%) form most of the benefits for the Oxney Road scheme, whereas Health (90%) accounts for nearly all the benefits for the Newark Road scheme alone.

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. Inflation has not been applied to the scheme costs because the costs are to be incurred during the 2022 price year.

Real Cost Increase (inflation) has been applied to the Base Investment Costs for the Oxney Road scheme only for 2022 to 2023 using TAG Data Book May 2022 Annual GDP and BCIS General Civil Engineering Cost Index (2022) values. The inflation factor applied (1.061) has been calculated by dividing the BCIS inflation factor of 1.080 (8.0%) by the TAG GDP factor of 1.018 (1.8%).

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 Fengate 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	Oxney Road Pedestrian Crossing	Newark Road Footway	Total
Base Investment Cost	£253,526	£203,237	£456,763
Base Cost with Real Cost Increases	£269,070	£203,237	£472,307
Base Cost with Real Cost Increases and Optimism Bias	£322,883	£243,885	£566,768
Rebased and Discounted to 2010, and Adjusted to Market Prices (PVC)	**£187,560**	**£151,277**	**£338,837**

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 below. 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 overleaf provides the Analysis of Monetised Costs and Benefits (AMCB) Table.

Table 7: Analysis of Monetised Costs and Benefits Table

Benefit Item	Value (£'000s)		
	Oxney Road	Newark Road	Total
Noise	0.25	0.11	0.36
Local Air Quality	0.53	0.24	0.77
Greenhouse Gases	1.78	0.81	2.59
Journey Quality	1.74	33.77	35.51
Physical Activity (Health)	958.42	435.13	1,393.55
Accidents	3.75	1.70	5.46
Congestion Benefit	21.84	9.91	31.75
Infrastructure Maintenance	0.12	0.06	0.18
Indirect Taxation	-2.24	-1.02	-3.26
Present Value of Benefits (PVB)	**1,001.72**	**480.66**	**1,482.38**
Broad Transport Budget	187.56	151.28	338.84
Present Value of Costs (PVC)	**187.56**	**151.28**	**338.84**
Net Present Value (NPV)	**814.17**	**329.38**	**1,143.55**
Initial Benefit to Cost Ratio (BCR)	**5.34**	**3.18**	**4.37**

Severance is not currently considered as an Established Monetised Impact within TAG or the Value for Money Framework. However, it could be considered an Indicative Monetised Impact that when combined with the core benefits reported within the AMCB Table would demonstrate an indicative PVB.

Without severance impacts in the economic assessment of the Oxney Road scheme would provide a PVB of £1,001,720, NPV of £814,170, and a BCR of 5.34 which equates to Very High Value for Money. Including severance impacts increases the BCR from 5.34 to 10.39.

The Newark Road scheme provides a PVB of £480,660, NPV of £329,380, and a BCR of 3.18, which equates to High Value for Money.

Combining both schemes together (without severance) provide a PVB of £1,482,380, NPV of £1,143,550, and a BCR of 4.37, which equates to Very High Value for Money. Including severance impacts increases the overall BCR from 4.37 to 7.17.

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 non-monetised environmental impacts have been considered in full within the Fengate 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.

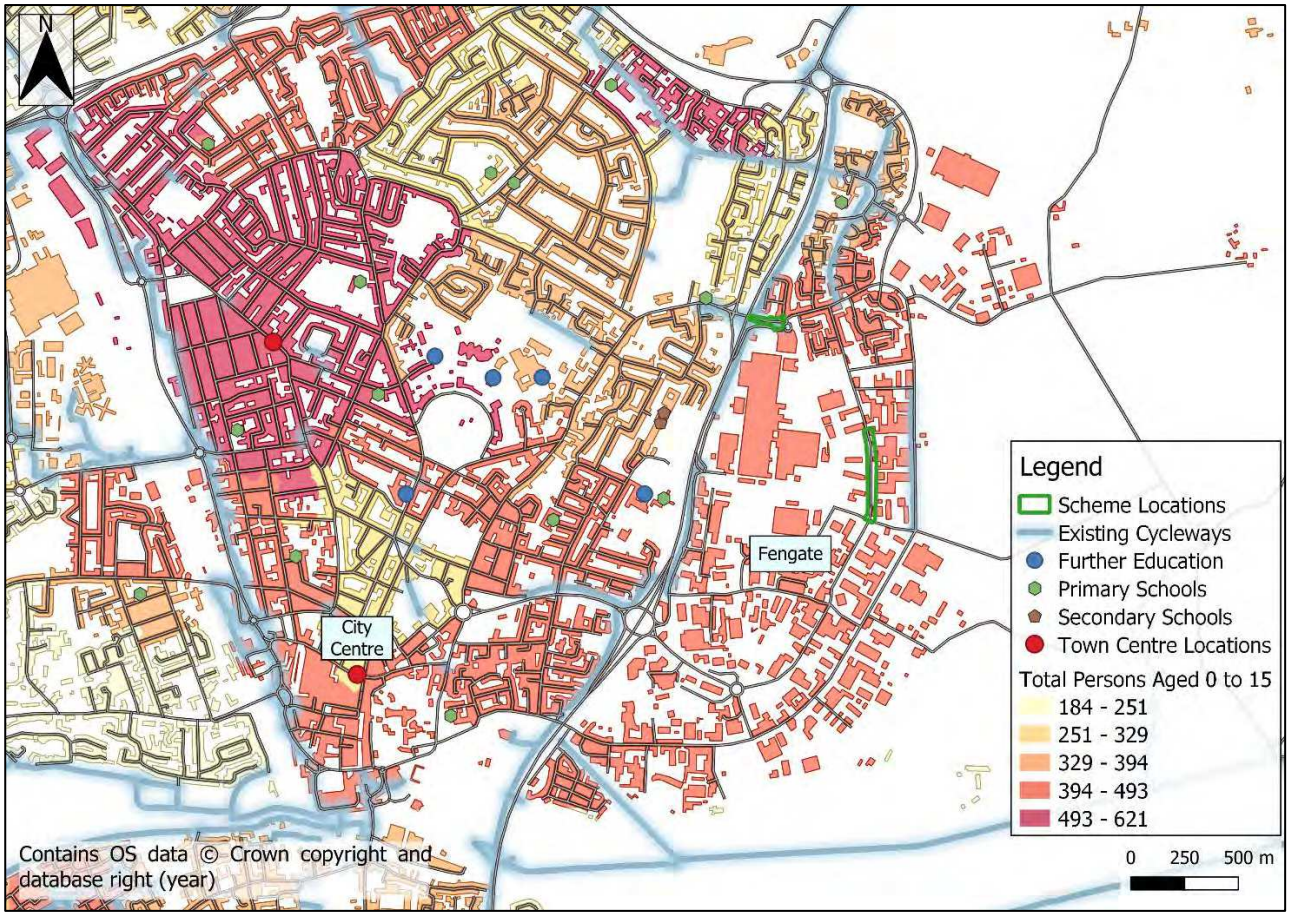

Figure 5: Number of Persons Aged 0 to 15 at LSOA Level across Peterborough in Relation to Key Services

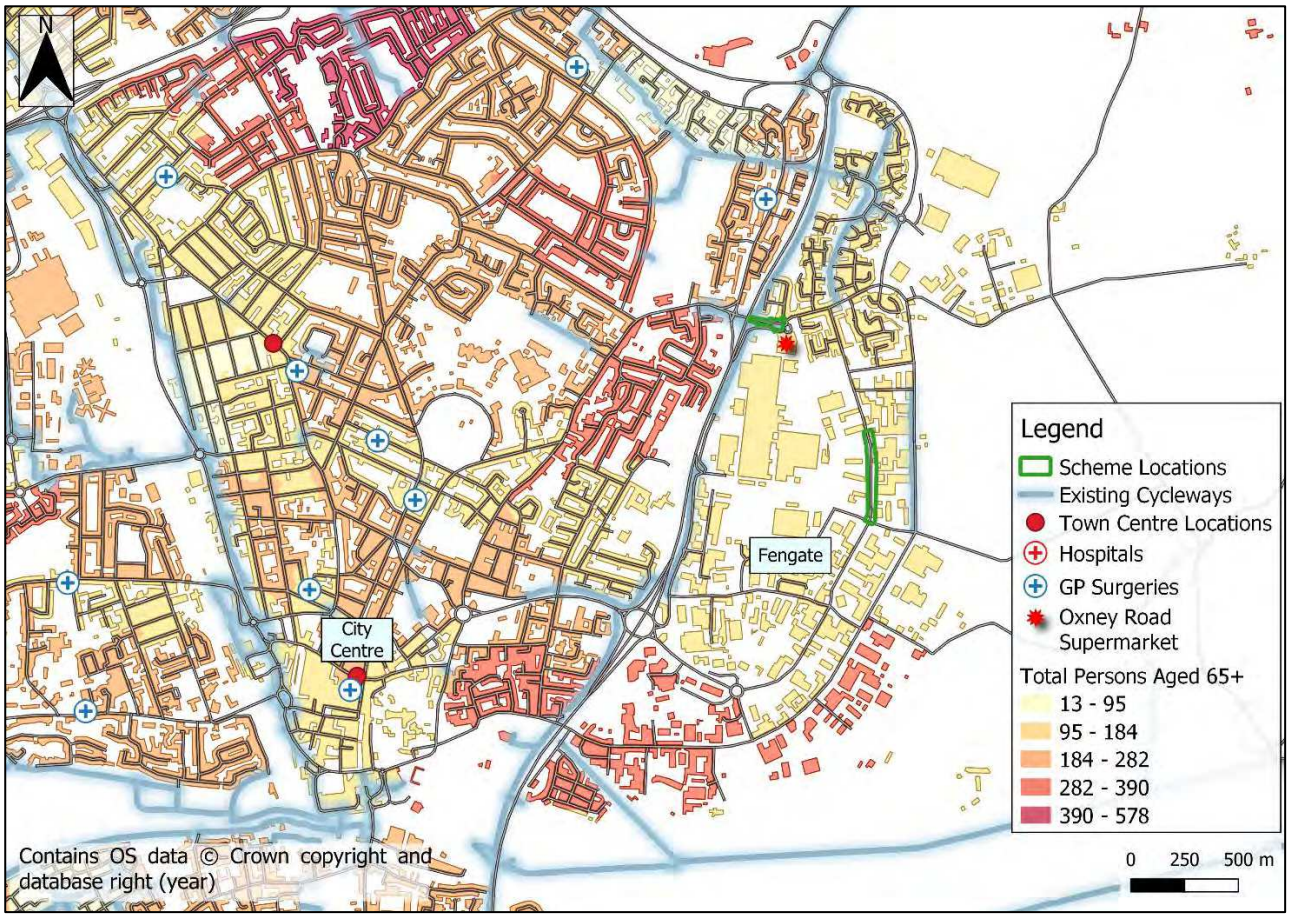

Figure 6: Number of Persons Aged 65+ at LSOA Level in Relation to Key Services

There is a particularly high number of persons aged 0 to 15 that live along Oxney Road and north-east of the nearest secondary schools that would be currently disadvantaged by the lack of a direct crossing point along Eastfield Road. Young people walking to school would have to wait for a gap in the traffic on Eastfield Road to cross or travel further west to find a suitable crossing and even then, they would have to cross the Eye Road Approach and Exit arms of the Eastfield Road / Eye Road Signalised Junction. Without the proposed crossing, it is expected younger people choosing to walk to school are currently experiencing increased journey times and therefore an increased cost of travel.

There is a significant number of persons aged 65 and above to the west of the Oxney Road Supermarket that would be currently disadvantaged by the lack of a direct crossing point along Eastfield Road. Whilst bus travel is free for senior citizens and there is a bus stop at the Oxney Road Supermarket, travelling by bus does not offer the same health benefits as those associated with active travel. The lack of a direct crossing point would increase journey times and the cost of travel for those wanting to walk.

Figure 7 shows the Income Deprivation Domain of the English Indices of Multiple Deprivation dataset for the study area.

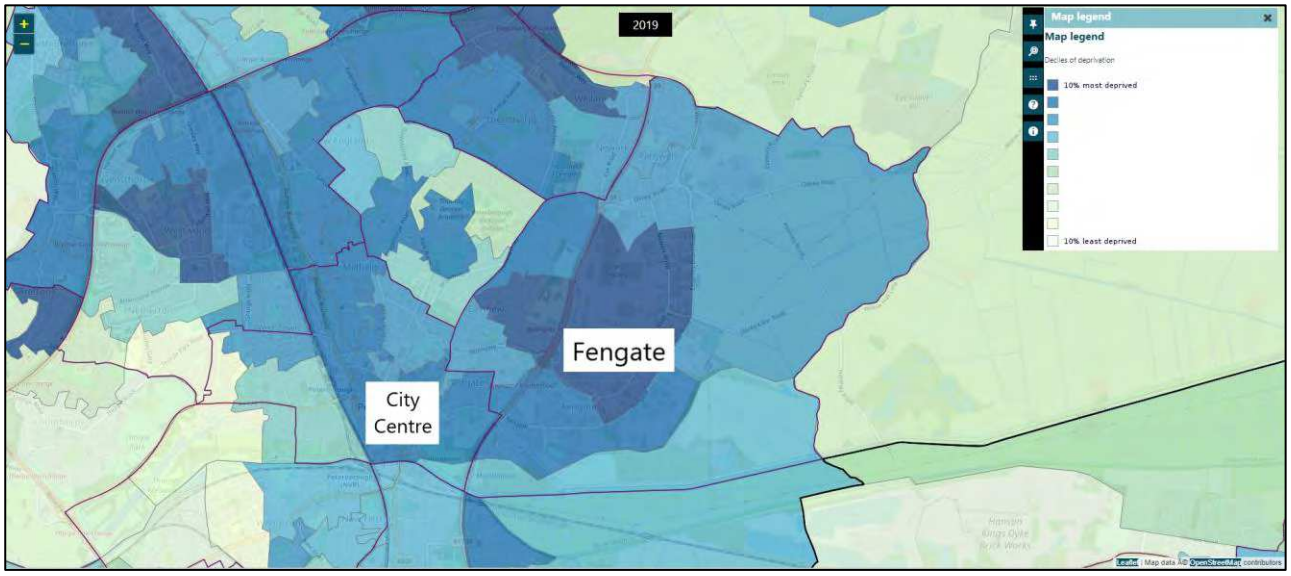

Figure 7: Income Deprivation Domain by LSOA

The LSOAs in and surrounding Fengate are in the top 30% most income deprived deciles for England. An improvement in the walking infrastructure of Fengate 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.

Fengate is a particularly car-dependent employment destination, as previously shown in Figures 2 to 4 of the Strategic Dimension, and the quality of the active travel infrastructure is of a lower quality compared to other areas of Peterborough.

The average car travel to work mode share for Fengate is 79%, whereas the whole of Peterborough is 61%. In contrast, Fengate has a low walking travel to work mode share of 3%, as shown in Figure 6. The whole of Peterborough has a walking mode share of 8%, which is almost triple of the mode share in Fengate. Without an improvement in active travel infrastructure, Fengate 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 Oxney Road Pedestrian Crossing and Newark Road Footway active travel schemes together will provide a PVB of £1,466,780 overall, with a BCR of 4.37 (Very High Value for Money) based on physical activity, journey quality, accidents, noise, local air quality, greenhouse gases, and congestion benefits. Including severance benefits increases the overall PVB to £2,415,600, with a BCR of 7.17.

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 Eastfield Road and the provision of a new footway on Newark Road is expected to make walking a more realistic and affordable alternative to car travel to key services in and around Fengate. The schemes would also benefit nearby residential areas that are currently in the top 30% 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	Newark Road scheme construction undertaken
January 2023 – March 2023	Oxney Road scheme construction undertaken
January 2023	CPCA Board to make funding decision for the main Fengate project. This was the original CPCA Board date for the Fengate active travel schemes.

Table 9 below shows the Financial Dimension Scheme Cost Estimates. The costs calculated for use within the Economic Assessment are presented in the Economic Dimension.

Table 9: Financial Dimension Scheme Cost Estimates

Description of Cost Type	Oxney Road	Newark Road
Base Investment Cost	253,526	203,237
Risk Adjusted Base Cost	275,960	252,387
Risk Adjusted Base Cost with Industry Inflation (Outturn Cost)	**298,037**	**252,387**

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 Oxney Road Pedestrian Crossing and Newark Road Footpath are £298,037 and £252,387, respectively.

Budgets and Funding Cover

It is anticipated that the full combined Outturn Cost of £550,424 will be funded from the Transforming Cities Fund (TCF). The TCF is time limited and must be spent by 31st March 2024.

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 Fengate active travel schemes can be reliably procured and implemented through existing channels whilst ensuring value for money in delivery of the scheme.

All phases to date and future phases of 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 Fengate 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	Newark Road scheme construction undertaken
January 2023 – March 2023	Oxney Road scheme construction undertaken
January 2023	CPCA Board to make funding decision for the main Fengate project. This was the original CPCA Board date for the Fengate active travel schemes.
March 2024	One-year post-scheme monitoring undertaken
March 2028	Five-year post-scheme monitoring undertaken

Stakeholder engagement was undertaken by the Project Team following approval of the SOC and were in line with the timings of the Public Consultation (February 2021 – March 2021). All stakeholders were consulted via email or letter for comments on the Preferred Scheme of the Fengate Access Study prior to the completion of Detailed Design.

Communication with stakeholders was maintained throughout the project and feedback from stakeholders largely centred on the environment, biodiversity, and sustainable travel elements of the Fengate Access Study preferred scheme. All feedback has been incorporated into the Detailed Design where appropriate.

A construction Risk Register for each scheme has been produced and can be provided 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 G – 60 Year Financial Dimension Cost Schedule

Fengate Access Study - 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	£390,689	£0	£0	£61,400	£19,385	**£471,474**	£79,292	**£550,766**	0.000	£0.00	**£550,766**	£0	£0	**£550,766**
2023	2	£3,606,198	£0	£0	£700,415	£138,477	**£4,445,090**	£761,686	**£5,206,776**	1.100	£520,677.65	**£5,727,454**	£0	£0	**£5,727,454**
2024	3	£683,336	£0	£0	£135,919	£11,330	**£830,584**	£177,370	**£1,007,954**	1.210	£211,670.33	**£1,219,624**	£0	£0	**£1,219,624**
2025	4	£0	£0	£0	£0	£25,000	**£25,000**	£0	**£25,000**	1.331	£8,275.00	**£33,275**	£0	£0	**£33,275**
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**	£25,000	£51,620	**£51,620**
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**	£0	£0	**£0**
2049	28	£0	£0	£0	£0	£0	**£0**	£0	**£0**	4.293	£0.00	**£0**	£25,000	£107,315	**£107,315**
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**	£0	£0	**£0**
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**	£25,000	£223,101	**£223,101**
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**	£0	£0	**£0**
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**	£25,000	£463,810	**£463,810**
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		**£4,680,223**	**£0**	**£0**	**£897,733**	**£194,192**	**£5,772,149**	**£1,018,348**	**£6,790,497**		**£740,623**	**£7,531,120**	**£100,000**	**£845,846**	**£8,376,966**

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2022 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 2023 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	**£5,772,149**
(2)	The base costs have been adjusted to incorporate risk.	**£6,790,497**
(3)	The risk adjusted costs have been adjusted to incorporate increases in construction costs.	**£7,531,120**
(4)	The inflated risk adjusted costs have been adjusted to incorporate whole life costs.	**£8,376,966**

Appendix H – 60 Year Economic Dimension Cost Schedule

(Construction and Maintenance)

Fengate Access Study - 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) Total Contribution of Optimism Bias		(4) Rebased to 2010 Price Base	(5) Discounted to 2010 Prices			(6) 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)	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£390,689	£0	£0	£61,400	£19,385	**£471,474**	0.000	£0.00	**£471,474**	£94,295	**£565,769**	**£443,508**	1.035	0.662	**£293,506**	**£349,272.12**
2023	2	£3,606,198	£0	£0	£700,415	£138,477	**£4,445,090**	1.060	£266,201.33	**£4,711,291**	£942,258	**£5,653,550**	**£4,431,828**	1.035	0.639	**£2,833,730**	**£3,372,138.16**
2024	3	£683,336	£0	£0	£135,919	£11,330	**£830,584**	1.146	£121,013.53	**£951,598**	£190,320	**£1,141,917**	**£895,151**	1.035	0.618	**£553,008**	**£658,079.51**
2025	4	£0	£0	£0	£0	£25,000	**£25,000**	1.234	£5,853.15	**£30,853**	£6,171	**£37,024**	**£29,023**	1.035	0.597	**£17,324**	**£20,615.04**
2026	5	£0	£0	£0	£0	£0	**£0**	1.273	£0.00	**£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**	1.035	0.557	**£0**	**£0.00**
2028	7	£0	£0	£0	£0	£0	**£0**	1.357	£0.00	**£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**	1.035	0.520	**£0**	**£0.00**
2030	9	£0	£0	£0	£0	£0	**£0**	1.446	£0.00	**£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**	1.035	0.486	**£0**	**£0.00**
2032	11	£0	£0	£0	£0	£0	**£0**	1.543	£0.00	**£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**	1.035	0.453	**£0**	**£0.00**
2034	13	£0	£0	£0	£0	£0	**£0**	1.649	£0.00	**£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**	1.035	0.423	**£0**	**£0.00**
2036	15	£0	£0	£0	£0	£0	**£0**	1.763	£0.00	**£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**	1.035	0.395	**£0**	**£0.00**
2038	17	£0	£0	£0	£0	£0	**£0**	1.882	£0.00	**£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**	1.035	0.369	**£0**	**£0.00**
2040	19	£0	£0	£0	£0	£0	**£0**	2.009	£0.00	**£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**	1.035	0.344	**£0**	**£0.00**
2042	21	£0	£0	£0	£0	£0	**£0**	2.147	£0.00	**£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**	1.035	0.321	**£0**	**£0.00**
2044	23	£0	£0	£0	£0	£0	**£0**	2.297	£0.00	**£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**	1.035	0.300	**£0**	**£0.00**
2046	25	£0	£0	£0	£0	£0	**£0**	2.460	£0.00	**£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**	1.035	0.280	**£0**	**£0.00**
2048	27	£0	£0	£0	£0	£0	**£0**	2.637	£0.00	**£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**	1.035	0.261	**£0**	**£0.00**
2050	29	£0	£0	£0	£0	£0	**£0**	2.828	£0.00	**£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**	1.035	0.244	**£0**	**£0.00**
2052	31	£0	£0	£0	£0	£0	**£0**	3.035	£0.00	**£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**	1.030	0.281	**£0**	**£0.00**
2054	33	£0	£0	£0	£0	£0	**£0**	3.256	£0.00	**£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**	1.030	0.264	**£0**	**£0.00**
2056	35	£0	£0	£0	£0	£0	**£0**	3.493	£0.00	**£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**	1.030	0.249	**£0**	**£0.00**
2058	37	£0	£0	£0	£0	£0	**£0**	3.747	£0.00	**£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**	1.030	0.235	**£0**	**£0.00**
2060	39	£0	£0	£0	£0	£0	**£0**	4.018	£0.00	**£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**	1.030	0.221	**£0**	**£0.00**
2062	41	£0	£0	£0	£0	£0	**£0**	4.306	£0.00	**£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**	1.030	0.209	**£0**	**£0.00**
2064	43	£0	£0	£0	£0	£0	**£0**	4.612	£0.00	**£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**	1.030	0.197	**£0**	**£0.00**
2066	45	£0	£0	£0	£0	£0	**£0**	4.937	£0.00	**£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**	1.030	0.185	**£0**	**£0.00**
2068	47	£0	£0	£0	£0	£0	**£0**	5.273	£0.00	**£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**	1.030	0.175	**£0**	**£0.00**
2070	49	£0	£0	£0	£0	£0	**£0**	5.636	£0.00	**£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**	1.030	0.165	**£0**	**£0.00**
2072	51	£0	£0	£0	£0	£0	**£0**	6.025	£0.00	**£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**	1.030	0.155	**£0**	**£0.00**
2074	53	£0	£0	£0	£0	£0	**£0**	6.448	£0.00	**£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**	1.030	0.146	**£0**	**£0.00**
2076	55	£0	£0	£0	£0	£0	**£0**	6.917	£0.00	**£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**	1.030	0.138	**£0**	**£0.00**
2078	57	£0	£0	£0	£0	£0	**£0**	7.430	£0.00	**£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**	1.030	0.130	**£0**	**£0.00**
2080	59	£0	£0	£0	£0	£0	**£0**	7.987	£0.00	**£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**	1.030	0.123	**£0**	**£0.00**
2082	61	£0	£0	£0	£0	£0	**£0**	8.590	£0.00	**£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**	1.030	0.116	**£0**	**£0.00**
2084	63	£0	£0	£0	£0	£0	**£0**	9.225	£0.00	**£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**	1.030	0.109	**£0**	**£0.00**
Total		**£4,680,223**	**£0**	**£0**	**£897,733**	**£194,192**	**£5,772,149**		**£393,068**	**£6,165,217**	**£1,233,043**	**£7,398,260**	**£5,799,510**			**£3,697,567**	**£4,400,105**

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2022 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 2023 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	**£5,772,149**
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	**£6,165,217**
(4)	The next stage is to apply optimism bias.	**£7,398,260**
(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).	**£5,799,510**
(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).	**£3,697,567**
(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	**£4,400,105**

Fengate Access Study - 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) Total Contribution of Optimism Bias		(4) Rebased to 2010 Price Base	(5) Discounted to 2010 Prices			(6) Adjusted to Market Prices
		Maintenance Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2022	1	£0	**£0**	0.000	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.662	**£0**	**£0.00**
2023	2	£0	**£0**	1.100	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.639	**£0**	**£0.00**
2024	3	£0	**£0**	1.210	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.618	**£0**	**£0.00**
2025	4	£0	**£0**	1.331	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.597	**£0**	**£0.00**
2026	5	£0	**£0**	1.398	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.577	**£0**	**£0.00**
2027	6	£0	**£0**	1.467	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.557	**£0**	**£0.00**
2028	7	£0	**£0**	1.541	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.538	**£0**	**£0.00**
2029	8	£0	**£0**	1.618	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.520	**£0**	**£0.00**
2030	9	£0	**£0**	1.699	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.503	**£0**	**£0.00**
2031	10	£0	**£0**	1.784	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.486	**£0**	**£0.00**
2032	11	£0	**£0**	1.873	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.469	**£0**	**£0.00**
2033	12	£0	**£0**	1.966	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.453	**£0**	**£0.00**
2034	13	£25,000	**£25,000**	2.065	£26,620.45	**£51,620**	£0.00	**£51,620**	**£40,465**	1.035	0.438	**£17,722**	**£21,089.29**
2035	14	£0	**£0**	2.168	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.423	**£0**	**£0.00**
2036	15	£0	**£0**	2.276	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.409	**£0**	**£0.00**
2037	16	£0	**£0**	2.390	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.395	**£0**	**£0.00**
2038	17	£0	**£0**	2.510	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.382	**£0**	**£0.00**
2039	18	£0	**£0**	2.635	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.369	**£0**	**£0.00**
2040	19	£0	**£0**	2.767	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.356	**£0**	**£0.00**
2041	20	£0	**£0**	2.905	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.344	**£0**	**£0.00**
2042	21	£0	**£0**	3.051	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.333	**£0**	**£0.00**
2043	22	£0	**£0**	3.203	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.321	**£0**	**£0.00**
2044	23	£0	**£0**	3.363	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.310	**£0**	**£0.00**
2045	24	£0	**£0**	3.532	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.300	**£0**	**£0.00**
2046	25	£0	**£0**	3.708	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.290	**£0**	**£0.00**
2047	26	£0	**£0**	3.894	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.280	**£0**	**£0.00**
2048	27	£0	**£0**	4.088	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.271	**£0**	**£0.00**
2049	28	£25,000	**£25,000**	4.293	£82,315.20	**£107,315**	£0.00	**£107,315**	**£84,125**	1.035	0.261	**£21,991**	**£26,169.55**
2050	29	£0	**£0**	4.507	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.253	**£0**	**£0.00**
2051	30	£0	**£0**	4.733	£0.00	**£0**	£0.00	**£0**	**£0**	1.035	0.244	**£0**	**£0.00**
2052	31	£0	**£0**	4.969	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.289	**£0**	**£0.00**
2053	32	£0	**£0**	5.218	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.281	**£0**	**£0.00**
2054	33	£0	**£0**	5.479	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.272	**£0**	**£0.00**
2055	34	£0	**£0**	5.753	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.264	**£0**	**£0.00**
2056	35	£0	**£0**	6.040	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.257	**£0**	**£0.00**
2057	36	£0	**£0**	6.342	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.249	**£0**	**£0.00**
2058	37	£0	**£0**	6.659	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.242	**£0**	**£0.00**
2059	38	£0	**£0**	6.992	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.235	**£0**	**£0.00**
2060	39	£0	**£0**	7.342	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.228	**£0**	**£0.00**
2061	40	£0	**£0**	7.709	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.221	**£0**	**£0.00**
2062	41	£0	**£0**	8.094	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.215	**£0**	**£0.00**
2063	42	£0	**£0**	8.499	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.209	**£0**	**£0.00**
2064	43	£25,000	**£25,000**	8.924	£198,100.59	**£223,101**	£0.00	**£223,101**	**£174,889**	1.030	0.203	**£35,445**	**£42,179.29**
2065	44	£0	**£0**	9.370	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.197	**£0**	**£0.00**
2066	45	£0	**£0**	9.839	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.191	**£0**	**£0.00**
2067	46	£0	**£0**	10.331	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.185	**£0**	**£0.00**
2068	47	£0	**£0**	10.847	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.180	**£0**	**£0.00**
2069	48	£0	**£0**	11.390	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.175	**£0**	**£0.00**
2070	49	£0	**£0**	11.959	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.170	**£0**	**£0.00**
2071	50	£0	**£0**	12.557	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.165	**£0**	**£0.00**
2072	51	£0	**£0**	13.185	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.160	**£0**	**£0.00**
2073	52	£0	**£0**	13.844	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.155	**£0**	**£0.00**
2074	53	£0	**£0**	14.536	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.151	**£0**	**£0.00**
2075	54	£0	**£0**	15.263	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.146	**£0**	**£0.00**
2076	55	£0	**£0**	16.026	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.142	**£0**	**£0.00**
2077	56	£0	**£0**	16.828	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.138	**£0**	**£0.00**
2078	57	£0	**£0**	17.669	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.134	**£0**	**£0.00**
2079	58	£25,000	**£25,000**	18.552	£438,810.11	**£463,810**	£0.00	**£463,810**	**£363,582**	1.030	0.130	**£47,297**	**£56,283.41**
2080	59	£0	**£0**	19.480	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.126	**£0**	**£0.00**
2081	60	£0	**£0**	20.454	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.123	**£0**	**£0.00**
2082	61	£0	**£0**	21.477	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.119	**£0**	**£0.00**
2083	62	£0	**£0**	22.551	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.116	**£0**	**£0.00**
2084	63	£0	**£0**	23.678	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.112	**£0**	**£0.00**
2085	64	£0	**£0**	24.862	£0.00	**£0**	£0.00	**£0**	**£0**	1.030	0.109	**£0**	**£0.00**
Total		**£100,000**	**£100,000**		**£745,846**	**£845,846**	**£0**	**£845,846**	**£663,061**			**£122,455**	**£145,722**

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2022 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 2023 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£100,000
(2)	The base costs have been adjusted to incorporate real cost increases (TAG A1.2) in construction costs.	£845,846
(4)	The next stage is to apply optimism bias.	£845,846
(5)	Optimism bias adjusted costs have been converted to the current price base (i.e. 2010) using the governments GDP deflator tool (TAG A1.2).	£663,061
(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 (TAG A1.2).	£122,455
(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	£145,722

Appendix I – Monitoring and Evaluation Plan

Fengate Access Study

Scheme Monitoring and Evaluation Plan

| Delivering what we **promise**

Document Control

Document ref: Fengate Access Study Monitoring and Evaluation Plan					Authorisation	
Rev	Purpose	Originated	Checked	Reviewed	Milestone	Date
1.0	First Issue	SP	NP	RMJ	RMJ	07.11.2022
2.0	Second Issue	SP	NP	RMJ	RMJ	15.12.2022

MILESTONE INFRASTRUCTURE
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Contents

Figures

Tables

| Delivering what we **promise**

1. Introduction

1.1.1 This document is the Scheme Evaluation Plan for the proposed Fengate Access Study package of schemes. The report has been produced in conjunction with the Fengate Access Study 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 Fengate Access Study package of schemes, whilst setting out the expected benefits and outcomes alongside the methods which will be used to monitor and evaluate these both pre and post construction.

1.2 Monitoring and Evaluation Guidance

1.2.1 The Cambridgeshire and Peterborough Combined Authority (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 Fengate Access Study package of schemes is less than £50m and the study has not been specified for Fuller Evaluation, resulting in the Fengate Access Study 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)

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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

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2. Scheme Background and Context

2.1 Scheme Location

2.1.1 The Fengate Access Study area focuses on the north of Fengate. The scheme location is shown in Figure 1.1 beneath and includes Junction 7 and Junction 8 of the A1139 Fletton Parkway (key access to / from the parkway system for Fengate), access routes into Fengate such as Parnwell Way and Oxney Road, and internal roads and footways within Fengate such as Edgerley Drain Road and Storeys Bar Road.

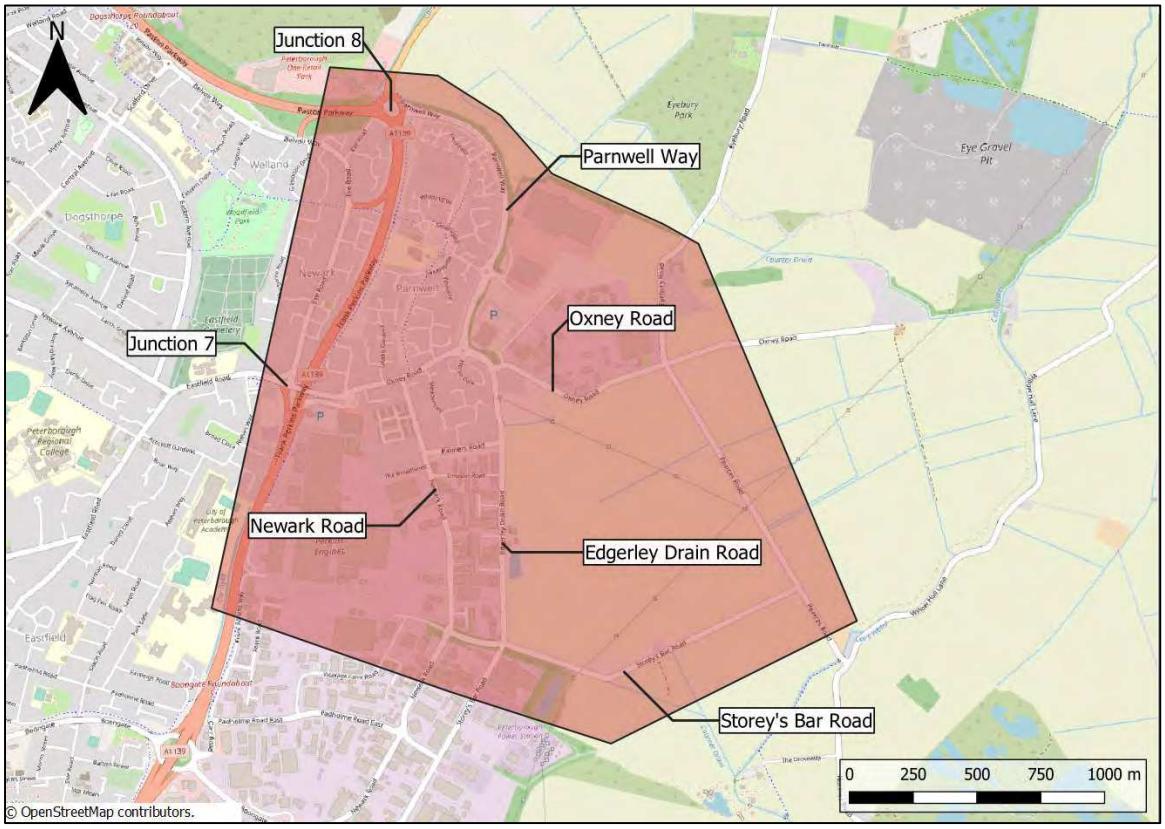

Figure 2.1: Fengate Access Study Area

2.1.2 The study area covers a mix of land uses. It is predominantly industrial at the southern end and residential at the northern end. The eastern part of the study area currently consists of agricultural fields; however, these are due to be developed, and outline planning permission has been granted for the Red Brick Farm site which will convert this to office, industrial and logistical use[3].

[3] Planning Reference 18/00080/OUT

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2.1.3 Figure 2.1 beneath highlights the Fengate area in relation to the Parkway network and City Centre.

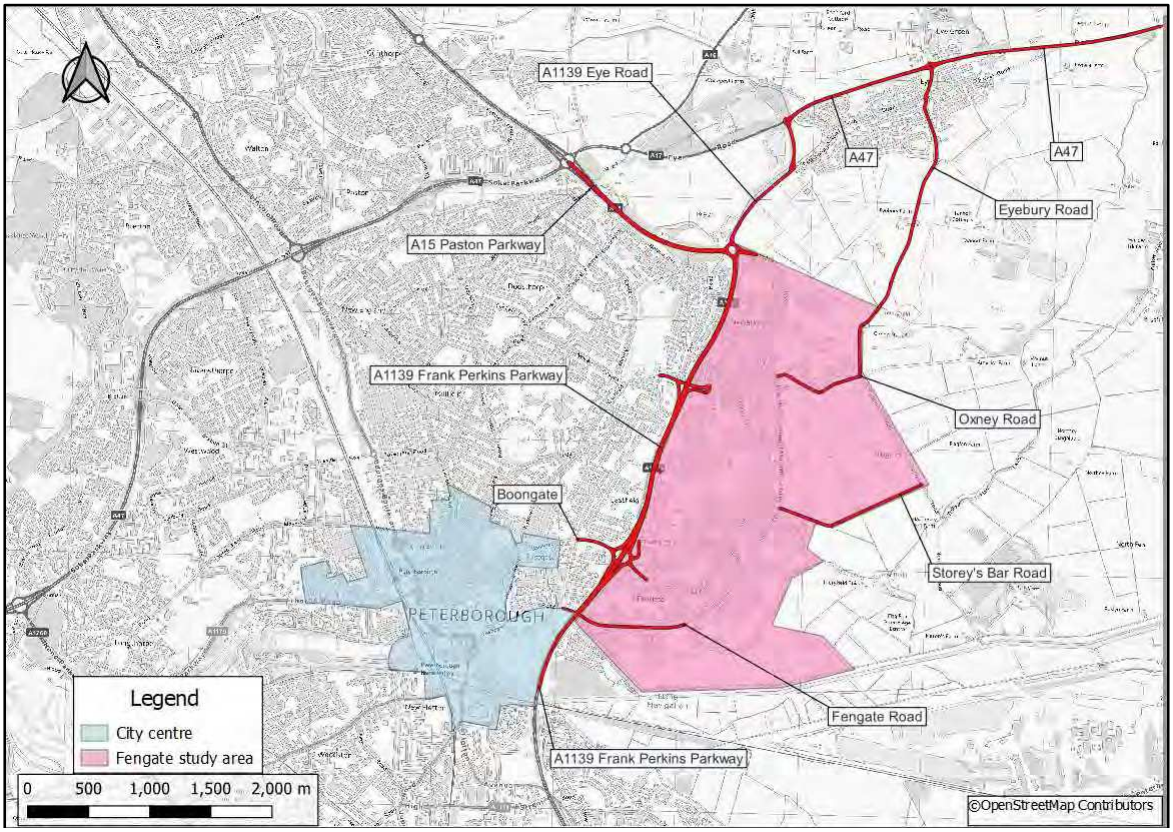

Figure 2.2: Location of Fengate area within Peterborough

2.1.4 The Peterborough Local Plan (adopted July 2019) sets out the overall vision, priorities and objectives for Peterborough up to 2036. The updated strategy identifies the required delivery of 21,315 new homes and 17,600 new jobs between 2016 and 20364.

2.1.5 Within the Local Plan Fengate is identified as an area of employment growth for the City, with proposed growth ranging between 18ha and 48ha of employment land. This is expected to generate over 3,000 jobs in the area. Investment (beyond developer contributions) is needed into the transport network to support these development aspirations.

2.1.6 The Fengate area is an important employment area for Peterborough, with many small and medium sized businesses located there, alongside large employers like Perkins Engines. The Local Plan seeks to build upon the existing industry in the area and has a number of allocations within the area for employment development.

4 Peterborough Local Plan, 24th July 2019

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2.1.7 The proposed scheme will address high levels of congestion and delay that are currently compromising the operational efficiency of the Fengate area road network. By addressing existing issues, and thus unlocking additional capacity, the scheme is expected to relieve the wider network and assist in delivering growth aspirations for the City.

2.2 Scheme Description

2.2.1 The Fengate Access Study Improvement schemes will be delivered in two phases. The first phase will deliver the Newark Road Footpath and the Oxney Road Pedestrian Crossing between November 2022 and March 2023, whilst the second phase will deliver the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road, Junction 7 and the Newark Road / Oxney Road Scheme between May 2023 and March 2024.

2.2.2 Construction of the scheme will address significant issues of congestion and delay in a vital industrial growth area, providing much needed capacity for Peterborough City Council (PCC) and the Cambridgeshire and Peterborough Combined Authority (CPCA) to meet their agenda for growth in Peterborough. They will also address safety concerns at the junctions and improve much needed active travel provision within the Fengate area.

2.2.3 The package consists of the following schemes:

- Traffic Signal Improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road).
- Creation of a mini roundabout at the junction of Oxney Road / Newark Road.
- Creation of a new pedestrian crossing over Eastfield Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.
- Traffic Signal Improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road.
- Improvements to Newark Road footpath.

2.2.4 Figure 2.2 Overleaf highlights the final Fengate Access Study scheme.

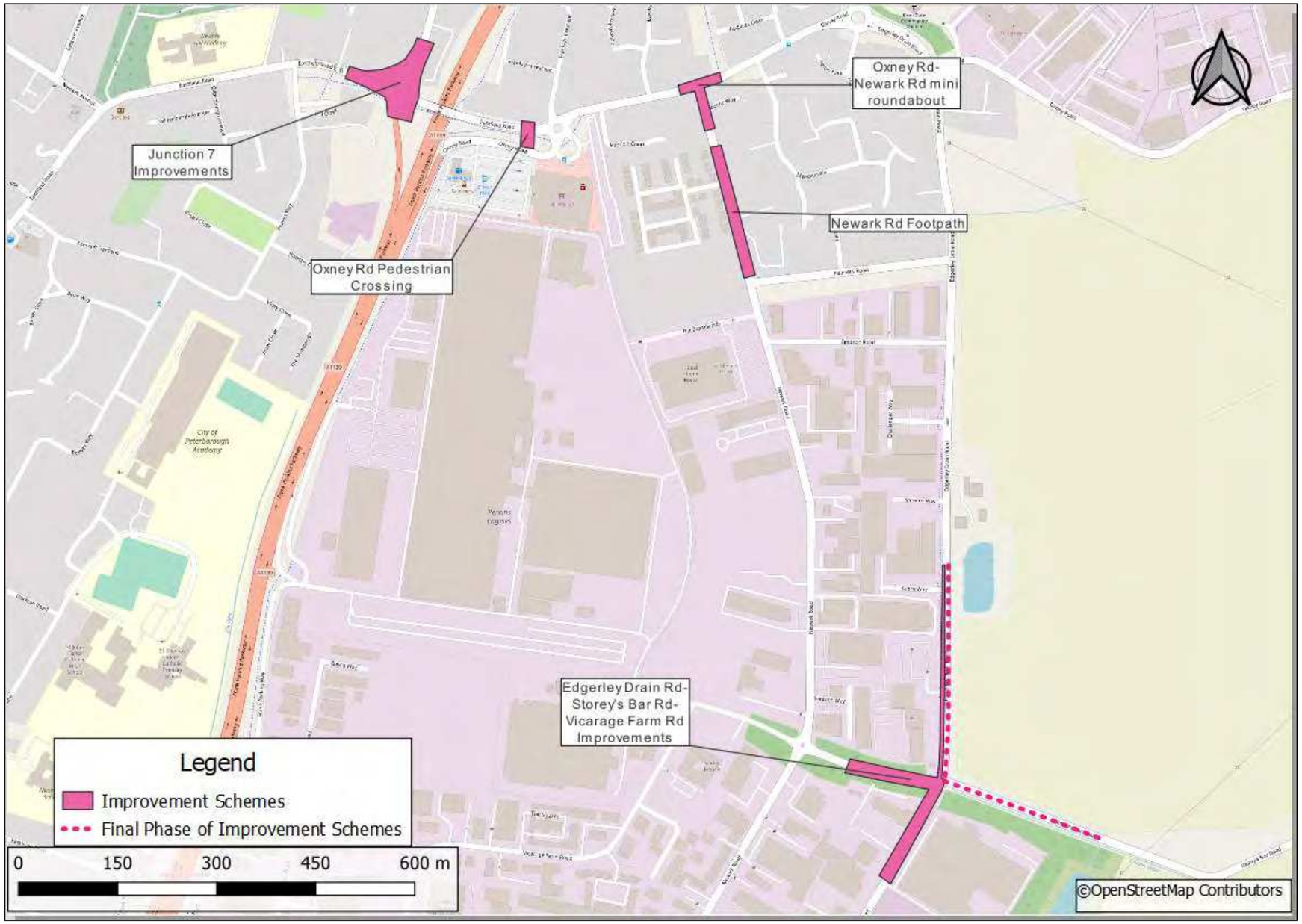

Figure 2.3: Fengate Access Study Improvement Package

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2.3 Scheme Costs and Funding

2.3.1 The forecast Outturn cost of the scheme is £7,531,120.

2.3.2 The CPCA currently have an allocation of £11,000,000 in the Medium-term Financial Strategy (MTFS) to support delivery of this scheme.

2.3.3 The scheme costs (excluding operating costs) can be summarised as:

- Base Investment Cost = £5,772,149
- Risk Adjusted Base Cost = £6,790,497
- Risk Adjusted Base Cost with Inflation (**Outturn Cost**) = £7,531,120

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2.4 Delivery and Timeframes

2.4.1 Key project milestones to scheme delivery are outlined in the Table 2.1 beneath.

Table 2.1: Key Project Milestones

Timescale	Activity
October 2022	CPCA Board approval for advance funding of active travel schemes (Newark Road Footpath and Eastfield Road Pedestrian Crossing)
November 2022	Construction commences on the Newark Road Footpath and Eastfield Road Pedestrian Crossing schemes.
January 2023	CPCA Board approval sought for the release of construction funding subject to an accepted FBC.
February 2023	Completion of the Newark Road Footpath and Eastfield Road Pedestrian Crossing schemes. Advance works begin for construction of the remaining three schemes, including vegetation clearance and STATS diversions.
May 2023	Construction starts on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road and Junction 7 schemes.
July 2023	Construction finishes on the Junction 7 scheme. Construction starts on the Oxney Road / Newark Road scheme.
September 2023	Construction finishes on the Oxney Road / Newark Road scheme.
March 2024	Construction finishes on the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road scheme.
April 2025	1-year post-scheme monitoring undertaken
April 2029	5-years post-scheme monitoring undertaken

2.4.2 It should be noted that the dates shown in Table 2.1 are dependent on approval for the release of construction funding at the CPCA's Board Meeting in January 2023.

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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. Secondary objectives tend to be delivered as a result of the primary objectives, as a causal chain effect.

3.1.2 The objectives for the Fengate Access Study were developed based on goals and outcomes from key local policy documents and align with the CPCA objectives, and therefore consider both the extent of existing conditions and future highway concerns alongside objectives to be delivered at the national, regional and local level (not necessarily in the scheme area).

3.1.1 Although the original objectives pre-date those of the CPCA, work has been undertaken to ensure they align with the problems identified in Section 2.4 and the most recent CPCA, PCC and transport objectives. The primary and secondary objectives for the Fengate Access Study are listed beneath.

3.1.2 The primary objectives include:

1. **Tackle congestion and reduce delay:** Tackle congestion at key pinch points across the Study Area and reduce delay in to the Fengate area

2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** Ensure that the planned employment growth at Red Brick Farm can be accommodated

3. **Protect the local environment and improve biodiversity:** Ensure a 20% biodiversity net enhancement within the study area.

4. **Improve Road Safety:** Reduce personal injury accidents and improve personal security amongst all travellers.

5. **Improve Active Travel Provision within Fengate:** Improve active travel provision within the Fengate Access Study area.

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3.1.3 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 Fengate
7. **Reduce Severance for Active Travel Users:** Reduce severance caused to active travel users by the road network
8. **Upgrade Junction 7:** Upgrade the junction to overcome maintenance and safety concerns with the current asset.

3.1.4 The Fengate Access Study package of schemes will aim to satisfy all primary objectives and as many of the secondary.

3.2 SMART Objectives

3.2.1 The Primary SMART objectives are:

1. **Tackle congestion and reduce delay:** To ensure that non-transient delay on all approaches remains below the following thresholds by 2026:
    - Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road – 30 seconds in both peak hours on any approach.
    - Junction 7 – 30 seconds in both peak hours on any approach.
2. **Support Peterborough's Growth Agenda and facilitate the development of the Red Brick Farm site:** to provide sufficient highway capacity at the following junctions (determined by a Degree of Saturation (DoS) of less than 90%) to support the development of the Red Brick Farm site within the current Local Plan period (to 2036).
    - Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road
    - Junction 7.
3. **Protect the local environment and improve biodiversity:**
    - To provide a 20% Biodiversity net enhancement within one year of scheme completion.
4. **Improve Road Safety:** to achieve the following per year reductions in personal injury accidents following scheme completion:

- Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road – 50% per year reduction in all personal injury accidents
- Junction 7 – 50% per year reduction in all personal injury accidents, and 75% per year reduction in personal injury accidents involving cyclists.
- Oxney Road / Newark Road - 75% per year reduction in personal injury accidents involving pedestrians and cyclists.

5. **Improve Active Travel Provision with Fengate:** to directly link the Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road Junction to the western Red Brick Farm access with new cycle infrastructure and provide an upgraded pedestrian route along Newark Road between Oxney Road and Palmer's Road.

3.2.2 Secondary SMART objectives include:

6. **Positively impact traffic conditions on the wider network:** to ensure that highway junctions within the study area to do not exceed an RFC of 0.85 / DoS of 90% because of growth from the Red Brick Farm site within the current Local Plan period (to 2036).
7. **Reduce Severance for Active Travel Users:** to provide an additional signalised crossing over Oxney Road between Junction 7 and the Oxney Road / Newark Road junction.
8. **Upgrade Junction 7:** to renew the assets twenty-year life expectancy and avoid all reactive maintenance costs for the traffic signal infrastructure at Junction 7 for five years following scheme completion (except for in the event of RTAs).

3.3 Scheme Outcomes

3.3.1 The proposed scheme is expected to achieve its objectives in the following ways:

- Reduce delay and journey times at key pinch points within Fengate and access into the area
- Ensure successful delivery of committed and statutory development across Peterborough, through increasing capacity on the road network, in order to cater for existing and future traffic demand
- Ensure a 20% biodiversity net Enhancement within the study area
- Improve personal security and reduce personal injury accidents amongst all travellers.
- Improve active travel provision with the Fengate Access Study area.
- Reduce delay and journey times on the surrounding network, positively impacting traffic flows through Junction 8 to the north of Fengate
- Reduce severance caused to active travel users by the road network.
- Overcome Maintenance and safety concerns with the current study area.
- Increase biodiversity through planting and landscaping within the scheme elements.

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3.4 Scheme Logic Map

3.4.1 Based on the objectives set for the scheme, the evaluation process will measure outcomes relating to:

- Changes in traffic flow and journey time reliability, in the Fengate Access study area
- 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 road network has improved Council Aspirations

3.4.2 The Logic Map in Figure 2.3 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

- The Fengate Access study will help support local growth, as well as provide wider network benefits. By addressing future congestion issues, increasing accessibility, and enhancing the local area and attractiveness of the city will support existing and future businesses
- The Scheme will provide the necessary improvements to unlock the identified growth throughout the area, as well as tackle any associated congestion issues from the proposed growth

Inputs

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

Network Improvement Scheme

Outputs

- Traffic Signal Improvements at Junction 7 of the A1139 Frank Perkins Parkway (A1139 Frank Perkins Parkway / Oxney Road / Eastfield Road).
- Creation of a mini roundabout at the junction of Oxney Road / Newark Road.
- Creation of a new pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road / Sainsburys Roundabout.
- Traffic Signal Improvements at the junction of Edgerley Drain Road / Storey's Bar Road / Vicarage Farm Road.
- Improvements to Newark Road footpath.

Transport Outcomes

- Improved journey times for users within the study area, particularly Edgerley Drain Road / Storeys Bar Road.
- Reduction in queue lengths, congestion, and accidents during peak times at key junctions
- Increased attractiveness of active travel modes through reduced severance and improved infrastructure provision

People, Business, and Place Outcomes

- Improved network efficiency will help facilitate development in the Fengate Study area, and will increase the attractiveness of the city as a place to live and invest in.
- Early environmental considerations, Improving 20% Biodiversity Net Enhancement within one year

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: Fengate Access Study Logic Model

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 needs to 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.

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Table 4.1: Benefits Realisation Strategy

Scheme Objective	Enabling Changes	Benefits Experienced	Key Beneficiaries	Data Collection Method	Benefit Owners	Benefit Enablers
Tackle congestion and improve journey time reliability: Tackle congestion at key pinch points across the Study Area and reduce delay in to the Fengate area.	• Traffic Signal Improvements at Junction 7 • Creation of a mini roundabout at the junction of Oxney/Newark Road • Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road	• Reduced peak hour congestion for motorists leading to more reliable journey times • Increased operational efficiency of the road network • Reduction in stationary / rolling traffic resulting in air quality improvement • Increased attractiveness of the Fengate area	• Commuters / Business trips • Local residents • Visitors to the City	• Desk study / site visits • Survey footage review • Journey time dataset for a month period	CPCA / PCC	• Completion of the schemes • Monitoring of network performance
Support Peterborough's Growth Agenda and facilitate the development of Red Brick Farm site: Ensure that the planned employment growth at Red Brick Farm can be accommodated.	• Traffic Signal Improvements at Junction 7 • Creation of a mini roundabout at the junction of Oxney/Newark Road • Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road	• Reduced peak hour congestion for journeys leading to more reliable journey times • Increased network capacity and operational efficiency • Increased attractiveness of the Fengate area	• PCC in regard to fulfilment of the Local Plan • Businesses in Fengate • Residents / Local Community	• Desk Study of economic data provided by PCC • Review of Local Plan goals for economic growth	CPCA / PCC	• Completion of the schemes • Promotion of Fengate businesses and wider City Area
Protect the local environment and improve biodiversity: Ensure a 20% biodiversity net enhancement within the study area.	• Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout	• Reduced peak hour congestion for journeys leading to more reliable journey times • Increased attractiveness of the Fengate area • Achievement of 20% biodiversity net enhancement	• PCC / CPCA in regard to environment and biodiversity • Businesses in Fengate area • Residents / Local Community	• Desk Study analysis FBC calculation for carbon • Analysis of key project documents by the schemes Project Board	CPCA / PCC	• Completion of the schemes • Promotion of Fengate businesses and wider City Area • Biodiversity Net Enhancement Calculation • Air quality monitoring
Improve Road Safety: Reduce personal injury accidents and improve personal security amongst all travellers.	• Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout • Improvements to Newark Road footpath • Traffic Signal Improvements at Junction 7 • Creation of a mini roundabout at the junction of Oxney/Newark Road	• Reduced peak hour congestion for journeys leading to more reliable journey times • Increased operational efficiency of the Fengate network • Fewer causalities • Fewer accidents involving rear end shunts on main approaches	• Commuters / Business trips • Local residents • Bus Operators	• Desk study / site visits • Collated data from 12-hour manual classified counts • Survey footage review • Journey time dataset for a month period	CPCA / PCC	• Monitoring of network performance • Completion of the schemes including walking and cycling elements • Road safety audit • Monitoring / investigation of accidents
Improve Active Travel Provision with Fengate: Improve active travel provision with the Fengate Access Study area.	• Improvements to Newark Road footpath • Creation of a mini roundabout at the junction of Oxney/Newark Road • Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout	• Fewer accidents involving rear end shunts on main approaches • Reduced peak hour congestion for journeys leading to more reliable journey times • Increased attractiveness of the Fengate area	• Commuters / Business trips • Local residents • Visitors to the City • Active Mode users • Fengate business users	• Desk study / site visits • Survey footage review	CPCA / PCC	• Completion of the schemes including walking and cycling elements • Road safety audit • Monitoring / investigation of accidents
Positively impact traffic conditions on the wider network: Positively impact the performance of local routes impacted by the traffic and congestion in and around Fengate	• Traffic Signal Improvements at Junction 7 • Creation of a mini roundabout at the junction of Oxney/Newark Road • Traffic Signal Improvements at the junction of Edgerley Drain Road/Storey's Bar Road/Vicarage Farm Road	• Reduced peak hour congestion for journeys 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	• Desk study / site visits • Collated data from 12-hour manual classified counts • Journey time dataset for a month period	CPCA / PCC	• Completion of the schemes • Monitoring of network performance
Reduce Severance for Active Travel Users: Reduce severance caused to active travel users by the road network	• Improvements to Newark Road footpath • Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout	• Reduced peak hour congestion for journeys leading to more reliable journey times • Fewer accidents involving rear end shunts on main approaches	• Commuters • Local residents • Visitors to the City	• Desk study / site visits • Survey footage review • Journey time dataset for a month period	CPCA / PCC	• Completion of the schemes • Monitoring of network performance
Upgrade Junction 7: Upgrade the junction to overcome maintenance and safety concerns with the current asset.	• Traffic Signal Improvements at Junction 7 • Creation of a new Pedestrian crossing over Oxney Road, between Junction 7 and the Oxney Road/Sainsbury's Roundabout	• Reduced peak hour congestion for journeys leading to more reliable journey times • Increased attractiveness of the Fengate area	• Commuters • Local residents • Visitors to the City • Bus Operators	• Desk study / site visits • Analysis of key project documents by the schemes Project Board • Survey footage review	CPCA / PCC	• Completion of the schemes • Monitoring of network performance

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5. Monitoring and Evaluation Approach

5.1.1 The Monitoring and Evaluation Plan for the Fengate Access Study package of improvements takes a proportionate and targeted approach and aims to demonstrate how the package of schemes has performed in relation to its objectives and intended outcomes.

5.1.2 The monitoring plan is designed to determine whether the Fengate Access Study package of improvements:

- 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 Package of Schemes
- Outputs – what has been delivered, and how it is being used
- Outcomes – intermediate effects of the Package of Schemes, 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, 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 2019 surveys, limited surveys / assessments to be undertaken in 2023 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 the Fengate Access Study are summarised in Table 5.1 beneath.

Table 5.1: Monitoring and Evaluation Timescales

Monitoring Activity	Timescale
Prior to scheme build (Baseline)	2019
During Construction	2023
Scheme Opening	2024
One year post scheme opening	2025
Five years post scheme opening	2029

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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 Fengate Access Study package of schemes 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.

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6. Data Requirements and Collection Methods

6.1.1 Data collection for the package of schemes 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 Fengate Access Study package of schemes, 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 schemes, 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 in the Fengate area, more specifically the volume of traffic on key approaches	• Desk study / site visits • Collated data from 12 hour manual classified counts	Baseline 2019 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 on key routes in the Fengate area	• Desk study / site visits • Survey footage review • Journey time dataset for a month period	Baseline 2019 before scheme completion, 1 year after scheme opening and 5 years 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 2019, before scheme completion, 1 year after scheme opening and 5 years after scheme opening
Impact on the Local Environment / Air Quality	• Carbon emission workshops / calculations • Biodiversity calculations – completed scheme maps	To monitor and assess the emissions as a result of the Fengate Access Study schemes and any impact on the environment	• Desk study / site visits • Analysis of key project documents by the schemes Project Board	Baseline 2019, during construction, before scheme completion, 1 year after scheme opening and 5 years after scheme opening
Carbon	• Carbon emission workshops / calculations • Traffic flows and speeds within the Fengate area	To monitor carbon emission within the Fengate Access 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 2019, before scheme completion, 1 year after scheme opening and 5 years 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:

- Classified Turning Counts (CTCs)
- Automatic Traffic Counts (ATCs)
- 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 2019 baseline dataset, enabling a direct comparison to be made.

Manual Classified Turning Counts

6.2.3 CTCs will be used to monitor changes in traffic demand in the Fengate area at both 1 year and 5 years after scheme completion.

6.2.4 CTC surveys will include the seven 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 September/October, reflecting the collection period of the baseline data.

6.2.5 CTC and ATC survey locations are detailed below and shown in Figure 6.1 overleaf:

1. CTC 1 - Junction 7
2. CTC 2 - Junction of Oxney road / Newark Road
3. CTC 3 - Edgerley Drain Road / Storey's Bar road / Vicarage Road signalised junction
4. ATC 1 - Eastfield Road, between Junction 7 and Oxney Road / Sainsbury's roundabout
5. ATC 2 - Edgerley Drain Road, between Storey's Bar road and Stevern Way

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Figure 6.1: Monitoring and Evaluation Survey Locations

Satellite Navigation Data / Journey Times

6.2.6 Satellite Navigation data will be used to monitor changes in journey times in the Fengate area at both 1 year and 5 years after scheme completion.

6.2.7 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 2019 baseline data set. Survey data will be collected for the AM (08:00 – 09:00), PM (17:00 – 18:00) and Interpeak (10:00-14:00) peak periods and the month period should exclude non-neutral days such as weekends, holidays, and any period relating to major roadworks / incidents.

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6.2.8 Journey time routes which will be covered in the dataset include:

- A1139 Frank Perkins Parkway Off-slip Northbound
- Eastfield Road Westbound approach to Junction 7
- Eastfield Road Eastbound approach to Junction 7
- Edgerley Drain Road Southbound
- Eye Road Southbound approach to Junction 7
- Newark Road Northbound
- Oxney Road Eastbound
- Oxney Road Westbound
- Storey's Bar Road Northbound
- Storey's Bar Road Westbound
- Vicarage Farm Road Eastbound

6.2.9 Journey time routes are displayed in Figure 6.2 below.

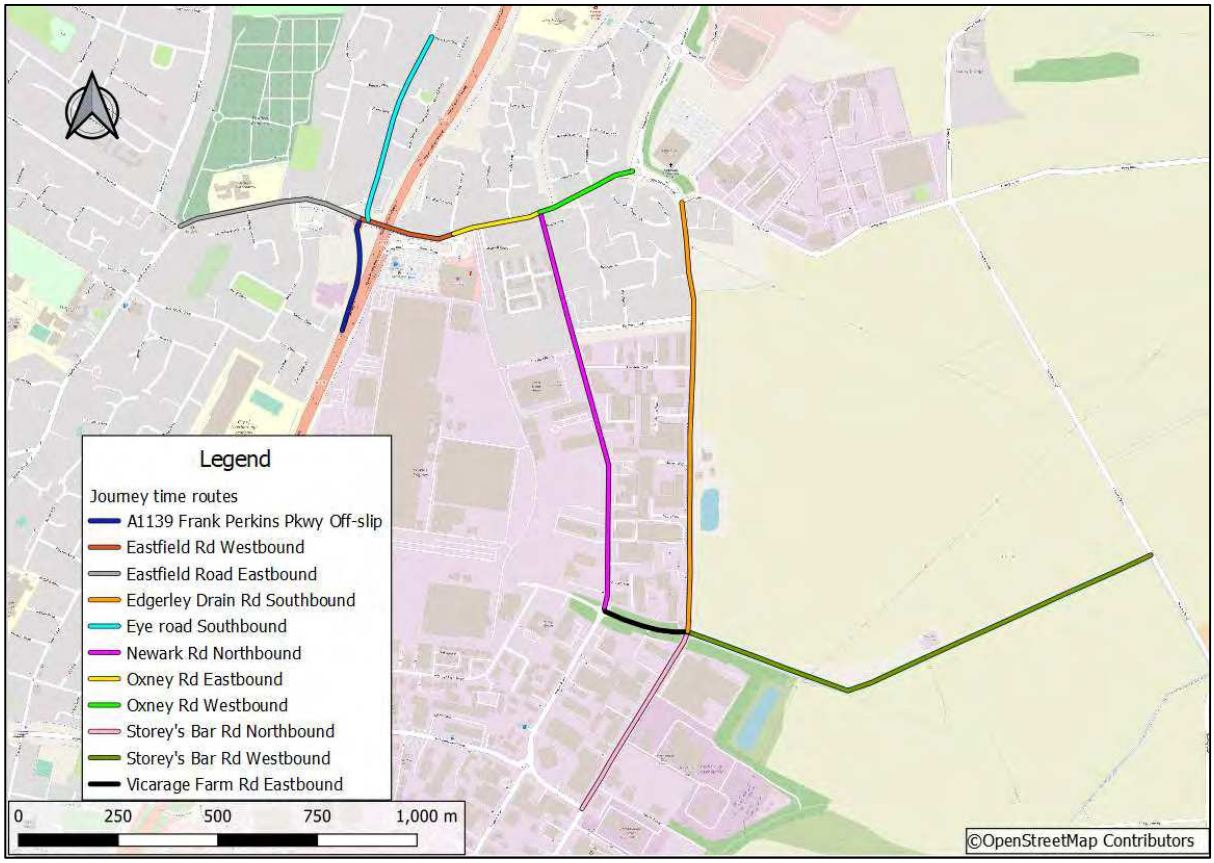

Figure 6.2: Monitoring and Evaluation Journey Time Routes

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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 the Fengate Access Study, highlighting data collection, reporting programme and indicative costs.

7.1.2 The necessary monitoring and evaluation budget is estimated to be £25,000, based on survey data, analysis, and reporting. A breakdown of costs is provided beneath in Table 7.1 beneath.

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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	October 2022 – January 2023	-	CPCA / PCC	-
Outputs	Scheme Build / Delivered Scheme	Infrastructure delivered as part of the scheme	Inspection On-Site	December 2022	November 2022 – March 2024	2025	CPCA / PCC	£1500
Objectives	**Outcomes**							
1 / 4 / 5 /8	Travel Time and Reliability	Enhanced Network Performance, particularly during Peak Hours	Satellite Navigation Data / Travel Time data / Site Visits / Survey Footage	Octoberber 2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		Enhanced Network Performance for Public Transport, namely for the Citi 4 and 37 Service	Local Bus Company Punctuality Data	2019 / 2022	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		New Infrastructure for Sustainable Modes	Site Inspection / Usage Data	2021 / 2022	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
		Reduce the number of accidents at Junction 7and Edgerley Drain Road / Storey's Bar Road Junction	Peterborough Database of Road Traffic Records	Dataset 2015 - 2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
4/5/6/7	Travel Demand	Enhanced Network Performance, Junction 7 and Edergerly Drain road/Storey's Bar road/Vicarage Farm road junction	Classified Turning Counts / Site Visits / Video Survey Footage	October 2019	-	April 2025 / April 2029	CPCA / PCC	£3,750 for count surveys and £500 for data analysis at both 1 year and 5 year reporting Total = £8,500
2 / 3	Impact on Economy	Employment Growth Ambitions in Fengate	PCC Planning Portal - Local and Regional Economic Reports / Development Figures Post scheme opening	2019	-	April 2025 / April 2029	CPCA / PCC	£500 for data analysis at both 1 year and 5 year reporting Total = £1000
3	Impact on the Local Environment	Ensure a Net Gain of Biodiversity across the Study Area	Biodiversity Calculation / Site Survey and Desk Based Assessment	October 2022	-	April 2025 / April 2029	CPCA / PCC	£1000 for site inspections and data analysis at both 1 year and 5 year reporting Total = £2000
1/6	Carbon	Improvement to Air Quality in Future Years	FBC Calculations for Carbon assessment / PCC Air Quality Monitoring Sites / Future traffic demand data	October 2022	-	April 2025 / April 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							**£25,000**

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7.2 Governance

7.2.1 The CPCA have the responsibility for ensuring Value for Money from the Fengate Access Study package of schemes. 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 monthly 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 continuing to meet on a monthly basis until the scheme is complete. Arrangements will then 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.

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Figure 7.1: Organisational and Governance Structure

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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.

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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: Risk Matrix and Mitigations

Risk	Likelihood Score (1-5)	Impact Score (1-5)	RAG Score (Likelihood x Impact)	Mitigations
Baseline Data Accuracy Accuracy lost because of programming or processing errors.	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 Incorrect data due to road works, weather etc	3	2	6	Construction programme is known, careful planning / weather monitoring to be undertaken when arranging surveys.
Data Processing Data recieved can be incosistent due to machine malfunction, Weather etc	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 Lack of funding for future year data collection	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 Lack of funding for evaluation process.	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 continued project team monthly meetings and receive the formal reporting associated with the Scheme Evaluation Plan.

8.4 Lessons Learnt

8.4.1 The Package of schemes 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 schemes have 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.

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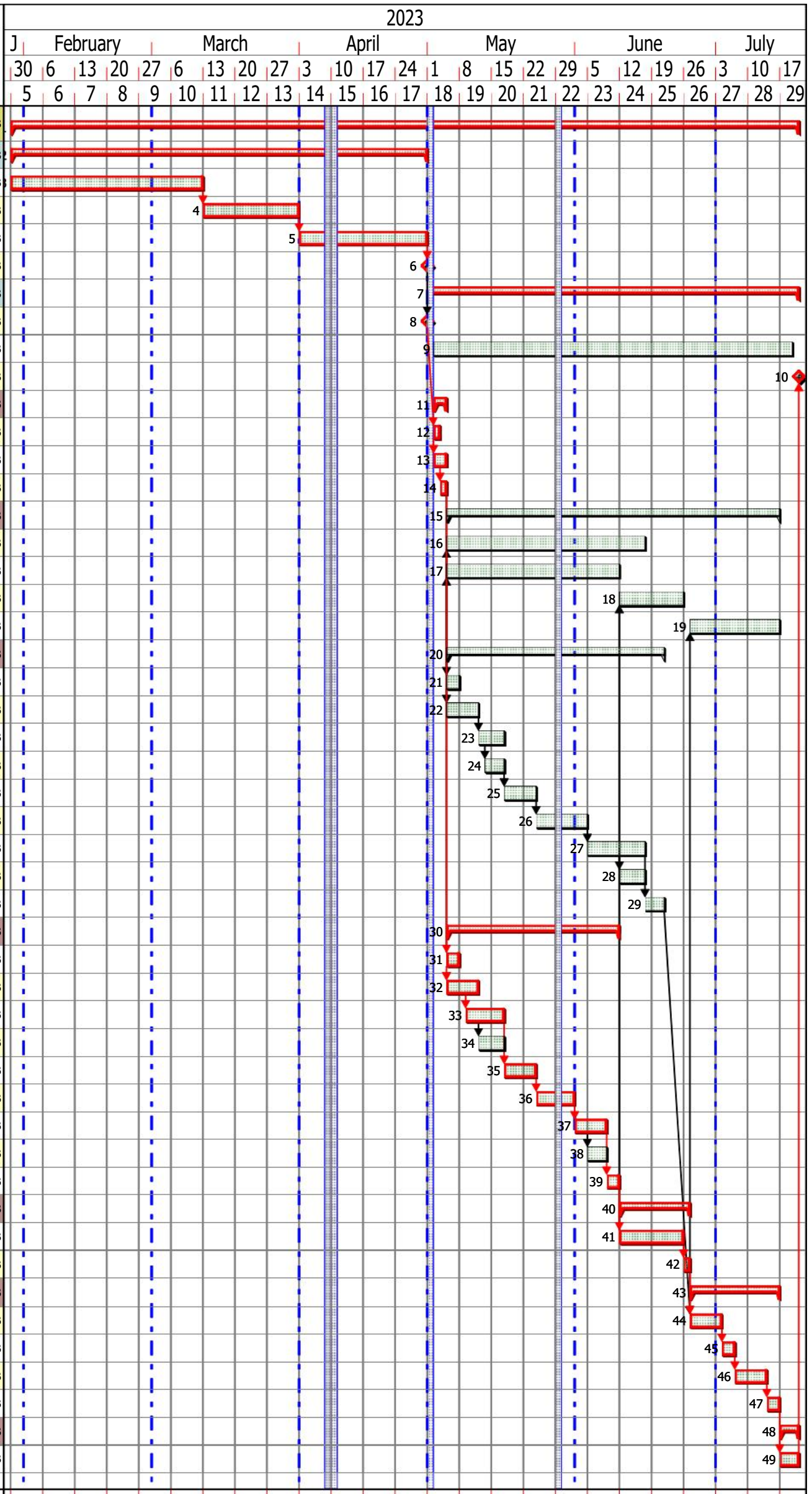
8.4.2 Lessons will be learnt by seeking answers to the following research questions

- **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 outturn 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 in the Fengate area, 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 the future?
- **Economy:** Has the Package of schemes 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 Schemes? 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 J – Construction Programmes

Line	Name	Duration	Start	Finish
1	**Junction 7 Eastfield Junction X19.5 Target Cost Programme**	**23w 4d**	**30/01/2023**	**19/07/2023**
2	**Pre-construction**	**12w 3d**	**30/01/2023**	**28/04/2023**
3	Target Cost Pricing Works	6w	30/01/2023	10/03/2023
4	Client Approval	3w	13/03/2023	31/03/2023
5	Mobilisation	3w 3d	03/04/2023	28/04/2023
6	Project Start Date		28/04/2023	28/04/2023
7	**Construction Period**	**11w 1d**	**28/04/2023**	**19/07/2023**
8	Access Date		28/04/2023	28/04/2023
9	Project Construction Period	11w	02/05/2023	18/07/2023
10	Completion Date		19/07/2023	19/07/2023
11	**Compound Setup**	**2d**	**02/05/2023**	**03/05/2023**
12	Heras Fence Compound location	1d	02/05/2023	02/05/2023
13	Create Hardstanding for Welfare and materials lay down area	2d	02/05/2023	03/05/2023
14	Install Site welfare	1d	03/05/2023	03/05/2023
15	**Site Traffic Management**	**10w 1d**	**04/05/2023**	**14/07/2023**
16	Road closure of Junction 7 A1139 offslip	6w	04/05/2023	15/06/2023
17	Road Closure of Junction 7 A1139 onslip	5w 1d	04/05/2023	09/06/2023
18	2 x Way Traffic Lights on Eastfield Road	2w	12/06/2023	23/06/2023
19	Night Road Closure of the junctions and Eastfield Road	2w 4d	27/06/2023	14/07/2023
20	**Phase 1 - Junction 7 offslip**	**6w 3d**	**04/05/2023**	**20/06/2023**
21	Switch off traffic signals	2d	04/05/2023	05/05/2023
22	Site Clearance Works	1w	04/05/2023	10/05/2023
23	Excavation of existing footpath and islands	4d	11/05/2023	16/05/2023
24	Drainage Works and signals ducting	3d	12/05/2023	16/05/2023
25	Kerbing and edging works	1w	17/05/2023	23/05/2023
26	Tactile and signal box installations	1w 2d	24/05/2023	02/06/2023
27	Footway and island construction	1w 4d	05/06/2023	15/06/2023
28	Sign installation	4d	12/06/2023	15/06/2023
29	Time Risk Allowance	3d	16/06/2023	20/06/2023
30	**Phase 2 - Junction 7 Eastbound Onslip**	**5w 1d**	**04/05/2023**	**09/06/2023**
31	Switch off traffic signals	2d	04/05/2023	05/05/2023
32	Site Clearance Works	1w	04/05/2023	10/05/2023
33	Excavation of existing footpath and islands	1w 1d	09/05/2023	16/05/2023
34	Drainage Works and signals ducting	4d	11/05/2023	16/05/2023
35	Kerbing and edging works	1w	17/05/2023	23/05/2023
36	Tactile and signal box installations	1w	24/05/2023	31/05/2023
37	Footway and island construction	1w	01/06/2023	07/06/2023
38	Sign installation	3d	05/06/2023	07/06/2023
39	Time Risk Allowance	2d	08/06/2023	09/06/2023
40	**Phase 3 - Eastfield Road Works**	**2w 1d**	**12/06/2023**	**26/06/2023**
41	Ducting for signals and sign installation	2w	12/06/2023	23/06/2023
42	Time Risk Allowance	1d	26/06/2023	26/06/2023
43	**Phase 4 - Resurfacing works and signals**	**2w 4d**	**27/06/2023**	**14/07/2023**
44	Resurfacing the junction	1w	27/06/2023	03/07/2023
45	Relining of the junction	2d	04/07/2023	05/07/2023
46	Traffic Signal installation and connections	1w	06/07/2023	12/07/2023
47	Time Risk Allowance	2d	13/07/2023	14/07/2023
48	**Demobilise**	**3d**	**17/07/2023**	**19/07/2023**
49	Demobilise compound and storage area	3d	17/07/2023	19/07/2023



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Programme No :
Revision No : A
Issue Date : 21/10/2022
Drawn by : Scott Blackburn

construction PETERBOROUGH CITY COUNCIL

Eastfield Road Junction 7 Business Case Programme

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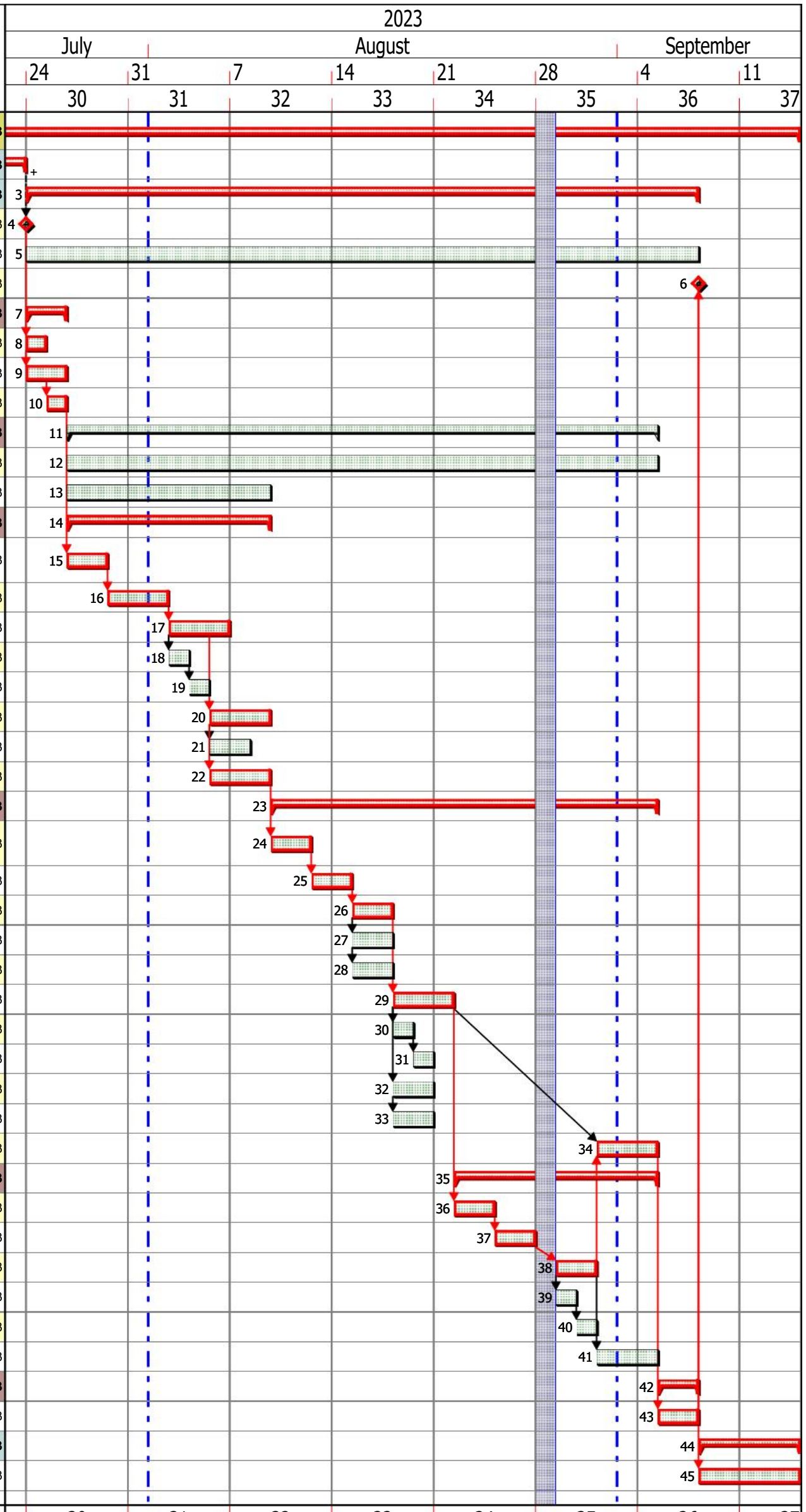
Page No:- 1

MILESTONE INFRASTRUCTURE A part of MGroupServices

File Ref. Peterborough - PCC Construction Programmes

Line	Name	Duration	Start	Finish
1	**Oxney Road Mini Roundabout X19.5 Target Cost Programme**	**24w 2d**	**21/03/2023**	**13/09/2023**
2	**Pre-construction**	**17w**	**21/03/2023**	**21/07/2023**
3	**Construction Period**	**6w 2d**	**21/07/2023**	**06/09/2023**
4	Access Date		21/07/2023	21/07/2023
5	Project Construction Period	6w 2d	24/07/2023	06/09/2023
6	Completion Date		06/09/2023	06/09/2023
7	**Compound Setup**	**2d**	**24/07/2023**	**25/07/2023**
8	Heras Fence Compound location	1d	24/07/2023	24/07/2023
9	Create Hardstanding for Welfare and materials lay down area	2d	24/07/2023	25/07/2023
10	Install Site welfare	1d	25/07/2023	25/07/2023
11	**Site Traffic Management**	**5w 3d**	**26/07/2023**	**04/09/2023**
12	Manned 2 Way Traffic Lights on Oxney Road	5w 3d	26/07/2023	04/09/2023
13	Road Closure on Neward Road - 24hr	2w	26/07/2023	08/08/2023
14	**Phase 1 - Sorthside Oxney Road and Newark Road**	**2w**	**26/07/2023**	**08/08/2023**
15	Site Clearance - 28m Kerbs / 22t Footway and verge / 1 No TS and 1 No Chamber / 1No Give Way Sign	2d	26/07/2023	27/07/2023
16	Install 40m kerbs / 21m channels / edgings	3d	28/07/2023	01/08/2023
17	Footway Construction and tactiles	3d	02/08/2023	04/08/2023
18	Install 1 x Belisha Beacon	1d	02/08/2023	02/08/2023
19	1 x DNO Connection	1d	03/08/2023	03/08/2023
20	Block Paved Construction - Type 1 / AC 20 / Sand / Blocks	3d	04/08/2023	08/08/2023
21	Install 4 x Road Signs	2d	04/08/2023	07/08/2023
22	Carriageway Resurfacing and Lining	3d	04/08/2023	08/08/2023
23	**Phase 2 - Northside Oxney Road**	**3w 3d**	**09/08/2023**	**04/09/2023**
24	SC - 25m kerbs - Remove existing footway construction - Traffic Signal equipment	2d	09/08/2023	10/08/2023
25	Install drainage	2d	11/08/2023	14/08/2023
26	Lay new kerb, channel line and edgings	2d	15/08/2023	16/08/2023
27	Traffic Island construction	2d	15/08/2023	16/08/2023
28	Install 2 x Rebound Bollards	2d	15/08/2023	16/08/2023
29	Footway Constuction and tactiles	3d	17/08/2023	21/08/2023
30	Install 1 x Belisha Beacon	1d	17/08/2023	17/08/2023
31	2 X DNO Connections	1d	18/08/2023	18/08/2023
32	Install 5 x Hazardmaster reflective Markers	2d	17/08/2023	18/08/2023
33	Install 2 x Road Signs	2d	17/08/2023	18/08/2023
34	Resurfacing and Lining	3d	31/08/2023	04/09/2023
35	**Phase 3 - Crossing near Sainsbury's**	**1w 4d**	**22/08/2023**	**04/09/2023**
36	Excavate crossing points	2d	22/08/2023	23/08/2023
37	Lay Kerbs and edgings	2d	24/08/2023	25/08/2023
38	Footway Construction and tactiles	2d	29/08/2023	30/08/2023
39	Install 2 x Belisha Beacon	1d	29/08/2023	29/08/2023
40	DNO Connections	1d	30/08/2023	30/08/2023
41	Resurfacing and Lining	3d	31/08/2023	04/09/2023
42	**Demobilise**	**2d**	**05/09/2023**	**06/09/2023**
43	Demobilise compound and storage area	2d	05/09/2023	06/09/2023
44	**Post Construction Works**	**1w**	**07/09/2023**	**13/09/2023**
45	Terminal Float	1w	07/09/2023	13/09/2023



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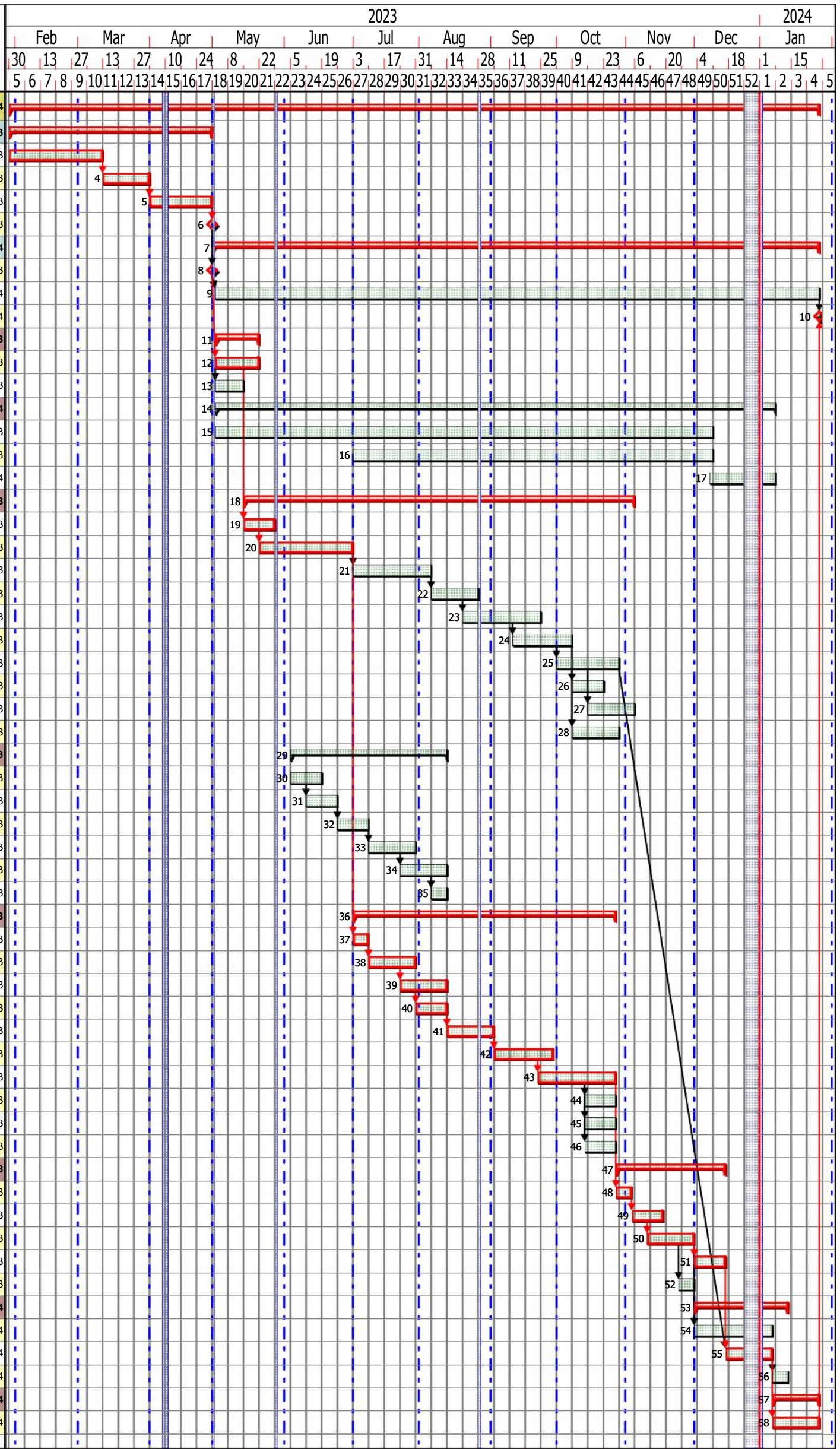
Programme No : **Revision No :** A **Issue Date :** 13/09/2022 **Drawn by :** Scott Blackburn	construction PETERBOROUGH CITY COUNCIL	**Oxney Road Mini Roundabout TC Programme**	Filter:- None Page No:- 1

MILESTONE INFRASTRUCTURE A part of MGroupServices

File Ref. Peterborough - PCC Construction Programmes

Line	Name	Duration	Start	Finish
1	**Storey's Bar Junction Improvements**	**49w 3d**	**30/01/2023**	**25/01/2024**
2	**Pre-construction**	**12w 3d**	**30/01/2023**	**28/04/2023**
3	Target Cost Pricing Works	6w	30/01/2023	10/03/2023
4	Client Approval	3w	13/03/2023	31/03/2023
5	Mobilisation	3w 3d	03/04/2023	28/04/2023
6	Project Start Date		28/04/2023	28/04/2023
7	**Construction Works**	**37w**	**28/04/2023**	**25/01/2024**
8	Project Access Date		28/04/2023	28/04/2023
9	Project Construction Period	37w	02/05/2023	25/01/2024
10	Project Completion Date		25/01/2024	25/01/2024
11	**Project Setup**	**2w 4d**	**02/05/2023**	**19/05/2023**
12	Compound Setup on Storey's Bar Road	2w 4d	02/05/2023	19/05/2023
13	Vegetation Clearance to Vicarage Farm Road	1w 4d	02/05/2023	12/05/2023
14	**Traffic Management**	**34w 1d**	**02/05/2023**	**05/01/2024**
15	Traffic Management - Road Closure Storey's Bar and Vicarage Farm Road	31w 2d	02/05/2023	08/12/2023
16	2 Way Traffic Lights on Edgerley Drain	22w 4d	03/07/2023	08/12/2023
17	Road Closure in all directions	3w	08/12/2023	05/01/2024
18	**Phase 1 - Storeys Bar Road**	**24w 3d**	**15/05/2023**	**03/11/2023**
19	Site Clearance - Including vegetation removal	2w	15/05/2023	26/05/2023
20	Earthworks	5w 4d	22/05/2023	30/06/2023
21	Drainage - Including ditch installations	5w	03/07/2023	04/08/2023
22	Street Light Ducting Works and Traffic Signals Works	3w	07/08/2023	25/08/2023
23	Pavement and Stabilisation of Carriageway Works	4w 4d	21/08/2023	22/09/2023
24	Kerbing works to road widening	3w 4d	12/09/2023	06/10/2023
25	Footway Construction	4w	02/10/2023	27/10/2023
26	Sign Installation	2w	09/10/2023	20/10/2023
27	Street Lighting Installtion	3w	16/10/2023	03/11/2023
28	VRS installation in socketed foundations	3w	09/10/2023	27/10/2023
29	**Phase 2 - Vicarage Farm Road Works**	**10w**	**05/06/2023**	**11/08/2023**
30	Site Clearance	2w	05/06/2023	16/06/2023
31	Earthworks	2w	12/06/2023	23/06/2023
32	Drainage	2w	26/06/2023	07/07/2023
33	Pavement and Stabilisation works	3w	10/07/2023	28/07/2023
34	Kerbing works	3w	24/07/2023	11/08/2023
35	Sign Installation	1w	07/08/2023	11/08/2023
36	**Phase 3 - Edgerley Road South Side**	**16w 3d**	**03/07/2023**	**26/10/2023**
37	Site Clearance	1w	03/07/2023	07/07/2023
38	Earthworks - Verge Works	3w	10/07/2023	28/07/2023
39	Rootlock System	3w	24/07/2023	11/08/2023
40	Drainage Works	2w	31/07/2023	11/08/2023
41	Ducting Works	2w 4d	14/08/2023	01/09/2023
42	Pavement Construction	3w 4d	04/09/2023	28/09/2023
43	Kerbing Works and Crossing Works at Junction	5w	22/09/2023	26/10/2023
44	Sign Installation	2w	13/10/2023	26/10/2023
45	Street Light Installation	2w	13/10/2023	26/10/2023
46	VRS installation	2w	13/10/2023	26/10/2023
47	**Phase 4 - Edgerley Drain North Side**	**7w**	**27/10/2023**	**14/12/2023**
48	Site Clearance	1w	27/10/2023	02/11/2023
49	Earthworks	2w	03/11/2023	16/11/2023
50	Kerbing Works and crossingworks	3w	10/11/2023	30/11/2023
51	Footpath Construction	2w	01/12/2023	14/12/2023
52	Sign Installation	1w	24/11/2023	30/11/2023
53	**Phase 5 - Junction and Surfacing Works**	**4w 4d**	**01/12/2023**	**11/01/2024**
54	Traffic Signal Installation	3w 4d	01/12/2023	04/01/2024
55	Carriageway Resurfacing	1w 4d	15/12/2023	04/01/2024
56	Relining and Studs	1w	05/01/2024	11/01/2024
57	**Phase 6 - Demobilisation**	**3w**	**05/01/2024**	**25/01/2024**
58	Remove Compound and clear Site	3w	05/01/2024	25/01/2024



Link Categories

Default (C) Default

Symbols

Critical

Milestone Appearances

Diamond

Programme No :

Revision No : A

Issue Date : 01/11/2022

Drawn by : Scott Blackburn

construction PETERBOROUGH CITY COUNCIL

Storey's Bar Road Junction Imrovements

Filter:- None

Page No:- 1

MILESTONE INFRASTRUCTURE A part of MGroupServices

File Ref. Peterborough - PCC Construction Programmes

Appendix K – Junction 15 Contractors (PHS Procurement Example)

Junction 15 Improvement Scheme (2022 - 2023)	
Contractor	**Service**
HW Martins	Traffic Management
PGR	Enabling & Civils Works
CD Fencing	Safety Fencing
Toppesfield	Resurfacing
MSF Ltd	Signage
Wilson & Scott Ltd	Lining / Studs / Anti-skid
Milestone	Street Lighting
Centregreat	Footbridge Structure
Bell Formwork	Structural Concrete
Ivor King	Piling
Anglian Tree	Landscaping
JF Hunt	Demolition