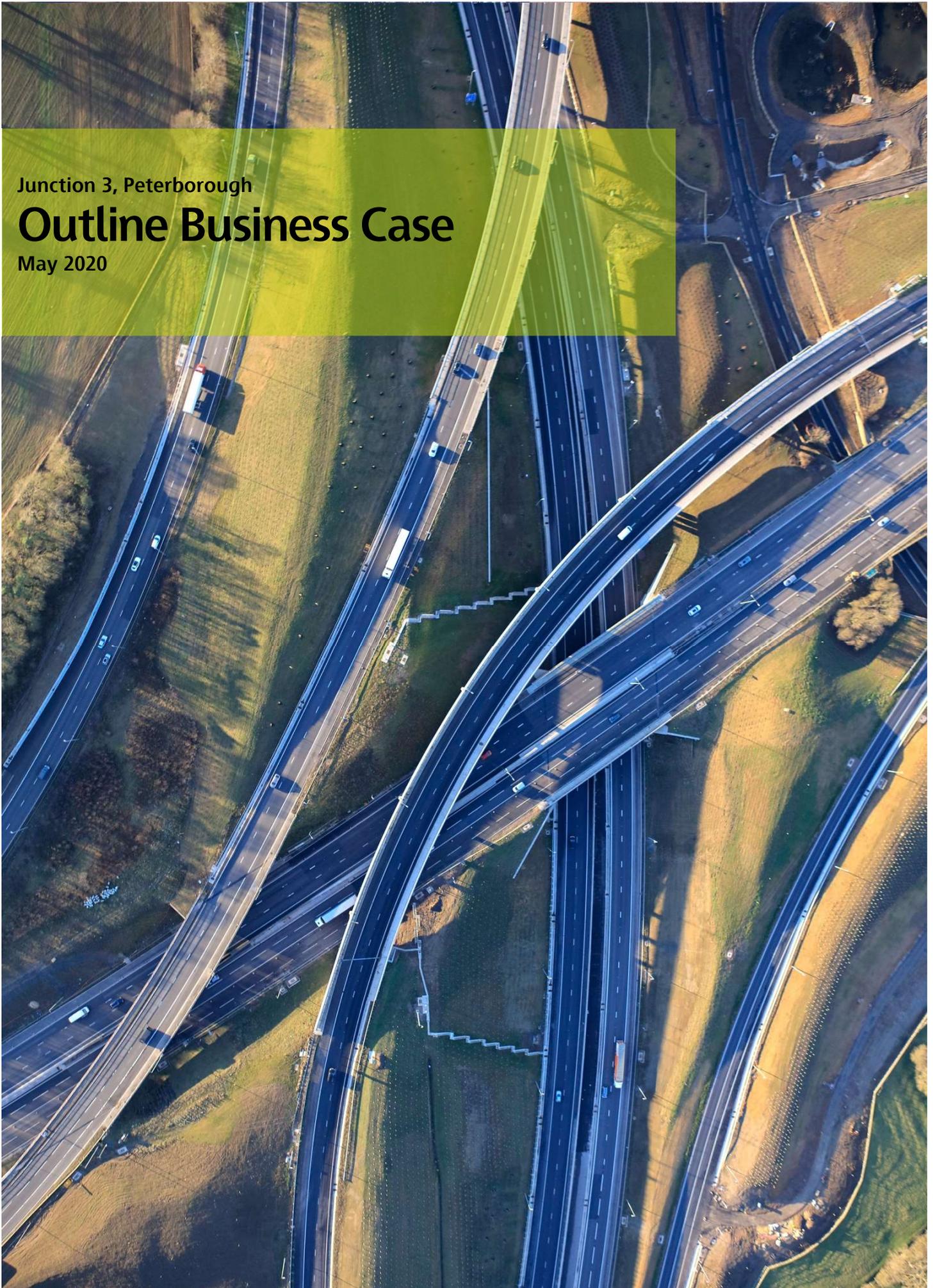


Junction 3, Peterborough

Outline Business Case

May 2020



Document Control

Job Number: 5080646						
Document ref: Junction 3 Outline Business Case					Authorisation	
Rev	Purpose	Originated	Checked	Reviewed	Skanska	Date
1.1	First Issue	JWH	JB	RMJ	RMJ	15.5.2020
2.0	Final Issue	JWH	JB	RMJ	RMJ	22.05.2020
2.1	Second Issue	JWH	JB	RMJ	RMJ	29.06.2020

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Executive Summary

This Outline Business Case makes a strong strategic and economic case for the Junction 3 Improvement Scheme, which will return High Value for Money.

Construction of the scheme will reduce significant issues of congestion and delay at a crucial cornerstone of Peterborough's Parkway Network, providing much needed capacity for Peterborough City Council (PCC) and the Cambridgeshire and Peterborough Combined Authority (CPCA) to meet their agenda for growth in Peterborough.

This Outline Business Case is set out in compliance with the DfT's Five Case Business Model.

Strategic Case

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

- Extensive queues and delays on the A1260 Nene Parkway
- Queueing on the A1260 The Serpentine
- High accident rate, particularly rear end shunts.

The policy review and data existing issues has been used to identify scheme objectives, and a long list of potential improvement options have been assessed against these objectives using the DfT's Early Assessment Sifting Tool (EAST). The scheme objectives are set out beneath.

Primary objectives include:

- **Tackle congestion and improve journey times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3
- **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth across Peterborough is promoted whilst providing for future demand
- **Create wider economic benefits:** Provide conditions that encourage inward investment in higher value employment sectors across Peterborough, and utilise available employment space.

In addition to the primary objectives, several secondary objectives were identified and are discussed within the Strategic Case.

The Strategic Case concludes with details of the Preferred Option which is the subject of this Business Case. Full details of the modelling and assessment work undertaken to identify the Preferred Option can be found in the Junction 3 Option Assessment Report (OAR).

The Preferred Option ('the scheme') includes:

1. Extend Junction 31 southbound on-slip to Junction 3
2. Add a flare to A1260 Nene Parkway approach to Junction 3 to create a 4 lane approach
3. Add a 4th lane to circulatory between A1260 Nene Parkway southbound approach and A1139 Fletton Parkway eastbound exit
4. Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a 3rd lane
5. Add a 3rd lane to circulatory between A1260 The Serpentine southbound exit and A1260 The Serpentine northbound approach
6. Add a 3rd lane on the A1260 The Serpentine northbound to the north of Hargate Way
7. Add a flare to the A1260 The Serpentine northbound approach to create a 4 lane approach
8. Add 4th lane to circulatory between A1260 The Serpentine northbound approach and A1139 Fletton Parkway westbound on-slip
9. Install traffic signals on the A1260 Nene Parkway southbound approach to Junction 3
10. Install traffic signals on the A1260 The Serpentine approach to Junction 3.

A full scheme drawing is provided in Appendix B.

Economic Case

The Economic Case demonstrates the scheme achieves a Benefit to Cost Ratio of 3.251, and offers **High Value for Money** based on transport user benefits alone. A breakdown of the scheme BCR is provided beneath.

Value (£'000s) 2010 prices, benefits discounted to 2010	
Benefits	
Greenhouse Gases	-108
Consumer Users (commuting)	8,651
Consumer Users (Other)	4,250
Business Users/Providers	3,438
Indirect Taxes	222
Present Value of Benefits (PVB)	16,453
Costs	
Broad Transport Budget	5,061
Present Value of Costs (PVC)	5,061
Net Benefit / BCR Impact	
Net Present Value (NPV)	11,392
Benefit/Cost Ratio (BCR)	3.251

The Present Value of Benefits used in the assessment have been derived from a custom built Aimsun Microsimulation model used to assess the impact of the scheme in future years. Results from this modelling were then assessed using the Transport User Benefits Appraisal (TUBA, 1.9.13) tool to calculate a scheme BCR. The **Present Value of Benefits** for the scheme are **£16,453,000** in 2010 prices.

The present value of costs used in the Economic Assessment is based upon a robust scheme cost estimate and has been calculated in line with WebTAG guidance over a 60 year assessment period. The **Present Value of Costs** for the scheme are **£5,061,000** in 2010 prices.

Sensitivity testing has been undertaken to determine whether or not the proposed scheme could still achieve value for money if the expected road traffic growth differs from current predictions. This testing has been undertaken by using figures from TEMPro (version 7.2b), to feed 'low' and 'high' growth scenarios into the model. The results from the sensitivity test are provided in the Table beneath.

BCR Component	Low Growth	Central Growth	High Growth
PVC (£)	5,061	5,061	5,061
PVB (£)	28,093	16,453	2,875
NPV (£)	23,032	11,392	-2,186
BCR	5.551	3.251	0.568

The modelling demonstrates that the proposed scheme returns Very High Value for Money in a low growth scenario. The benefit is diminished in a high growth scenario, however a review of the traffic modelling has identified that the benefit is suppressed by the lack of signal optimisation across the junction, and this will be investigated further during the next stage of assessment with the support of traffic signal specialists. However, a high growth scenario at this junction is considered to be highly unlikely in the wake of the Coronavirus pandemic, and given other network constraints surrounding Junction 3.

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

- Landscape
- Heritage
- Arboriculture
- Ecology
- Noise.

These assessments did not identify any significant concerns and was used to inform the Preliminary Designs. The assessment results are included within the Appraisal Summary Table (AST).

Financial Case

The Financial Case demonstrates that the scheme has been robustly costed in line with WebTAG guidance.

This Scheme Outturn Cost (including risk and inflation) is £5,850,749. This represents the amount required by PCC to deliver the scheme, and it is anticipated that this will be funded by the CPCA from the Single Investment Fund.

Peterborough City Council request that the Design Cost of £439,736 is released in advance of the funds required for construction, in order to undertake the Detailed Design and produce a Full Business Case. This work is provisionally programmed to be undertaken between July 2020 and January 2021, with a view to construction commencing on site in January 2022.

Commercial Case

The Commercial Case demonstrates that the scheme can be reliably procured and implemented through existing channels whilst ensuring value for money in delivery of the scheme.

All phases of the scheme, including detailed design, construction and site supervision will be delivered in house by Peterborough Highway Services (PHS), who have been responsible for all planning and design work undertaken on the Junction 3 scheme to date.

The scheme 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 commercial competitive and offers value for money, all subcontract packages will be subject to competitive tendering.

Procuring the scheme directly through the PHS contract enables PCC to appoint a contractor 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.

Management Case

The Management Case demonstrates that PCC, through the PHS Framework, has the necessary experience and governance structure to successfully manage the delivery of the scheme.

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

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



Junction 20 Improvement (post scheme)

The scheme will be delivered by a Project Team led by a PCC Project Manager, and consisting of all the key project delivery partners. The Project Team will be responsible for the daily running of the project, coordinating with all key stakeholders, and managing the delivery programme.

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.

Every month the Project Manager will also submit a highlight report to the CPCA recording what progress has been made and whether there are any new risks that could impact the scheme.

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

Timescale	Milestone Activity
May 2020 – July 2020	Outline Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding to undertake Detailed Design and produce a Full Business Case.
July 2020 – January 2021	Detailed Design undertaken and Full Business Case produced.
February 2021 – March 2021	Full Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding for scheme construction.
Jan 2022 – Dec 2022	Mobilisation, construction and demobilisation.

An online public and stakeholder consultation exercise on the final scheme will be undertaken following approval of the OBC, and prior to completion of the Detailed Design. No residents are directly affected by this scheme. All other communication with key stakeholders and the public will be coordinated by a designated Project Liaison Officer who will be based with the project delivery team.

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. The Risk Register is a live document and is 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 shown within the Management Case, and include a range of quantitative and qualitative data collection methods that will be undertaken at one, three and five years post scheme opening.

Summary

This Outline Business Case makes a strong strategic and economic case for the Junction 3 Improvement Scheme, which will return **High Value for Money**.

The Business Case demonstrates that the scheme has been robustly costed, can be efficiently procured through existing commercial channels whilst proving value for money, and that the necessary mechanisms are in place to ensure that the delivery of the scheme can be successfully managed on behalf of the Cambridgeshire and Peterborough Combined Authority.

1. Introduction

This document sets out the Business Case for the Junction 3 improvement scheme in Peterborough. The scheme will address severe levels of congestion and delay that are currently compromising the operational efficiency of the surrounding road network, including a cornerstone section of Peterborough's strategic Parkway Network. By addressing existing issues, and building in additional capacity, the scheme will assist with delivering growth aspirations across Peterborough.

This Outline Business Case is the second stage of the decision making process using the format as set out in "The Transport Business Cases" document published by the Department for Transport (DfT) in January 2013.

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 and the design matures.

A SOBC and an Optional Appraisal Report (OAR) were submitted to the Cambridgeshire and Peterborough Combined Authority (CPCA), and approved in October 2019. This paved the way for preliminary design work to be undertaken on the preferred scheme, and for this OBC to be produced.

The primary purpose of the OBC is to:

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

Study Area

The extent of the study is shown in Figure 1.11 beneath. This includes Junction 3 and nearby elements of the Principal Road Network which are directly linked to the operation of the junction. Malborne Way is also included, which experiences rat-running as a result of congestion at Junction 3.

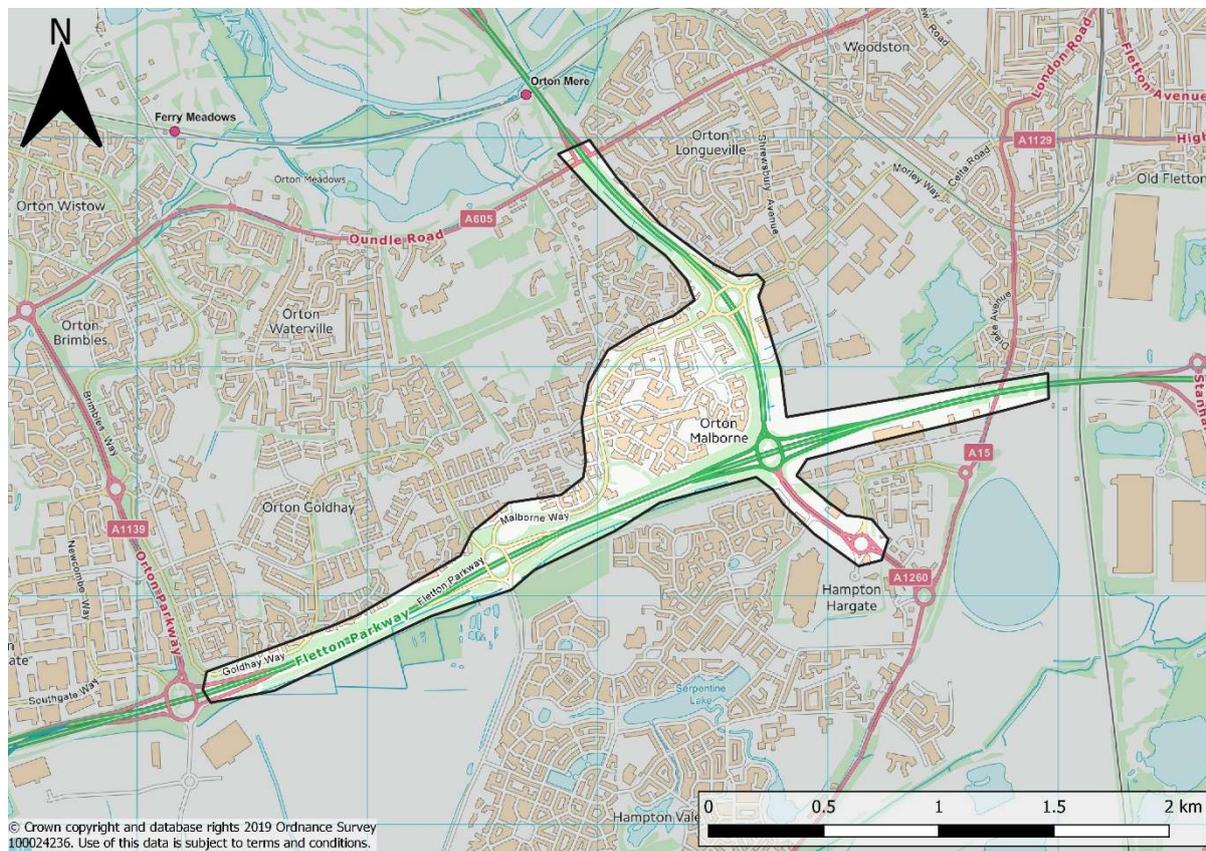


Figure 1.1: Junction 3 Study Area Extents

Location

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

The junction is used by trips from across the Peterborough area, and experiences significant peak hour congestion on the A1260 Nene Parkway and the A1260 The Serpentine approaches. Because of its strategic location, the junction is critical to Peterborough’s growth aspirations.

Figure 1.2 beneath highlights the location of Junction 3 in relation to the Parkway system and Peterborough City Centre.

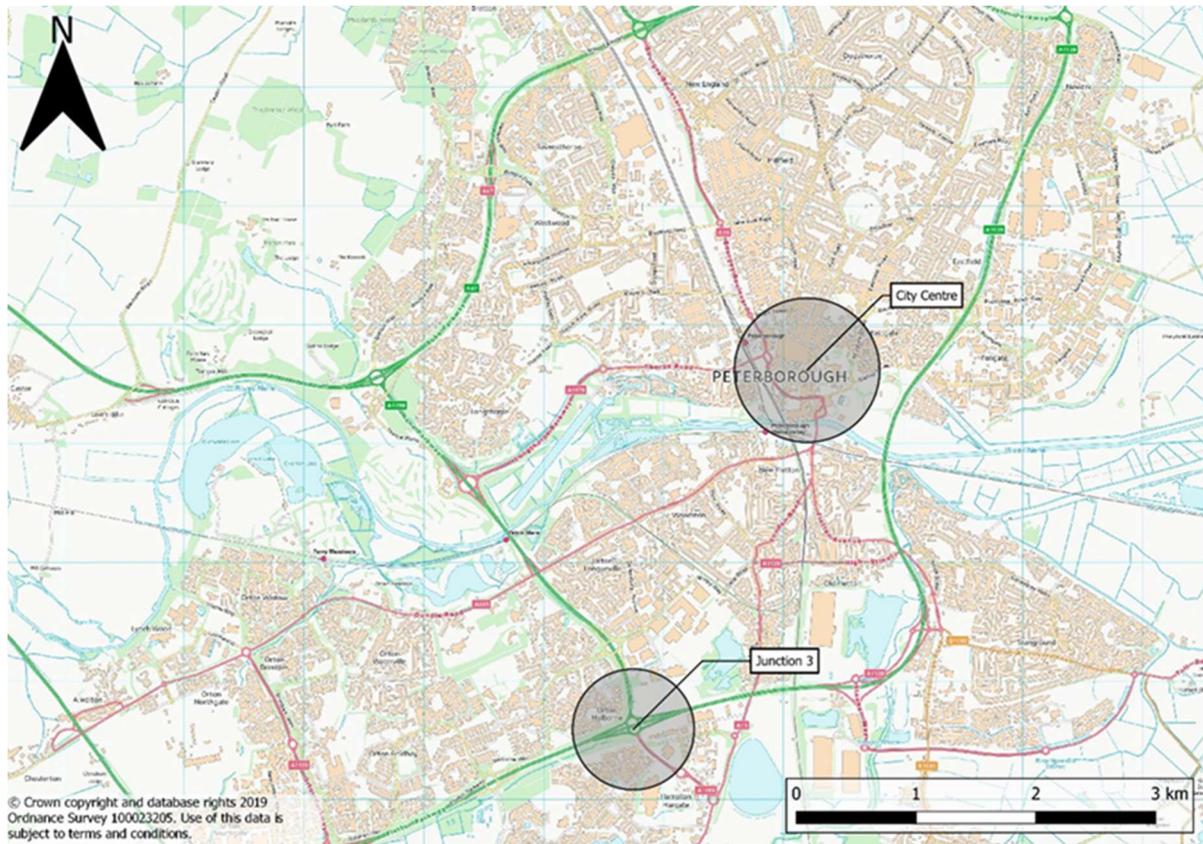


Figure 1.2: Junction 3 Location Plan

Background Context

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

It is heavily used by trips in the southwest of Peterborough, and a large number of facilities, businesses, and residences are immediately to the south of the junction.

The emerging Peterborough Local Plan (adopted in 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 21,315 new homes and 17,600 new jobs by 2036.

The population of Peterborough has grown considerably over recent years, increasing by 22% between 2001 and 2015, to 196,640 residents (2015). This places Peterborough within the UK's top ten cities for population growth.

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

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

Additionally, improvements at Junction 3 are expected to have wider network benefits beyond the Parkway system, particularly to Malborne Way which experiences congestion as vehicles rat-run in order to avoid queues during the peak hours.

Document Structure

The remainder of this document is structured as follows:

- **Chapter 2: The Strategic Case** identifies the need for an improvement at this location, considers an initial long list of options, and how these perform against CPCA, PCC and the scheme objectives
- **Chapter 3: Economic Case** demonstrates that the preferred option offers value for money
- **Chapter 4: Financial Case** shows how the scheme has been robustly costed, and how funding needs to be profiled
- **Chapter 5: Commercial Case** sets out how PCC will procure in a way that delivers value for money
- **Chapter 6: Management Case** explains how delivery of the scheme will be managed.

2. Strategic Case

2.1. Introduction

This chapter sets out the strategic case for the Junction 3 scheme, and demonstrates why improvements are needed at this location. It considers how a scheme at this location fits with local, regional and national policy, and will assist Peterborough to meet deliver its planned growth.

2.2. Business Strategy

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

[Department for Transport Single Departmental Plan](#)

The Single Departmental Plan published in June 2019¹ sets out the DfT's objectives and the plans for achieving them.

The objectives are:

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

An improvement scheme at Junction 3 will reduce congestion and improve journey time reliability, and add further capacity into Peterborough's Parkway Network. The delivery of these benefits will support housing and economic growth, As such, the delivery of a scheme at Junction 3 will provide benefits aligned to delivering the main objectives of the DfT's single departmental plan.

1

Cambridgeshire and Peterborough Combined Authority

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

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.

To help achieve these ambitions and provide the requisite support, the CPCA has set out a short-term business plan² that is aimed at giving a clear pathway to deliver on their ambitious and transformational agenda for Cambridgeshire and Peterborough. The business plan sets out the CPCA budget plans for the next four-year period alongside a focussed to-do list of projects of which Improvement works at Junction 3 are listed. Figure 2.1 sets out the CPCA Policy Framework.



Figure 2.1: CPCA Policy Framework

The CPCA Mayor’s Growth Ambition Strategy sets out the area’s priorities for achieving ambitious levels of inclusive growth and meeting the commitments of the Devolution Deal. The Strategy is based upon significant work undertaken by the Cambridgeshire and Peterborough Independent Economic Review (CPIER).

The CPIER³ was commissioned by the Combined Authority and other local partners to provide a robust and independent assessment of the Cambridgeshire and Peterborough Economy and its potential for growth.

² <https://cambridgeshirepeterborough-ca.gov.uk/assets/Uploads/CPCA-Business-Plan-2019-20-dps.pdf>

³ <https://www.cpier.org.uk>

The assessment makes a number of recommendations for the CPCA to take forward over the short, medium and long-term.

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.

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. However it also states that it has a lower proportion of high-level skills than elsewhere in the area, and educational and health outcomes in Peterborough are relatively poor. The CPIER believes a strong focus on these issues is needed to improve productivity and well-being, which should also include new higher education provision.

The Local Industrial Strategy⁴ sets out the economic strategy for Cambridgeshire and Peterborough, taking a lead role in implementing the business growth, productivity and skills elements of the Growth Ambitions Strategy. The Local Industrial Strategy is focussed around five key foundations of productivity established in the UK Industrial Strategy:

- People
- Ideas
- Business Environment
- Infrastructure
- Place.

It is a core principle of the Local Industrial Strategy that the fifth foundation of place reflects the findings of the CPIER, responding to the three sub-economies identified:

- Greater Cambridge
- Greater Peterborough
- The Fens.

The CPCA Assurance Framework 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.

⁴

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

In January 2020, the CPCA adopted a Local Transport Plan for Cambridgeshire and Peterborough⁵ 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.

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.

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

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'.

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

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

⁵ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>

The objectives of the Local Transport Plan underpin the delivery of the goals for an improvement at Junction 3, and form the basis against which schemes, initiatives and policies will be assessed. The initial scheme objectives for a Junction 3 improvement scheme were devised at the beginning of the study and pre-date the objectives of the Local Transport Plan. Since the introduction of the CPCA's Local Transport Plan, these initial scheme objectives have been refined to ensure they meet those objectives both locally (for Peterborough) and regionally (for the CPCA). The scheme objectives for a Junction 3 improvement scheme are set out later on in this chapter.

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 in to all planning and transport operations to achieve Vision Zero (zero fatalities or serious injuries)
- **Accessibility** – promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all
- **Health and Well-being** – provide 'healthy streets' and 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.

Junction 3 is identified within the Local Transport Plan as a congestion pinch point on the Peterborough Parkway network where improvements are necessary to improve journey time reliability, and enable the growth identified within the Local Plan to emerge⁶.

⁶ Peterborough Long Term Transport Strategy, 2010

2.3. Fit with the Wider Policy Context

The wider policy context is set out in Table 2.1 below, each policy document is set out alongside its objectives and how the proposed scheme will support and facilitate the objectives of each policy document.

Appendix A details other local policies that are relevant to improvements at Junction 3.

Table 2.1: Wider Policy Context and Impact of Delivering an Improvement Scheme at Junction 3

Policy Framework	Policy Function	Objectives	How the Study Supports and Facilitates the Policy Objectives
<p>Department for Transport Single Departmental Plan</p>	<p>Sets out the DfT's objectives and the plans for achieving them</p>	<ul style="list-style-type: none"> • 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. 	<p>Improvements at Junction 3 will:</p> <ul style="list-style-type: none"> • Support the housing and economic growth ambitions of the city • Improve reliability for drivers on this section of the city's road network
<p>Cambridgeshire and Peterborough Combined Authority Local Transport Plan</p>	<p>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</p>	<ul style="list-style-type: none"> • 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 in to all planning and transport operations to achieve Vision Zero (zero fatalities or serious injuries) • Accessibility – promote social inclusion through the provision of a sustainable transport network that is affordable and accessible for all • Health and Well-being – provide 'healthy streets' and 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. 	<p>Improvements at Junction 3 will:</p> <ul style="list-style-type: none"> • 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
<p>Peterborough City Council Strategic Priorities</p>	<p>The Council's priorities to help meet its vision to 'create a bigger and better Peterborough that grows the right way, and through truly sustainable growth</p>	<ul style="list-style-type: none"> • Drive growth, regeneration and economic development • Improve educational attainment and skills • Safeguard vulnerable children and adults • Implement the Environment Capital Agenda 	<p>Improvements at Junction 3 will:</p> <ul style="list-style-type: none"> • 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
<p>Peterborough City Council Local Plan</p>	<p>Updates the 2011 Core Strategy and looks to deliver 21,315 homes and 17,600 jobs by 2036</p>	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Reduce the number of accidents at the junction

2.4. The Need for Change

Problems Identified

Junction 3 is heavily congested during peak hours, which creates the following issues:

- Extensive queues on the A1260 Nene Parkway
- Queueing on the A1260 The Serpentine
- High accident rate, particularly rear end shunts.

The above issues, if not resolved, will compromise the city's growth aspirations as well as the Council's objectives to keep Peterborough a pleasant place to live and work.

Extensive Queues on the A1260 Nene Parkway

Extensive queueing occurs on the A1260 Nene Parkway southbound approach to Junction 3, particularly in the PM Peak Period. Figure 2.22 shows the observed queue from this approach stretching past the Junction 31 on-slips in the PM peak period.



Figure 2.2: AM Peak Period Queueing on the A1260 Nene Parkway Southbound

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

The majority of traffic on this approach will make a right turn onto the A1139 Fletton Parkway, this creates a high number of weaving movements across the 3 lanes for vehicles coming from the Junction 31 on-slip.

The queuing at this location also results in rat-running along Orton Malborne which is a residential distributor road. Vehicles approaching Junction 31 on A1260 Nene Parkway and on Morley Way have the opportunity to make a decision whether to continue on to Junction 3 or re-route via Malborne Way based on the level of queuing that is occurring on A1260 Nene Parkway Southbound in the PM Peak Period. The rat-running traffic on Malborne Way can cause queuing and congestion along Malborne Way approaching Junction 2, as shown in Figure 2.3.

Queuing on the A1260 The Serpentine

During both the AM and PM peak congestion occurs on the A1260 The Serpentine approach. As shown in Figure 2.3 and 2.4, queues generally extend back to the junction with Hargate Way but can sometimes extend back to the Tesco roundabout in the AM Peak. In the PM peak period, queuing/slow moving traffic extends back beyond the Tesco roundabout.

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

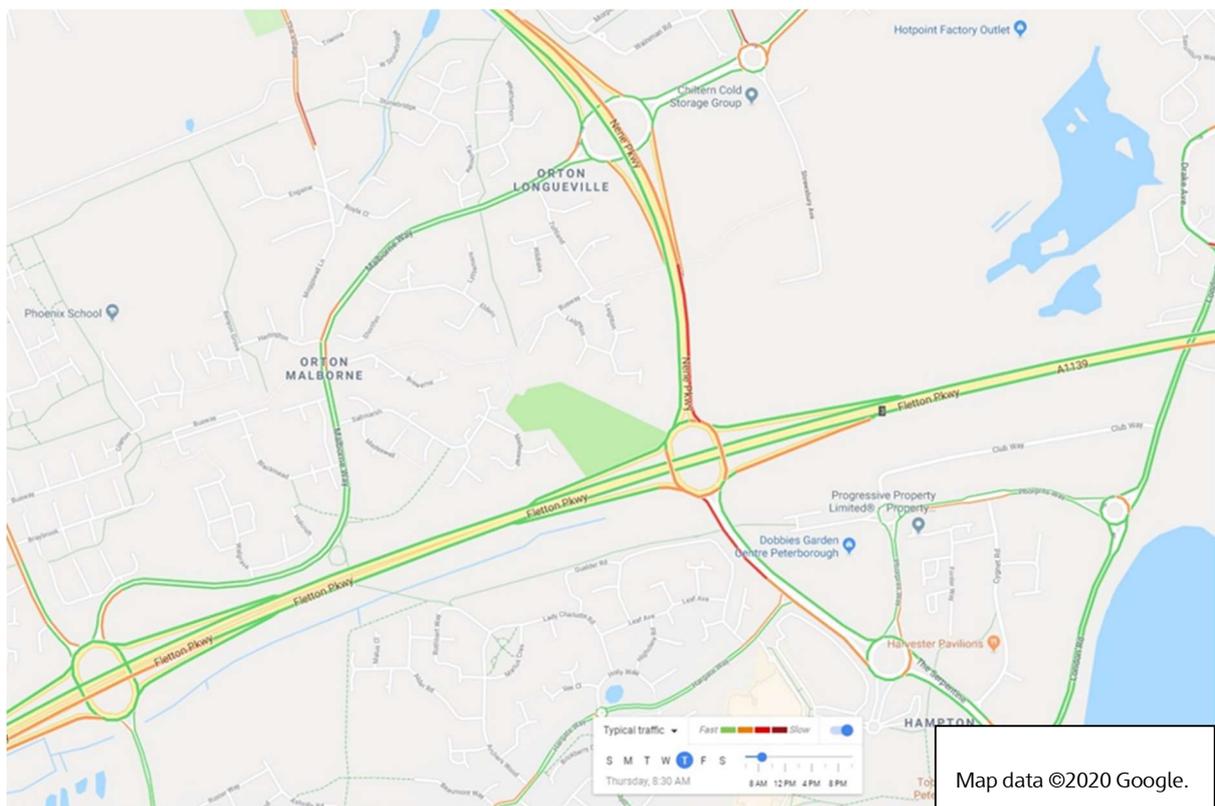


Figure 2.3: Google Traffic, AM Peak Congestion around Junction 3

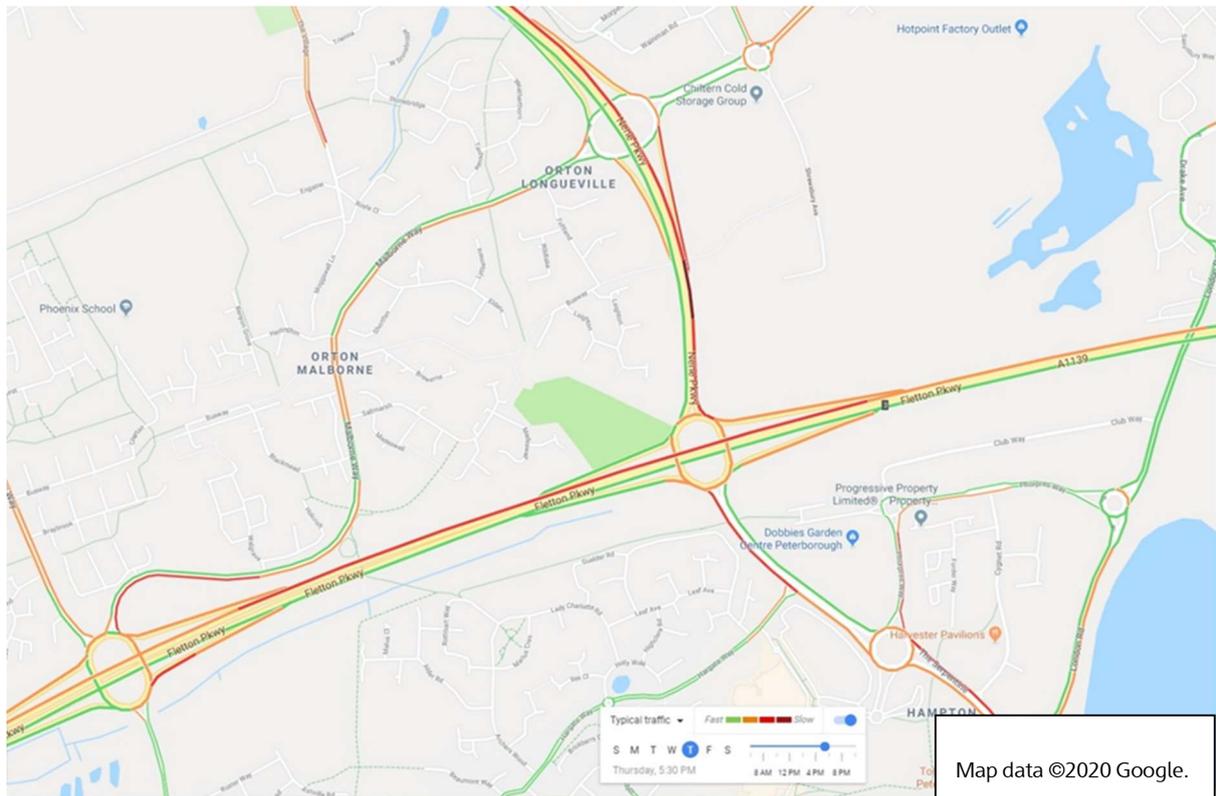


Figure 2.4: Google Traffic, PM Peak Congestion around Junction 3

High Incident Rate

Figure 2.5 displays the Incident Density by Severity at Junction 3 compared to the wider area of Peterborough (2013 to 2017). Junction 3 is noticeably darker than surrounding junctions, indicating that it is the most Incident prone area in the south of Peterborough.

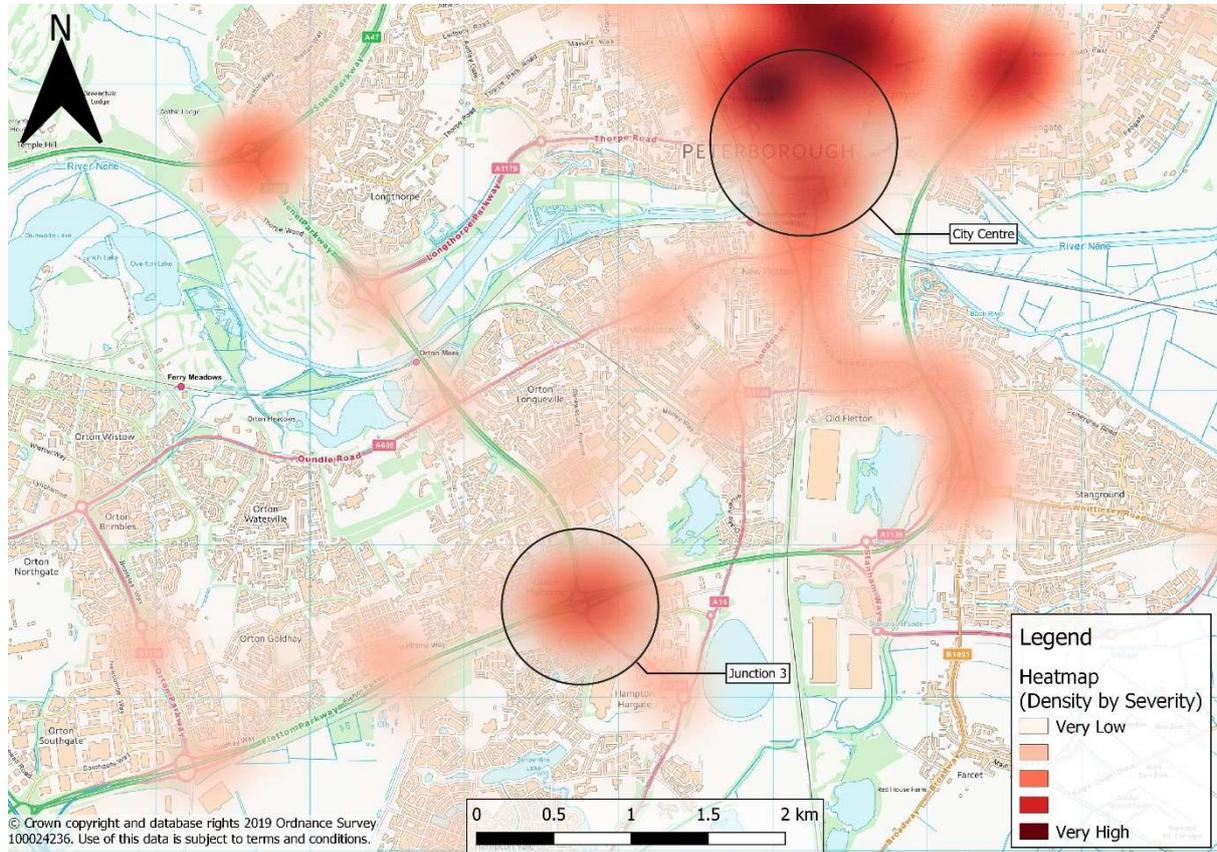


Figure 2.5: Incident Density by Severity for South Peterborough

Figure 2.6 below shows Incident Density by Severity around Junction 3, between 2013 and 2017. Figure 2.7 summarises the data in Figure 2.6.



Figure 2.6: Incident Density by Severity around Junction 3

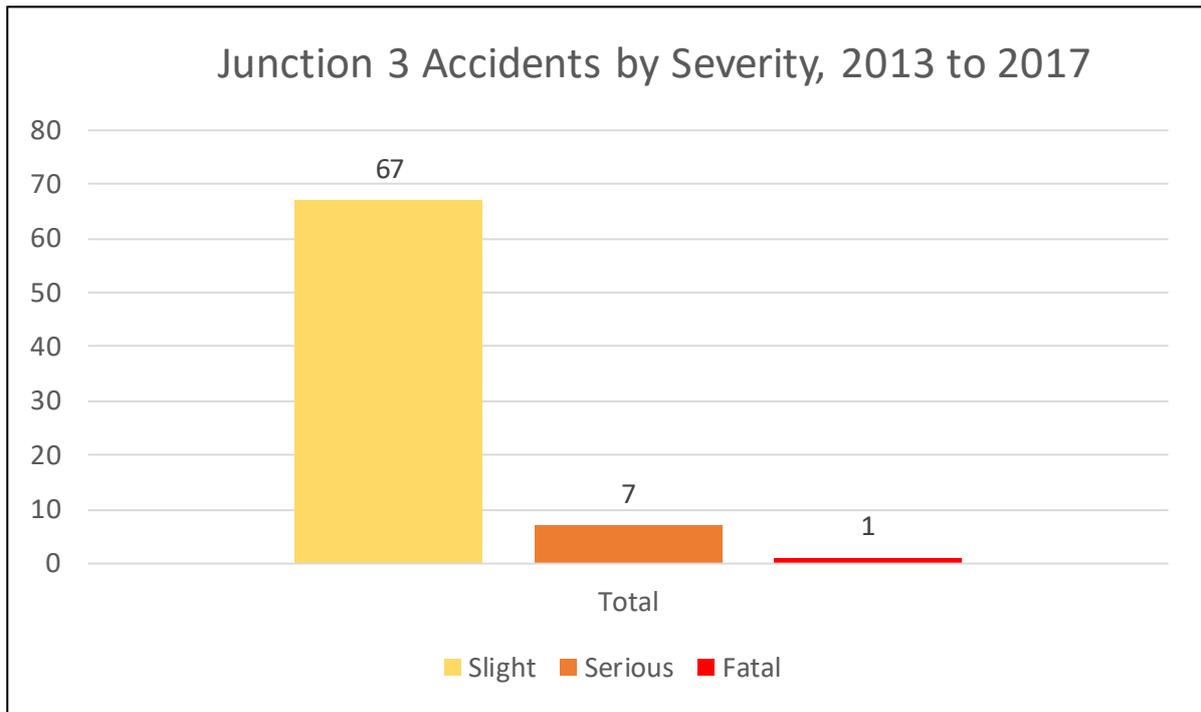


Figure 2.7: Incidents by Severity at Junction 3, 2013 to 2017

Figure 2.6 shows that most incidents occur on the A1139 Fletton Parkway eastbound on-slip. The scope of this study will include options to improve safety on this on-slip.

The approach with the most incidents is the northbound The Serpentine approach where it meets the roundabout circulatory. This is a conflict point with a high number of right turning vehicles from A1260 Nene Parkway on to A1139 Fletton Parkway westbound and a high flow of vehicles approaching the junction from the A1260 The Serpentine. Due to the volume of circulating traffic, vehicles joining the roundabout from the A1260 The Serpentine have limited gap availability which can lead to driver frustration and an increased likelihood of incidents.

There is a cluster of slight incidents on the A1260 Nene Parkway southbound approach close to the give way line, these are likely to be rear end shunts as a result of queueing vehicles.

Assessment of the incident data has shown that there is not an association between incidents occurring and the peak travel periods.

2.5. Impact of Not Changing Junction 3

The impacts of not progressing this scheme would be:

- Worsening of congestion, delay, and journey times
- Increased likelihood of accidents
- Attractiveness of business in Hampton (and Peterborough) will decrease.

Congestion, Delay, and Journey Times

The existing issues of congestion, delay, and poor journey time reliability will continue to worsen, impacting the operational performance of Junction 3 and the wider area of the A1260 Nene Parkway and A1139 Fletton Parkway. Table 2.2 beneath compares the delay and total travel time through the junction in 2018 (Base scenario) and 2031 (Modelled Do-Minimum scenario).

Table 2.2: Delay Comparison between 2018 Base Model and 2031 DM model

Location	Approach	Exit	Delay Time (secs)				Travel Time (secs)			
			AM		PM		AM		PM	
			2018	2031	2018	2031	2018	2031	2018	2031
Junction 3	A1260 Nene Parkway	A1260 Nene Parkway	-	-	-	-	-	-	-	-
		A1139 Fletton Parkway (East)	83	139	180	172	109	164	206	198
		A1260 Serpentine Green	137	210	200	181	181	254	244	224
		A1139 Fletton Parkway (West)	160	218	215	186	199	257	253	224
		Total	381	567	595	539	488	675	703	647
	A1139 Fletton Parkway (East)	A1260 Nene Parkway	52	51	45	55	104	103	97	107
		A1139 Fletton Parkway (East)	-	-	-	-	-	-	-	-
		A1260 Serpentine Green	30	41	31	32	73	84	74	75
		A1139 Fletton Parkway (West)	-	-	-	-	-	-	-	-
		Total	81	92	76	87	177	187	171	182
	A1260 Serpentine Green	A1260 Nene Parkway	104	118	85	97	138	152	119	131
		A1139 Fletton Parkway (East)	113	127	117	135	149	163	152	170
		A1260 Serpentine Green	141	184	121	144	193	235	173	197
		A1139 Fletton Parkway (West)	61	66	48	52	81	86	68	72
		Total	419	495	371	428	560	635	512	570
	A1139 Fletton Parkway (West)	A1260 Nene Parkway	25	28	27	27	60	64	62	63
		A1139 Fletton Parkway (East)	-	-	-	-	-	-	-	-
		A1260 Serpentine Green	75	94	72	74	130	148	127	128
		A1139 Fletton Parkway (West)	-	-	-	-	-	-	-	-
		Total	100	122	99	101	190	212	189	191
Junction Total		981	1277	1141	1155	1415	1709	1575	1590	
MALBORNE WAY	Eastbound		19	23	20	20	131	135	133	135
	Westbound		122	259	84	326	239	376	201	326
	Bidirectional Total		140	282	105	346	369	511	334	461

Overall Table 2.2 shows that the operation of Junction 3 will deteriorate if nothing is implemented. The total delay time for the junction in the 2018 AM peak is 981 seconds and the PM peak is 1,141 seconds, by 2031 this has risen to 1,277 seconds in the AM Peak and 1,155 seconds in the PM peak. In addition, the delay on Malborne Way significantly increases between 2018 and 2031, particularly in the PM peak. Delay more than doubles from 105 seconds in 2018 to 346 seconds in 2031.

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

Likelihood Accidents will Increase

There is an increasing likelihood that accidents at Junction 3 will rise, particularly rear end shunts. As shown above, the forecast increased in delay and travel time is expected to rise which will entail more stopping and starting on approach to the junction.

Attractiveness of Hampton (and Peterborough) as a place to work will decrease

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

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

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

2.6. Internal Drivers for Change

Internal drivers for change are the factors that are driving the need for change, and come from the scheme promoter. Examples include aspirations for growth, or increasing network resilience. In this instance, the scheme promoters are the CPCA and Peterborough City Council.

The internal drivers for improvements at Junction 3 come from local growth aspirations, and the structured framework of support provided by the CPCA to enable this growth to be realised.

Local Growth Aspirations

Peterborough is forecast to experience significant employment and population growth over the next few decades, reflecting a continuation of past trends.

Peterborough is one of the fastest growing cities in England, with 21,315 new homes required by 2036. This level of growth will in turn 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”, and 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 related to housing and employment growth. The consequence of this is increased strain on the cities’ transport infrastructure. Improving the transport infrastructure to enable Peterborough’s strong history of growth to continue is the primary internal driver for change at Junction 3.

It is acknowledged by the Council that if no changes are made to existing congestion and journey time issues on major routes across the city, then growth aspirations will be compromised. The Local Transport Plan identifies the major infrastructure requirements that are needed to address existing capacity constraints on the network, and those that are required to enable the travel demand to increase in accordance with the city’s growth aspirations. Junction 3 improvements is identified as a key scheme.

Combined Authority Support

The CPCA has identified a number of strategic projects which it believes will provide transformational benefits for the area. This feasibility study for Junction 3 improvements is one of the studies shortlisted as a priority, beginning in the financial year 2017/2018.

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

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

In order to facilitate the pipeline of work, the process includes initially exploring the feasibility of schemes, and then developing business cases. These are essential steps in defining an improvement and securing funding for its realisation.

In October 2017 the CPCA methodology was set out for prioritising investment, which was based on the criteria shown in Table 2.3 below.

Table 2.3: Combined Authority Criteria

Case	Criteria
Strategic	<ul style="list-style-type: none"> • Reduce congestion • Unlock housing and jobs
Economic	<ul style="list-style-type: none"> • Scale of impact • Value for money
Financial	<ul style="list-style-type: none"> • Other funding sources / contributors
Management	<ul style="list-style-type: none"> • Delivery certainty • Project risks • Stakeholder support

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

2.7. External Drivers for Change

External drivers for change are factors that are driving the need for change, that are outside of the scheme promoter's organisation. Examples include public opinion, legislative changes, or response from other events.

Malborne Way Quality of Life

Malborne Way provides vehicle access to residential areas in Orton Malborne. With the congestion at Junction 3, many drivers choose to drive down Malborne Way instead, creating a "through-route" effect. This means that the quality of life for residents of Orton Malborne is reduced, as the otherwise quiet roads are flooded with traffic in the peak periods. Improvements to Junction 3 should reduce the need for vehicles to rat-run along Malborne Way, and thus improve the quality of life for residents. Figure 2.8 shows the through-route used along Malborne Way in Red, and the preferred route via Junction 3 in Green.

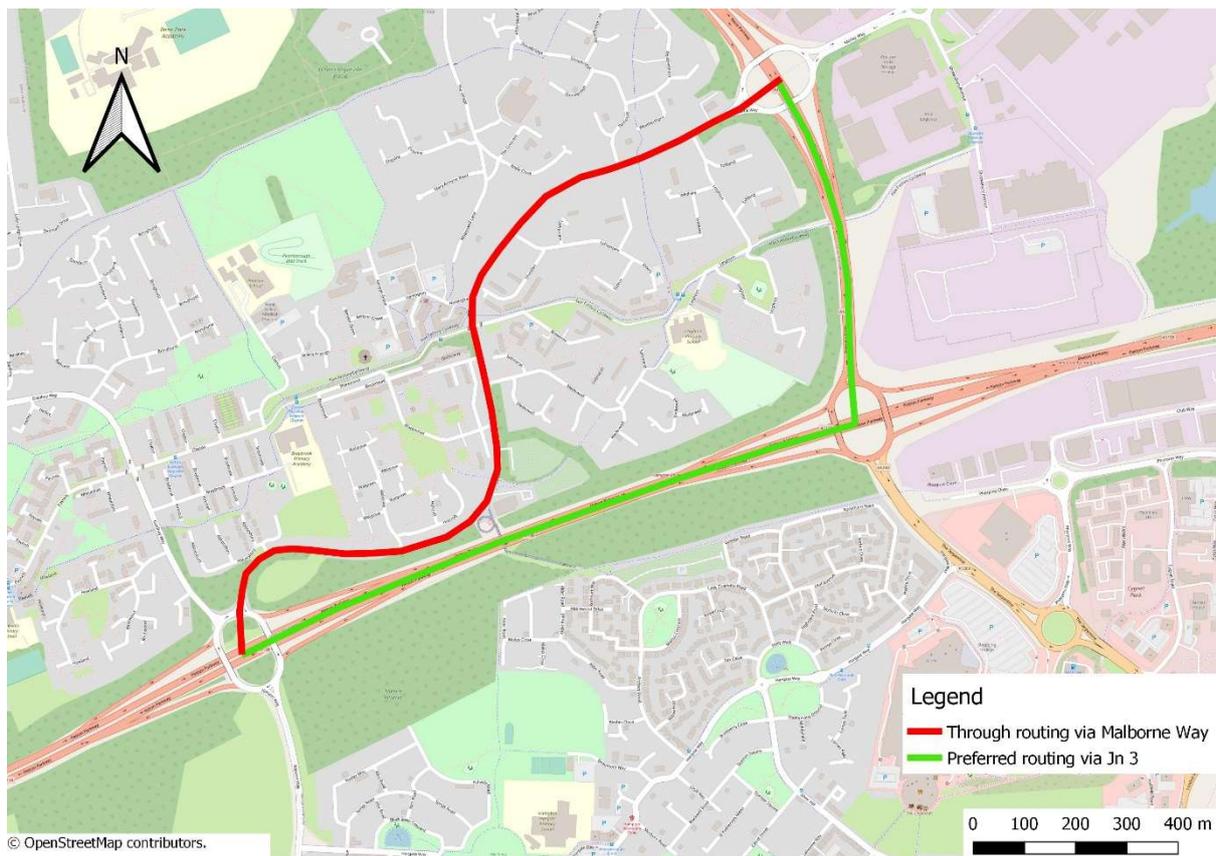


Figure 2.8: Through Route via Malborne Way compared to Preferred Route via Junction 3

Employment Areas

Junction 3 acts as a gateway to major businesses in the Hampton area. Table 2.4 below summarises information about a number of recent and planned developments in the area.

Table 2.4: Development in the Hampton Area

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

Table 2.4 demonstrates that Junction 3 is a key location for growth in Peterborough. Improvements will be necessary in order to accommodate the full growth ambition. If journey times are not improved around Junction 3, it could inhibit the operation of current and prospective businesses, resulting in restriction to their growth which could ultimately cause them to relocate.

Lynchwood Business Park, whilst not located in the study area, will also benefit from improvements to Junction 3. Commuters travelling from between the north of Peterborough and Lynchwood often use Oundle Road as an alternative to the Parkway and Junction 3. Ideally commuters to Lynchwood would use the parkway system (and thus Junction 3), as the parkway is better suited to the volumes than Oundle Road. Improvements to Junction 3 should attract more trips from Oundle Road, which benefits both the Lynchwood commuters and the other present users of Oundle Road (including residents and schools).

2.8. Scheme Objectives

A transport scheme can have both primary and secondary objectives. The primary objectives are the fundamental outputs of why the scheme is being promoted, and therefore must be achieved. Secondary objectives are other outputs that are achieved along the way, but are not necessary to the success of the scheme. The secondary objectives tend to be delivered as a consequence of delivering the primary objectives.

The primary objectives therefore represent the transport outcomes required by the scheme.

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

Although these objectives pre-date those of the CPCA as previously discussed in this chapter, work has been undertaken to build upon the objectives and ensure they align with those of the CPCA.

Primary objectives include:

- **Tackle congestion and improve journey times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3
- **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth across Peterborough is promoted whilst providing for future demand
- **Create wider economic benefits:** Provide conditions that encourage inward investment in higher value employment sectors across Peterborough, and utilise available employment space.

Secondary objectives include:

- **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as the A1260 Nene Parkway and Malborne Way
- **Improve road safety:** Reduce accidents and improve personal security for all travellers around the junction
- **Mitigate the impact of Air Quality on the local environment:** Maintain or improve air quality within the designated study area, as a result of minimising stationary / queuing traffic.

Any schemes developed for Junction 3 will need to satisfy all of the primary objectives, and as many of the secondary objectives as possible.

Both the CPCA and PCC have committed to combatting climate change and moving towards net zero carbon emission in communities and economies, as well as to protect and increase biodiversity. Any transport scheme must take this into account and work towards these objectives. Any scheme identified for Junction 3 will look to mitigate any carbon emission and biodiversity issues throughout the design stage in a number of ways, including but not limited to:

- Tree planting
- Improvements to localised sustainable transport routes
- Use of sustainable material in construction
- Improved ways of working.

All PCC decisions require a Carbon Impact Assessment to be undertaken prior to a project being given the go ahead. This is one of the governance steps the council has setup in relation to it declaring a climate emergency (net zero by 2030) which details what benefits and implications there could be and mitigation measures.

The scheme objectives were compared and aligned to the CPCA objectives and the Council's strategic priorities (also shared by the Council's Core Strategy, Local Plan and the CPCA Local Transport Plan 4), and is illustrated in Table 2.5 below.

2.9. Measures of Success

Table 2.5 beneath sets out the measures for success against which any potential improvements should be monitored. The primary objectives are highlighted in white and the secondary objectives are highlighted in blue.

Table 2.5: Study Objectives and Measures of Success

Objective	Scheme Outcome
Tackle congestion and improve journey time reliability	<ul style="list-style-type: none"> • Reduced congestion and journey time delays on the primary approaches to Junction 3 • Reduced volume of through traffic along Malborne Way.
Support the growth agenda and encourage the development of homes and jobs	<ul style="list-style-type: none"> • 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.
Wider economic benefits	<ul style="list-style-type: none"> • Reduced congestion at Junction 3 Continued / increased level of investment in Peterborough to encourage further development and increase the city's attractiveness.
Positively impact the wider network	<ul style="list-style-type: none"> • Positively impact the interaction between Nene Parkway and Malborne Way.
Improve road safety	<ul style="list-style-type: none"> • Reduce accidents across all modes of transport.
Improve air quality	<ul style="list-style-type: none"> • Reduce air quality problems caused by stationary traffic across the designated study area.

2.10. Constraints

The following constraints for delivery of a scheme at Junction 3 have been identified:

- **Funding:** 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
- **Environmental:** Land to the south-west of Junction 3 is identified as a being a Site of Special Scientific Interest. Deciduous Woodland surrounds most of Junction 3.
- **Topographical:** There are significant level differences around Junction 3, which is approximately 10 - 15m above the level of the A1139 Fletton Parkway
- **Funding / Budget:** Improvements will need to be achievable within the budgets available
- **Structural / Highway Boundary:** Improvements will need to be achievable within the land available. Underpasses positioned around Junction 3 constrain the available space
- **Disapproval from the public or stakeholders:** The scheme should not be considered controversial, and should be capable of gaining support during stakeholder and public consultation.
- **COVID-19** – it is not yet known what impact the COVID-19 pandemic is going to have on how the general public will interact with transport systems moving forward. There is currently no data on how highway demand will be impacted and as such any assumptions made on future traffic growth will need to be considered carefully once more information is known. To mitigate this issue within the Junction 15 scheme, a sensitivity test has been undertaken on the preferred scheme with both Low Growth (possible COVID levels of transport) and High Growth scenarios.

The preliminary design has taken account of these constraints.

2.11. Interdependencies

Improvements to Junction 3 are required as part of a planning application at Serpentine Green, to accommodate improved leisure facilities. These improvements are being considered as part of the wider option development and assessment.

The developer is required to make the following improvements: widening of the flare on the A1260 The Serpentine northbound approach, changes to lane markings on the A1139 Fletton Parkway westbound off-slip to allow a left turn in both lanes, changes to the circulatory carriageway to enable 3 lanes of traffic. Plans of the proposed improvements are in Appendix B.

2.12. Stakeholders

The key stakeholders are considered to be:

- Cambridgeshire and Peterborough Combined Authority (CPCA)
- Peterborough City Council (PCC / The Council)
- Peterborough Highways Services (PHS)
- Highways England (HE)
- The Wildlife Trust
- Emergency services
- Businesses situated in Hampton.

Stakeholder Consultation

Stakeholder consultation will be undertaken by the Project Team following approval of the OBC, and before work commences on the Detailed Design. This consultation will be on the preferred option, and will enable feedback from key stakeholders to be taken into consideration during the Detailed Design stage.

All key Stakeholders will be consulted via email for comments on the preferred option prior to completion of Detailed Design.

Public Consultation

Public consultation on the concept of a scheme at this location has already been undertaken as part of the CPCA Local Transport Plan that was adopted in January 2020.

An online consultation exercise on the final scheme will be undertaken prior to completion of the Detailed Design, and the feedback from this consultation will be included within the design and FBC.

2.13. Options

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 Junction 3 Option Assessment Report (OAR), which was submitted along with the Strategic Outline Business Case in October 2019.

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

A total of ten options were devised, with potential schemes ranging widely in estimated cost and level of impact on the network. These ten options form the 'Long List', and are summarised in Table 2.6.

Table 2.6: Long List of Options for Junction 3

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

EAST Assessment

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

The options were scored against the following CPCA and the council objectives using the EAST framework. Scores were based on the discussion and collective opinion of the workshop delegates. The objectives which were scored against are outlined in Table 2.7 beneath.

Table 2.7: Scheme Objectives

Strategic Objectives
Ability to reduce congestion/ improve journey times
Making the best use of existing infrastructure
Safety Improvements
Ability to support the local growth agenda, including housing and employment growth
Economic Objectives
Affordability (Value for Money)
Scale of impact on local environment (ecology, noise, air)
Management / Deliverability Objectives
Land Acquisition and CPO
Scheme Risk / Buildability
Stakeholder Support

Shortlisting Summary

Table 2.8 summarises the EAST assessment and which options have been shortlisted for progression to the OAR.

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

Table 2.8: Option Shortlisting Summary

Option	Option Description	EAST Score	Shortlisted
1	Provide 3 lanes from Junction 31 to Junction 3 on A1260 Nene Parkway Southbound	7	✓
2	Provision of a bridge from A1260 Nene Parkway to A1139 Fletton Parkway westbound	4	✓
3	Dedicated left from A1260 Nene Parkway to A1139 Fletton Parkway eastbound	4	✓
4	Widening of A1139 Frank Perkins Parkway westbound off-slip to 3 lanes	4	✓
5	Improvements to A1139 Frank Perkins Parkway eastbound on-slip merge	9	✓
6	Lengthen flare on northbound approach of A1260 The Serpentine	2	✓
7	Dedicated left turn lane from A1260 The Serpentine to A1139 Fletton Parkway westbound	1	✓
8	Improve lane markings on the roundabout circulatory and reduce circulatory speeds	3	✓
9	Full Signalisation	9	✓
10	Increase southbound carriageway of Malborne Way to 2 lanes	0	✓

Technical Assessment

The shortlisted options were assessed using a purposely built Aimsun microsimulation model. The 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, in order to represent the most congested time periods.

The base model was built using current traffic data from 2018 and validated well against traffic flow and journey time data.

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

The results from the Junction 3 AIMSUN modelling show the worst delays and longest travel time in both the AM and PM Peak Hour period for 2026 and 2031 forecast years to be the A1260 Nene Parkway southbound approach. In addition, A1260 The Serpentine northbound approach is suffering from significant delays and long travel times in the PM Peak Hour period.

The results show that some of the shortlisted options will have a positive impact on the operation of Junction 3 in the forecast years of 2026 and 2031, however there seems to be no one option that provides a suitable solution for improving the efficiency and journey time reliability at Junction 3. Therefore a package of options has been put together to address as many identified issues as possible. The package encompasses the following improvements:

1. Extend Junction 31 southbound on-slip to Junction 3
2. Add a flare to A1260 Nene Parkway approach to Junction 3 to create a 4 lane approach
3. Add a 4th lane to circulatory between A1260 Nene Parkway southbound approach and A1139 Fletton Parkway eastbound exit
4. Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a 3rd lane
5. Add a 3rd lane to circulatory between A1260 The Serpentine southbound exit and A1260 The Serpentine northbound approach
6. Add a 3rd lane on the A1260 The Serpentine northbound to the north of Hargate Way
7. Add a flare to the A1260 The Serpentine northbound approach to create a 4 lane approach
8. Add 4th lane to circulatory between A1260 The Serpentine northbound approach and A1139 Fletton Parkway westbound on-slip
9. Install traffic signals on the A1260 Nene Parkway southbound approach to Junction 3
10. Install traffic signals on the A1260 The Serpentine approach to Junction 3.

3. The Economic Case

3.1 Introduction

This section sets out the approach taken to assess the Economic Case for the Junction 3 improvement scheme, and proves that the scheme offers **High Value for Money**.

The scheme appraisal focuses on the aspects of scheme performance that are relevant to the nature of the intervention and uses the latest WebTAG guidance. 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.

3.2 Options Appraised

Details of the option development and assessment process are summarised in the Strategic Case and full details are provided in the OAR.

The technical assessment documented in the OAR identifies the package of options as the preferred option, and this was progressed to Preliminary Design and costing, The Economic Assessment has been undertaken on this package.

The key scheme components are listed beneath:

1. Extend Junction 31 southbound on-slip to Junction 3
2. Add a flare to A1260 Nene Parkway approach to Junction 3 to create a 4 lane approach
3. Add a 4th lane to circulatory between A1260 Nene Parkway southbound approach and A1139 Fletton Parkway eastbound exit
4. Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a 3rd lane
5. Add a 3rd lane to circulatory between A1260 The Serpentine southbound exit and A1260 The Serpentine northbound approach
6. Add a 3rd lane on the A1260 The Serpentine northbound to the north of Hargate Way
7. Add a flare to the A1260 The Serpentine northbound approach to create a 4 lane approach
8. Add 4th lane to circulatory between A1260 The Serpentine northbound approach and A1139 Fletton Parkway westbound on-slip
9. Install traffic signals on the A1260 Nene Parkway southbound approach to Junction 3
10. Install traffic signals on the A1260 The Serpentine approach to Junction 3.

The Preliminary Design for this scheme is provided in Appendix B. The package of options is referred to as 'the scheme' for the remainder of the document.

3.3 Economic Assessment

Approach to Appraisal

The Economic Case for this scheme is focused on the following aspects:

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

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

Key Risks, Sensitivities and Uncertainties

The scheme is considered to be low risk in construction terms, especially since the required land is within ownership of PCC. However, sensitivity tests have been undertaken to confirm the robustness of the business case in a lower-growth scenario.

The COVID-19 pandemic has seen a significant drop in highway usage as part of the national lock-down, as no-one knows what overall impact this will have on highway usage and growth moving forward, the low-growth sensitivity test is a way to measure the scheme benefits against a scenario where traffic growth doesn't match pre-COVID-19 levels.

As the benefits of the scheme largely relate to reducing delay to existing and future traffic, a growth in future traffic levels beneath that anticipated is considered to be the greatest risk to the scheme. The sensitivity tests, and their impact on the business case, are detailed later in this chapter.

As part of the scheme design and costing process, a Risk Register and a Quantified Risk Assessment (QRA) have been produced and the risk allowance is incorporated into the scheme costs used within the Economic Assessment. Further details on these costs are provided beneath.

The objective of the scheme is to unlock congestion and significantly reduce delay at a key interchange on the parkway system, positively improving the operational performance of other major routes and junctions on the city network, particularly Nene Parkway, Malborne Way and The Serpentine. As described in the Peterborough LTTS, these improvements will help facilitate the identified growth aspirations set for the city.

Present Value Costs

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

The Economic Assessment has undertaken for a 60 year assessment period (2020 to 2080).

The Base Investment Cost is the capital cost required to construct the scheme in current year (2020) prices, without a risk allowance. This is derived from the scheme cost estimate based on the Preliminary Design produced by Highway and Structures Engineers.

Table 3.1 shows the Base Investment Cost profiled over the next five calendar years, and broken down into Construction, Land, Design and Supervision costs. Note that Construction Cost has been divided into Highways and Structures elements to enable the application of different rates of Optimism Bias within the Economic Assessment.

Table 3.1: Base Investment Cost (2020 Prices)

Calendar Year	Construction Costs (Highways) (£)	Construction Costs (Structures) (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Total Base Investment Cost (£)
2020				439,736	439,736
2021					
2022	3,552,623			484,045	4,036,668
2023					
2024					
Total	3,552,623			923,781	4,476,404

The PVC for use in the Economic Assessment has been calculated using the following steps:

- 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 (5%) by the Annual GDP Factor derived from the TAG Databook (May 2019) for each of the years within the assessment period. The inflation rate of 5% was derived from construction output price indices as well as previous knowledge of costs associated with past schemes in Peterborough. Peterborough Highways Services works is measured using BCIS indices, the Table 3.2 shows the categories and price increase (%) for 2019-2020.

Table 3.2: Inflation increases on Construction Costs 2019-2020

Category	Price increase 2019-2020
WC10/ 1 Routine, Cyclic and Time Charge Works	3.25%
WC10/ 2 Renewals and Construction Works	1.81%
WC10/ 3 Professional Services	3.62%
WC10/ 4 Machine Surfacing	4.23%
WC10/ 5 Hand Surfacing/Patching	3.04%
WC10/ 6 Surface Dressing	5.38%
WC10/ 7 Road Markings	1.76%
WC10/ 8 Street Lighting	1.56%

- A Risk allowance of 20% (£871,281) was then applied during the year of construction based on the QRA contained within the Risk Register. This includes risks associated with post-COVID19 working practices and social distancing requirements, for example additional welfare facilities on site and increased site compound size.
- Optimism Bias was then applied based on the recommended level of the QS. An Optimism Bias of 15% was used to reflect the maturity of the design, and the total Optimism Bias applied was £784,153.
- Costs were then rebased back to 2010 using factors derived from the TAG Databook (May 2019) 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.

Table 3.3 beneath shows the costs described above, split into construction costs and maintenance costs.

Table 3.3: Economic Case Scheme Cost Estimates

Description of Cost Type	Construction Cost (£)	Maintenance Cost over 60 Years (£)
Base Investment Cost	4,476,404	1,562,860
Base Cost with Real Cost Increases	4,750,242	4,206,523
Risk Adjusted Base Cost with Real Cost Increases	5,621,523	4,206,523
Risk Adjusted Base Cost with Real Cost Increases and Optimism Bias	6,405,676	4,206,523
Rebased to 2021 Price Year	5,387,001	3,420,487
Discounted to 2010 Prices	3,597,733	893,352
Adjusted to Market Prices	3,969,328	1,063,089

A full profile for these costs is provided within Appendix C.

Present Value of Benefits

The transport benefits of the scheme were assessed using an Aimsun microsimulation model (Aimsun Next software Version 8.4).

Validation of the model was undertaken using Manual Classified Turning Counts (MCCs) and Automatic Traffic Counts (ATCs) against modelled demand, and modelled Journey times assessed against TomTom data. Full details relating to the calibration and validation of the model can be found in the Local Model Validation Report (LMVR).

Forecast traffic flows were then produced using information from TEMPro (version 7.2b), following the methodology as set out by the DfT's WebTAG guidance Unit A1-1. Two forecast years of 2026, and 2031 were produced to reflect the years used within PCC's Local Plan and to remain consistent with other transport scheme assessments within Peterborough. The purpose of modelling these forecast years was to ensure that the preferred scheme is able to perform with additional traffic that can be reasonably expected in the future, and to understand the level of benefit that the scheme could generate within the sixty year assessment period.

Once a forecast model was created, two core network scenarios were developed, these were the Do Minimum (DM) and Do Something (DS) scenarios. The DM scenario represents future growth without highway intervention (without scheme), and the DS scenario includes the scheme within the model network (with scheme) with the same level of future traffic growth.

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.

The model output files are then entered into the Transport User Benefits Appraisal (TUBA, 1.9.13) software to undertake the Economic Assessment and calculate a BCR.

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 due to the improvements, which reduces the money the government receives in taxes.

This identifies the Present Value Benefits (PVB) to be **£16,453,000**. A breakdown of these benefits are shown in Table 3.4 beneath.

Benefit Cost Ratio

The Benefit Cost Ratio (BCR) is the ratio of PVB to PVC. Table 3.4 beneath summarises the BCR for the preferred scheme as calculated using TUBA.

Table 3.4: TUBA BCR Assessment

Value (£'000s) 2010 prices, benefits discounted to 2010	
Benefits	
Greenhouse Gases	-108
Consumer Users (commuting)	8651
Consumer Users (Other)	4250
Business Users/Providers	3438
Indirect Taxes	222
Present Value of Benefits (PVB)	16,453
Costs	
Broad Transport Budget	5061
Present Value of Costs (PVC)	5061
Net Benefit / BCR Impact	
Net Present Value (NPV)	11,392
Benefit/Cost Ratio (BCR)	3.251

The DfT uses the following thresholds to determine the Value for Money statement associated with a BCR:

- Low Value for Money if BCR = 1.0 to 1.5
- Medium Value for Money if BCR = 1.5 to 2.0
- High Value for Money if BCR = 2.0 to 4.0
- Very High Value for Money if BCR > 4.0.

Based on transport user benefits alone, this scheme will provide **High Value for Money**.

TUBA Benefits Breakdown

As well as providing a BCR, 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. Table 3.5 below shows the time benefits saving by vehicle.

Table 3.5: Non-monetised Time Benefits by Time Saving

NON MONETISED TIME BENEFITS BY TIME SAVING							
Time benefits (thousands of person hrs) by size of time saving							
Vehicle type	Purpose	< -5 mins	-5 to -2 mins	-2 to 0 mins	0 to 2 mins	2 to 5 mins	> 5 mins
Car	Business	-4	-55	-108	187	114	202
Car	Commuting	-22	-304	-602	1042	634	1119
Car	Other	-23	-324	-638	1109	679	1215
LGV Freight	Business	-3	-55	-143	201	173	88
LGV Freight	Commuting	0	0	0	0	0	0
LGV Freight	Other	0	0	0	0	0	0
OGV1	Business	-1	-21	-24	41	52	5
OGV1	Commuting	0	0	0	0	0	0
OGV1	Other	0	0	0	0	0	0

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

Table 3.6 below shows the time benefits by distance.

Table 3.6: 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
Car	Business	8	328	0	0
Car	Commuting	46	1822	0	0
Car	Other	49	1970	0	0
LGV Freight	Business	10	251	0	0
LGV Freight	Commuting	0	0	0	0
LGV Freight	Other	0	0	0	0
OGV1	Business	3	49	0	0
OGV1	Commuting	0	0	0	0
OGV1	Other	0	0	0	0

The table shows that those making localised trips (1-5km) benefit most from the proposed scheme. As with the time savings, car users experience the greatest benefits, mostly those who commute or travel for other purposes.

Table 3.7 below shows that the scheme benefits are greater in the PM than the AM peak, but both peaks have significant benefits.

Table 3.7: User Benefits by Time Period

User benefits and changes in revenues total. £000s.	
Period	User Time
AM	2,953
PM	13,230

3.4 Sensitivity Test

Sensitivity testing has been undertaken to determine whether or not the proposed scheme could still achieve value for Money if the expected road traffic growth differs from current predictions. The low growth scenario represents the possible post COVID-19 growth, although not enough is yet known about how transport will be affected. This testing has been undertaken by using figures from TEMPro (version 7.2b), to feed 'low' and 'high' growth scenarios into the model. This is done by changing the increase in trips in the forecast matrices.

The trip matrix totals are displayed in Table 3.8 below, and represented graphically in Figure 3.1 and Figure 3.2 below.

Table 3.8: Number of Trips in Low, Central, and High Growth Scenarios

Total Number of Trips by Scenario			
AM	Low	Central	High
2018	14,153	14,153	14,153
2026	14,508	15,508	16,509
2031	14,943	16,219	17,494
PM	Low	Central	High
2018	14,442	14,442	14,442
2026	14,810	15,832	16,853
2031	15,270	16,572	17,873

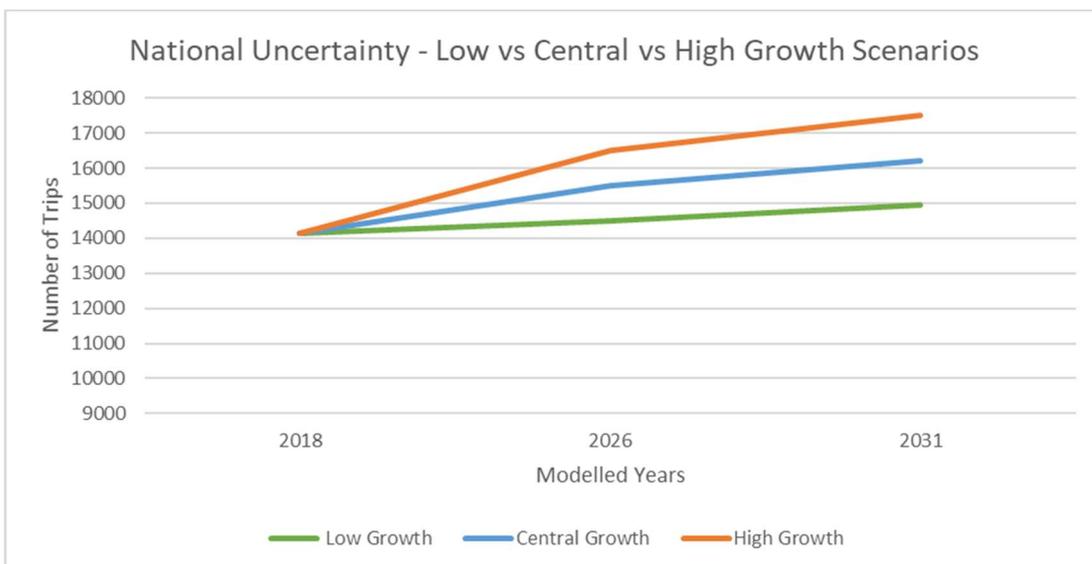


Figure 3.1: AM Peak Hour: Total Number of Trips in Model

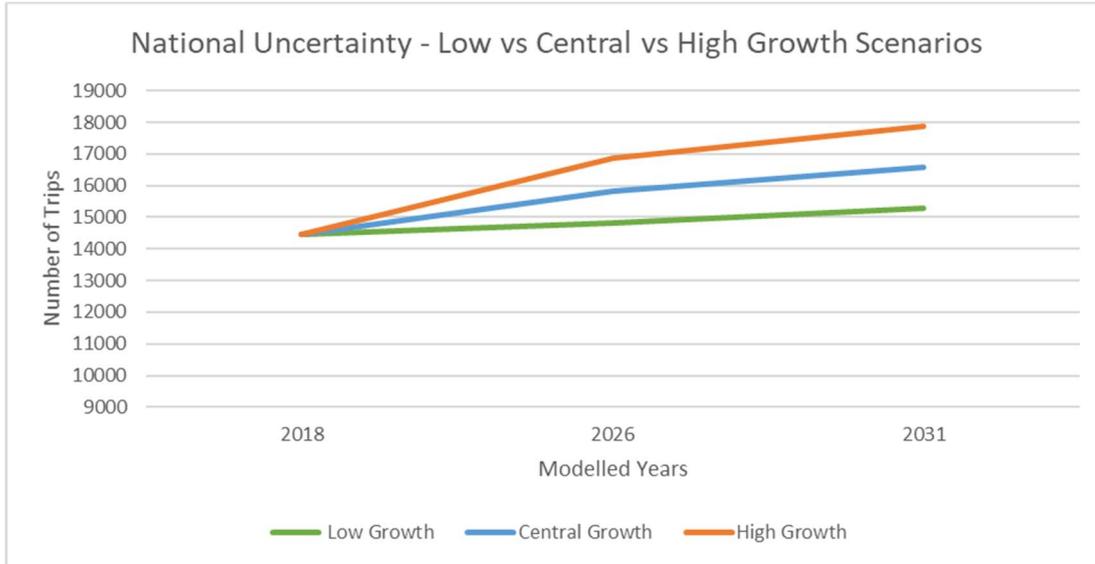


Figure 3.2: PM Peak Hour: Total Number of Trips in Model

Once assigned, the Economic Assessment was repeated with the low and high growth scenarios 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 BCR for each of the growth ranges used in the sensitivity test is presented in Table 3.9 below.

Table 3.9: Changes in Benefits under different Growth Scenarios

BCR Component	Low Growth	Central Growth	High Growth
PVC (£)	5061	5061	5061
PVB (£)	28,093	16,453	2875
NPV (£)	23,032	11,392	-2186
BCR	5.551	3.251	0.568

The modelling demonstrates that the proposed scheme returns Very High Value for Money in a low growth scenario. The benefit is diminished in a high growth scenario, however a review of the traffic modelling has identified that the benefit is suppressed by the lack of signal optimisation across the junction, and this will be investigated further during the next stage of assessment with the support of traffic signal specialists. However, a high growth scenario at this junction is considered to be highly unlikely in the wake of the Coronavirus pandemic, and given other network constraints surrounding Junction 3.

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

3.5 Additional Qualitative Appraisal

Due to the nature of the scheme, the appraisal and Value for Money assessment has focused on transport user benefits.

However, a qualitative analysis has been undertaken for the environmental, social and distributional impacts of the Junction 3 scheme where appropriate. These are summarised beneath, and included within the Appraisal Summary Table (AST) contained within Appendix D.

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 transport user benefits.

Landscape

Fletton Parkway J3 Site (Junction 3 Northern Arm) - The scheme would affect a limited strip of the vegetation flanking the southbound highway, but this would not have a significant effect on the enclosed character of the site or the views into/out of the site. Enough vegetation would be retained and, combined with replacement planting (if possible), would ensure that the existing landscape character is maintained.

The design of the scheme should consider whether there is scope for any additional or replacement planting to be included in the new highway and verge layout.

Fletton Parkway J3 Site (Junction 3 Westbound Off-slip) - The scheme would affect a limited strip of the scrubby, low value vegetation flanking the westbound highway, but this would not have a significant effect on the character of the site or the views into/out of the site. Some vegetation would be retained and, combined with replacement planting (if possible), would mean that the existing landscape character is maintained. A net gain in planting is likely to be possible (subject to landownership agreement) as space within the rough grassland area could be utilized for additional planting.

The design of the scheme should consider whether there is scope for any additional or replacement planting to be included in the new highway and verge layout.

Fletton Parkway J3 Site (Junction 3 Southern arm) - The scheme would require regrading works on the embankment to the immediate south west of the northbound carriageway along this section, and this would result in the removal of part of the scrubby vegetation at the top of the embankment and also some of the tree planting on the side of the embankment. This would cause temporary effects of a Slight adverse nature in this area although the character of the highway and surrounds would remain similar in the long term if replacement planting could be put in place once all construction works are finished.

The works would cause temporary adverse visual effects on a number of residents in properties facing to the northeast, with good views of the embankment, including those along the north eastern part of Buckthorn Road and those in Royce House, located between Hedda Drive and Hargate Way. Removal of embankment vegetation and constructions works related to embankment regrading/reconfiguration would be immediately evident to residents and also people using the public path adjacent to Buckthorn Road.

The design of the scheme should consider whether there is scope for any additional or replacement planting to be included in the new embankment and verge layout.

Heritage

Overall, appraisal of the historic environment baseline has identified that the area has a high archaeological potential due to the known buried archaeological remains nearby from the prehistoric period onwards. There has been significant development in the area during Peterborough's New Town expansion phase, which may have already partially or completely removed any buried archaeological remains. For example, construction of Fletton Parkway, Nene Parkway and the residential and commercial areas nearby will have likely impacted to a depth which could disturb or remove archaeological remains.

The potential impact which has been identified by the proposed Junction works would be a direct, physical, impact to buried archaeological remains, if present. This potential impact would occur as a result of the new infrastructure (i.e. a new lane and associated works).

No impact to the setting of heritage assets has been identified due to the proposed works.

Arboriculture

Ornamental planting is in evidence at this junction. However, there is an area of woodland which accompanies the path that leads long Fletton Parkway that forms part of the Orton Pit Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). Furthermore, the trees to the north-west adjacent to Orton Marlborne and the area of woodland within the Orton Pit SSSI are both identified as Deciduous Woodland on the Priority Habitat Inventory. In addition, a felling license is in effect for these areas.

The proposed scheme will not result in significant changes to the existing environment, for instance lighting levels will generally remain the same as currently experienced. There will be losses to the tree cover, however these would be minimised where possible through the adherence to an arboricultural method statement that would be supervised by an arboriculturalist. Furthermore, it is recommended that any trees that are removed are replaced on completion of the works.

Ecology

Although the proposed works are not located within a statutory designated site for conservation, Orton Pit Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) is within 60-70m at its closest point. This site is afforded protection for its population of great crested newt, network of meso-eutrophic standing water and nationally rare and scarce stonewort plant species. Consultation with Natural England will be required to discuss the proposals and agree any mitigation (or licensing) requirements that may be required.

Noise

The potential noise impacts associated with the highways improvements at Junction 3 were assessed using the WebTAG Guidance (Unit A3.2 Noise Impacts, DfT, August 2019).

The study area was determined by identifying affected links within the network in accordance with the DMRB criteria and incorporated an area of up to 1km around the proposed works areas. Noise levels due to road traffic were calculated at properties within 600m of the principal routes identified as having significant changes in traffic/alignment due to the proposed scheme. This included a total of 2023 properties.

The results of the noise assessment for Junction 3 indicate no change in the short term noise levels at the noise sensitive receptors as a result of the highways improvement works. Although there are areas where the localised changes in road alignment will bring roads slightly closer to noise sensitive properties, this will be mitigated by the improved road surface.

Both long-term assessments (with / without scheme) indicated an increase in noise level. In the 'without scheme' an increase in noise level is not unexpected due to the increase in flow of traffic within the study area (up to 18%). The 'with scheme' showed a similar increase in noise level which is also considered to be largely due to the increase in traffic with the localised changes in road alignment and road surfacing balancing out additional changes in noise level.

The increase in noise level is predicted to be less than 1dB in both the long-term with / without scheme assessments, and therefore no additional noise mitigation is considered necessary as a result of the scheme.

Summary of Benefits and Costs

The immediate benefit of a scheme will be less delay and more reliable journey times for vehicles using Junction 3, particularly in peak periods.

The additional capacity delivered by a scheme in this critical strategic location on Peterborough's parkway network will contribute toward the delivery of the housing and employment growth identified within Peterborough's Local Plan, as demonstrated by the Peterborough LTTS (Long Term Transport Strategy).

The scheme costs relate to design and construction costs, as well as ongoing maintenance costs for the additional infrastructure created by the scheme.

The PVB is expected to be **£16,453,000**. The scheme PVC have been identified as **£5,061,000**. The scheme BCR is **3.251**.

Value for Money Statement

The Economic Assessment has shown that the scheme will provide **High Value for Money**.

4. The Financial Case

4.1 Introduction

This section of the report presents the Financial Case for Junction 3 improvements. It concentrates on the affordability of the proposal and its funding arrangements.

4.2 Scheme Costing

The scheme cost estimates have been prepared in line with WebTAG (March 2019) guidance set out in TAG Unit A1.2 Scheme Costs (DfT, July 2017), and each of the steps taken to produce the cost estimate required for both the Financial Case and the Economic Case are explained beneath. The estimate has been robustly costed based on Preliminary Design information, and includes a quantified risk register.

The scheme cost estimates are presented in Table 4.1 beneath, and each is explained in further detail beneath.

Table 4.1: Scheme Cost Estimates

Description of Cost Type	Cost (£)
Base Investment Cost	4,476,404
Risk Adjusted Base Cost	5,347,684
Risk Adjusted Base Cost with Construction Industry Inflation (Outturn Cost)	5,850,749
Inflated Risk Adjusted Costs incorporating Whole Life Costs (60 year assessment period)	15,657,378

Note that the costs calculated for use within the Economic Assessment are presented in the Economic Case.

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

Base Investment Cost

The Base Investment Cost is the capital cost required to construct the scheme in current year (2020) prices, without a risk allowance. This is derived from the scheme cost estimate provided by the Quantity Surveyor and based on the Preliminary Design produced by Highway and Structural Engineers.

Table 4.2 shows the Base Investment Cost profiled over the next five calendar years, and broken down into Construction, Land, Design and Supervision, and Other costs. Note that Construction Cost has been divided into Highways and Structures elements to enable the application of different rates of Optimism Bias within the Economic Assessment.

Table 4.2: Base Investment Cost (2020 Prices)

Calendar Year	Construction Costs (Highways) (£)	Construction Costs (Structures) (£)	Land & Property Costs (£)	Preparation and Supervision Costs (£)	Total Base Investment Cost (£)
2020				439,736	439,736
2021					
2022	3,552,623			484,045	4,036,668
2023					
2024					
Total	3,552,623			923,781	4,476,404

The scheme Base Investment Cost in 2020 prices is £4,476,404, this includes £3,552,623 of Construction related costs and £923,781 of Detailed Design and Supervision Costs (£439,736 Design / £484,045 Supervision). The Detailed Design costs include all necessary surveys and an allowance to develop a Full Business Case upon completion of the Detailed Design.

The cost profile is based upon the construction programme shown in Appendix F and assumes that Detailed Design work will be undertaken between July and December 2020, with Construction and Supervision beginning in January 2022 and lasting for twelve months.

Note that the scheme is scheduled for construction in January 2022 to avoid conflicting with the construction of the Junction 15 scheme at the northern end of the A1260 Nene Parkway between April and November 2021.

There are no land or property costs associated with this scheme, as all the required land is within Peterborough City Council's ownership.

Risk Adjusted Base Cost

The Risk Adjusted Base Cost includes a component for risk based upon the Quantified Risk Assessment (QRA). The Risk Allowance made for this scheme is £871,281, which represents 20% of the total scheme cost. The Risk Register demonstrates how this has been calculated, and is shown in Appendix G. Table 4.3 beneath shows the inclusion of the QRA within the scheme costs.

Table 4.3: Risk Adjusted Base Costs (2020 Prices)

Calendar Year	Construction Costs (Highways) (£)	Construction Costs (Structures) (£)	Preparation and Supervision Costs (£)	Risk Allowance (£)	Risk Adjusted Base Cost (£)
2020			439,736		439,736
2021					
2022	3,552,623		484,045	871,281	4,907,948
2023					
2024					
Total	3,552,623		923,781	871,281	5,347,684

The addition of the Risk Allowance takes the Risk Adjusted Base Cost to £5,347,684.

Inflated Risk Adjusted Cost (Outturn Cost)

The Inflated Risk Adjusted Cost, or Outturn Cost, takes is the Risk Adjusted Base Cost with construction industry applied. An inflation rate of 5% per annum has been used based on the Office for National Statistics (ONS) Construction Output Price Indices⁷ (2019 / Q4) for the 'New Work/Infrastructure). The inflation rate of 5%, as well as being derived from Construction Output Price Indices was derived using previous knowledge of costs associated with past schemes in Peterborough. Peterborough Highways Services works is measured using BCIS indices, Table 4.4 shows the categories and price increase (%) for 2019-2020.

Table 4.4: Inflation increases on Construction Costs 2019-2020

Category	Price increase 2019-2020
WC10/ 1 Routine, Cyclic and Time Charge Works	3.25%
WC10/ 2 Renewals and Construction Works	1.81%
WC10/ 3 Professional Services	3.62%
WC10/ 4 Machine Surfacing	4.23%
WC10/ 5 Hand Surfacing/Patching	3.04%
WC10/ 6 Surface Dressing	5.38%
WC10/ 7 Road Markings	1.76%
WC10/ 8 Street Lighting	1.56%

Inflation has been applied in line with the Construction Programme (Appendix F), and the cost of this is presented beneath in Table 4.5.

Table 4.5: Inflated Risk Adjusted Cost (2020 Prices)

Calendar Year	Risk Adjusted Base Cost (£)	Cost of Inflation (£)	Total with Inflation (£)
2020	439,736		439,736
2021			
2022	4,907,948	503,065	5,411,013
2023			
2024			
Total	5,347,684	503,065	5,850,749

The cost of inflation is £503,065, all of which is accrued during 2022 when Construction and Supervision costs (with QRA) are scheduled to occur, and brings the Scheme Outturn Cost to £5,850,749.

The Outturn Cost represents the amount required by PCC to deliver the scheme.

⁷ <https://www.ons.gov.uk/businessindustryandtrade/constructionindustry/datasets/interimconstructionoutputpriceindices>

Inflated Risk Adjusted Cost Including Whole Life Costs

Maintenance costs have been calculated for the 60 year assessment period taking account of construction industry inflation.

Maintenance costs have only been included for the new infrastructure associated with the scheme. All maintenance costs associated with the existing infrastructure will continue to occur separate to the Junction 3 scheme, and so have not been included within the assessment. Funding for the Maintenance costs are not requested as part of the scheme funding.

The annual maintenance cost used to calculate the Whole Life Costs is £26,489.

Maintenance costs have been calculated using records of all maintenance, repair and capital renewal costs for the A1260 Nene Parkway for the ten year period for 2010 to 2020. Costs relating to repairs following Road Traffic Collisions and correction work to the Vehicle Restraint System have been removed from these costs. Note that capital renewal costs have not been separated from the routine maintenance costs and separately profiled.

The costs for the ten year period were then used to calculate an average per year. As the costs supplied were for the entire 3.5km length of the A1260 Nene Parkway, they have been divided by 3500 to provide a cost per metre. This cost per metre was then multiplied by the length of new carriageway being created as part of the scheme (approx. 688m).

The annual maintenance costs have then been calculated for the 60 year assessment period, and then inflated using the same 5% rate applied to the Inflated Risk Adjusted Cost. The resultant costs are shown in Table 4.5 beneath.

Table 4.6: Calculation of Whole Life Maintenance Costs

Whole Life Maintenance Costs	Cost (£)
Maintenance Cost per year	26,489
Maintenance Cost for 60 Assessment Period (without inflation)	1,562,860
Maintenance Cost for 60 Assessment Period (with inflation)	9,806,629

Table 4.6 beneath shows the total Inflated Risk Adjusted Cost Including Whole Life Costs.

Table 4.7: 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)	2020 - 2021	5,850,749
Inflated Whole Life Costs	2022 - 2080	9,806,629
Inflated Risk Adjusted Cost Including Whole Life Costs	2020 - 2080	15,657,378

The Inflated Risk Adjusted Cost Including Whole Life Costs over the 60 year assessment period is £15,657,378. The Outturn Cost required by PCC to deliver the scheme is £5,850,749.

The full 60 year schedule showing how these costs have been calculated is shown in Appendix C.

4.3 Budgets and Funding Cover

Funding Cover

It is anticipated that the full scheme Outturn Cost of £5,850,749 will be funded by the CPCA from the Single Investment Fund. The CPCA have confirmed that the full funding is available and matches the funding profile provided.

The CPCA have an infrastructure delivery budget of £20 million per year, allocated for the next 30 years. This funding will be invested into the Cambridgeshire and Peterborough Single Investment Fund, in order to boost growth within the region. The CPCA have committed to providing £16 million of funding within its first four years, to complete major highway improvements that decrease congestion and support local growth. No local or developer contribution is available for this scheme.

Completion of the Business Case

Subject to acceptance of the Outline Business Case, the next stage of scheme development is completion of a Detailed Design and production of a Full Business Case. Costs for these tasks are currently included within the scheme costs reported in this chapter and the Value for Money assessment undertaken within the Economic Case, however funding to progress the Detailed Design and Full Business Case needs to be secured to enable this work to progress.

Peterborough City Council request that the Design Cost of £439,736 is released in advance of the funds required for construction, in order to undertake the Detailed Design and produce a Full Business Case. This work is provisionally programmed to be undertaken between July 2020 and January 2021, with a view to commencing on site in January 2022. These costs would be discounted from the Scheme Cost estimates during the FBC.

5. The Commercial Case

5.1 Introduction

The Commercial Case demonstrates that the scheme can be reliably procured and implemented through existing channels whilst ensuring value for money in delivery of the scheme.

5.2 Output Based Specification

The Junction 3 Options Assessment Report (OAR) details the work undertaken to develop multiple improvement options at this location, and the modelling undertaken to identify the preferred scheme.

The Junction 3 OAR discusses the process through which the preferred scheme has been identified. The scheme will include the following outputs:

1. Extend Junction 31 southbound on-slip to Junction 3
2. Add a flare to A1260 Nene Parkway approach to Junction 3 to create a 4 lane approach
3. Add a 4th lane to circulatory between A1260 Nene Parkway southbound approach and A1139 Fletton Parkway eastbound exit
4. Add a flare of 150m to A1139 Fletton Parkway westbound off-slip to create a 3rd lane
5. Add a 3rd lane to circulatory between A1260 The Serpentine southbound exit and A1260 The Serpentine northbound approach
6. Add a 3rd lane on the A1260 The Serpentine northbound to the north of Hargate Way
7. Add a flare to the A1260 The Serpentine northbound approach to create a 4 lane approach
8. Add 4th lane to circulatory between A1260 The Serpentine northbound approach and A1139 Fletton Parkway westbound on-slip
9. Install traffic signals on the A1260 Nene Parkway southbound approach to Junction 3
10. Install traffic signals on the A1260 The Serpentine approach to Junction 3.

Preliminary Design work has been completed on the scheme, and the General Arrangement (GA) drawing for this is provided in Appendix B. Further design information is available upon request.

This scheme will meet all of the primary scheme objectives outlined in the Strategic Case. Details of how the scheme will be measured against these objectives are provided in the Benefits Realisation Plan (BRP) and Monitoring and Evaluation Plan (MEP) discussed within the Management Case.

5.3 Procurement Strategy

All phases of the scheme, including Detailed Design, Construction and Site Supervision will be delivered in house by Peterborough Highway Services (PHS).

PHS is a ten-year NEC3 Term Service Contract between PCC and Skanska, with responsibility for improving and maintaining Peterborough's highway network. The collaboration began in 2013 and runs to 2023, with the possibility of a further ten-year extension.

PHS 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.

Market Maturity

PHS has successfully developed and delivered multiple highway schemes around Peterborough since the beginning of the contract in 2013, including several CPCA schemes. PHS has been responsible for all planning and design work undertaken on the Junction 15 scheme to date.

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

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

Contract and Payment Mechanisms

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.

The following Payment Mechanisms will be used:

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

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.

Contract Length

The Construction Programme (Appendix F) sets out a twelve-month construction programme for the scheme, with work on site beginning in January 2022.

A high-level overview of the project timescales is provided in Table 5.1 beneath. Note that timescales relating to CPCA review and approval are assumed, and have not yet been agreed.

Table 5.1: Project Implementation Timescales

Timescale	Activity
May 2020 – July 2020	Outline Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding to undertake Detailed Design and produce a Full Business Case.
July 2020 – January 2021	Detailed Design undertaken and Full Business Case produced.
February 2021 – March 2021	Full Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding for scheme construction.
Jan 2022 – Dec 2022	Mobilisation, construction and demobilisation.

The construction of a scheme at Junction 3 is subject to CPCA approval and the availability of funding, however it is anticipated that it will be delivered within the initial lifespan of PHS.

Risk Allocation and Management

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.

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 Case.

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 Framework⁸.

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

Contract Management

Project Progress Meetings and existing governance arrangements such as the Peterborough Highways Project Board will be used to monitor the delivery of the scheme and all commercial arrangements relating to this.

PCC will both nominate a Project Manager to work closely with the delivery team throughout the project. The Project Manager will be responsible for the delivery of the scheme.

Performance monitoring and key decisions will be managed by the PHS Project Board which meets on a monthly basis to discuss progress and matters relating to live and upcoming schemes.

Governance between PCC and the CPCA will be managed through progress meetings and monthly highlight reports in line with the CPCA's Assurance Framework.

⁸ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Assurance-Framework-Publication-Nov-2019.pdf>

Further details of how PHS will manage the contract are set out within the Management Case.

Benefits of Procurement Strategy

Procuring the scheme directly through the PHS contract enables PCC to appoint a contractor to construct the scheme 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.

6. The Management Case

6.1 Introduction

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

6.2 Evidence of Similar Projects

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.

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

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

This scheme was constructed between summer 2016 and spring 2017, and involved fully signalling 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 pinchpoint and to enable nearby housing growth.

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.

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.

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

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

This scheme was constructed between spring 2014 and summer 2015 and consisted of the widening of the A1139 Fletton Parkway from two to three lanes between the A1 (M) and Junction 2 in Peterborough to provide significant and critically needed capacity improvements. The total cost of the scheme was £18 million, funded through the Greater Cambridgeshire and Greater Peterborough Local Enterprise Partnership, Developer Funding and Council Capital Funding.

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



Figure 6.2: Junction 17 Improvement

6.3 Programme / Project Dependencies

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

- **Programme Constraints:** the construction programme will need to carefully consider any other infrastructure works that may be underway on the highway network during the same period. The programme will be planned to avoid works that may compound the disruption caused to road users as a result of the Junction 3 scheme, although this will be limited through the careful planning of traffic management arrangements.
- **Construction Disruption:** The Council have significant recent experience of undertaking maintenance and delivering improvements on its highway network, particularly on the Parkway network, and is proficient in mitigating the impact of this.
- **Utility Diversions:** initial site 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 utilities companies will begin 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

The CPCA are the organisation ultimately responsible for the delivery of the Junction 3 scheme, and the Council are nominated as the delivery partner.

Delivery of the scheme will be managed by a Project Team led by a PCC Project Manager, and consisting of all the key project delivery partners. The Project Team will be responsible for the daily running of the project, coordinating with all key stakeholders, and managing the delivery programme.

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

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

The Project Management Team will be responsible for delivery and day-to-day management of the consultants and contractors. They will co-ordinate 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
- Early Contractor Involvement (ECI) and Scheme delivery.

The key roles and lines of accountability for the development and delivery of the scheme are shown beneath in Figure 6.3.

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

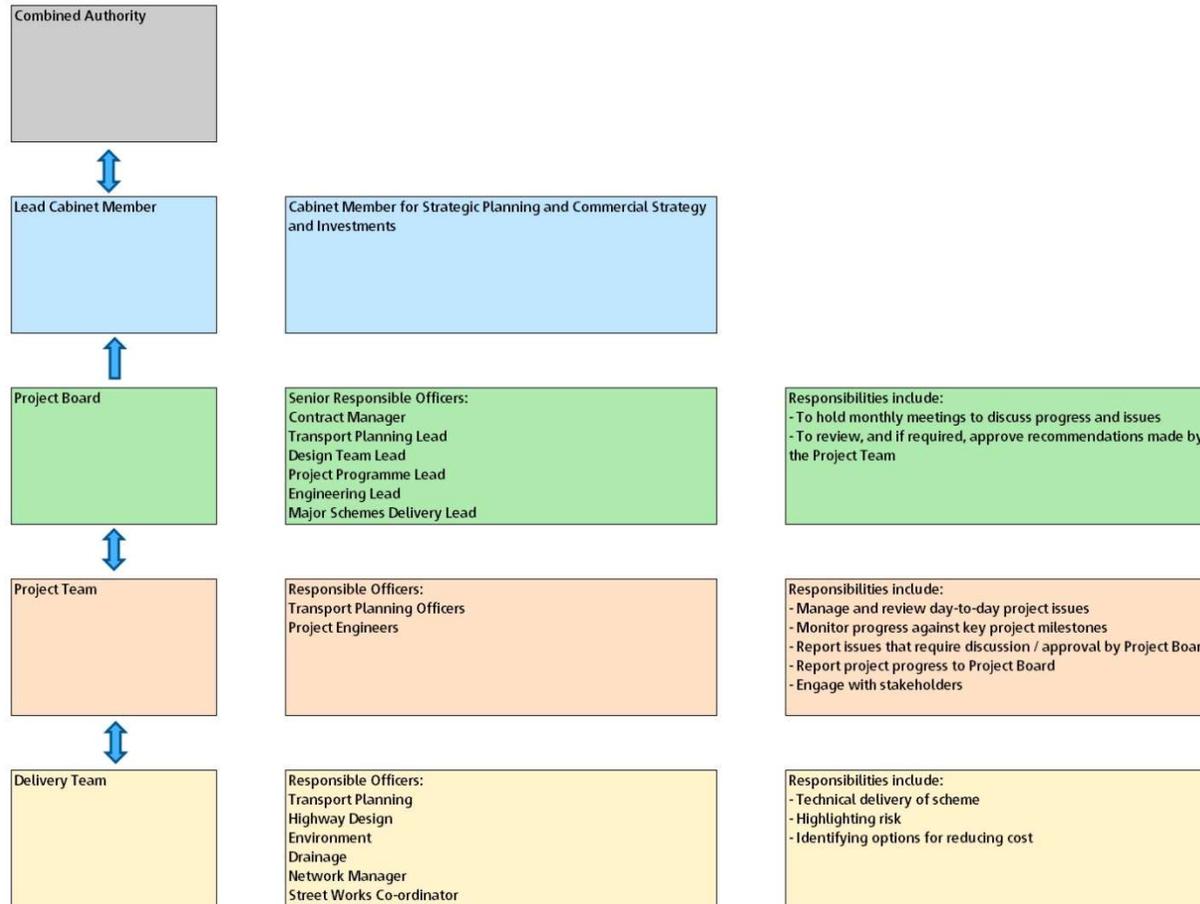


Figure 6.3: Key Project Roles and Responsibilities

6.5 Programme / Project Reporting

The Project Manager will report how the project is performing against the project objectives / key milestones. This will be completed using established finance and programme management tools such as Verto and reported on a regular basis to the Project Board.

Every month the Project Manager will also submit a highlight report to the CPCA recording what progress has been made and whether there are any new risks that could impact the scheme. 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.

Regular Project Progress Meetings will be 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

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

Table 6.1: Key Project Milestones

Timescale	Milestone Activity
May 2020 – July 2020	Outline Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding to undertake Detailed Design and produce a Full Business Case.
July 2020 – January 2021	Detailed Design undertaken and Full Business Case produced.
February 2021 – March 2021	Full Business Case reviewed by CPCA and approval sought from CPCA board for the release of funding for scheme construction.
Jan 2022 – Dec 2022	Mobilisation, construction and demobilisation.

These dates are indicative only and assume that funding will be available to progress each of the stages.

In addition to the project programme, a detailed construction programme is included within Appendix F. The programme shows that the scheme would take twelve months to construct.

6.7 Assurance and Approvals Plan

The Council will manage the project in line with their existing assurance and approvals process. The Project Manager will be responsible for the daily running of the project, and any approvals required will be provided by the Project Board.

Technical Assurance is provided by the CPCA's technical assurance framework, and each stage of the project is 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

Communication and Stakeholder engagement will consist of:

- Providing regular updates on delivery progress and key activities for the local community, businesses, and key stakeholder
- Engaging with the local community, businesses, and key stakeholders regarding delivery. This is to ensure local needs are taken into account throughout the duration of the project
- Ensuring information is shared using appropriate methods of communication to all sectors of the community, business, and key stakeholders.

Project Liaison Officer

A designated Project Liaison Officer will be assigned to the scheme throughout the public consultation period and during construction and act as a single point of contact for outgoing and incoming communication. The PLO will be attached to the scheme delivery team and their responsibilities will include issuing progress updates via email and social media in the lead up to, and during construction, and coordinating responses to members of the public and key stakeholders when queries are raised.

Stakeholder Consultation

Stakeholder consultation will be undertaken by the Project Team following approval of the Outline Business Case, and before work commences on the Detailed Design. This consultation will be on the preferred option, and will enable feedback from key stakeholders to be taken into consideration during the Detailed Design stage.

The key stakeholders identified for this consultation event include:

- Cambridgeshire and Peterborough Combined Authority (CPCA)
- Peterborough City Council (The Council)
- Peterborough Highways Services (PHS)
- The Wildlife Trust
- Emergency services
- Businesses situated in Hampton.

All key Stakeholders will be consulted via email for comments on the preferred option prior to completion of Detailed Design. Key Stakeholders will also be communicated to regularly throughout the construction phase by the PLO.

Public Consultation

Public consultation on the concept of a scheme at this location has already been undertaken as part of the CPCA Local Transport Plan⁹ that was adopted in January 2020.

An online consultation exercise on the final scheme will be undertaken following approval of the OBC, and prior to completion of the Detailed Design. The feedback from this consultation will be included within the FBC and reflected in the Detailed Design. No residents are directly affected by this scheme.

6.9 Risk Management Strategy

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. The Risk Register identifies potential risks, considers the impact they may have, the likelihood of them occurring, and the measures that will be taken to mitigate these.

The Risk Register is a live document and is reviewed regularly at progress meetings and updates are reported to the CPCA through the monthly Highlight Reports.

6.10 Scheme Evaluation Plan (Benefits Realisation and Monitoring)

This Scheme Evaluation Plan for the Junction 3 study has been prepared prior to scheme construction to set out guidance detailing how this scheme's effects should be evaluated, following implementation of the scheme.

The Scheme Evaluation Plan comprises the Benefits Realisation Plan and the Monitoring and Evaluation Plan.

The purpose of the Scheme Evaluation Plan is to clearly set out which indicators should be monitored to verify that the scheme achieves its objectives. Post monitoring is important for determining that the scheme has been successful.

Expected Benefits

The scheme objectives, outputs and outcomes are summarised below. These objectives are described within the Strategic Case and explain what the scheme is expected to deliver.

⁹ <https://cambridgeshirepeterborough-ca.gov.uk/assets/Transport/Draft-LTP.pdf>

Primary objectives include:

- **Tackle congestion and improve journey times:** Tackle congestion and address journey time delays on the primary approaches to Junction 3
- **Support Peterborough's growth agenda:** Ensure that the planned employment and housing growth across Peterborough is promoted whilst providing for future demand
- **Create wider economic benefits:** Provide conditions that encourage inward investment in higher value employment sectors across Peterborough, and utilise available employment space.

Secondary objectives include:

- **Positively impact traffic conditions on the wider network:** Positively impact the performance of local routes impacted by the traffic and congestion in and around Junction 3, such as the A1260 Nene Parkway and Malborne Way
- **Improve road safety:** Reduce accidents and improve personal security for all travellers around the junction
- **Mitigate the impact of Air Quality on the local environment:** Maintain or improve air quality within the designated study area, as a result of minimising stationary / queuing traffic.

Benefits Monitoring and Evaluation

The Monitoring and Evaluation plan for the Junction 3 Improvement Scheme takes a proportionate and targeted approach, which will aim to demonstrate how the scheme has performed in relation to its objectives and intended outcomes. The principal aims of Monitoring and Evaluation are to determine whether a scheme has been delivered as planned and whether it has delivered the expected benefits. Where outcomes differ from those expected, data collected for Monitoring and Evaluation evidence base will assist in understanding the reasons for this and the lessons that can be learnt.

Monitoring and evaluation of the schemes performance against its objectives must be undertaken to determine whether the scheme has been a success. Details of how this will be measured are provided in Table 6.2 beneath.

Table 6.2: Benefits Realisation Monitoring

	Indicator / Metrics	Source	Reporting Programme			Ownership	Indicative Cost
			Baseline	Implementation	Post Implementation		
Inputs							
Scheme Funding	CPCA Funding	CPCA Funding submission Final Scheme Cost Data	Planned	Actual	-	PCC	
Outputs							
Infrastructure	Infrastructure delivered as part of the scheme	Site Inspection	Jan 2022	May 2022	May 2023	PCC	£500
Outcomes							
Tackle congestion	Average AM and PM peak journey time	Trafficmaster / Tom Tom data	Planned for Spring 2022		Summer 2023	PCC	£500 cost to process the data
Address journey time reliability on the primary approaches to junction 3	Queue Length Data	Automatic Traffic Counters Video survey footage	Planned for Spring 2022		Summer 2023	PCC	£1000 cost of surveys and processing data
Improve journey time reliability for public transport users	Bus punctuality data	Local bus companies	Planned for Spring 2022		Summer 2023	PCC	
Improved Road Safety	Number of KSI incidents	Peterborough database of road traffic records	Planned for Spring 2022		Summer 2023	PCC	£250 cost to process the data
Improving Air Quality	Air quality data	PCC air quality monitoring	Available at PCC		Summer 2023	PCC	£250 cost to process the data
Support Growth Agenda encouraging new homes and jobs	Local economic growth and development figures post scheme opening	PCC Planning Portal Local and regional economic reports	Available on-line		Summer 2027	PCC/CPCA	£250 cost to process the data
Create Wider Economic Benefits							
Reporting							
Baseline and Year 1 reports summarising the outcomes of the monitoring and evaluation work			2022		2024	PCC	£3,000
Year 5 report summarising local economic growth, scheme impacts and development figures prior and post opening of the scheme					2028	PCC	£3,000
Total Monitoring and Evaluation Budget							£8,750

Scheme Logic Mapping

The logic map detailed in figure 6.4 highlights the links between context, inputs, outputs, outcomes and impacts of the scheme and gives a visual representation of where Monitoring and Evaluation should be focused. The logic model outlines the causal chain of events that represent the process by which the desired outcomes and scheme objectives are to be achieved. The logic model has informed the approach proposed in this M&E plan and will help ensure monitoring resources are targeted appropriately through the timeline of scheme development and provide effective measurement of objectives and outcomes.

The implementation of the Monitoring and Evaluation Plan will help provide an understanding of the following:

- Inputs (did we apply the money and resources that we said we would?);
- Outputs (how much did we build/provide?);
- Outcomes (what changes in behaviour came about as a result?); and
- Impacts (what effect did the outcomes have on the economy, society and environment?).

The logic model also incorporates the use of bounding objectives which represent positions beyond which it is not proposed to attribute effects resulting from the scheme. However, the outcomes of the Monitoring and Evaluation plan will help understand the potential for wider impacts resulting from the scheme as outlined in the Logic Map.

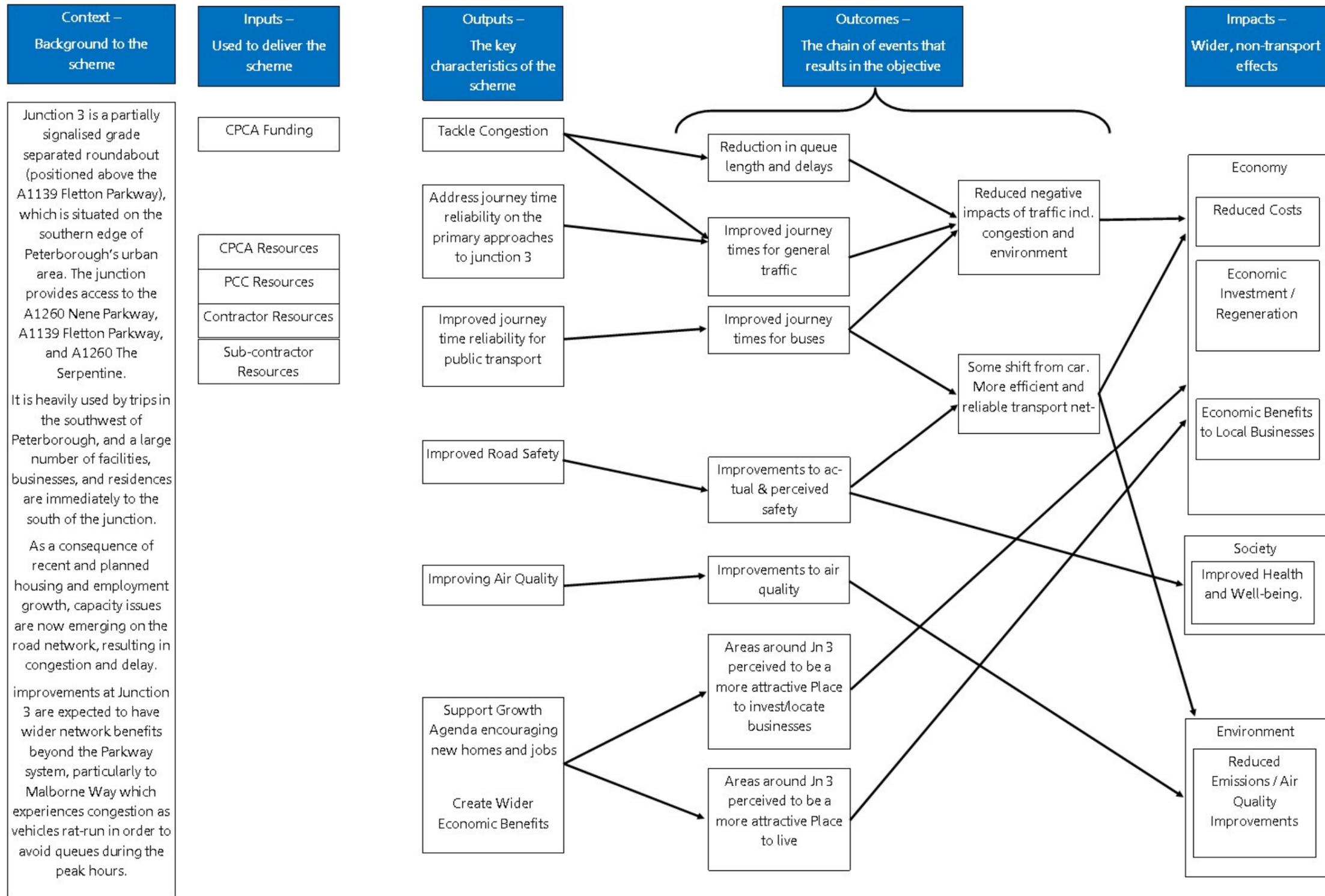


Figure 6.4: Junction 3 Monitoring and Evaluation Logic Map

Evaluation Timescale

Monitoring and Evaluation will be required both during development and construction, as well as in the years following implementation of the road improvement scheme in order to meet the stated evaluation objectives and effectively assess any scheme outcomes and impacts. Monitoring and Evaluation is expected to take place over the following timescale:

- Prior to scheme build (baseline): 2021/22;
- During development and construction: April 2022 to April 2023; and
- Post scheme implementation:
 - One Year After Report: 2024
 - Final Evaluation (Five Years After) Report: 20278

7. Appendices

Appendix A: Wider Policy Context

National Planning Policy Framework

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and should be considered in the preparation of development plans. Proposed development that accords with an up to date Local Plan should be approved unless other material considerations indicate otherwise.

The NPPF states that all plans are expected to be based upon and to reflect the presumption in favour of sustainable development with clear policies that will guide how the presumption should be applied locally.

The scheme will contribute to delivering the following NPPF objectives:

- **Delivering a sufficient supply of homes.** The scheme will provide crucial transport capacity along the Parkway network which will support the housing growth set out for Peterborough within the Local Plan.
- **Building a strong, competitive economy.** The NPPF states that development proposals should support economic growth and productivity. The scheme will provide essential network capacity at a crucial location to enable Peterborough to deliver the jobs set out in the Local Plan.
- **Promoting healthy and safe communities and sustainable transport.** The NPPF stipulates that communities should be safe, accessible and supportive of a healthy lifestyle through the provision of cycling and walking facilities. The scheme not only provides highway capacity for strategic Parkway trips, but also includes local sustainable transport infrastructure improvements to upgrade access to Cygnet Park Business Park and the Hamptons residential area from the east, west and the north.

Department for Transport Single Departmental Plan

The single departmental plan for the Department for Transport sets out the strategic objectives to 2020 and the plans for achieving them. The DfT's overall mission is to create a safe, secure, efficient and reliable transport system that works for the people who depend on it; supporting a strong productive economy and the jobs and homes people need.

The objectives outlined in the plan 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 we do.

Peterborough City Council's Vision and Strategic Priorities

The Council's vision is to

'Create a bigger and better Peterborough that grows the right way and through truly sustainable development and growth:

- *Improves the quality of life of all its people and communities, and ensures that all communities benefit from the growth and the opportunities it brings*
- *Creates a truly sustainable Peterborough, the urban centre of a thriving sub-regional community of villages and market towns, a healthy, safe and exciting place to live, work and visit, famous as the environmental capital of the UK'.*

The strategic priorities for the Council are:

- Drive growth, regeneration and economic development
- Improve education attainment and skills
- Safeguard vulnerable children and adults
- Implement the Environment Capital agenda
- Support Peterborough's culture and leisure trust Vivacity
- Keep all our communities safe, cohesive and healthy
- Achieve the best health and wellbeing for the city

Peterborough City Council Local Plan

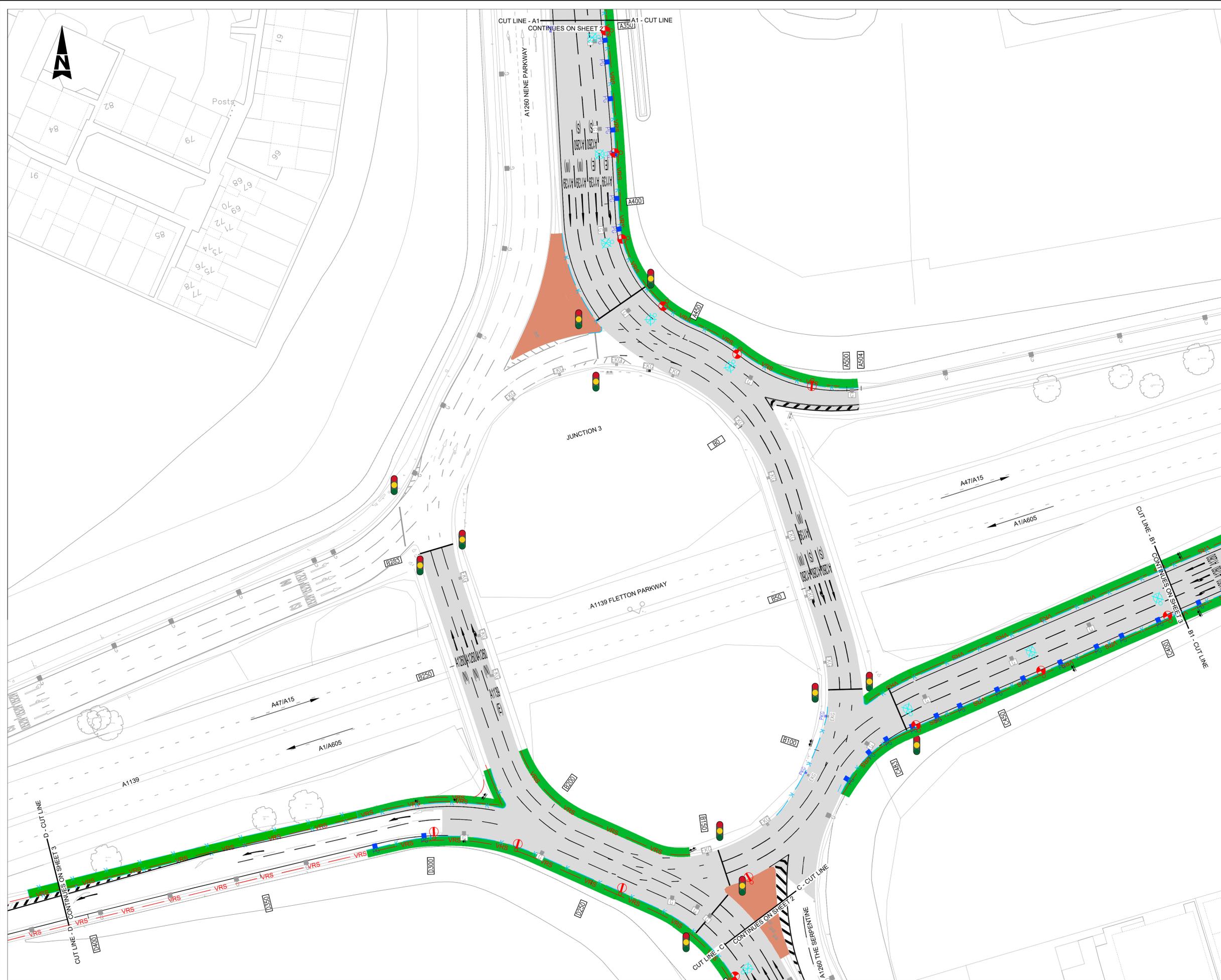
The Local Plan (adopted July 2019) updates the 2011 Core Strategy and looks to deliver 21,315 new homes between 2017 and 2036, and 17,600 jobs between 2015 and 2036. The development strategy for the new Local Plan is to focus the majority of new housing development in, around and close to the urban area of the city of Peterborough. Only a small percentage of residential development is allocated to the villages and rural area. Similarly, employment development will be focussed on the city centre, urban area or urban extensions.

The Local Plan will deliver the council's corporate priorities (listed below) which aim to improve the quality of life for all residents and communities.

- Drive growth, regeneration and economic development
- Improve education attainment and skills
- Safeguard vulnerable children and adults
- Implement the Environment Capital agenda
- Support Peterborough's culture and leisure trust Vivacity
- Keep all our communities safe, cohesive and healthy
- Achieve the best health and wellbeing for the City.

Policy LP13: Transport states that the impact of growth on the city's transport infrastructure will require careful planning and that new development must ensure that appropriate provision is made for the transport need that it will create.

Policy LP14: Infrastructure identifies that the major growth and expansion of Peterborough will be supported by necessary infrastructure such as roads, schools and health and community facilities is in place to help the creation of sustainable communities.



- KEY:**
- PROPOSED CARRIAGEWAY (WIDENING/RESURFACING) (SEE NOTE 8)
 - PROPOSED TRAFFIC ISLAND/HARDENED AREA
 - PROPOSED VERGE
 - PROPOSED VRS (SEE NOTE 6)
 - INDICATIVE TRAFFIC LIGHT LOCATION (SEE NOTE 10)
 - PROPOSED ROAD MARKINGS (SEE NOTE 9)
 - EXISTING ROAD MARKINGS
 - CHAINAGE
 - EXISTING GULLY (SEE NOTE 7)
 - PROPOSED GULLY (SEE NOTE 7)
 - EXISTING KERB OFFLET (SEE NOTE 7)
 - PROPOSED KERB OFFLET (SEE NOTE 7)
 - PROPOSED KERBING (SEE NOTE 7)
 - EXISTING SIGN (SEE NOTE 9)
 - PROPOSED SIGN (SEE NOTE 9)
 - EXISTING STREET LIGHTING COLUMN (SEE NOTE 11)
 - PROPOSED STREET LIGHTING COLUMN (SEE NOTE 11)

- NOTES:**
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 3. REPORT ALL DISCREPANCIES TO THE DRAWING ORIGINATOR IMMEDIATELY.
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 5. FOR DETAILS OF STATUTORY UNDERTAKERS APPARATUS LOCATIONS REFER TO DRAWING 5080752-SKA-VUT-ZZ-DR-CH-0105 TO 0107.
 6. FOR DETAILS OF PROPOSED VRS REFER TO DRAWING 5080752-SKA-HRR-ZZ-DR-CH-0401 TO 0403.
 7. FOR DETAILS OF PROPOSED CONCEPT DRAINAGE REFER TO DRAWING 5080752-SKA-HDG-ZZ-DR-CH-0501 TO 0503.
 8. FOR DETAILS OF PROPOSED PAVEMENT REFER TO DRAWING 5080752-SKA-HPV-ZZ-DR-CH-0701 TO 0703.
 9. FOR DETAILS OF PROPOSED ROAD MARKINGS AND SIGNS REFER TO DRAWING 5080752-SKA-HMK-ZZ-DR-CH-1201 TO 1203.
 10. TRAFFIC SIGNAL LOCATIONS TO BE DESIGNED BY OTHERS
 11. FOR DETAILS OF STREET LIGHTING REFER TO DRAWING 5080608-SKA-HGL-OR-DR-EO-1301-1303.

Residual Risk Assessment
 Wherever possible, risk is designed-out of this proposal during the design process. Where this is not possible, the risk will be minimised and any residual significant risk will be noted and indicated by the symbol.

SIGNIFICANT CDM HEALTH & SAFETY RISKS

1. STATUTORY UNDERTAKERS PLANT PRESENT				
PO2	01/05/20	ALIGNMENT CHANGES	JC	ARPT
Rev	Date	Description	Dwn	Chkd
Revisions				
Drawing Originator				

Peterborough Highway Services

Delivered by

Dodson House
Fengate
Peterborough
PE5 1 5FS

Tel: +44 (0)1773 747474
Facsimile: +44 (0)1773 453444

Drawing Status
FOR INFORMATION

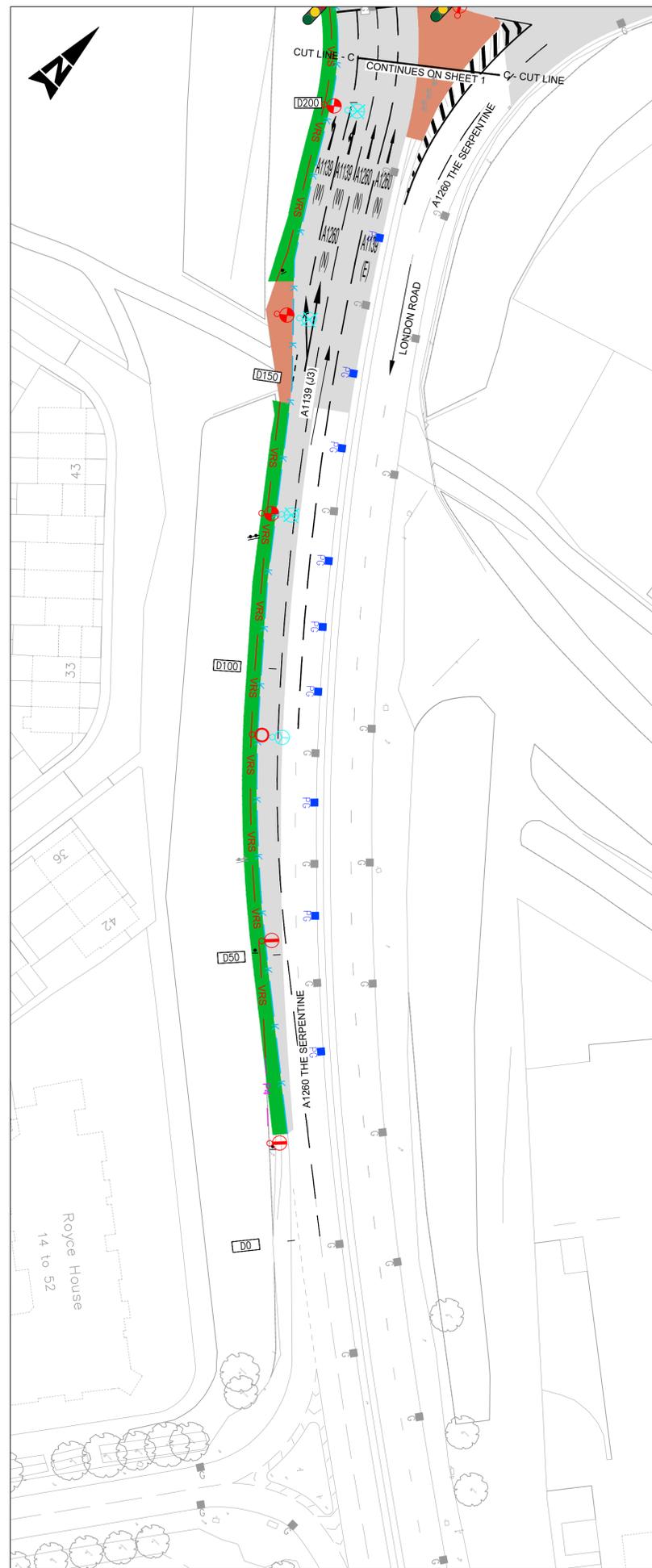
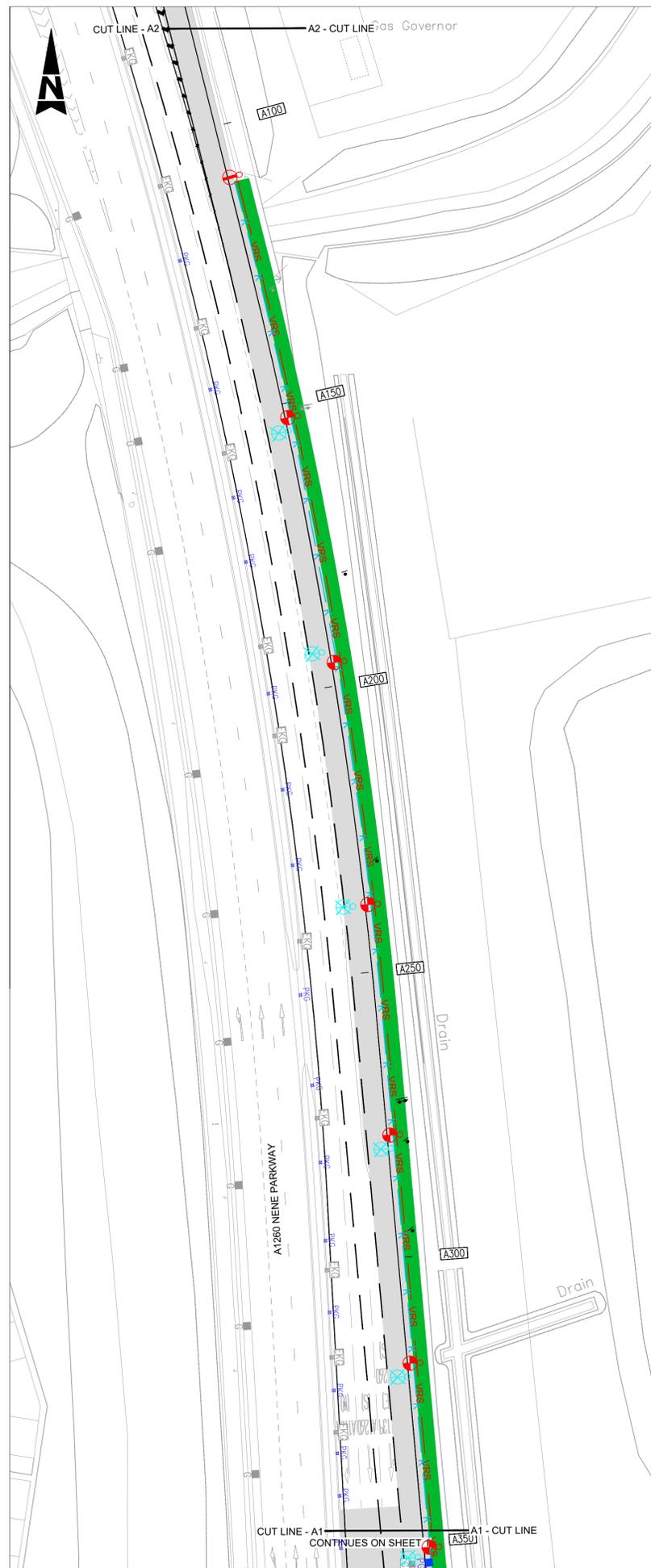
Project Name
FLETTON PARKWAY JUNCTION 3 IMPROVEMENTS

Title
 Original drawing sheet is A1

GENERAL ARRANGEMENT SHEET 1 OF 3

Scale 1:500	Drawn by CP	Checked by JC	Approved by ARPT
	Drawn Date 28/02/20	Checked Date 28/02/20	Approved Date 02/03/20
Drawing Number		Rev	

5080752-SKA-HGN-ZZ-DR-CH-0101 PO2



- KEY:**
- PROPOSED CARRIAGEWAY (WIDENING/RESURFACING) (SEE NOTE 8)
 - PROPOSED TRAFFIC ISLAND/HARDENED AREA
 - PROPOSED VERGE
 - VRS- PROPOSED VRS (SEE NOTE 6)
 - INDICATIVE TRAFFIC LIGHT LOCATION (SEE NOTE 10)
 - PROPOSED ROAD MARKINGS (SEE NOTE 9)
 - EXISTING ROAD MARKINGS
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 10. TRAFFIC SIGNAL LOCATIONS TO BE DESIGNED BY OTHERS.
 11. FOR DETAILS OF STREET LIGHTING REFER TO DRAWING 5080608-SKA-HGL-OR-DR-EO-1301-1303.

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SIGNIFICANT CDM HEALTH & SAFETY RISKS

1. STATUTORY UNDERTAKERS PLANT PRESENT			
PO2	01/05/20	ALIGNMENT CHANGES	
Rev	Date	Description	Dwn Chkd
Revisions			

Drawing Originator

Peterborough Highway Services

Delivered by

SKANSKA **PETERBOROUGH CITY COUNCIL**

Dodson House
 Fensgate
 Peterborough
 PE51 5FS

Tel: +44 (0)1773 747474
 Facsimile: +44 (0)1773 453444

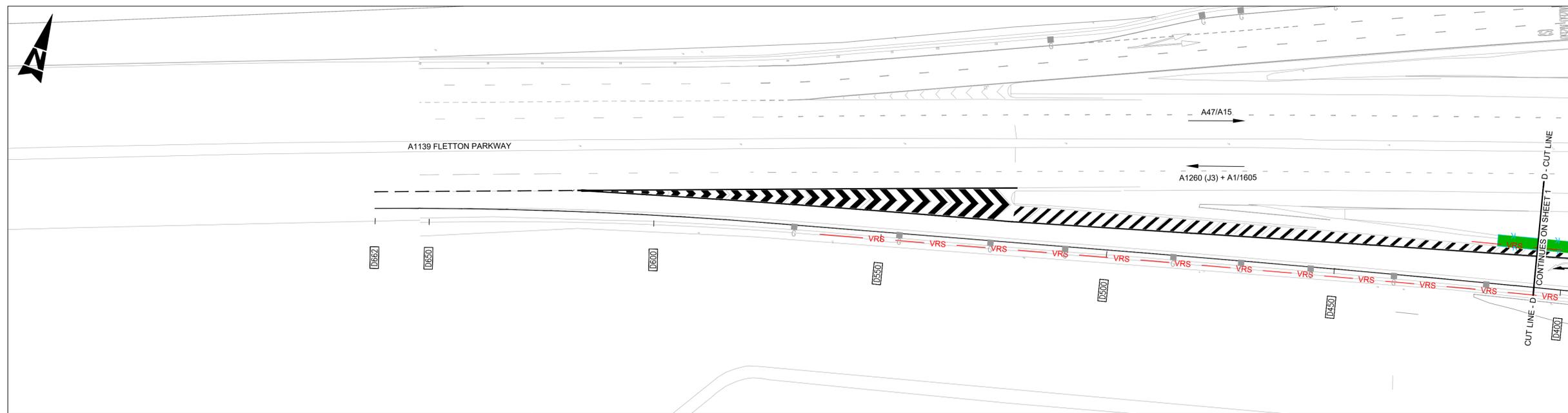
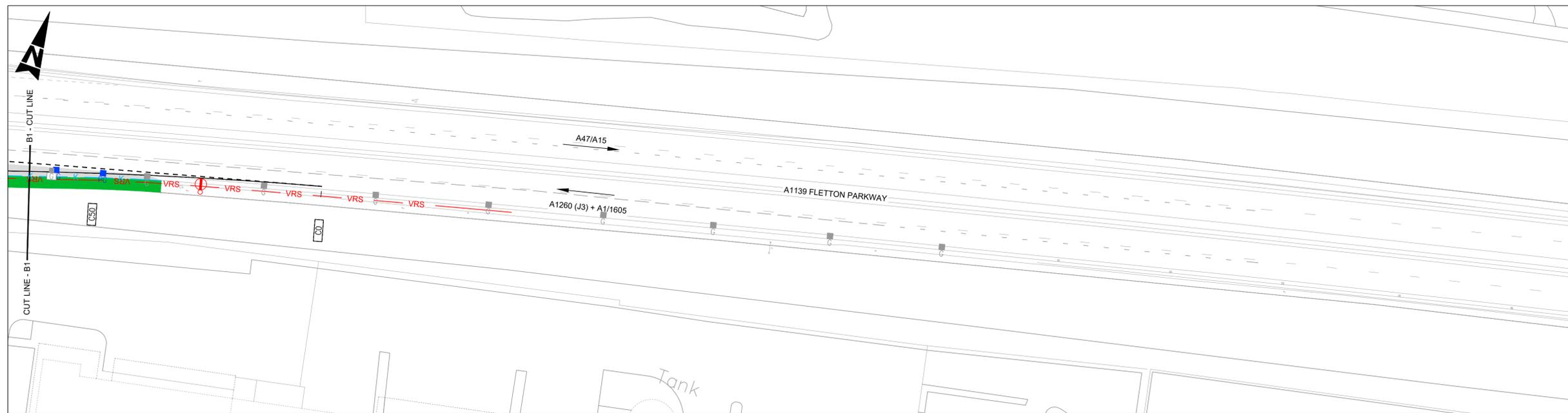
Drawing Status
FOR INFORMATION

Project Name
FLETTON PARKWAY JUNCTION 3 IMPROVEMENTS

Title
 Original drawing sheet is A1

GENERAL ARRANGEMENT SHEET 2 OF 3

Scale 1:500	Drawn by CP	Checked by JC	Approved by ARPT
	Drawn Date 28/02/20	Checked Date 28/02/20	Approved Date 02/03/20
Drawing Number 5080752-SKA-HGN-ZZ-DR-CH-0102			Rev P02



- KEY:**
- PROPOSED CARRIAGEWAY (WIDENING/RESURFACING) (SEE NOTE 8)
 - PROPOSED TRAFFIC ISLAND/HARDENED AREA
 - PROPOSED VERGE
 - PROPOSED VRS (SEE NOTE 6)
 - INDICATIVE TRAFFIC LIGHT LOCATION (SEE NOTE 10)
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SIGNIFICANT CDM HEALTH & SAFETY RISKS

1. STATUTORY UNDERTAKERS PLANT PRESENT

Rev	Date	Description	Dwn	Chkd
P02	01/05/20	ALIGNMENT CHANGES		

Drawing Originator

Peterborough Highway Services

Delivered by

SKANSKA **PETERBOROUGH CITY COUNCIL**

Dodson House
 Fensgate
 Peterborough
 PE51 5FS

Tel: +44 (0)1773 747474
 Facsimile: +44 (0)1773 453444

Drawing Status

FOR INFORMATION

Project Name

FLETTON PARKWAY JUNCTION 3 IMPROVEMENTS

Title Original drawing sheet is A1

GENERAL ARRANGEMENT SHEET 3 OF 3

Scale	Drawn by	Checked by	Approved by
1:500	CP	JC	ARPT
	Drawn Date	Checked Date	Approved Date
	28/02/20	28/02/20	02/03/20

Drawing Number	Rev
5080752-SKA-HGN-ZZ-DR-CH-0103	P02

Junction 3 - Do Something Scheme Costs in 2010 Market Prices for Input to Economic Case

Calendar Year	Assessment Year	(1) Base Cost Estimate (2016 Prices)						(2) Base Cost Estimate Including Real Cost Increases (2016 Prices)			(3) Risk Adjusted Base Cost (2016 Prices)		(4) Total Contribution of Optimism Bias		(5) Rebased to 2010 Price Base	(6) Discounted to 2010 Prices			(7) Adjusted to Market Prices
		Construction Costs (Highways)	Construction Costs (Structures)	Land & Property Costs	Preparation and Supervision Costs	Other Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Quantified Risk Adjustment	Risk Adjusted Cost	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2020	0	£0	£0	£0	£439,736	£0	£439,736	0.000	£0.00	£439,736	£0	£439,736	£0	£439,736	£369,806	1.035	0.709	£262,163	£311,973.44
2021	1	£0	£0	£0	£0	£0	£0	1.031	£0.00	£0	£0	£0	£702,470	£702,470	£590,758	1.035	0.685	£404,637	£481,519
2022	2	£3,552,623	£0	£0	£484,045	£0	£4,036,668	1.068	£273,838.83	£4,310,506	£326,730	£4,637,237	£0	£4,637,237	£3,899,791	1.035	0.662	£2,580,817	£3,071,172
2023	3	£0	£0	£0	£0	£0	£0	1.108	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.639	£0	£0
2024	4	£0	£0	£0	£0	£0	£0	1.146	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.618	£0	£0
2025	5	£0	£0	£0	£0	£0	£0	1.185	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.597	£0	£0
2026	6	£0	£0	£0	£0	£0	£0	1.224	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.577	£0	£0
2027	7	£0	£0	£0	£0	£0	£0	1.266	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.557	£0	£0
2028	8	£0	£0	£0	£0	£0	£0	1.306	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.538	£0	£0
2029	9	£0	£0	£0	£0	£0	£0	1.346	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.520	£0	£0
2030	10	£0	£0	£0	£0	£0	£0	1.385	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.503	£0	£0
2031	11	£0	£0	£0	£0	£0	£0	1.425	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.486	£0	£0
2032	12	£0	£0	£0	£0	£0	£0	1.464	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.469	£0	£0
2033	13	£0	£0	£0	£0	£0	£0	1.504	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.453	£0	£0
2034	14	£0	£0	£0	£0	£0	£0	1.544	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.438	£0	£0
2035	15	£0	£0	£0	£0	£0	£0	1.585	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.423	£0	£0
2036	16	£0	£0	£0	£0	£0	£0	1.628	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.409	£0	£0
2037	17	£0	£0	£0	£0	£0	£0	1.672	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.395	£0	£0
2038	18	£0	£0	£0	£0	£0	£0	1.718	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.382	£0	£0
2039	19	£0	£0	£0	£0	£0	£0	1.764	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.369	£0	£0
2040	20	£0	£0	£0	£0	£0	£0	1.811	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.356	£0	£0
2041	21	£0	£0	£0	£0	£0	£0	1.859	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.344	£0	£0
2042	22	£0	£0	£0	£0	£0	£0	1.908	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.333	£0	£0
2043	23	£0	£0	£0	£0	£0	£0	1.959	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.321	£0	£0
2044	24	£0	£0	£0	£0	£0	£0	2.011	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.310	£0	£0
2045	25	£0	£0	£0	£0	£0	£0	2.065	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.300	£0	£0
2046	26	£0	£0	£0	£0	£0	£0	2.121	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.290	£0	£0
2047	27	£0	£0	£0	£0	£0	£0	2.178	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.280	£0	£0
2048	28	£0	£0	£0	£0	£0	£0	2.238	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.271	£0	£0
2049	29	£0	£0	£0	£0	£0	£0	2.299	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.261	£0	£0
2050	30	£0	£0	£0	£0	£0	£0	2.363	£0.00	£0	£0	£0	£0	£0	£0	1.035	0.253	£0	£0
2051	31	£0	£0	£0	£0	£0	£0	2.428	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.298	£0	£0
2052	32	£0	£0	£0	£0	£0	£0	2.497	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.289	£0	£0
2053	33	£0	£0	£0	£0	£0	£0	2.567	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.281	£0	£0
2054	34	£0	£0	£0	£0	£0	£0	2.639	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.272	£0	£0
2055	35	£0	£0	£0	£0	£0	£0	2.711	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.264	£0	£0
2056	36	£0	£0	£0	£0	£0	£0	2.784	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.257	£0	£0
2057	37	£0	£0	£0	£0	£0	£0	2.861	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.249	£0	£0
2058	38	£0	£0	£0	£0	£0	£0	2.939	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.242	£0	£0
2059	39	£0	£0	£0	£0	£0	£0	3.021	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.235	£0	£0
2060	40	£0	£0	£0	£0	£0	£0	3.105	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.228	£0	£0
2061	41	£0	£0	£0	£0	£0	£0	3.192	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.221	£0	£0
2062	42	£0	£0	£0	£0	£0	£0	3.281	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.215	£0	£0
2063	43	£0	£0	£0	£0	£0	£0	3.372	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.209	£0	£0
2064	44	£0	£0	£0	£0	£0	£0	3.466	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.203	£0	£0
2065	45	£0	£0	£0	£0	£0	£0	3.561	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.197	£0	£0
2066	46	£0	£0	£0	£0	£0	£0	3.658	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.191	£0	£0
2067	47	£0	£0	£0	£0	£0	£0	3.758	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.185	£0	£0
2068	48	£0	£0	£0	£0	£0	£0	3.859	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.180	£0	£0
2069	49	£0	£0	£0	£0	£0	£0	3.960	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.175	£0	£0
2070	50	£0	£0	£0	£0	£0	£0	4.062	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.170	£0	£0
2071	51	£0	£0	£0	£0	£0	£0	4.168	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.165	£0	£0
2072	52	£0	£0	£0	£0	£0	£0	4.277	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.160	£0	£0
2073	53	£0	£0	£0	£0	£0	£0	4.389	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.155	£0	£0
2074	54	£0	£0	£0	£0	£0	£0	4.503	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.151	£0	£0
2075	55	£0	£0	£0	£0	£0	£0	4.621	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.146	£0	£0
2076	56	£0	£0	£0	£0	£0	£0	4.741	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.142	£0	£0
2077	57	£0	£0	£0	£0	£0	£0	4.865	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.138	£0	£0
2078	58	£0	£0	£0	£0	£0	£0	4.992	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.134	£0	£0
2079	59	£0	£0	£0	£0	£0	£0	5.122	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.130	£0	£0
2080	60	£0	£0	£0	£0	£0	£0	5.256	£0.00	£0	£0	£0	£0	£0	£0	1.030	0.126	£0	£0
Total		£3,552,623	£0	£0	£923,781	£0	£4,476,404		£273,839	£4,750,242	£326,730	£5,076,973	£702,470	£5,779,443	£4,860,356			£3,247,617	£3,552,690

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2021 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£4,476,404
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£4,750,242
(3)	Following the real cost adjustment a quantified risk contribution has been applied.	£5,076,973
(4)	The next stage is to apply optimism bias.	£5,779,443
(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).	£4,860,356
(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).	£3,247,617
(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	£3,552,690

Junction 3 - Do Something Scheme Costs in 2010 Market Prices for Input to Economic Case

Calendar Year	Assessment Year	(1) Base Cost Estimate (2016 Prices)		(2) Base Cost Estimate Including Real Cost Increases (2016 Prices)			(3) Risk Adjusted Base Cost (2016 Prices)		(4) Total Contribution of Optimism Bias		(5) Rebased to 2010 Price Base	(6) Discounted to 2010 Prices			(7) Adjusted to Market Prices
		Maintenance Costs	Total	Real Cost Inflation	Contribution to Real Cost Increases	Total (Including Real Cost Increases)	Quantified Risk Adjustment	Risk Adjusted Cost	Optimism Bias Adjustment	Optimism Bias Adjusted Cost		Discount Rate	Discount Factor	Discounted to 2010 Prices	
2020	0	£0	£0	0.000	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.709	£0	£0.00
2021	1	£0	£0	1.031	£0.00	£0	£0	£0	£0.00	£0	£0	1.035	0.685	£0	£0
2022	2	£26,489	£26,489	1.068	£1,796.97	£28,286	£0	£28,286	£0.00	£28,286	£23,788	1.035	0.662	£15,742	£18,733
2023	3	£26,489	£26,489	1.108	£2,850.79	£29,340	£0	£29,340	£0.00	£29,340	£24,674	1.035	0.639	£15,777	£18,774
2024	4	£26,489	£26,489	1.146	£3,878.51	£30,368	£0	£30,368	£0.00	£30,368	£25,538	1.035	0.618	£15,777	£18,775
2025	5	£26,489	£26,489	1.185	£4,896.06	£31,385	£0	£31,385	£0.00	£31,385	£26,394	1.035	0.597	£15,754	£18,748
2026	6	£26,489	£26,489	1.224	£5,945.99	£32,435	£0	£32,435	£0.00	£32,435	£27,277	1.035	0.577	£15,731	£18,720
2027	7	£26,489	£26,489	1.266	£7,032.95	£33,522	£0	£33,522	£0.00	£33,522	£28,191	1.035	0.557	£15,708	£18,693
2028	8	£26,489	£26,489	1.306	£8,102.84	£34,592	£0	£34,592	£0.00	£34,592	£29,091	1.035	0.538	£15,661	£18,637
2029	9	£26,489	£26,489	1.346	£9,159.21	£35,648	£0	£35,648	£0.00	£35,648	£29,979	1.035	0.520	£15,594	£18,557
2030	10	£26,489	£26,489	1.385	£10,208.49	£36,698	£0	£36,698	£0.00	£36,698	£30,862	1.035	0.503	£15,510	£18,457
2031	11	£26,489	£26,489	1.425	£11,253.06	£37,742	£0	£37,742	£0.00	£37,742	£31,740	1.035	0.486	£15,412	£18,340
2032	12	£26,489	£26,489	1.464	£12,294.40	£38,784	£0	£38,784	£0.00	£38,784	£32,616	1.035	0.469	£15,302	£18,209
2033	13	£26,489	£26,489	1.504	£13,352.51	£39,842	£0	£39,842	£0.00	£39,842	£33,506	1.035	0.453	£15,188	£18,073
2034	14	£26,489	£26,489	1.544	£14,407.83	£40,897	£0	£40,897	£0.00	£40,897	£34,393	1.035	0.438	£15,063	£17,925
2035	15	£26,489	£26,489	1.585	£15,499.45	£41,989	£0	£41,989	£0.00	£41,989	£35,311	1.035	0.423	£14,942	£17,781
2036	16	£26,489	£26,489	1.628	£16,629.89	£43,119	£0	£43,119	£0.00	£43,119	£36,262	1.035	0.409	£14,825	£17,642
2037	17	£26,489	£26,489	1.672	£17,803.28	£44,292	£0	£44,292	£0.00	£44,292	£37,249	1.035	0.395	£14,714	£17,509
2038	18	£26,489	£26,489	1.718	£19,009.02	£45,498	£0	£45,498	£0.00	£45,498	£38,263	1.035	0.382	£14,603	£17,378
2039	19	£26,489	£26,489	1.764	£20,238.34	£46,728	£0	£46,728	£0.00	£46,728	£39,297	1.035	0.369	£14,491	£17,244
2040	20	£26,489	£26,489	1.811	£21,476.16	£47,965	£0	£47,965	£0.00	£47,965	£40,338	1.035	0.356	£14,371	£17,102
2041	21	£26,489	£26,489	1.859	£22,743.54	£49,233	£0	£49,233	£0.00	£49,233	£41,403	1.035	0.344	£14,252	£16,960
2042	22	£26,489	£26,489	1.908	£24,045.43	£50,535	£0	£50,535	£0.00	£50,535	£42,498	1.035	0.333	£14,134	£16,820
2043	23	£26,489	£26,489	1.959	£25,391.12	£51,880	£0	£51,880	£0.00	£51,880	£43,630	1.035	0.321	£14,020	£16,684
2044	24	£26,489	£26,489	2.011	£26,785.73	£53,275	£0	£53,275	£0.00	£53,275	£44,803	1.035	0.310	£13,910	£16,553
2045	25	£26,489	£26,489	2.065	£28,216.24	£54,705	£0	£54,705	£0.00	£54,705	£46,006	1.035	0.300	£13,801	£16,423
2046	26	£26,489	£26,489	2.121	£29,686.89	£56,176	£0	£56,176	£0.00	£56,176	£47,243	1.035	0.290	£13,692	£16,294
2047	27	£26,489	£26,489	2.178	£31,206.72	£57,696	£0	£57,696	£0.00	£57,696	£48,521	1.035	0.280	£13,587	£16,169
2048	28	£26,489	£26,489	2.238	£32,783.07	£59,272	£0	£59,272	£0.00	£59,272	£49,846	1.035	0.271	£13,487	£16,049
2049	29	£26,489	£26,489	2.299	£34,411.92	£60,901	£0	£60,901	£0.00	£60,901	£51,216	1.035	0.261	£13,389	£15,932
2050	30	£26,489	£26,489	2.363	£36,093.21	£62,582	£0	£62,582	£0.00	£62,582	£52,630	1.035	0.253	£13,293	£15,819
2051	31	£26,489	£26,489	2.428	£37,837.99	£64,327	£0	£64,327	£0.00	£64,327	£54,097	1.030	0.298	£16,101	£19,160
2052	32	£26,489	£26,489	2.497	£39,643.56	£66,133	£0	£66,133	£0.00	£66,133	£55,616	1.030	0.289	£16,071	£19,124
2053	33	£26,489	£26,489	2.567	£41,503.39	£67,993	£0	£67,993	£0.00	£67,993	£57,180	1.030	0.281	£16,041	£19,089
2054	34	£26,489	£26,489	2.639	£43,407.67	£69,897	£0	£69,897	£0.00	£69,897	£58,781	1.030	0.272	£16,010	£19,052
2055	35	£26,489	£26,489	2.711	£45,312.75	£71,802	£0	£71,802	£0.00	£71,802	£60,383	1.030	0.264	£15,968	£19,002
2056	36	£26,489	£26,489	2.784	£47,269.78	£73,759	£0	£73,759	£0.00	£73,759	£62,029	1.030	0.257	£15,925	£18,951
2057	37	£26,489	£26,489	2.861	£49,284.70	£75,774	£0	£75,774	£0.00	£75,774	£63,724	1.030	0.249	£15,884	£18,902
2058	38	£26,489	£26,489	2.939	£51,372.18	£77,861	£0	£77,861	£0.00	£77,861	£65,479	1.030	0.242	£15,846	£18,857
2059	39	£26,489	£26,489	3.021	£53,543.96	£80,033	£0	£80,033	£0.00	£80,033	£67,306	1.030	0.235	£15,813	£18,818
2060	40	£26,489	£26,489	3.105	£55,771.20	£82,260	£0	£82,260	£0.00	£82,260	£69,179	1.030	0.228	£15,780	£18,778
2061	41	£26,489	£26,489	3.192	£58,062.23	£84,551	£0	£84,551	£0.00	£84,551	£71,105	1.030	0.221	£15,747	£18,739
2062	42	£26,489	£26,489	3.281	£60,413.77	£86,903	£0	£86,903	£0.00	£86,903	£73,083	1.030	0.215	£15,714	£18,699
2063	43	£26,489	£26,489	3.372	£62,833.70	£89,323	£0	£89,323	£0.00	£89,323	£75,118	1.030	0.209	£15,681	£18,660
2064	44	£26,489	£26,489	3.466	£65,310.92	£91,800	£0	£91,800	£0.00	£91,800	£77,201	1.030	0.203	£15,646	£18,619
2065	45	£26,489	£26,489	3.561	£67,835.31	£94,324	£0	£94,324	£0.00	£94,324	£79,324	1.030	0.197	£15,608	£18,574
2066	46	£26,489	£26,489	3.658	£70,415.18	£96,904	£0	£96,904	£0.00	£96,904	£81,494	1.030	0.191	£15,568	£18,526
2067	47	£26,489	£26,489	3.758	£73,048.27	£99,537	£0	£99,537	£0.00	£99,537	£83,708	1.030	0.185	£15,526	£18,475
2068	48	£26,489	£26,489	3.859	£75,723.86	£102,213	£0	£102,213	£0.00	£102,213	£85,958	1.030	0.180	£15,479	£18,419
2069	49	£26,489	£26,489	3.960	£78,396.94	£104,886	£0	£104,886	£0.00	£104,886	£88,206	1.030	0.175	£15,421	£18,351
2070	50	£26,489	£26,489	4.062	£81,122.74	£107,612	£0	£107,612	£0.00	£107,612	£90,499	1.030	0.170	£15,361	£18,279
2071	51	£26,489	£26,489	4.168	£83,923.00	£110,412	£0	£110,412	£0.00	£110,412	£92,854	1.030	0.165	£15,301	£18,209
2072	52	£26,489	£26,489	4.277	£86,804.61	£113,294	£0	£113,294	£0.00	£113,294	£95,277	1.030	0.160	£15,243	£18,140
2073	53	£26,489	£26,489	4.389	£89,761.43	£116,251	£0	£116,251	£0.00	£116,251	£97,764	1.030	0.155	£15,186	£18,071
2074	54	£26,489	£26,489	4.503	£92,795.41	£119,285	£0	£119,285	£0.00	£119,285	£100,315	1.030	0.151	£15,128	£18,002
2075	55	£26,489	£26,489	4.621	£95,908.58	£122,398	£0	£122,398	£0.00	£122,398	£102,933	1.030	0.146	£15,071	£17,934
2076	56	£26,489	£26,489	4.741	£99,103.00	£125,592	£0	£125,592	£0.00	£125,592	£105,620	1.030	0.142	£15,014	£17,866
2077	57	£26,489	£26,489	4.865	£102,380.79	£128,870	£0	£128,870	£0.00	£128,870	£108,376	1.030	0.138	£14,957	£17,799
2078	58	£26,489	£26,489	4.992	£105,744.13	£132,233	£0	£132,233	£0.00	£132,233	£111,205	1.030	0.134	£14,900	£17,731
2079	59	£26,489	£26,489	5.122	£109,195.24	£135,684	£0	£135,684	£0.00	£135,684	£114,107	1.030	0.130	£14,844	£17,664
2080	60	£26,489	£26,489	5.256	£112,736.42	£139,226	£0	£139,226	£0.00	£139,226	£117,085	1.030	0.126	£14,788	£17,597
Total		£1,562,860	£1,562,860		£2,643,662	£4,206,523	£0	£4,206,523	£0	£4,206,523	£3,420,487			£893,352	£1,063,089

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of Opening is assumed to be 2021 in this assessment. No historic (bygone) costs have been provided and it is assumed that these won't influence the investment decision.	£1,562,860
(2)	The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs.	£4,206,523
(3)	Following the real cost adjustment a quantified risk contribution has been applied.	£4,206,523
(4)	The next stage is to apply optimism bias.	£4,206,523
(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).	£3,420,487
(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).	£893,352
(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	£1,063,089

Appendix D – Appraisal Summary Table

Impacts		Summary of key impacts	Assessment	
			Qualitative	Quantitative (Monetary)
Economy	Business Users & Transport Providers	A bespoke spreadsheet model has applied the value of time savings to 60 years of benefits, discounted to the 2010 base year and expressed in 2010 market prices. This identifies that the Present Value Benefits (PVB) is estimated to be £16,453,000. The benefit calculations are only based on de-congestion benefits.	Not Assessed	£ 16,453,000 (PVB)
	Reliability Impact on Business Providers	Business users are expected to benefit from more reliable journey times because of congestion reductions.	Slight Beneficial	Not Assessed
	Regeneration	No regeneration proposals in the vicinity of the scheme	Not Assessed	Not Assessed
	Other impacts – impact on local business	Cygnat Park Employment Area is accessed via Junction 3. Any proposed measures to improve journey time reliability and reduce congestion should help to keep the employment area as an attractive location for businesses.	Slight Beneficial	Not Assessed
Environmental	Noise	The noise assessment showed that without the scheme the majority of properties within the study area experience an increase in noise level of up to 0.9dB in the short term and 2.9dB in the long-term. With the scheme, the predicted long-long term change in noise level is an increase of 0.1dB to 2.9dB for all properties within the study area. With the scheme, the predicted short-long term change in noise level is an increase of between 0.1dB to 0.9dB for the majority of properties within the study area.	Slight Adverse	£779
	Air Quality	The reduction in queueing, and therefore idling, is anticipated to have a beneficial impact on air quality at receptors near the scheme site. However, further assessments will be required as the scheme progresses.	Slight Beneficial	Not Assessed
	Greenhouse Gases	Due to the introduction of further signals, there is likely a small negative impact on greenhouse gas emissions will be seen upon scheme completion. Further assessments will be undertaken as the scheme progresses	Slight Beneficial	- £108,000
	Landscape	Existing character of the highway will be retained and the scheme is not considered to alter the landscape.	Neutral	Not Assessed
	Townscape	Existing character of the highway will be retained and the scheme is not considered to alter the townscape.	Neutral	Not Assessed
	Historic Environment	The potential impact identified by the proposed Junction 3 works would be a direct, physical, impact to buried archaeological remains, if present. This potential impact would occur as a result of the new infrastructure (i.e. a new lane and associated works).	Neutral	Not Assessed
	Biodiversity	The proposed works are not located within a statutory designated site for conservation. The proposed scheme will not result in significant changes to the existing environment, for instance lighting levels will generally remain the same as currently experienced. There will be losses to the tree cover, however these would be minimised where possible through the adherence to an arboriculture method statement that would be supervised by an arboriculturalist. Furthermore, it is recommended that any trees that are removed are replaced on completion of the works.	Neutral	Not Assessed
Water Environment	No part of the Study Area is within an area at risk of flooding (Env Agency Flood Map for Planning)	Neutral	Not Assessed	
Social	Commuting & Other Users	A bespoke spreadsheet model has applied the value of time savings to 60 years of benefits, discounted to the 2010 base year and expressed in 2010 market prices. This identifies that the Present Value Benefits (PVB) is estimated to be £16,453,000. Users are expected to benefit from improved journey times because of congestion reductions.	Not Assessed	£ 16,453,000 (PVB)
	Physical Activity	Improvements for pedestrians and cyclists will be delivered as part of the scheme.	Slight Beneficial	Not Assessed
	Journey Quality	Driver's frustration caused by unreliable journey times is likely to be reduced significantly. Overall improvement in safety.	Slight Beneficial	Not Assessed
	Accidents	Scheme improvements centred on the busiest junction approach of Junction 3 is expected to have a slight benefit on road safety.	Slight Beneficial	Not Assessed
	Personal Security	Although improved pedestrian facilities could lead to users feeling more secure, an in-depth analysis has not been undertaken at this stage.	Not Assessed	Not Assessed
	Access to the transport system	No significant improvements in accessibility to the transport network, however journeys will be more reliable	Slight Beneficial	Not Assessed

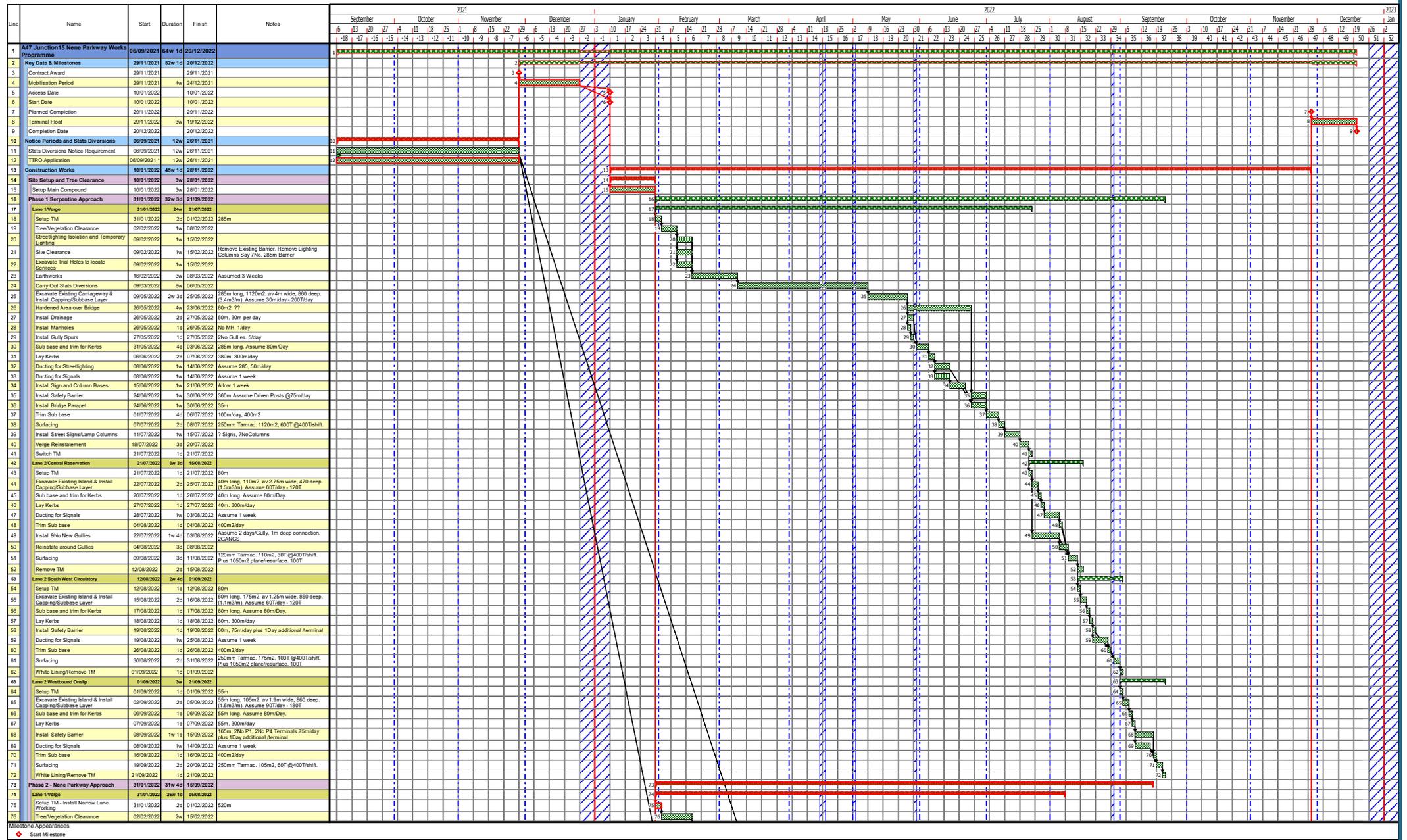
Appendix D – Appraisal Summary Table

Impacts		Summary of key impacts	Assessment	
			Qualitative	Quantitative (Monetary)
	Affordability	No specific changes to the cost of travel (public transport fares, road user pricing or car parking increases)	Neutral	Not Assessed
	Severance	Improvements in pedestrian facilities could ease severance,	Neutral	Not Assessed
	Option & Non-Use Values	Not Applicable	Not Assessed	Not Assessed
Public Accounts	Cost to Broad Transport Budget	The scheme PVC has been identified as £5,061,000. The scheme BCR is 3.251.	Not Assessed	High Value for Money (BCR 3.251)
	Indirect Tax Revenues	The indirect taxes would be £222,000	Not Assessed	£222,000

Junction 3 - Do Something Scheme Costs for Input to Financial Case

Calendar Year	Assessment Year	(1) Base Cost Estimate 2020 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)
2020	0	£0	£0	£0	£439,736	£0	£439,736	£0	£439,736	0.000	£0.00	£439,736	£0	£0	£439,736
2021	0	£0	£0	£0	£0	£0	£0	£0	£0	1.050	£0.00	£0	£0	£0	£0
2022	1	£3,552,623	£0	£0	£484,045	£0	£4,036,668	£326,730	£4,363,398	1.103	£447,248.27	£4,810,646	£26,489	£29,204	£4,839,850
2023	2	£0	£0	£0	£0	£0	£0	£0	£0	1.158	£0.00	£0	£26,489	£30,665	£30,665
2024	3	£0	£0	£0	£0	£0	£0	£0	£0	1.216	£0.00	£0	£26,489	£32,198	£32,198
2025	4	£0	£0	£0	£0	£0	£0	£0	£0	1.276	£0.00	£0	£26,489	£33,808	£33,808
2026	5	£0	£0	£0	£0	£0	£0	£0	£0	1.340	£0.00	£0	£26,489	£35,498	£35,498
2027	6	£0	£0	£0	£0	£0	£0	£0	£0	1.407	£0.00	£0	£26,489	£37,273	£37,273
2028	7	£0	£0	£0	£0	£0	£0	£0	£0	1.477	£0.00	£0	£26,489	£39,137	£39,137
2029	8	£0	£0	£0	£0	£0	£0	£0	£0	1.551	£0.00	£0	£26,489	£41,093	£41,093
2030	9	£0	£0	£0	£0	£0	£0	£0	£0	1.629	£0.00	£0	£26,489	£43,148	£43,148
2031	10	£0	£0	£0	£0	£0	£0	£0	£0	1.710	£0.00	£0	£26,489	£45,305	£45,305
2032	11	£0	£0	£0	£0	£0	£0	£0	£0	1.796	£0.00	£0	£26,489	£47,571	£47,571
2033	12	£0	£0	£0	£0	£0	£0	£0	£0	1.886	£0.00	£0	£26,489	£49,949	£49,949
2034	13	£0	£0	£0	£0	£0	£0	£0	£0	1.980	£0.00	£0	£26,489	£52,447	£52,447
2035	14	£0	£0	£0	£0	£0	£0	£0	£0	2.079	£0.00	£0	£26,489	£55,069	£55,069
2036	15	£0	£0	£0	£0	£0	£0	£0	£0	2.183	£0.00	£0	£26,489	£57,823	£57,823
2037	16	£0	£0	£0	£0	£0	£0	£0	£0	2.292	£0.00	£0	£26,489	£60,714	£60,714
2038	17	£0	£0	£0	£0	£0	£0	£0	£0	2.407	£0.00	£0	£26,489	£63,749	£63,749
2039	18	£0	£0	£0	£0	£0	£0	£0	£0	2.527	£0.00	£0	£26,489	£66,937	£66,937
2040	19	£0	£0	£0	£0	£0	£0	£0	£0	2.653	£0.00	£0	£26,489	£70,284	£70,284
2041	20	£0	£0	£0	£0	£0	£0	£0	£0	2.786	£0.00	£0	£26,489	£73,798	£73,798
2042	21	£0	£0	£0	£0	£0	£0	£0	£0	2.925	£0.00	£0	£26,489	£77,488	£77,488
2043	22	£0	£0	£0	£0	£0	£0	£0	£0	3.072	£0.00	£0	£26,489	£81,362	£81,362
2044	23	£0	£0	£0	£0	£0	£0	£0	£0	3.225	£0.00	£0	£26,489	£85,430	£85,430
2045	24	£0	£0	£0	£0	£0	£0	£0	£0	3.386	£0.00	£0	£26,489	£89,702	£89,702
2046	25	£0	£0	£0	£0	£0	£0	£0	£0	3.556	£0.00	£0	£26,489	£94,187	£94,187
2047	26	£0	£0	£0	£0	£0	£0	£0	£0	3.733	£0.00	£0	£26,489	£98,896	£98,896
2048	27	£0	£0	£0	£0	£0	£0	£0	£0	3.920	£0.00	£0	£26,489	£103,841	£103,841
2049	28	£0	£0	£0	£0	£0	£0	£0	£0	4.116	£0.00	£0	£26,489	£109,033	£109,033
2050	29	£0	£0	£0	£0	£0	£0	£0	£0	4.322	£0.00	£0	£26,489	£114,485	£114,485
2051	30	£0	£0	£0	£0	£0	£0	£0	£0	4.538	£0.00	£0	£26,489	£120,209	£120,209
2052	31	£0	£0	£0	£0	£0	£0	£0	£0	4.765	£0.00	£0	£26,489	£126,219	£126,219
2053	32	£0	£0	£0	£0	£0	£0	£0	£0	5.003	£0.00	£0	£26,489	£132,530	£132,530
2054	33	£0	£0	£0	£0	£0	£0	£0	£0	5.253	£0.00	£0	£26,489	£139,157	£139,157
2055	34	£0	£0	£0	£0	£0	£0	£0	£0	5.516	£0.00	£0	£26,489	£146,115	£146,115
2056	35	£0	£0	£0	£0	£0	£0	£0	£0	5.792	£0.00	£0	£26,489	£153,420	£153,420
2057	36	£0	£0	£0	£0	£0	£0	£0	£0	6.081	£0.00	£0	£26,489	£161,091	£161,091
2058	37	£0	£0	£0	£0	£0	£0	£0	£0	6.385	£0.00	£0	£26,489	£169,146	£169,146
2059	38	£0	£0	£0	£0	£0	£0	£0	£0	6.705	£0.00	£0	£26,489	£177,603	£177,603
2060	39	£0	£0	£0	£0	£0	£0	£0	£0	7.040	£0.00	£0	£26,489	£186,483	£186,483
2061	40	£0	£0	£0	£0	£0	£0	£0	£0	7.392	£0.00	£0	£26,489	£195,808	£195,808
2062	41	£0	£0	£0	£0	£0	£0	£0	£0	7.762	£0.00	£0	£26,489	£205,598	£205,598
2063	42	£0	£0	£0	£0	£0	£0	£0	£0	8.150	£0.00	£0	£26,489	£215,878	£215,878
2064	43	£0	£0	£0	£0	£0	£0	£0	£0	8.557	£0.00	£0	£26,489	£226,672	£226,672
2065	44	£0	£0	£0	£0	£0	£0	£0	£0	8.985	£0.00	£0	£26,489	£238,005	£238,005
2066	45	£0	£0	£0	£0	£0	£0	£0	£0	9.434	£0.00	£0	£26,489	£249,906	£249,906
2067	46	£0	£0	£0	£0	£0	£0	£0	£0	9.906	£0.00	£0	£26,489	£262,401	£262,401
2068	47	£0	£0	£0	£0	£0	£0	£0	£0	10.401	£0.00	£0	£26,489	£275,521	£275,521
2069	48	£0	£0	£0	£0	£0	£0	£0	£0	10.921	£0.00	£0	£26,489	£289,297	£289,297
2070	49	£0	£0	£0	£0	£0	£0	£0	£0	11.467	£0.00	£0	£26,489	£303,762	£303,762
2071	50	£0	£0	£0	£0	£0	£0	£0	£0	12.041	£0.00	£0	£26,489	£318,950	£318,950
2072	51	£0	£0	£0	£0	£0	£0	£0	£0	12.643	£0.00	£0	£26,489	£334,897	£334,897
2073	52	£0	£0	£0	£0	£0	£0	£0	£0	13.275	£0.00	£0	£26,489	£351,642	£351,642
2074	53	£0	£0	£0	£0	£0	£0	£0	£0	13.939	£0.00	£0	£26,489	£369,224	£369,224
2075	54	£0	£0	£0	£0	£0	£0	£0	£0	14.636	£0.00	£0	£26,489	£387,686	£387,686
2076	55	£0	£0	£0	£0	£0	£0	£0	£0	15.367	£0.00	£0	£26,489	£407,070	£407,070
2077	56	£0	£0	£0	£0	£0	£0	£0	£0	16.136	£0.00	£0	£26,489	£427,423	£427,423
2078	57	£0	£0	£0	£0	£0	£0	£0	£0	16.943	£0.00	£0	£26,489	£448,794	£448,794
2079	58	£0	£0	£0	£0	£0	£0	£0	£0	17.790	£0.00	£0	£26,489	£471,234	£471,234
2080	59	£0	£0	£0	£0	£0	£0	£0	£0	18.679	£0.00	£0	£26,489	£494,796	£494,796
Total		£3,552,623	£0	£0	£923,781	£0	£4,476,404	£326,730	£4,803,134		£447,248	£5,250,382	£1,562,860	£9,806,629	£15,057,011

Step	Description	Scheme Cost at Each Step
(1)	Outlines the initial estimate of the investment costs in 2020 prices but taking no account of real increases in construction costs. Includes Design cost, Construction cost profile, Land cost, Preparation and Administration costs. Year of	£4,476,404
(2)	The base costs have been adjusted to incorporate risk.	£4,803,134
(3)	The risk adjusted costs have been adjusted to incorporate increases in construction costs.	£5,250,382
(4)	The inflated risk adjusted costs have been adjusted to incorporate whole life costs.	£15,057,011



General Risk Register

Estimate Value (£)

Scheme #: Estimate		Scheme Name:					Junction 3- Fletton Pway Widening				
Ref	Risk/ Opportunity Subject Allocation	Features of Risk/Opportunity	Measures to be Applied - Mitigate, Transfer, Prevent, Accept, Share	Comments on Apportionment, Probability and Assessment of Impact	Holder	Manager	Minimum Impact (£)	Likely Impact (£)	Maximum Impact (£)	Probability (%)	Suggested Client contingency (£)
A	B	C	D	E	F	G	H	I	J	K	
Sequential Reference Number. Use to Group as B	Group Heading - e.g. Design, Labour, Plant etc.	A clear description of the Risk. As an aid to clarity, the drafter should describe the risk as if it begins with the words: "The Risk is that....." It is important that the description is carefully worded so as to define the scope of the risk.	Brief description what measures could be taken to reduce or minimise the risk. Could be used to help evaluate.	Modelling Note. A realistic assessment of resources and costs that will be used to populate the Minimum, Most Likely and Maximum Cost cells	Used to allocate risks to either contractor or client - n.b. impact on change control	Person or Party who will take the measures required to control the risk on behalf of the Holder	Based on Modelling Note in Column E	Based on Modelling Note in Column E	Based on Modelling Note in Column E	Likelihood of the Risk occurring (regardless of impact)	K x (H+I+J)/3. Indicative value where Risk Software is not used
1	Working Areas	Public issues/ Access Issues	Allow % disruption	3% of the cost	Client	Client	£43,564.04	£87,128.07	£174,256.14	16%	£16,263.91
2	Working Areas	Weather disruption	Check forecasts, manage sites accordingly	5 -8 days @ £3000	Client	Client	£50,098.64	£62,623.30	£78,279.13	10%	£6,366.70
3	Working Areas	Working around Stats/3rd Parties/ disrupted working	programme can only allow concurrent working and this will very likely lead to a loss of production for us during the simultaneous working period	3-10% total cost	Client	Client	£130,692.11	£196,038.16	£326,730.27	25%	£54,455.04
4	Working Areas	Under ground condition- soft spots	Delay to the Programme due to dealing with soft spots- additional excavation, disposal and filling works	5% total cost for bridge construction	Client	Client	£25,000.00	£37,500.00	£50,000.00	30%	£11,250.00
5	Working Areas	Contamination	Cost to remove and dispose contaminated materials	3%	Client	Client	£130,692.11	£261,384.21	£261,384.21	10%	£21,782.02
6	Working Areas	RTA	Removal of TM by instruction	5 days@ 3000	Client	Client	£16,500.00	£33,000.00	£33,000.00	30%	£8,250.00
7	Working Areas	Working Restrictions	Restrictions are not clear at the moment, currently assumed that though there may be restriction in some part of the worksite, we will be able to works in a controlled manner.	10% of total Labour and Plant if not work is allowed with in the restricted time	Client	Client	£196,038.16	£294,057.24	£392,076.32	15%	£44,108.59
8	Working Areas	Other issues classed in risk including Risk associated with BREXIT	all other risk that are possible	2.50%	Client	Client	£87,128.07	£174,256.14	£348,512.28	35%	£71,154.59
9	Working Areas	Works delayed by community disruption	Programme could be affected by community disruption	Delay on programme/ rephrasing of works	Client	Client	£217,820.18	£217,820.18	£217,820.18	15%	£32,673.03
10	Working Areas	Risk associated with Covid 19- or its impact/ Associat4ed Inflation	difficult to assess and excluded at this stage	Delay on programme/ rephrasing of works	Client	Client	£108,910.09	£163,365.13	£245,047.70	35%	£60,354.34
11	STATS	Risk of unidentified STATS works		Increase in cost and delay to programme							£544,622.49
							£396,546.89	£677,673.74	£923,649.75	£871,280.71	


Suggested Risk figure

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